MITSUBISHI

MELSOFT

Integrated FA Software

GX Works2 Version 1

Operating Manual

Common

MELSOFT
Integrated FA Software

SW1DNC-GXW2-E

● SAFETY PRECAUTIONS ●

(Always read these instructions before using this product.)

Before using this product, thoroughly read this manual and the relevant manuals introduced in this manual and pay careful attention to safety and handle the products properly.
The precautions given in this manual are concerned with this product. For the safety precautions of the programmable controller system, refer to the User's Manual for the CPU module.

In this manual, the safety precautions are ranked as "⚠WARNING" and "⚠CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that the ⚠CAUTION level may lead to serious consequences according to the circumstances. Always follow the precautions of both levels because they are important for personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[Design Instructions]

⚠ WARNING

- **When data change, program change, or status control is performed from a personal computer to a running programmable controller, create an interlock circuit outside the programmable controller to ensure that the whole system always operates safely.**
  Furthermore, for the online operations performed from a personal computer to a programmable controller CPU, the corrective actions against a communication error due to such as a cable connection fault should be predetermined as a system.

[Startup/Maintenance Instructions]

⚠ CAUTION

- **The online operations performed from a personal computer to a running programmable controller CPU (Program change when a programmable controller CPU is RUN, operating status changes such as forced input/output operation and RUN-STOP switching, and remote control operation) must be executed after the manual has been carefully read and the safety has been ensured.**
  When changing a program while a programmable controller CPU is RUN, it may cause a program corruption in some operating conditions. Fully understand the precautions described in Section 12.9 before use.
- **The positioning test functions of OPR, JOG, inching or positioning data for QD75/LD75 positioning module must be executed with the programmable controller set to STOP after the manual has been carefully read and the safety has been ensured. Specially when executing the function on the network system, ensure the safety thoroughly since the machinery whose operation cannot be checked by an operator may be activated. The operation failure may cause the injury or machine damage.**

● CONDITIONS OF USE FOR THE PRODUCT ●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

Print date	Manual number[*1]	Revision
Jul. 2008	SH(NA)-080779ENG-A	First edition
Jan. 2009	SH(NA)-080779ENG-B	**Model Addition** Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, Q20UDEH, FX series **Addition** MANUALS, Section 2.1, Section 2.1.2, Section 2.1.3, Section 2.1.5, Section 2.1.6, Section 2.1.7, Section 2.1.8, Section 2.3, Section 3.2.8, Section 5.2, Section 12.8, Section 13.2, Section 14.5, Section 14.6, Section 14.7, Section 15.2.2, Section 15.3, Section 15.4, Section 17.1.2, Section 17.4.3, Section 17.4.4, Appendix 6 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.1.4, Section 2.3, Section 2.5, Section 3.2.1, Section 3.2.2, Section 3.2.3, Section 3.2.4, Section 3.2.6, Section 3.3.1, Section 3.3.4, Section 4.1.6, Section 4.1.7, Section 4.2.1, Section 4.3, Section 4.3.1, Section 4.3.5, Section 4.4, Section 4.4.1, Section 4.5.2, Section 4.5.3, Section 4.6, Section 4.6.1, Section 4.7, Section 6.1, Section 6.1.1, Section 6.2, Section 6.2.1, Section 7.1.2, Section 7.2.2, Section 7.2.4, Section 8.1.2, Section 9.1.1, Section 9.1.2, Section 10.1.2, Section 10.2, Section 10.3, Section 11.1.1, Section 11.2.3, Section 11.3, Section 11.8.1, Section 12.2, Section 12.5, Section 12.9.1, Section 12.9.5, Section 13.1.1, Section 14.1, Section 14.3, Section 15.5.4, Section 16.1, Section 16.3, Section 16.5, Section 17.4.1, Section 17.4.2, Section 18.3.2, Chapter 19, Appendix 1, Appendix 2, Appendix 3, Appendix 4, Appendix 5, Appendix 7, Appendix 8, Appendix 9.3
Jul. 2009	SH(NA)-080779ENG-C	**Model Addition** Q00J, Q00, Q01 **Addition** Section 4.1.4, Section 7.2.4, Section 10.3.2, Section 10.3.3, Section 10.3.4, Section 10.3.5, Section 11.1.2, Section 12.9.3, Section 12.10, Section 15.2.1, Section 15.2.2, Section 15.2.3, Section 16.5, Section 18.6.1, Chapter 19 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.3, Section 2.5, Section 3.2.1, Section 3.2.8, Section 4.1.1, Section 4.1.8, Section 4.2.1, Section 4.3.1, Section 4.3.5, Section 4.4, Section 4.6, Section 4.8, Section 5.2, Section 6.1.1, Section 7.1.2, Section 7.2.2, Section 7.2.3, Section 7.3, Section 7.4.2, Section 8.2, Section 9.1.1, Section 9.2.1, Section 9.2.2, Section 10.3.1, Section 10.3.6, Section 11.1, Section 11.2.3, Section 11.4, Section 11.9, Section 12.1, Section 12.1.5, Section 12.5, Section 12.9.1, Section 12.9.4, Section 12.9.6, Section 12.11, Section 14.2.2, Section 14.7, Section 15.1, Section 15.2, Section 16.2, Section 16.4, Section 17.2, Section 18.3, Section 18.4, Section 18.6, Section 20.2, Section 20.3, Section 21.2, Section 22.2.2, Appendix 1, Appendix 2, Appendix 4, Appendix 5, Appendix 6, Appendix 7, Appendix 8, Appendix 9, Appendix 10 **Modification** Section 4.1.4 to 4.1.7 → Section 4.1.5 to 4.1.8, Section 4.6.4 → Section 4.7, Section 4.7 to 4.8 → Section 4.8 to 4.9, Section 7.2.4 to 7.2.5 → Section 7.2.5 to 7.2.6, Section 10.2 to 10.3 → Section 10.1 to 10.2, Section 11.1.2 → Section 11.2.3, Section 11.9.3 to 11.9.5 → Section 11.9.4 to 11.9.6, Section 12.10 → Section 12.11, Section 14.2.3 to 14.2.4 → Section 14.2.2 to 14.2.3, Section 15.1.1 → Section 15.2, Section 15.1.2 → Section 15.4, Section 15.2 to 15.5 → Section 16.1 to 16.4, Chapter 16 to 17 → Chapter 17 to 18, Chapter 18 to 19 → Chapter 20 to 21, Appendix 7 → Appendix 6, Appendix 10 → Appendix 8 **Deletion** Section 3.3.5, Section 4.4.1
Oct. 2009	SH(NA)-080779ENG-D	**Addition** Appendix 13 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3.1, Section 1.3.6, Section 2.1, Section 4.1.7, Section 6.1, Section 10.1.1, Section 10.3, Section 11.8.1, Section 11.8.2, Section 12.2, Section 20.3.2, Section 21.1, Section 21.2, Appendix 1.2, Appendix 1.6, Appendix 4.2, Appendix 4.3, Appendix 4.4, Appendix 4.5, Appendix 4.9, Appendix 4.10, Appendix 4.14, Appendix 7, Appendix 8, Appendix 10.1, Appendix 12

Print date	Manual number*1	Revision
Jan. 2010	SH(NA)-080779ENG-E	**Model Addition** L02, L26-BT **Addition** CONDITIONS OF USE FOR THE PRODUCT, Section 3.3.4, Section 13.2, Section 16.6, Section 18.4.5, Section 18.6.1, Section 18.7, Appendix 10.7, Appendix 14 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.1, Section 2.2, Section 2.3, Section 2.4, Section 3.2.7, Section 4.1.1, Section 4.1.3, Section 4.1.7, Section 4.1.8, Section 4.3, Section 4.5.1, Section 4.5.5, Section 4.6, Section 6.1, Section 6.2, Section 6.3, Section 6.4, Section 7.1.2, Section 7.2.6, Section 7.3, Section 9.1.2, Section 9.4.2, Section 10.1, Section 10.2, Section 10.3, Section 11.2.1, Section 11.2.3, Section 11.3, Section 11.5, Section 11.7, Section 11.8.1, Section 11.8.2, Section 12.1, Section 12.1.2, Section 12.1.4, Section 12.2, Section 12.3, Section 12.5, Section 12.6, Section 12.8, Section 12.8.2, Section 12.9.1, Section 12.9.2, Section 12.9.4, Section 12.9.5, Section 12.9.6, Section 12.10.2, Section 12.10.3, Section 12.10.4, Section 12.11, Section 12.11.1, Section 12.11.2, Section 13.3.1, Section 13.3.2, Section 13.3.3, Section 14.1.2, Section 14.5, Section 14.7, Section 15.1, Section 15.2, Section 15.2.1, Section 15.2.3, Section 16.1, Section 16.4.1, Section 16.4.2, Section 16.4.3, Section 16.4.4, Section 17.1, Section 17.2, Section 17.3, Section 17.4, Section 17.5, Section 18.1.1, Section 18.1.2, Section 18.1.3, Section 18.1.4, Section 18.4.1, Section 18.4.3, Section 18.5, Section 18.5.2, Section 18.5.3, Section 18.6, Section 19.3, Section 19.4.1, Section 19.4.2, Section 19.5.3, Section 19.6, Section 19.8, Section 21.1, Section 21.2, Appendix 1, Appendix 1.1, Appendix 1.3, Appendix 1.4, Appendix 1.5, Appendix 1.6, Appendix 1.7.1, Appendix 1.8, Appendix 2.1, Appendix 2.2, Appendix 2.3, Appendix 2.4, Appendix 4.2, Appendix 4.9, Appendix 4.13, Appendix 5, Appendix 6, Appendix 7, Appendix 8.1, Appendix 9, Appendix 10, Appendix 10.1, Appendix 10.2, Appendix 10.3, Appendix 10.4, Appendix 10.5, Appendix 10.6, Appendix 10.7, Appendix 12
Apr. 2010	SH(NA)-080779ENG-F	**Model Addition** Q50UDEH, Q100UDEH, LJ72GF15-T2 **Addition** Section 4.1.8, Section 6.1.1, Section 6.1.2, Section 6.2.1, Section 12.12, Section 18.1.4, Section 18.4, Appendix 4.13, Appendix 10.8 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.1, Section 1.2, Section 1.3.1, Section 2.1.1, Section 2.1.2, Section 2.1.3, Section 2.1.8, Section 2.3, Section 2.5, Section 3.2, Section 3.4, Section 3.5, Section 4.1.2, Section 4.6, Section 4.6.3, Section 4.8, Section 4.8.5, Section 6.1, Section 6.1.1, Section 6.4, Section 10.1.1, Section 11.1.1, Section 11.2.3, Section 11.3, Section 11.4, Section 11.5, Section 11.6, Section 11.7, Section 12.4.1, Section 12.6, Section 12.8, Section 12.9.1, Section 12.9.2, Section 12.9.6, Section 11.2.3, Section 14.1.2, Section 14.2.2, Section 16.1, Section 16.4.2, Section 16.4.3, Section 17.1, Section 17.2, Section 17.3, Section 17.6, Section 18.1, Section 18.3, Section 18.4, Section 18.5.3, Section 18.7, Section 18.7.2, Section 20.1, Section 20.3.2, Section 21.1, Section 21.2, Chapter 22, Appendix 1.1, Appendix 1.6, Appendix 2, Appendix 4.1, Appendix 4.2, Appendix 4.5, Appendix 4.9, Appendix 4.13, Appendix 5, Appendix 6, Appendix 7, Appendix 10, Appendix 12, Appendix 13 **Modification** Section 18.4 to 18.6 → Section 18.5 to 18.7, Appendix 4.13 to 4.14 → Appendix 4.14 to 4.15

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Sept. 2010	SH(NA)-080779ENG-G	**Model Addition** QJ72LP25, QJ72BR15 **Addition** Section 16.2.2, Section 17.7, Section 18.8, Appendix 2.3, Appendix 15 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.2, Section 1.3.1, Section 1.3.2, Section 1.3.4, Section 1.3.5, Section 1.3.8, Section 2.1, Section 2.1.2, Section 2.1.4, Section 2.1.6, Section 2.1.7, Section 2.2, Section 2.2.1, Section 2.3, Section 3.2.1, Section 3.2.2, Section 3.2.3, Section 3.2.4, Section 3.2.6, Section 3.3, Section 3.3.4, Section 3.3.5, Section 4.1.1, Section 4.1.2, Section 4.1.3, Section 4.1.7, Section 4.1.8, Section 4.2.1, Section 4.2.5, Section 4.5.3, Section 4.5.5, Section 4.6, Section 4.6.1, Section 4.7, Section 4.8, Section 4.8.5, Section 4.9, Section 6.1.1, Section 6.2, Section 6.2.1, Section 9.1.2, Section 9.2.1, Section 9.2.2, Section 10.1, Section 10.1.1, Section 10.2, Section 10.3, Section 10.3.1, Section 10.3.2, Section 10.3.3, Section 10.3.4, Section 10.3.5, Section 11.1, Section 11.1.1, Section 11.2, Section 11.2.1, Section 11.2.2, Section 11.2.3, Section 11.3, Section 11.4, Section 11.5, Section 11.6, Section 11.7.1, Section 11.7.2, Section 11.8.1, Section 11.8.2, Section 11.9, Section 12.1, Section 12.1.3, Section 12.1.4, Section 12.1.5, Section 12.2, Section 12.3, Section 12.4, Section 12.8, Section 12.9.1, Section 12.9.5, Section 12.12, Section 13.1, Section 13.1.1, Section 13.2, Section 13.2.1, Section 14.1.1, Section 14.1.2, Section 14.2.1, Section 14.2.2, Section 14.3, Section 15.1.2, Section 15.2, Section 17.1, Section 17.2, Section 17.3, Section 17.4, Section 17.7, Section 18.1.1, Section 18.1.4, Section 18.2.5, Section 18.2.7, Section 18.2.8, Section 18.3, Section 18.4, Section 18.4.4, Section 18.4.5, Section 18.4.6, Section 18.5.1, Section 18.5.3, Section 18.6.2, Section 18.6.3, Section 18.6.4, Section 18.7, Section 21.2, Appendix 1.1, Appendix 1.2, Appendix 1.6, Appendix 2.1, Appendix 2.2, Appendix 2.4, Appendix 2.5, Appendix 4.2, Appendix 4.5, Appendix 4.12, Appendix 4.14, Appendix 4.15, Appendix 6.1, Appendix 6.2, Appendix 7, Appendix 8, Appendix 9, Appendix 10.1, Appendix 10.2, Appendix 10.3, Appendix 10.4, Appendix 10.5, Appendix 10.6, Appendix 10.7, Appendix 10.9, Appendix 12, Appendix 15 **Modification** Appendix 4.6.3 → Appendix 4.6.2, Appendix 2.3 → Appendix 2.4
Jan. 2011	SH(NA)-080779ENG-H	**Addition** TERMS, Section 3.3, Section 4.1, Section 12.5, Section 14.1, Section 14.3.4, Section 20.4, Appendix 16 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.1.1, Section 2.1.3, Section 2.2, Section 2.3, Section 3.2.5, Section 3.2.6, Section 4.1.2, Section 4.2.1, Section 4.2.2, Section 4.2.3, Section 4.2.4, Section 4.2.5, Section 4.2.7, Section 4.2.8, Section 4.3.1, Section 4.3.5, Section 4.7.1, Section 4.8, Section 6.1.2, Section 8.2, Section 9.4.1, Section 9.4.2, Section 10.1.1, Section 10.2, Section 11.8, Section 12.1.5, Section 12.1.6, Section 12.2, Chapter 14, Section 16.3, Section 18.1.1, Section 18.7, Section 19.1.1, Section 19.1.3, Section 20.2, Section 20.3.1, Section 20.3.2, Section 21.2, Appendix 1.1, Appendix 1.4, Appendix 1.8, Appendix 4, Appendix 7, Appendix 12, Appendix 15, Appendix 16 **Modification** Section 4.1 to 4.9 → Section 4.2 to 4.10, Section 12.5 → Section 12.6, Section 14.1 to 14.7 → Section 14.2 to 14.8
Mar. 2011	SH(NA)-080779ENG-I	**Addition** Section 4.9, Section 16.6, Section 20.1, Section 20.3, Section 20.4, Section 20.5, Section 20.6, Section 20.11, **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.1, Section 1.3.1, Section 1.3.3, Section 2.2, Section 2.3, Section 3.3, Section 4.2.1, Section 4.2.2, Section 4.2.3, Section 4.2.4, Section 4.3.2, Section 4.6.1, Section 4.7.1, Section 6.1.1, Section 6.2, Section 6.4, Section 10.1, Section 10.2, Section 10.3, Section 11.1.1, Section 12.1.5, Section 12.7.1, Section 12.9.1, Section 14.1.2, Section 14.6.2, Section 15.1.2, Section 15.3, Section 16.6.3, Section 18.4, Section 18.6.3, Section 20.5.7, Section 20.8.1, Section 21.2, Appendix 1.1, Appendix 1.6, Appendix 4, Appendix 7, Appendix 10, Appendix 12, Appendix 13, Appendix 16, Appendix 17 **Modification** Section 20.1 → Section 20.2, Section 20.2 → Section 20.9, Section 20.3.1 → Section 20.7, Section 20.3.2 → Section 20.10, Section 20.4 → Section 20.8, Appendix 15 and 16 → Appendix 16 and 17

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Jul. 2011	SH(NA)-080779ENG-J	**Model Addition** L02-P, L26-PBT **Addition** Section 2.1.9, Section 3.4.1, Section 4.1.2, Section 5.2, Section 5.3, Section 10.1.2, Section 12.10.4, Section 20.5.1, Section 20.5.2, Section 20.5.3, Section 20.5.8, Section 20.5.12, Section 20.5.13, Section 20.5.14, Section 20.5.15, Section 20.5.16, Section 20.5.18, Appendix 1.2 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, TERMS, Section 1.3.1, Section 1.3.2, Section 1.3.3, Section 1.3.6, Section 2.1, Section 2.2, Section 2.3, Section 2.5, Section 3.1, Section 3.3, Section 3.4, Section 4.1, Section 4.1.1, Section 4.2.1, Section 4.2.2, Section 4.2.3, Section 4.2.7, Section 4.2.8, Section 4.3.1, Section 4.11, Section 4.11.2, Section 6.1.1, Section 9.1.1, Section 9.2.2, Section 9.4.2, Section 10.1, Section 10.1.1, Section 10.1.3, Section 10.2, Section 10.3.1, Section 10.3.2, Section 10.3.3, Section 10.3.4, Section 11.6, Section 12.1, Section 12.1.5, Section 12.1.6, Section 12.9.1, Section 12.9.6, Section 12.10.1, Section 12.10.2, Section 12.10.3, Section 13.3, Section 16.6, Section 16.6.1, Section 16.6.2, Section 16.6.3, Section 16.6.4, Section 16.6.5, Section 16.6.8, Section 17.1, Section 17.5, Section 18.1.1, Section 18.4, Section 18.5.1, Section 18.6.2, Section 20.1, Section 20.3, Section 20.4, Section 20.5.2, Section 20.5.3, Section 20.5.13, Section 20.5.18, Section 20.5.4, Section 20.5.5, Section 20.5.6, Section 20.5.9, Section 20.5.11, Section 20.10, Section 20.11, Section 21.1, Section 21.2, Appendix 1.1, Appendix 1.7, Appendix 4.2, Appendix 4.5, Appendix 4.10, Appendix 4.13, Appendix 4.16, Appendix 4.18, Appendix 6.1, Appendix 6.2, Appendix 7, Appendix 10.9, Appendix 12 **Modification** Section 2.1.9 → Section 2.1.10, Section 3.4.6 and Section 3.4.7 → Section 3.4.3 and Section 3.4.4, Section 4.1.2 → Section 4.1.3, Section 5.2 → Section 5.4, Section 10.1.2 → Section 10.1.3, Section 12.10.4 → Section 12.10.5, Section 20.5.1 to Section 20.5.4 → Section 20.5.4 to Section 20.5.7, Section 20.5.5 to Section 20.5.7 → Section 20.5.9 to Section 20.5.11, Section 20.5.8 → Section 20.5.17, Appendix 1.2 to Appendix 1.8 → Appendix 1.3 to Appendix 1.9 **Deletion** Section 3.4.2, Section 3.4.3, Section 3.4.5, Section 3.4.6
Sept. 2011	SH(NA)-080779ENG-K	**Addition** Section 2.1.10, Section 9.5, Section 11.9, Section 20.3.1 **Correction** TERMS, Section 1.3.1, Section 2.1, Section 3.2.6, Section 3.4, Section 4.2.7, Section 4.2.8, Section 4.6.5, Section 6.2, Section 9.1.2, Section 9.2.1, Section 9.4.2, Section 11.1.1, Section 12.1.3, Section 12.2, Section 18.1.1, Section 20.2, Section 20.3, Section 20.4, Section 20.5.4, Section 20.5.5, Section 20.5.6, Section 20.5.9, Section 20.5.11, Section 20.5.12, Section 20.5.14, Section 20.11, Appendix 4.3, Appendix 4.6, Appendix 4.16, Appendix 5.1, Appendix 6.1, Appendix 7, Appendix 8, Appendix 10, Appendix 12, Appendix 13.1, Appendix 13.2 **Modification** Section 2.1.10 → Section 2.1.11, Section 11.9 → Section 11.10 **Deletion** Section 6.2.2

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Nov. 2011	SH(NA)-080779ENG-L	**Addition** Section 1.3.7, Section 4.3.5, Section 6.2.2, Section 6.2.3, Section 6.2.4, Section 6.5, Section 6.6, Chapter 22, Appendix 4.16, Appendix 18 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, TERMS, Section 1.1, Section 1.3.1, Section 1.3.2, Section 1.3.3, Section 1.3.6, Section 2.1, Section 2.1.7, Section 2.1.10, Section 3.2.1, Section 4.2.7, Section 4.2.8, Section 4.7.1, Section 6.1.2, Section 6.2, Section 6.4, Section 9.3.1, Section 9.3.2, Section 9.4.2, Section 10.1, Section 10.2, Section 11.1, Section 11.2.1, Section 11.3, Section 11.8.1, Section 11.9, Section 12.1.3, Section 12.1.6, Section 12.2, Section 12.11.1, Section 13.1, Section 13.2, Section 14.1.1, Section 15.1.2, Section 16.4.3, Section 18.5.1, Section 18.5.2, Section 18.5.3, Section 18.5.4, Section 18.5.5, Section 18.7, Section 20.1, Section 21.2, Appendix 1.1, Appendix 1.3, Appendix 1.6, Appendix 1.7, Appendix 2.2, Appendix 2.3, Appendix 2.4, Appendix 4.1, Appendix 4.3, Appendix 4.5, Appendix 4.6, Appendix 4.11, Appendix 4.17, Appendix 4.19, Appendix 7, Appendix 8.1, Appendix 9, Appendix 12, Appendix 15, Appendix 17 **Modification** Section 1.3.7 to Section 1.3.9 → Section 1.3.8 to Section 1.3.10, Section 4.3.5 → Section 4.3.6, Appendix 2.1 to Appendix 2.2 → Appendix 2.2 to Appendix 2.3, Appendix 2.3 → Appendix 2.1, Appendix 4.16 to Appendix 4.18 → Appendix 4.17 to Appendix 4.19
Jan. 2012	SH(NA)-080779ENG-M	**Model Addition** FX3GC **Addition** Section 18.4.2 **Correction** Section 1.3.1, Section 2.1.3, Section 2.1.7, Section 2.1.10, Section 2.3, Section 3.4.1, Section 4.2.8, Section 6.1.1, Section 6.2.1, Section 6.2.2, Section 11.1.1, Section 11.9, Section 12.1, Section 12.1.6, Section 12.9.6, Section 18.4, Section 18.4.4, Section 18.4.6, Section 18.4.7, Section 20.5.2, Section 21.2, Appendix 4.17, Appendix 7, Appendix 10.1, Appendix 10.7, Appendix 12 **Modification** Section 18.4.2 to Section 18.4.6 → Section 18.4.3 to Section 18.4.7 **Deletion** Section 4.7.3

Print date	Manual number[*1]	Revision
May 2012	SH(NA)-080779ENG-N	**Model Addition** Q02PH, Q06PH, Q12PH, Q12PRH, Q25PH, Q25PRH **Addition** Section 6.2, Section 9.4, Section 11.5, Section 12.11.2, Section 17.2, Section 20.5.1, Section 20.5.4, Section 20.5.6, Appendix 4.20, Appendix 10.5, Appendix 10.6, Appendix 11.2 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, TERMS, Section 1.3.1, Section 1.3.2, Section 1.3.3, Section 2.1.7, Section 2.1.10, Section 2.2, Section 2.2.1, Section 2.3, Section 2.4, Section 3.2.1, Section 3.2.2, Section 3.2.5, Section 3.2.6, Section 3.2.7, Section 3.3, Section 3.4.1, Section 4.2.1, Section 4.2.2, Section 4.2.7, Section 4.2.8, Section 4.3.2, Section 4.3.6, Section 4.5, Section 4.6.5, Section 4.7.1, Section 4.10.4, Section 4.11.1, Section 5.2, Section 5.3, Section 6.1, Section 6.1.1, Section 6.2.2, Section 6.2.4, Section 6.3, Section 6.3.1, Section 6.5, Section 6.7, Section 7.2.2, Section 9.1.1, Section 9.1.2, Section 9.2.2, Section 9.5.2, Section 10.1, Section 10.1.1, Section 10.1.2, Section 10.2, Section 11.1.1, Section 11.3, Section 11.4, Section 12.1.6, Section 12.2, Section 12.9.1, Section 12.9.6, Section 12.10.3, Section 14.1.2, Section 14.3, Section 14.4, Section 14.6.2, Section 17.1, Section 17.3, Section 18.1.1, Section 18.1.4, Section 18.6.3, Section 18.6.4, Section 18.7, Section 18.8, Section 20.1, Section 20.5.7, Section 20.5.8, Section 20.5.9, Section 20.5.12, Section 20.10, Section 20.11, Section 21.1, Section 21.2, Appendix 1.1, Appendix 1.3, Appendix 1.7, Appendix 2.3, Appendix 2.4, Appendix 2.5, Appendix 4.1, Appendix 4.2, Appendix 4.4, Appendix 4.5, Appendix 4.10, Appendix 4.17, Appendix 5, Appendix 6.1, Appendix 6.2, Appendix 7, Appendix 8, Appendix 10, Appendix 10.2, Appendix 10.3, Appendix 10.4, Appendix 10.7, Appendix 10.8, Appendix 10.9, Appendix 11, Appendix 12, Appendix 13, Appendix 14, Appendix 17 **Modification** Section 6.2 to Section 6.6 → Section 6.3 to Section 6.7, Section 9.4 to Section 9.5 → Section 9.5 to Section 9.6, Section 11.5 to Section 11.10 → Section 11.6 to Section 11.11, Section 17.2 to Section 17.7 → Section 17.3 to Section 17.8, Section 20.5.1 to Section 20.5.2 → Section 20.5.2 to Section 20.5.3, Section 20.5.3 → Section 20.5.5, Section 20.5.4 to Section 20.5.18 → Section 20.5.7 to Section 20.5.21, Appendix 10.5 to Appendix 10.9 → Appendix 10.7 to Appendix 10.11
Sept. 2012	SH(NA)-080779ENG-O	**Addition** Section 1.3.7, Section 6.3.2, Section 12.1.6 **Correction** MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, TERMS, Section 1.3.1, Section 3.2.2, Section 3.3, Section 4.2.1, Section 4.2.7, Section 4.2.8, Section 4.5, Section 4.6.5, Section 4.7.1, Section 5.2, Section 5.3, Section 6.1.1, Section 6.3.1, Section 6.3.3, Section 6.3.4, Section 6.5, Section 9.1.1, Section 10.1.1, Section 10.1.2, Section 10.2, Section 10.3.1, Section 10.3.2, Section 10.3.3, Section 10.3.4, Section 10.3.5, Section 11.2.2, Section 12.1, Section 12.1.4, Section 12.1.7, Section 12.9.1, Section 12.9.6, Section 12.10.5, Section 15.2, Section 16.4.3, Section 16.4.4, Section 16.4.5, Section 18.4, Section 18.6, Section 18.6.2, Section 18.6.3, Section 18.7, Section 21.1, Section 21.2, Appendix 1.6, Appendix 7, Appendix 10.11, Appendix 11, Appendix 12 **Modification** Section 1.3.7 to Section 1.3.10 → Section 1.3.8 to Section 1.3.11, Section 6.3.2 to Section 6.3.4 → Section 6.3.3 to Section 6.3.5

Print date	Manual number*1	Revision
Feb. 2013	SH(NA)-080779ENG-P	**Model Addition** Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV, L02S, L06, L26, LJ72MS15 **Addition** Section 1.3.9, Section 1.3.10, Section 4.11, Section 13.1, Section 13.5, Section 18.3.2, Section 18.7, Appendix 13 **Correction** GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3.1, Section 1.3.2, Section 1.3.7, Section 1.3.8, Section 2.1, Section 2.2, Section 2.3, Section 2.4, Section 3.1, Section 3.2.1, Section 3.2.2, Section 3.2.3, Section 3.2.5, Section 3.2.8, Section 4.2.2, Section 4.2.8, Section 4.5, Section 4.8, Section 4.12.1, Section 6.1, Section 6.1.1, Section 6.3, Section 6.3.1, Section 6.3.2, Section 6.3.3, Section 6.3.5, Section 6.4 Section 9.1.1, Section 9.3.1, Section 9.3.2, Section 9.4, Section 10.1.1, Section 10.1.2, Section 11.2.2, Section 11.5.3, Section 11.7, Section 11.8, Section 11.9.1, Section 11.10, Section 12.1, Section 12.1.7, Section 12.5, Section 12.8, Section 12.10.2, Section 12.10.5, Section 12.11.1, Section 12.11.2, Section 13.1, Section 13.2, Section 13.3, Section 14.2, Section 14.3, Section 14.6, Section 14.6.1, Section 14.6.2, Section 14.6.3, Section 15.1, Section 15.2, Section 15.3, Section 16.2.1, Section 16.3.1, Section 16.3.2, Section 16.3.3, Section 16.4.2, Section 16.4.5, Section 16.6.2, Section 16.6.3, Section 16.6.4, Section 16.7, Section 17.4, Section 17.7, Section 18.1.1, Section 18.1.4, Section 18.3, Section 18.4, Section 18.4.2, Section 18.5.1, Section 18.5.2, Section 18.5.3, Section 18.5.4, Section 18.5.5, Section 18.6.1, Section 18.6.2, Section 18.6.3, Section 19.4.1, Section 20.5.8, Section 20.10, Section 21.2, Section 22.1.1, Appendix 1.1, Appendix 1.7, Appendix 2.2, Appendix 2.3, Appendix 2.4, Appendix 2.5, Appendix 4.2, Appendix 4.3, Appendix 4.5, Appendix 4.13, Appendix 4.15, Appendix 6.2, Appendix 7, Appendix 10, Appendix 10.2, Appendix 10.3, Appendix 10.4, Appendix 10.5, Appendix 10.6, Appendix 10.7, Appendix 10.8, Appendix 10.9, Appendix 10.10, Appendix 10.11, Appendix 10.12, Appendix 12 **Modification** Section 1.3.9 to Section 1.3.11 → Section 1.3.11 to Section 1.3.13, Section 4.11 → Section 4.12, Section 13.1 to Section 13.3 → Section 13.2 to Section 13.4, Section 18.3.2 to Section 18.3.3 → Section 18.3.3 to Section 18.3.4, Section 18.7 to Section 18.9 → Section 18.8 to Section 18.10, Appendix 13 to Appendix 18 → Appendix 14 to Appendix 19

*1 : The manual number is written at the bottom left of the back cover.

Japanese Manual Version SH-080730-AB

INTRODUCTION

Thank you for purchasing the Mitsubishi integrated FA software, MELSOFT series.
Before using the product, thoroughly read this manual to develop full familiarity with the functions and performance to ensure correct use.

CONTENTS

5 EDITING PROGRAMS

12 WRITING/READING DATA

15 SIMULATING PROGRAMS

16 DEBUGGING PROGRAMS

17 OPERATING PROGRAMMABLE CONTROLLER CPU

18 DIAGNOSING PROGRAMMABLE CONTROLLER STATUS

19 SIMULATING OPERATIONS OF EXTERNAL DEVICES

20 PRINTING

INDEX

■ MANUALS

Related manuals are separately issued according to the purpose of their functions in GX Works2.

● **Related manuals**

The manuals related to this product are shown below.
Refer to the following tables when ordering required manuals.

1) Operation of GX Works2

Manual name	Manual number (Model code)
GX Works2 Version 1 Operating Manual (Simple Project) Explains methods for such as creating and monitoring programs in Simple project of GX Works2. (Sold separately)	SH-080780ENG (13JU64)
GX Works2 Version 1 Operating Manual (Simple Project, Function Block) Explains methods for such as creating function blocks, pasting function blocks to sequence programs, and operating FB library in Simple project of GX Works2. (Sold separately)	SH-080984ENG (13JU72)
GX Works2 Version 1 Operating Manual (Structured Project) Explains methods for such as creating and monitoring programs in Structured project of GX Works2. (Sold separately)	SH-080781ENG (13JU65)
GX Works2 Version 1 Operating Manual (Intelligent Function Module) Explains methods of intelligent function module for such as parameter setting, monitoring programs, and predefined protocol support function in GX Works2. (Sold separately)	SH-080921ENG (13JU69)
GX Works2 Beginner's Manual (Simple Project) Explains fundamental methods for such as creating, editing, and monitoring programs in Simple project for users inexperienced with GX Works2. (Sold separately)	SH-080787ENG (13JZ22)
GX Works2 Beginner's Manual (Structured Project) Explains fundamental methods for such as creating, editing, and monitoring programs in Structured project for users inexperienced with GX Works2. (Sold separately)	SH-080788ENG (13JZ23)

2) Structured programming

Manual name	Manual number (Model code)
MELSEC-Q/L/F Structured Programming Manual (Fundamentals) Explains the programming methods, types of programming languages, and other information required to create structured programs. (Sold separately)	SH-080782ENG (13JW06)
MELSEC-Q/L Structured Programming Manual (Common Instructions) Explains the specifications and functions of common instructions such as sequence instructions, basic instructions, and application instructions, that can be used in structured programs. (Sold separately)	SH-080783ENG (13JW07)
MELSEC-Q/L Structured Programming Manual (Application Functions) Explains the specifications and functions of application functions that can be used in structured programs. (Sold separately)	SH-080784ENG (13JW08)
MELSEC-Q/L Structured Programming Manual (Special Instructions) Explains the specifications and functions of special instructions such as module dedicated instruction, PID control instruction, and built-in I/O function dedicated instruction, that can be used in structured programs. (Sold separately)	SH-080785ENG (13JW09)
FXCPU Structured Programming Manual [Device & Common] Explains the devices and parameters provided in GX Works2 for structured programming. (Sold separately)	JY997D26001 (09R925)
FXCPU Structured Programming Manual [Basic & Applied Instruction] Explains the sequence instructions provided in GX Works2 for structured programming. (Sold separately)	JY997D34701 (09R926)
FXCPU Structured Programming Manual [Application Functions] Explains the application functions provided in GX Works2 for structured programming. (Sold separately)	JY997D34801 (09R927)

3) Operation of iQ Works

Manual name	Manual number (Model code)
iQ Works Beginner's Manual Explains fundamental methods for such as managing the system using MELSOFT Navigator and using system labels for users inexperienced with GX Works2. (Sold separately)	SH-080902ENG (13JZ44)

Point

The Operating Manuals are included on the CD-ROM of the software package in a PDF file format. Manuals in printed form are sold separately for single purchase. Order a manual by quoting the manual number (model code) listed in the table above.

● **Purpose of this manual**

This manual explains the functions that are common to Simple project and Structured project, including system configuration, parameter settings, and operation methods for online functions of GX Works2. Manuals for reference are listed in the following table according to their purpose.
For information such as the content and number of each manual, refer to the list of 'Related manuals'.

1) Installation of GX Works2 and USB driver

Purpose	GX Works2 Installation Instructions	GX Works2 Version 1 Operating Manual
		Common
Learning the operating environment and installation method	Details	
Learning a USB driver installation method		Details

2) Operation of GX Works2

Purpose	GX Works2 Beginner's Manual		GX Works2 Version 1 Operating Manual				
	Simple Project	Structured Project	Common	Simple Project		Structured Project	Intelligent Function Module
					Function Block		
Learning all functions of GX Works2			Outline				
Learning the project types and available languages in GX Works2			Outline				
Learning the basic operations and operating procedures when creating a simple project for the first time	Details						
Learning the basic operations and operating procedures when creating a structured project for the first time		Details					
Learning the operations of available functions regardless of project type.			Details				
Learning the functions and operation methods for programming			Outline	Details		Details	
Learning the operations and operating procedures when creating function blocks (FB) in Simple project.					Details		
Learning data setting methods for intelligent function module							Details

3) Operations in each programming language

For details of instructions used in each programming language, refer to the section 4 and the section 5 on the following pages.

Purpose		GX Works2 Beginner's Manual		GX Works2 Version 1 Operating Manual	
		Simple Project	Structured Project	Simple Project	Structured Project
Simple Project	Ladder Diagram				
	Sequential Function Chart				
	Structured Text				
Structured Project	Ladder Diagram				
	Sequential Function Chart				
	Structured Ladder/ FBD				
	Structured Text				

*1 : MELSAP3 and FX series SFC only

4) Details of instructions in each programming language (for QCPU (Q mode)/LCPU)

Purpose		MELSEC-Q/L/F Structured Programming Manual	MELSEC-Q/L Structured Programming Manual			MELSEC-Q/L Programming Manual	MELSEC-Q/L/QnA Programming Manual		Manual for module to be used
		Fundamentals	Common Instructions	Special Instructions	Application Functions	Common Instruction	PID Control Instructions	SFC	–
All languages	Learning details of programmable controller CPU error codes, special relays, and special registers					Details			
Using Ladder Diagram	Learning the types and details of common instructions					Details			
	Learning the types and details of instructions for intelligent function modules								Details
	Learning the types and details of instructions for network modules								Details
	Learning the types and details of instructions for the PID control function						Details		
Using Sequential Function Chart	Learning details of specifications, functions, and instructions of SFC (MELSAP3)							Details	
Using Structured Ladder/ FBD or Structured Text	Learning the fundamentals for creating a structured program	Details							
	Learning the types and details of common instructions		Details						
	Learning the types and details of instructions for intelligent function modules			Outline					Details
	Learning the types and details of instructions for network modules			Outline					Details
	Learning the types and details of instructions for the PID control function			Outline			Details		
	Learning the types and details of application functions				Details				

5) Details of instructions in each programming language (for FXCPU)

Purpose		MELSEC-Q/L/F Structured Programming Manual	FXCPU Structured Programming Manual			FXCPU Programming Manual		
		Fundamentals	Device & Common	Basic & Applied Instruction	Application Functions	FX0, FX0S, FX0N, FX1, FXU, FX2C	FX1S, FX1N, FX2N, FX1NC, FX2NC	FX3G, FX3U, FX3GC, FX3UC
Using Ladder Diagram	Learning the types and details of basic/ application instructions, descriptions of devices and parameters					Details	Details	Details
Using Sequential Function Chart	Learning details of specifications, functions, and instructions of SFC					Details	Details	Details
Using Structured Ladder/ FBD or Structured Text	Learning the fundamentals for creating a structured program	Details						
	Learning the descriptions of devices, parameters, and error codes		Details					
	Learning the types and details of sequence instructions			Details				
	Learning the types and details of application instructions				Details			

● How to read this manual

Supported CPU

Supported programmable controller CPUs are shown in icons under the section title.

Screen display

Describes the screen display procedure.
Follow the ⇒ and select [(menu)] to open the screen.
*Screen display may differ depending on the CPU type.
In that case, typical example is described.

Display contents

Describes the display contents on the screen.

Reference location

☞ leads to the reference location and reference manual.

Section title

Clarifies the section of currently open page.

Chapter heading

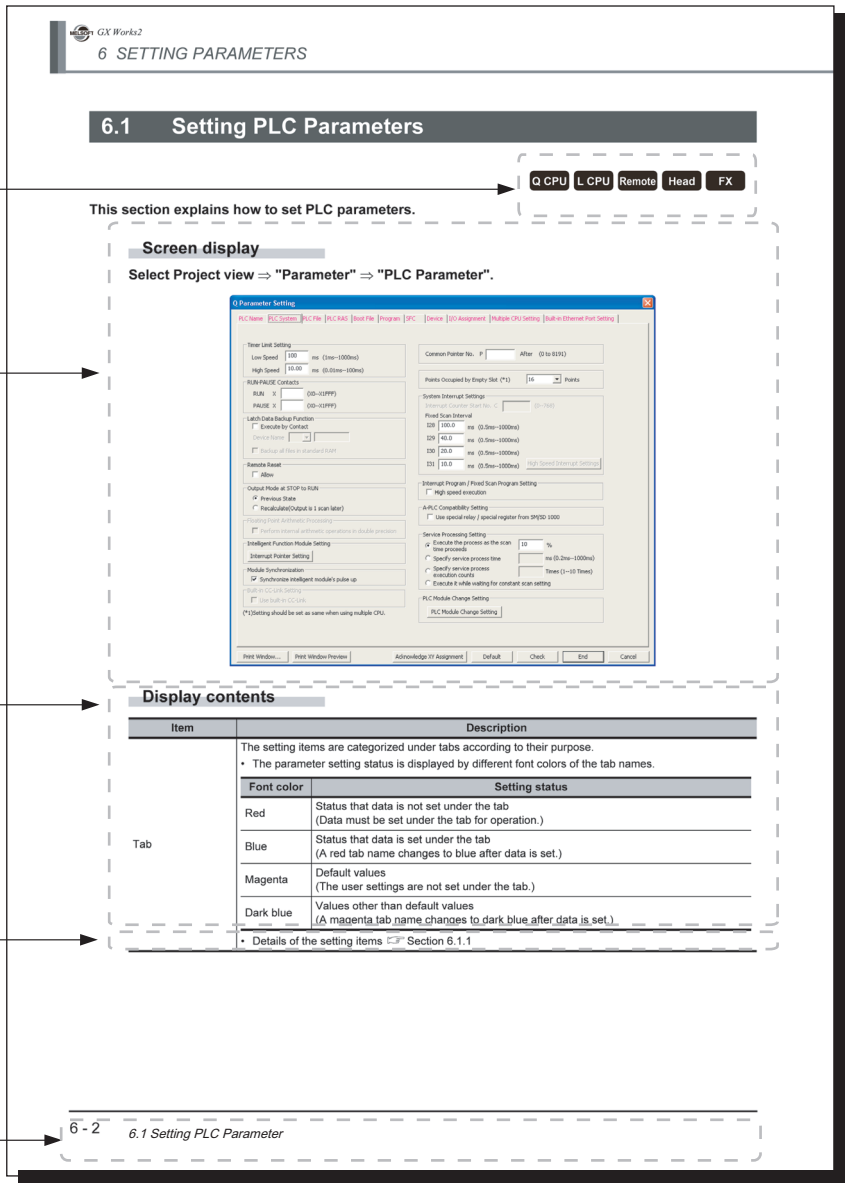
Index on the right of the page number clarifies the chapter of currently open page.

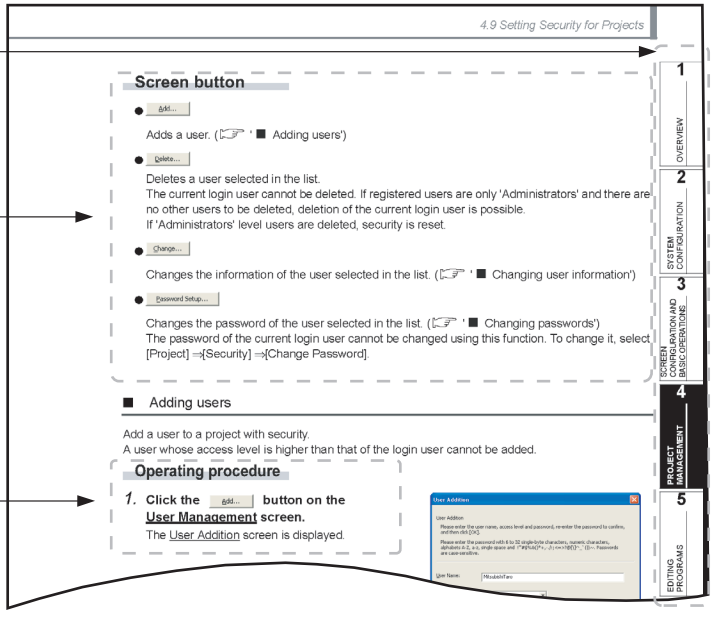
Screen button

Describes the buttons in the screen.

Operating procedure

Describes the operating procedure of the function.





The following table explains the CPU module icons that indicate the function availability.

Icon					Description
QCPU (Q mode)	LCPU	Remote I/O	Communication head module	FXCPU	
Q CPU	L CPU	Remote	Head	FX	Normal icons indicate that the corresponding function is available.
*1 Q CPU	*1 L CPU	–	*1 Head	*1 FX	Icons with * (asterisk) symbol indicate that the corresponding function is available with restrictions such as CPU types.
Q CPU	L CPU	Remote	Head	FX	Icons with × symbol indicate that the corresponding function is not available.

This manual also uses the following columns:

Point

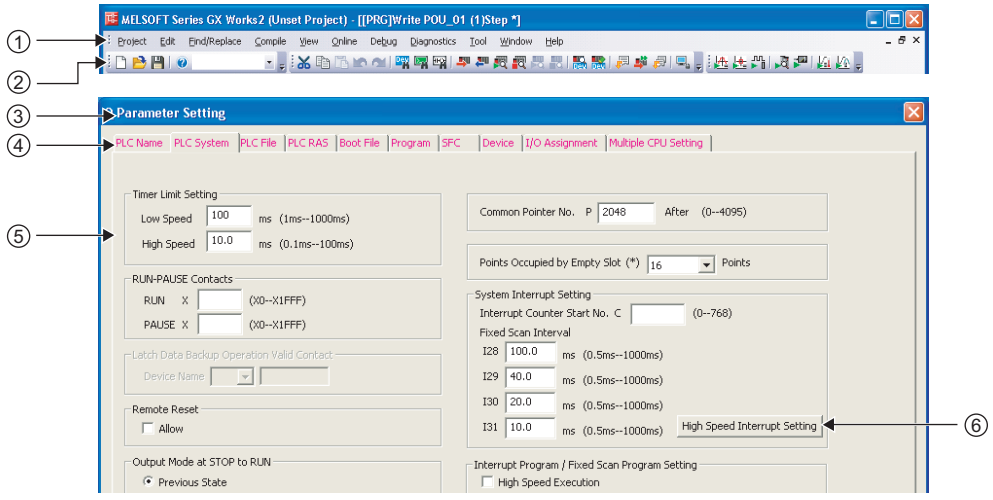
This indicates notes requiring attention or useful functions relating to the information given on the same page.

Restrictions

This indicates restrictions relating to the information given on the same page.

● Symbols used in this manual

The following shows the symbols used in this manual with descriptions and examples.



No.	Symbol	Description	Example
①	[ ]	Menu name on a menu bar	[Project]
②		Toolbar icon	
③	(Underline)	Screen name	Q Parameter Setting screen
④	《 》	Tab name in a screen	<<PLC System>>
⑤	" "	Item name in a screen	"Timer Limit Setting"
⑥		Button on a screen	High Speed Interrupt Setting button
–		Keyboard key	Ctrl

■ GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL

The following are the generic terms/abbreviations of such as software packages and programmable controller CPUs used in this manual.

Generic term and abbreviation		Description
GX Works2		Generic product name for SWnDNC-GXW2-E (n: version)
Existing application		–
	GX Developer	Generic product name for SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA (n: version)
	GX IEC Developer	Product name for SWnD5C-MEDOC3 (n: version)
	GX Simulator	Generic product name for SWnD5C-LLT-E, SWnD5C-LLT-EA, SWnD5C-LLT-EV, and SWnD5C-LLT-EVA (n: version)
	GX Configurator	Generic product name for GX Configurator-AD/DA/SC/CT/TC/TI/FL/PT/AS/QP
MELSOFT Navigator		Product name for the integrated development environment included in SWnDNC-IQWK (iQ Platform compatible engineering environment MELSOFT iQ Works) (n: version)
iQ Works		Abbreviation for iQ platform supporting engineering environment MELSOFT iQ Works
GX Simulator2		Abbreviation for GX Works2 simulation function
Personal computer		Generic term for personal computer on which Windows® operates
Q series		Abbreviation for Mitsubishi programmable controller MELSEC-Q series
L series		Abbreviation for Mitsubishi programmable controller MELSEC-L series
FX series		Abbreviation for Mitsubishi programmable controller MELSEC-F series
Basic model QCPU		Generic term for Q00J, Q00, and Q01
High Performance model QCPU		Generic term for Q02, Q02H, Q06H, Q12H, and Q25H
Process CPU		Generic term for Q02PH, Q06PH, Q12PH, and Q25PH
Redundant CPU		Generic term for Q12PRH and Q25PRH
Universal model QCPU		Generic term for Q00UJ, Q00U, Q01U, Q02U, Q03UD, Q03UDE, Q03UDV, Q04UDH, Q04UDEH, Q04UDV, Q06UDH, Q06UDEH, Q06UDV, Q10UDH, Q10UDEH, Q13UDH, Q13UDEH, Q13UDV, Q20UDH, Q20UDEH, Q26UDH, Q26UDEH, Q26UDV, Q50UDEH, and Q100UDEH
QnUD(H)CPU		Generic term for Q03UD, Q04UDH, Q06UDH, Q10UDH, Q13UDH, Q20UDH, and Q26UDH
QnUDE(H)CPU		Generic term for Q03UDE, Q04UDEH, Q06UDEH, Q10UDEH, Q13UDEH, Q20UDEH, Q26UDEH, Q50UDEH, and Q100UDEH
High-speed Universal model QCPU		Generic term for Q03UDV, Q04UDV, Q06UDV, Q13UDV, and Q26UDV
Built-in Ethernet port QCPU		Generic term for QnUDE(H)CPU and Universal model high-speed type QCPU
QCPU (Q mode)		Generic term for Basic model QCPU, High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU
LCPU		Generic term for L02S, L02, L02-P, L06, L26, L26-BT, and L26-PBT
FXCPU		Generic term for FX_0, FX_{0S}, FX_{0N}, FX_1, FX_U, FX_{2C}, FX_{1S}, FX_{1N}, FX_{1NC}, FX_{2N}, FX_{2NC}, FX_{3G}, FX_{3GC}, FX_{3U}, and FX_{3UC}
CPU module		Generic term for QCPU (Q mode), LCPU, and FXCPU
Built-in Ethernet type CPU		Generic term for Built-in Ethernet port QCPU and LCPU
Display module		A module with LCD to be mounted to LCPU
Base unit/Block		Generic term for the following: • base unit • a composition of modules from the power supply module to the END cover in MELSEC-L series
FXGP(WIN)		Abbreviation for SW0PC-FXGP/WIN-E

Generic term and abbreviation	Description
C24	Generic term for QJ71C24, QJ71C24-R2, QJ71C24N, QJ71C24N-R2, QJ71C24N-R4, LJ71C24, and LJ71C24-R2
ACPU	Generic term for A2A, A2A-S1, A3A, A2AP21/R21, A2AP21/R21-S1, A3AP21/R21, A2U, A2U-S1, A3U, A4U, A2US, A2US-S1, A2USH-S1, Q02(H)-A, and Q06H-A
QnACPU	Generic term for Q2AS, Q2AS-S1, Q2ASH, Q2ASH-S1, Q2A, Q3A, and Q4A
Q series C24	Generic term for QJ71C24, QJ71C24-R2, QJ71C24N, QJ71C24N-R2, and QJ71C24N-R4
CC-Link IE Controller Network module	Generic term for QJ71GP21-SX and QJ71GP21S-SX
CC-Link IE Field Network master/local module	Generic term for QJ71GF11-T2, LJ71GF11-T2
CC IE Field head module	Generic term for LJ72GF15-T2
SSCNET III/H head module	Generic term for LJ72MS15
Communication head module	Generic term for CC IE Field head module and SSCNET III/H head module
CC-Link IE	Generic term for CC-Link IE Controller Network and CC-Link IE Field Network
MELSECNET/H network module	Generic term for QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, QJ71BR11, QJ72LP25-25, QJ72LP25G, QJ72BR15, and QJ71NT11B
QJ72LP25	Generic term for QJ72LP25-25 and QJ72LP25G
Remote I/O module	Generic term for QJ72LP25 and QJ72BR15
Ethernet adapter module	Generic term for NZ2GF-ETB
Ethernet adapter	Generic term for FX3U-ENET-ADP
Q series-compatible E71	Generic term for QJ71E71-100, QJ71E71-B5, QJ71E71-B2, and QJ71E71
QE71	Generic term for AJ71QE71, AJ71QE71-B5, A1SJ71QE71-B2, A1SJ71QE71-B5, AJ71QE71N-T, A1SJ71QE71N-T, AJ71QE71N-B5, A1SJ71QE71N-B5, AJ71QE71N-B2, A1SJ71QE71N-B2, AJ71QE71N-B5T, A1SJ71QE71N-B5T, AJ71QE71N3-T, and A1SJ71QE71N3-T
A series-compatible E71	Generic term for AJ71E71-S3, A1SJ71E71-B2-S3, A1SJ71E71-B5-S3, AJ71E71N-B2, AJ71E71N-B5T, A1SJ71E71N-B2, A1SJ71E71N-B5T, AJ71E71N-T, A1SJ71E71N-T, AJ71E71N-B5, A1SJ71E71N-B5, AJ71E71N3-T, and A1SJ71E71N3-T
L series-compatible E71	Generic term for LJ71E71-100
Ethernet module	Generic term for Q series-compatible E71, QE71, A series-compatible E71, and L series-compatible E71
CC-Link master/local module	Generic term for QJ61BT11, QJ61BT11N, and LJ61BT11
Q series CC-Link	Generic term for QJ61BT11 and QJ61BT11N
CC-Link bridge module	Abbreviation for AJ65SBT-CLB CC-Link - CC-Link/LT bridge module
CC-Link IE Field Network bridge module	Generic term for NZ2GF-CCB
CC-Link IE Field Network high-speed counter module	Generic term for NZ2GFCF-D62PD2
Simple motion module	Generic term for QD77MS2, QD77MS4, QD77MS16, QD77GF16, LD77MH4, and LD77MH16
G4 module	Generic term for AJ65BT-G4(-S3) peripheral connection module and AJ65BT-R2N CC-Link system RS-232 interface module
QA extension base unit	Generic term for QA1S65B, QA1S68B, QA65, and QA68B
CC-Link IE Field Network communication unit	Generic term for GT15-J71GF13-T2
MELSECNET/H board	Generic term for Q80BD-J71BR11, Q80BD-J71LP21-25, and Q80BD-J71LP21G
CC-Link IE Controller Network board	Generic term for Q80BD-J71GP21-SX and Q80BD-J71GP21S-SX Abbreviation for CC-Link IE Controller Network interface board
CC-Link IE Field Network board	Abbreviation for Q81BD-J71GF11-T2 CC-Link IE Field Network interface board

Generic term and abbreviation	Description
Ethernet board	Generic term for Ethernet cards for personal computer and Ethernet interface boards
CC-Link board	Generic term for CC-Link Ver.1 board and CC-Link Ver.2 board
CC-Link Ver.1 board	Generic term for A80BD-J61BT11 and A80BD-J61BT13
CC-Link Ver.2 board	Generic term for Q80BD-J61BT11N
GOT	Generic term for Mitsubishi Graphic Operation Terminal GOT1000 series, GOT-A900 series, and GOT-F900 series
Windows® XP	Generic term for Microsoft® Windows® XP Professional Operating System and Microsoft® Windows® XP Home Edition Operating System
Windows Vista®	Generic term for Microsoft® Windows Vista® Home Basic Operating System, Microsoft® Windows Vista® Home Premium Operating System, Microsoft® Windows Vista® Business Operating System, Microsoft® Windows Vista® Ultimate Operating System, and Microsoft® Windows Vista® Enterprise Operating System
Windows® 7	Generic term for Microsoft® Windows® 7 Starter Operating System, Microsoft® Windows® 7 Home Premium Operating System, Microsoft® Windows® 7 Professional Operating System, Microsoft® Windows® 7 Ultimate Operating System, and Microsoft® Windows® 7 Enterprise Operating System
MELSAP3	Abbreviation for the SFC function in MELSAP3 display format
MELSAP-L	Generic term for the SFC function in MELSAP-L (instruction format) and MELSAP-L (start conditions format)
SFC	Generic term for MELSAP3, MELSAP-L, and FX series SFC
MELSOFT Library	Generic term for components (FB library, sample programs, drawing data) which provide easy operation of programmable controller related modules and GOTs, and various devices that are connected to them Contact your local Mitsubishi representative to obtain components of MELSOFT Library.

■ TERMS

The following are the terms used in this manual.

Term	Description
Execution program	A compiled program created in a project with labels A program that can be executed on a programmable controller CPU
Actual device	An actual device assigned to label after compiling a project with labels, or a device that is not described using a label
Common instruction	Generic term for sequence instructions, basic instructions, application instructions, data link instructions, multiple CPU dedicated instructions, and multiple CPU high-speed transmission dedicated instructions
Special instruction	Generic term for module dedicated instructions, PID control instructions, socket communication function instructions, built-in I/O function instructions, and data logging function instructions
Simple project	Generic term for projects created using Ladder Diagram/Sequential Function Chart/Structured Text
Without labels	Generic term for projects created without selecting "Use Label" when creating new projects
With labels	Generic term for projects created with selecting "Use Label" when creating new projects
Structured project	Generic term for projects created using Ladder Diagram/Sequential Function Chart/Structured Text/Structured Ladder/FBD
Project without labels	Generic term for Simple projects that do not use labels
Project with labels	Generic term for Simple projects that use labels and Structured projects
Project with security	Generic term for projects whose securities are set
New project creation with data read from programmable controller CPU	A function to create a new project with data read from a programmable controller CPU without opening a project
Direct connection	A connection method using a USB/serial/Ethernet port of a programmable controller CPU
Slave station	Stations other than the master station (local stations, remote I/O stations, remote device stations, intelligent device stations, etc.)
Redundant system	A system configured using Redundant CPUs
Connective system	A Redundant CPU selected on the Transfer Setup screen
Target system	The other Redundant CPU connected to the connective system with a tracking cable
System A	A system to which system A connector for tracking cable is connected in the redundant system
System B	A system to which system B connector for tracking cable is connected in the redundant system
Control system	A system that performs program operation, system control, and network communication in the redundant system
Standby system	A backup system to continue system control in case of a module failure or an error in the control system in the redundant system
Backup mode	A mode for normal operation of the redundant system
Separate mode	A mode for maintaining a system (partial modification of a program, replacement of modules mounted on the main base unit) without stopping the control during an operation of the redundant system
Debug mode	A mode for performing a debug using a single system prior to a redundant system operation

MEMO

1 OVERVIEW

This chapter explains an overview of GX Works2.

1.1 Product Overview

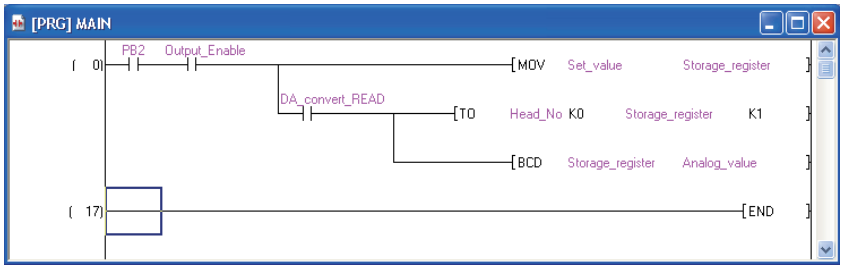
GX Works2 is a programming tool for designing, debugging, and maintaining programs on Windows®. GX Works2 has improved functionality and operability, with easier-to-use features compared to existing GX Developer.

■ Main functions of GX Works2

GX Works2 can manage programs and parameters in units of projects for each programmable controller CPU.
The following explains the main functions.

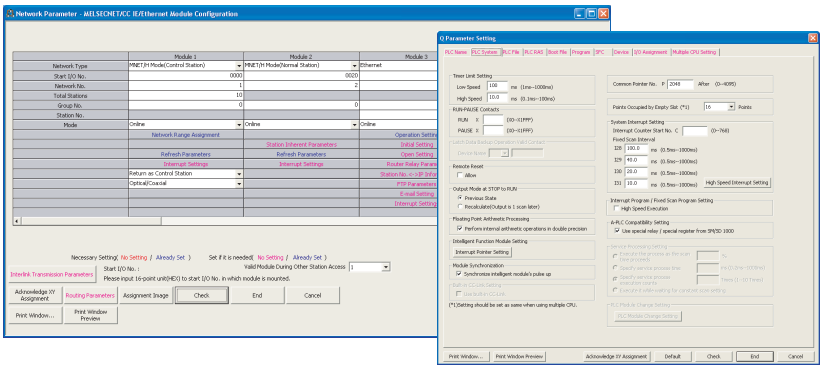
● Programming

Programs can be created in a Simple project in a similar way with existing GX Developer. Structured programming in a Structured project is also available with GX Works2.



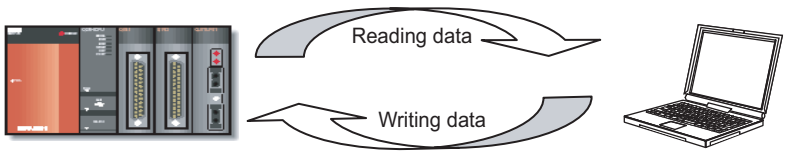
● Setting parameters

Programmable controller parameter and network parameter can be set with GX Works2.
Intelligent function module parameter can be set as well.



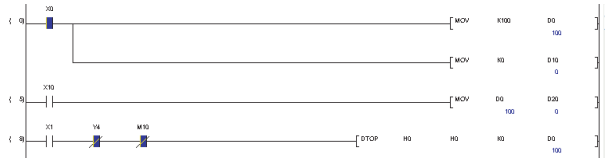
● Writing/reading data to/from a programmable controller CPU

Created sequence programs can be written to/read from a programmable controller CPU using the Read from PLC/Write to PLC function. Also, using the Online program change function, the sequence programs can be changed even when the programmable controller CPU is in RUN.

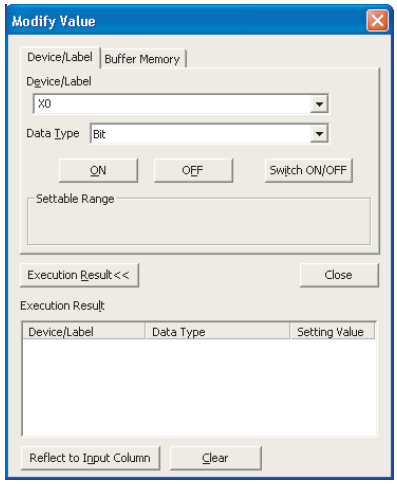


● Monitoring/debugging

Created sequence programs can be written to the programmable controller CPU and device value at operation can be monitored online/offline.

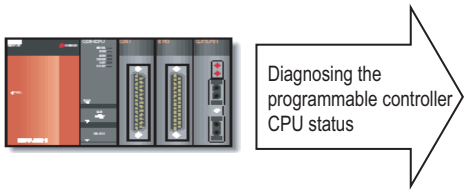


Programs can be monitored and debugged.

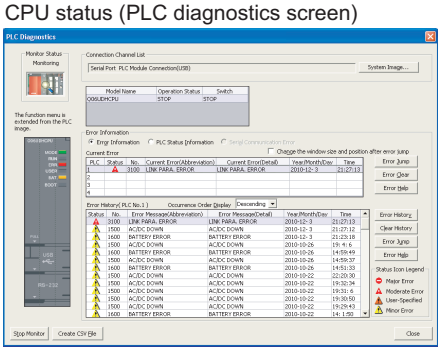


● Diagnostics

The current error status and error history of the programmable controller CPU can be diagnosed. Using the diagnostics function, the recovery work is completed in a short time.
Using the System monitor function (for QCPU (Q mode)/LCPU), detailed information on such as intelligent function modules can be obtained. This helps to shorten the recovery work time at error occurrence.



Diagnosing the programmable controller CPU status (PLC diagnostics screen)



1.2 Features

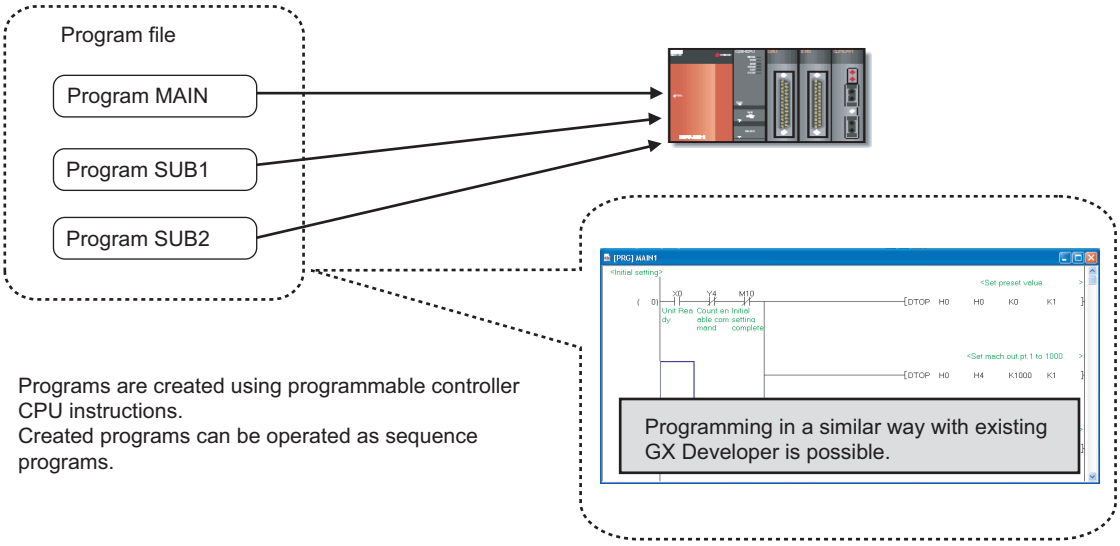
This section explains the features of GX Works2.

■ Project types in GX Works2

In GX Works2, the project type can be selected from either of Simple project or Structured project.

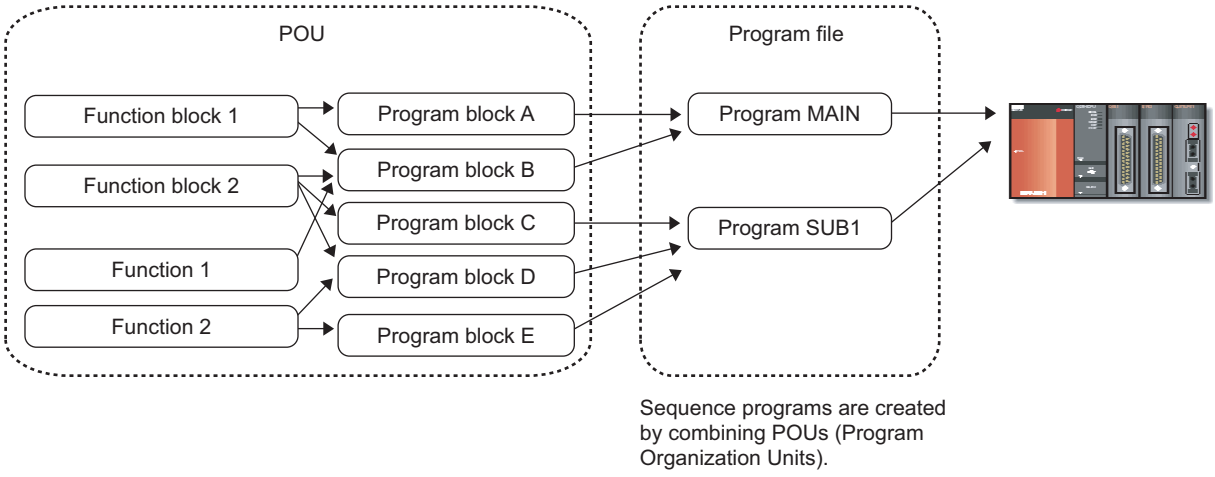
● Simple project

The Simple project creates sequence programs using instructions for Mitsubishi programmable controller CPU.
Programs in a Simple project can be created in a similar way to existing GX Developer.
Programming without labels and label programming are supported as in GX Developer.



● Structured project

In a Structured project, programs can be created by structured programming.
By segmenting a whole control process program into common program parts, highly manageable and usable programming (structured programming) is possible.
Only label programming is supported.

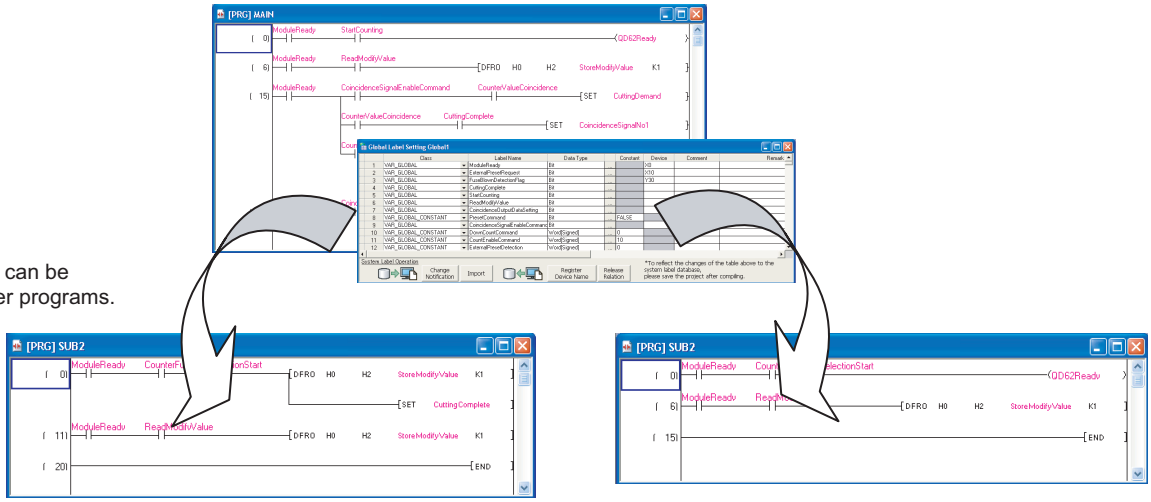


■ Programming using labels

Using the label programming, programs can be created without regard for the device numbers.
By compiling a program created with the label programming, devices are automatically assigned and the program becomes available as an actual program.

Created global labels can be utilized for other programs.

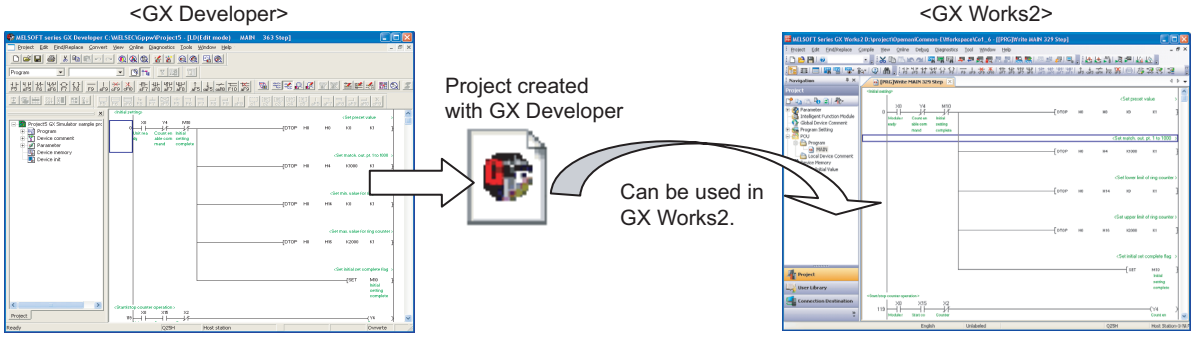
Created labels can be utilized for other programs.



In addition, global labels can be registered as system labels and be shared within iQ Works compliant products (GX Works2, MT Developer2, and GT Designer3).
For details of system labels, refer to the following manual.
(☞ iQ Works Beginner's Manual)

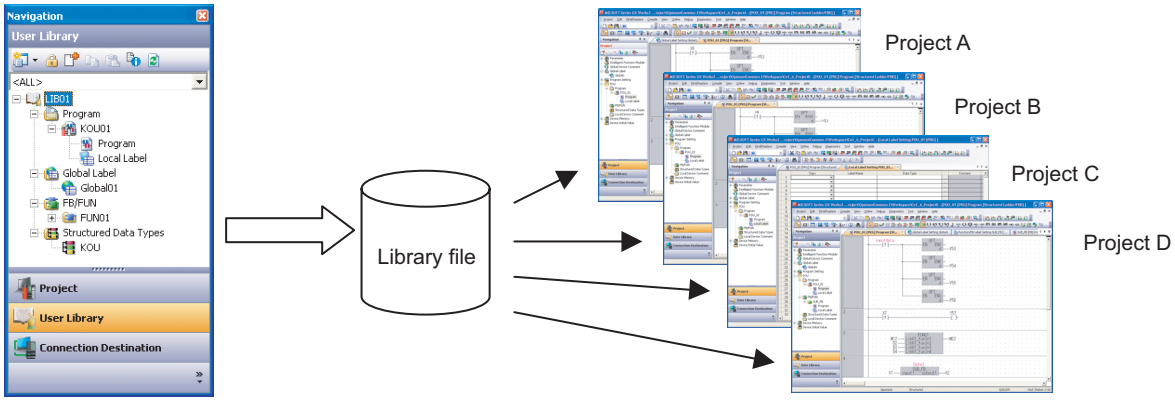
■ Enhanced use of program assets

Projects created with existing GX Developer can be utilized in a Simple project. Utilizing the past assets improves the efficiency of program design.



■ Sharing Program Organization Unit (POU) registered as libraries

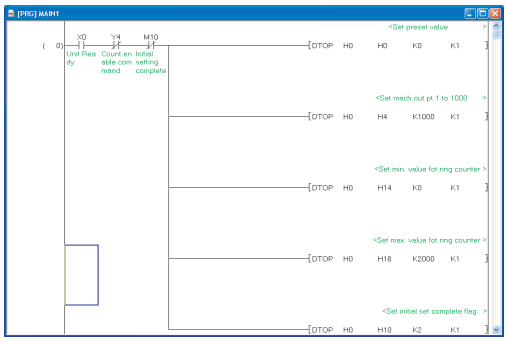
In a Structured project, programs, global labels, and structures frequently used can be registered as user libraries. Utilizing these user libraries reduces time required for creating programs.



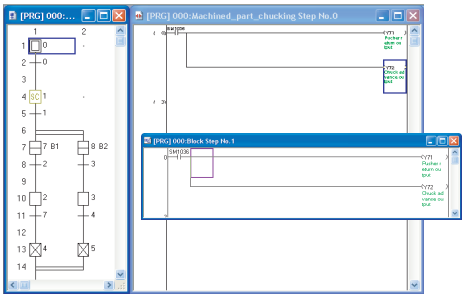
■ Wide variety of programming languages

The wide variety of programming languages available with GX Works2 enables to select the optimum programming language according to control.

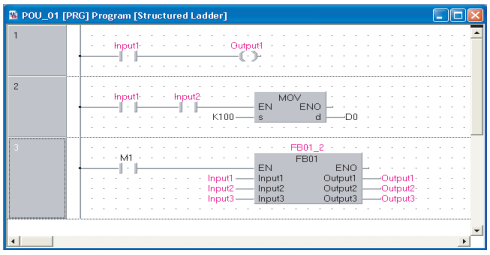
<Ladder Diagram>
Programming similar to existing GX Developer



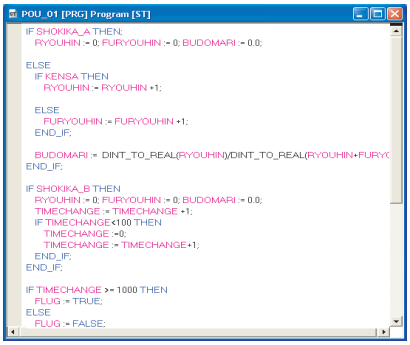
<Sequential Function Chart>
Programming to clarify the procedure



<Structured Ladder>
Programming a ladder diagram graphically



<Structured Text>
Programming in a text language similar to C language

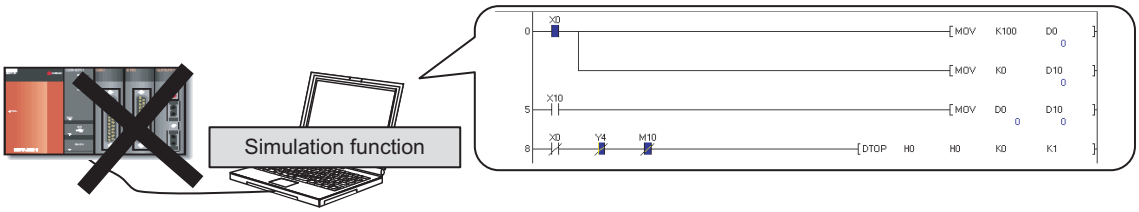


ST programs can be used on the ladder editor of GX Works2 using the Inline structured text function.

■ Other features

● Offline debugging

Offline debugging using the simulation function is possible with GX Works2. This enables debugging to ensure the normal operation of created sequence programs without connecting GX Works2 to the programmable controller CPU.

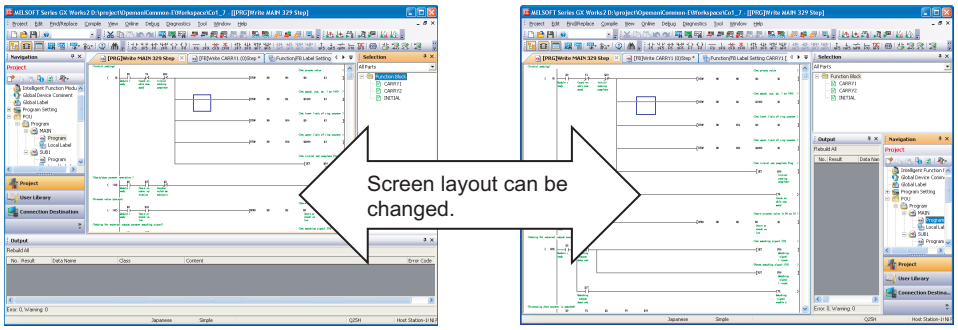


Connecting to the programmable controller is unnecessary.

Without connecting to the programmable controller CPU, programs can be monitored and debugged in the same way with debugging by the programmable controller CPU.

● The screen layout can be customized to the user's preference

Use dockable windows to change the screen layout of GX Works2.



1.3 List of Functions

This section shows the list of functions of GX Works2.
The functions are divided into common functions available (Project, Online, Debug, Diagnostics, Tool, Window, and Help) and functions used for each editing or setting target (Edit, Find/Replace, Compile, and View).
For (Simple), (FB), (Structured), and (Intelligent) indicated in the Reference column, refer to the following manuals respectively:

(Simple) … GX Works2 Version 1 Operating Manual (Simple Project)
(FB) … GX Works2 Version 1 Operating Manual (Simple Project, Function Block)
(Structured) … GX Works2 Version 1 Operating Manual (Structured Project)
(Intelligent) … GX Works2 Version 1 Operating Manual (Intelligent Function Module)

1.3.1 List of functions common to Simple project and Structured project

This section explains the functions common to Simple project and Structured project.

■ List of common functions

The following tables show functions that are available regardless of the type of editing or setting target.

Project (common function)			Reference
New		Create a new project.	Section 4.2.1
Open		Open an existing project.	Section 4.2.2
Close		Close the open project.	Section 4.2.6
Save		Save the project.	Section 4.2.3
Save As		Name and save the project.	
Compress/Unpack			–
	Compress	Compress and save a project.	Section 4.2.4
	Unpack	Decompress a compressed project.	
Delete		Delete an existing project.	Section 4.2.5
Verify		Verify between two project data.	Section 4.2.7
Project Revision			–
	Revision Entry	Register the project change history.	Section 4.6.1
	Revision List	Display the list of project change history.	Section 4.6.2
Change PLC Type		Change the programmable controller CPU type.	Section 4.2.8
Change Project Type		Change the project type from Simple project (without labels) to Simple project (with labels), or from Simple project (with labels) to Structured project.	Section 4.5

Project (common function)			Reference
Object			–
	New	Add data to the project.	Section 4.3.1
	Rename	Rename the selected data.	Section 4.3.3
	Delete	Delete the selected data.	Section 4.3.4
	Copy	Copy the selected data.	Section 4.3.2
	Paste	Paste the copied data.	
	Set as Default Connection	Specify data in selected connection destination as a connection destination for regular use.	Section 11.1.3
	Property	Display the selected data properties.	Section 4.3.6
Intelligent Function Module			–
	New Module	Add new intelligent function module data.	(Intelligent)
	Delete Module	Delete intelligent function module data.	
	Property	Display properties of the intelligent function module data.	
	Save the Positioning Module Data	Save data of the positioning module selected on the Project view to a file.	
	Read from the Positioning Module Data	Read data from the positioning module and apply it to the positioning module selected on the Project view.	
	Save GX Configurator-QP Data	Save the positioning module data in GX Configurator-QP format.	
	Import GX Configurator-QP Data	Read a project created with GX Configurator-QP.	
	Intelligent Function Module Parameter List	Display a list of set/unset parameters of the intelligent function module.	
Open Other Data			–
	Open Other Project	Open a project created with GX Developer.	Section 4.7.1
	Read ASC Format File	Read an ASC format file.	Section 4.7.2
Export to GX Developer Format File		Save the open project in GX Developer format.	Section 4.8
Library			–
	Create	Create a new library.	(Structured)
	Install	For Simple projects (with labels), import an FB library to the project. For Structured projects, import a created library to the project.	(FB) (Structured)
	Deinstall	Delete the library from the project.	(Structured)
	Reload	Update the library imported to the project.	
	Rename	Rename the library.	
	Open	Enable editing of the library.	
	Close	Disable editing of the library.	
	Change Password	Set a password for the library.	
	Save As	Name and save the project.	
	Save	Save the library file.	
	Help	Display help information of the library.	
Security			–
	Change Password	Change the password of the current login user.	Section 4.10.2
	User Management	Manage user information of the project. Add/delete a user, or change the user information.	Section 4.10.1 Section 4.10.2
	Data Security Setting	Set the access authorization of each user related to reading/writing data.	Section 4.10.4
	Soft Security Key Management	Manage the security key which is used to lock or unlock the project.	Section 4.11
Print		Batch print multiple data in the project.	Section 20.3
Print Preview		Display the print preview of data to be batch printed.	Section 20.6
Print Window		Print the open screen.	Section 20.7
Print Window Preview		Display the print preview of the open screen.	Section 20.9

Project (common function)		Reference
Printer Setup	Change the printer settings.	Section 20.2
(Recently used files 1 to 4)	Display the recently used GX Works2 project paths, and open the selected project.	–
Start GX Developer	Start GX Developer from GX Works2.	Section 4.9
Exit	Exit GX Works2.	Section 3.1

Edit (common function)		Reference
Undo	Restore the previous processing status.	–
Redo	Restore the processing deleted with [Undo].	
Cut	Cut the selected data.	
Copy	Copy the selected data.	
Paste	Paste the cut or copied data at the cursor position.	

Find/Replace (common function)		Reference
Cross Reference	Display the usage of selected device or label.	Section 10.1
Device List	Display the usage of devices.	Section 10.2
Find Device	Search a device/label in the program.	Section 10.3.1
Find Instruction	Search an instruction.	Section 10.3.2
Find Contact or Coil	Search a contact or coil corresponding to the specified device.	
Find String	Search a string.	Section 10.3.3
Replace Device	Replace a device/label in the program.	Section 10.3.1
Replace Instruction	Replace an instruction.	Section 10.3.2
Replace String	Replace a string.	Section 10.3.3
Change Open/Close Contact	Change an open contact to a closed contact, or change a closed contact to an open contact.	Section 10.3.4
Device Batch Replace	Batch-replace devices with the specified device.	Section 10.3.5
Register to Device Batch Replace	Register selected devices on the Device Batch Replace screen.	

Compile (common function)		Reference
Build	Convert/compile a program being edited.	Section 5.4
Online Program Change	Write sequence programs to a programmable controller CPU after the conversion/compilation.	
Rebuild All	Convert/compile all programs in the project.	

View (common function)			Reference
Toolbar			–
	Toolbar name	Display/hide each toolbar.	Section 3.2.2
	Display All	Display/hide all toolbars.	
Statusbar		Display/hide the status bar.	Section 3.2.6
Color and Font		Set the display color for characters such as labels and device comments on the work window.	Section 3.2.7
Docking Window			–
	Navigation	Display/hide the Navigation window.	Section 3.2.5
	Element Selection	Display/hide the Function Block Selection window. Select a part such as function block and function on the window for utilizing it to a program.	(FB) (Structured)
	Output	Display/hide the Output window. The conversion (compilation) result is displayed.	(Simple) (Structured)
	Cross Reference	Display/hide the Cross Reference window. The devices/labels used in the project are displayed.	Section 10.1
	Device Use List	Display/hide the Device List window. The usage of selected device is displayed.	Section 10.2
	CC-Link Device Reference Window	Display/hide the CC-Link Device Reference window. Assignments of CC-Link refresh devices and link devices are displayed.	Section 6.3.5
	Watch 1 to 4	Display/hide the Watch window. The monitoring result is displayed.	Section 14.6
	Intelligent Function Module Monitor		–
		Module 1 to 10	Display/hide the Intelligent Function Module Monitor window.	(Intelligent)
	Intelligent Function Module Guidance	Display/hide the Intelligent Function Module Guidance window.	
	Find/Replace	Display/hide the Find/Replace window. The search/replace result is displayed.	Section 10.3
	Debug		–
		Break Point	Display/hide the Break Point window.	Section 16.6.2
		Break Device	Display/hide the Break Device window.	Section 16.6.3
		Skip Range	Display/hide the Skip Range window.	Section 16.6.4

Online (common function)			Reference
Read from PLC		Read data from the programmable controller CPU.	Section 12.1
Write to PLC		Write data to the programmable controller CPU.	
Verify with PLC		Verify a project being edited against the data on the programmable controller CPU.	Section 12.2
Remote Operation		Remotely control RUN/PAUSE/STOP of the programmable controller CPU from GX Works2.	Section 17.1
Redundant Operation		Remotely control the system switch, operation mode change, or memory copy on the Redundant CPU from GX Works2.	Section 17.2
Password/Keyword			–
	New	Set a password/keyword to the programmable controller CPU.	Section 13.2.1 Section 13.3.1 Section 13.4.1
	Delete	Cancel the password/keyword set to the programmable controller CPU.	Section 13.2.2 Section 13.3.2 Section 13.4.2
	Disable	Temporarily unlock the password/keyword set to the programmable controller CPU.	Section 13.2.3 Section 13.3.3 Section 13.4.3
Soft Security Key Management		Manage the security key which is used to lock or unlock the programmable controller CPU.	Section 13.5
PLC Memory Operation			–
	Format PLC Memory	Format the programmable controller CPU memory.	Section 17.3
	Clear PLC Memory	Clear the programmable controller CPU memory.	Section 17.4
	Arrange PLC Memory	Arrange the programmable controller CPU memory.	Section 17.5
Delete PLC Data		Delete data on the programmable controller CPU.	Section 12.3
PLC User Data			–
	Read	Read the programmable controller CPU user data.	Section 12.5
	Write	Write the programmable controller CPU user data.	
	Delete	Delete the programmable controller CPU user data.	
Export to ROM Format		Copy the program memory data on the programmable controller CPU to ROM.	Section 12.4
Program Memory Batch Download		Transfer the content of program cache memory to program memory in batch.	Section 12.6
Latch Data Backup			–
	Backup	Back up device memory/file register/error history data to the standard ROM.	Section 12.7.1
	Delete Backup Data	Delete the backup data on the programmable controller CPU.	Section 12.7.2
PLC Module Change			–
	Create Backup Data	Back up data on the programmable controller CPU to the memory card.	Section 12.8.1
	Restore	Restore the backup data to another programmable controller CPU.	Section 12.8.2
Set Clock		Set the clock on the programmable controller CPU.	Section 17.6
Register/Cancel Display Module Menu		Register/cancel menus to operate intelligent function module using the LCPU display module menu.	Section 17.7

Online (common function)			Reference
Monitor			–
	Monitor Mode	Switch the mode of the open window to "Monitor Mode" during monitoring.	(Simple)
	Monitor (Write Mode)	Switch the mode of the open window to "Monitor (Write Mode)" during monitoring.	
	Start Monitoring (All Windows)	Start monitoring the programs of all open windows.	Section 14.8
	Stop Monitoring (All Windows)	Stop monitoring the programs of all open windows.	
	Start Monitoring	Start monitoring the program of the open window.	Section 14.2
	Stop Monitoring	Stop monitoring the program of the open window.	Section 14.1
	Change Value Format (Decimal)	Display the current device value in decimal in program monitoring.	(Simple) (Structured)
	Change Value Format (Hexadecimal)	Display the current device value in hexadecimal in program monitoring.	
	Device/Buffer Memory Batch	Monitor device/buffer memory in batch.	Section 14.3
	Program List	Monitor the processing time of programs being executed.	Section 14.4
	Interrupt Program List	Monitor the number of executions of interrupt programs.	Section 14.5
	Change Instance (Function Block)	Select an instance of the function block to be monitored.	(FB) (Structured)
	SFC All Block Batch Monitoring	Batch monitor all blocks in the SFC program.	(Simple)
	SFC Auto Scroll	Scroll the screen to display active steps automatically when they are out of the screen during monitoring.	
Watch			–
	Start Watching	Start monitoring the current values of registered devices/labels and intelligent function module.	Section 14.6
	Stop Watching	Stop monitoring the current values of registered devices/labels and intelligent function module.	
	Bit Device Display Format		
	Numerical Display	Switch the display format of the current value of bit device to the numerical display (1/0).	
	ON/OFF Display	Switch the display format of the current value of bit device to the 'ON/OFF' display.	
	Symbol Display	Switch the display format of the current value of bit device to the symbol display (●/○).	
	Register to Watch	Register the selected devices/labels to the Watch window.	
Local Device Batch Read + Save CSV		Read local device data from the programmable controller CPU and saves them on a personal computer in CSV format.	Section 12.12

Debug (common function)			Reference
Start/Stop Simulation		Start/stop simulation.	Section 15.2
Instructions Unsupported by Simulation		Display a list of the instructions and devices used in the program that is not supported by the simulation function.	Section 15.3
Modify Value		For ladder and SFC (Zoom) programs, change the ON/OFF status and values of devices and labels used in the program.	Section 16.1
Forced Input Output Registration/ Cancellation		Register/cancel the forced input/output of the device 'X'/'Y'.	Section 16.2
Device Test with Execution Condition			–
	Register	Register the device test with execution condition.	Section 16.3.1
	Registration Check/Disable	Check/disable the registration of device test with execution condition.	Section 16.3.2
	Batch Disable	Batch disable the device test with execution condition in batch.	Section 16.3.3
Sampling Trace			–
	Open Sampling Trace	Display the Sampling Trace screen.	Section 16.4.1
Scan Time Measurement		Measure the scan time of a desired section.	Section 16.5

Debug (common function)			Reference
Step Execution			–
	Stop	Stop the step execution.	Section 16.6.9
	Cancel	Cancel the step execution.	Section 16.6.7
	Break Execution	Execute the break execution.	Section 16.6.6
	Step Execution	Execute the step execution.	Section 16.6.5
	Execution Option	Display the "Execution Option" screen of the step execution.	Section 16.6.8
Break Setting			–
	Set/Cancel Break Point	Set a break point at the cursor position, or cancel the set break point.	Section 16.6.2
	Enable/Disable Break Point	Enable/disable the break point at the cursor position.	
	Cancel All Break Points	Cancel all break points.	
	Break Point Window	Display the Break Point window.	
	Cancel All Break Devices	Cancel all break devices.	Section 16.6.3
	Break Device Window	Display the Break Device window.	
Skip Setting			–
	Set/Cancel Skip Range	Set a skip range, or cancel the set skip range.	Section 16.6.4
	Enable/Disable Skip Range	Enable/disable the skip range at the cursor position.	
	Cancel All Skip Ranges	Cancel all skip ranges.	
	Skip Range Window	Display the Skip Range window.	

Diagnostics (common function)		Reference
PLC Diagnostics	Diagnose the operating status of the programmable controller CPU.	Section 18.1
Ethernet Diagnostics	Diagnose Ethernet.	Section 18.6
CC IE Control Diagnostics	Diagnose CC-Link IE Controller Network.	Section 18.3
CC IE Field Diagnostics	Diagnose CC-Link IE Field Network.	Section 18.4
MELSECNET Diagnostics	Diagnose MELSECNET/10(H).	Section 18.2
CC-Link Diagnostics	Diagnose CC-Link and CC-Link/LT.	Section 18.5
Sensor/Device Monitor	Monitor the status of the equipment connected with AnyWireASLINK or CC-Link.	Section 18.7
System Monitor	Monitor the system status of the programmable controller CPU.	Section 18.8
Online Module Change	Change modules online.	Section 18.9

Tool (common function)			Reference
IC Memory Card			–
	Read IC Memory Card	Read data from the IC memory card.	Section 12.11.1
	Write IC Memory Card	Write data to the IC memory card.	
	Read from IC Memory Card (Edit and Data Copy)	Read data saved by the batch save function of programmable controller CPU from the IC memory card.	Section 12.11.2
	Write to IC Memory Card (Edit and Data Copy)	Write data to the IC memory card in the format which can be used for the batch load function of programmable controller CPU.	
Check Program		Check programs of the project without labels and display errors.	(Simple)
Check Parameter		Check parameters and display errors.	Section 6.5
Clear All Parameters		Delete all selected parameters.	Section 6.7
Check Device Duplication of Global Label		Check duplications of devices assigned to global labels, and display the result.	(Simple) (Structured)
Device/Label Automatic-Assign Setting		Set device range to be automatically assigned to a label.	(Simple) (Structured)
Block Password		Set a block password to data.	Section 4.12

Tool (common function)			Reference
Confirm Memory Size		Calculate the size of files to be written to the programmable controller CPU.	Section 12.10
Merge Data		Merge ladder programs or device comment data.	Section 4.3.5
Set TEL Data/Connect via Modem			–
	Line Connection	Connect the line.	Section 11.10.2
	Line Disconnection	Disconnect the line.	
	AT Command Registration	Register a modem between a personal computer and a serial communication module, or a personal computer and an FXCPU.	Section 11.10.1
	Phone Book	Set phone numbers of targets such as remote access targets.	
	Options	Set options for TEL data.	Section 11.10.3
Logging Configuration Tool		Start QnUDVCPU & LCPU Logging Configuration Tool.	Section 16.7
Ethernet Adapter Module Configuration Tool		Start the Ethernet adapter module configuration tool.	Section 17.8
Built-in I/O Module Tool			–
	Positioning Monitor	Display the Positioning Monitor screen.	Section 18.10
	High-Speed Counter Monitor	Display the High-Speed Counter Monitor screen.	
	I/O Monitor	Display the I/O Monitor screen.	
Check Intelligent Function Module Parameter			–
	Check Auto Refresh Duplication	Check duplications of devices set in the Auto refresh function and display the result.	(Intelligent)
Intelligent Function Module Tool			–
	Analog Module	–	(Intelligent)
	Offset/Gain Setting	Configure the offset/gain setting of the analog module.	
	Q61LD Two-Point Calibration Setting	Configure the Q61LD two-point calibration setting.	
	Q61LD Default Setting	Configure the Q61LD default setting.	
	Create Wave Output Data	Create waveform output data.	
	Temperature Input Module	–	
	Offset/Gain Setting	Configure the offset/gain setting of the temperature input module.	
	Temperature Control Module	–	
	Auto Tuning	Execute the auto tuning function of the temperature control module.	
	Sensor Correction Function	Execute the sensor correction function of the temperature control module.	
	Counter Module	–	
	Preset	Execute the preset function of the counter module.	
	QD75/LD75 Positioning Module	–	
	Positioning Monitor	Execute the positioning monitor.	
	Positioning Test	Execute the positioning test.	
	Wave Trace	Execute the wave trace.	
	Location Trace	Execute the location trace.	
	Serial Communication Module	–	–
	Circuit Trace	Execute the circuit trace.	(Intelligent)
	Predefined Protocol Support Function	Start the predefined protocol support function.	
Language Selection		Select a language used in the project.	Section 3.3
Register Profile		Register profiles of CC IE Field modules and CC-Link modules to GX Works2.	Section 6.3.4
Key Customize		Change the settings of the shortcut keys.	Section 3.2.8
Options		Set various options.	Chapter 21

Window (common function)		Reference
Cascade	Cascade windows.	Section 3.2.3
Tile Vertically	Tile windows vertically.	
Tile Horizontally	Tile windows horizontally.	
Arrange Icons	Arrange the icons at the bottom of the window.	
Close All	Close all open windows.	
(Switch to other window)	Display the open window.	
Other Windows	Display the list of open windows. Also, open or arrange specified windows.	

Help (common function)		Reference
GX Works2 Help	Display the GX Works2 Help screen.	Section 3.4.1
Operating Manual		–
GX Works2 Beginner's Manual (Simple Project)	Display the operating manuals.	Section 3.4.2
GX Works2 Beginner's Manual (Structured Project)		
Operating Manual Common		
Operating Manual (Simple Project)		
Operating Manual (Structured Project)		
Operating Manual (Intelligent Function Module)		
Operating Manual (Simple Project, Function Block)		
About	Display product information such as the version.	Section 3.4.3

■ List of functions for setting labels

The following table shows the functions for setting and editing labels.

Edit (function for label setting)			Reference
Delete		Delete the selected data.	–
Select All		Select all items.	(Simple) (Structured)
New Declaration (Before)		Add a row above the cursor position.	
New Declaration (After)		Add a row below the cursor position.	
Delete Row		Delete the row at the cursor position.	
Read from CSV File		Read label settings from the CSV file.	
Write to CSV File		Write label settings to the CSV file.	
System Label			–
	Reservation to Register System Label	Reserve the selected global label for registration as a system label.	(Simple) (Structured)
	Reservation to Release System Label	Reserve the selected global label for deregistration of system label.	
	Import System Label	Import the system label information and apply it to global labels.	
	Reflect to System Label Database	Apply the registration-reserved/deregistration-reserved global labels to the system label data base.	
	Confirm Update of System Label Database	Apply system label information changed in another project to global labels.	–
	Execute Verification Synchronous with System Label	Resolve a mismatch when system label information contains it.	
Sort			–
	Class	Sort the labels in ascending/descending order with the selected item.	(Simple) (Structured)
	Label Name		
	Data Type		
	Constant		
	Device		
	Address		
	Comment		
	Remark		
Unused label list		Extract and display unused labels. Extracted unused labels can be deleted in batch.	(Simple) (Structured)

■ List of functions for editing device comments

The following table shows functions for editing device comments.

Edit (function for editing device comments)			Reference
Delete		Delete the selected data.	–
Select All		Select all data being displayed.	–
Import from Sample Comment			–
	Special Relay/Special Register	Utilize sample comments of SM/SD.	Section 9.5.1
	Intelligent Function Module	Utilize sample comments of intelligent function module device.	Section 9.5.2
Clear All (All Devices)		Delete all device comment data.	Section 9.3.1
Clear All (All Displayed Devices)		Delete all device comment data being displayed.	Section 9.3.2
Read from CSV File		Read device comments from the CSV file.	Section 9.6
Write to CSV File		Write device comments to the CSV file.	
Hide Bit Specification Information		Hide the bit-specified word device comment of the selected row.	Section 9.2.1
Show Bit Specification Information		Display the bit-specified word device comment of the selected row.	
Cut The Range including Hidden Bit Specification Information		Cut data including hidden bit-specified comment.	
Copy The Range including Hidden Bit Specification Information		Copy data including hidden bit-specified comment.	
Paste The Range including Hidden Bit Specification Information		Paste data including hidden bit-specified comment.	

■ List of functions for setting device memory

The following tables show the functions for setting device memory.

Edit (function for setting device memory)		Reference
Delete	Delete the selected data.	–
Insert Row	Insert a row at the cursor position.	Section 7.2
Input Device	Enter a device.	Section 7.2.2
Paste Text	Enter a character string.	Section 7.2.3
FILL	Set the same value to consecutive devices simultaneously.	Section 7.2.4

Find/Replace (function for setting device memory)		Reference
Find Device Cell	Search for a device.	Section 7.3

View (function for setting device memory)		Reference
Display Mode		–
Binary	Display data in binary.	Section 7.2.5
Octal	Display data in octal.	
Decimal	Display data in decimal.	
Hexadecimal	Display data in hexadecimal.	
Float	Display data in real number.	
String	Display data in character string.	
String (ASCII only)	Display data in ASCII string.	
Register		–
16-bit	Display data in units of words.	Section 7.2.5
32-bit	Display data in units of double words.	
64-bit	Display data in units of 64 bits.	
Setup	Change the editor size.	Section 7.2.6

Tool (function for setting device memory)		Reference
Read Device Memory from PLC	Read device memory data from the programmable controller CPU.	Section 7.4.1
Write Device Memory to PLC	Write device memory data to the programmable controller CPU.	
Read from Excel File	Read data from an Excel file.	Section 7.4.2
Write to Excel File	Write data to an Excel file.	

■ List of functions for verification result

The following tables show the functions for verification result.

Edit (function for verification result)		Reference
Write to CSV File	Write verification result to a CSV file.	Section 4.2.7

Find/Replace (function for verification result)		Reference
Next Unmatch	Move to the next mismatched data.	Section 4.2.7
Previous Unmatch	Move to the previous mismatched data.	

View (function for verification result)		Reference
Return to Result List	Return to the <<Verify Result List>> tab from the <<Detail Verify Result>> tab.	Section 4.2.7
Close Detail Result	Close the <<Detail Verify Result>> tab being displayed.	
Close All Detail Result	Close all <<Detail Verify Result>> tabs being displayed.	

■ List of functions for executing sampling trace

The following tables show the functions for executing sampling trace.

View (function for executing sampling trace)			Reference
Result Position			–
	Move to Trigger Point	Display the trigger position.	–
Switching Display Items			–
	Device	Display/hide the display item titles.	Section 16.4.3
	Address		
	Comment		
	Data Types		
	Radix		
Timing Chart Scale			–
	Narrow Scale	Enlarge/reduce the timing chart scale.	Section 16.4.4
	Wide Scale		
Trend Graph Scale			–
	Narrow Scale	Enlarge/reduce the trend graph scale.	Section 16.4.4
	Wide Scale		
	Initial Display		
Additional Information			–
	Past Time	Display/hide the additional information.	Section 16.4.2 Section 16.4.4
	Program Name		

Debug (function for executing sampling trace)			Reference
Sampling Trace			–
	Open Sampling Trace	Display the Sampling Trace screen.	Section 16.4.1
	Trace Setting	Display the screen on which the sampling trace conditions are set.	Section 16.4.2
	Start Trace	Start sampling trace.	Section 16.4.4
	Stop Trace	Suspend sampling trace.	–
	Execute Manual Trigger	Generate a trigger at any given timing.	–
	Register Trace	Write trace settings to the programmable controller CPU. Execute this to control the sampling trace start by a sequence program. Sampling trace starts when the Trace start command (SM801) is executed after executing "Register Trace".	Section 16.4.4
	Forced Execution Registration Effective	Enable to execute the sampling trace from the peripherals.	
	Display Trace Buffer Condition	Display trace data storage status.	
	Export CSV Data	Save the trace data (trace settings + results) on the personal computer in CSV file format.	Section 16.4.5
	Read from PLC	Read the sampling trace data (trace settings + results) from the programmable controller CPU.	
	Write to PLC	Write the trace data (trace settings + results) to the programmable controller CPU.	
	Delete All Data	Delete all information including the device data registered and the sampling trace result displayed on the Sampling Trace screen.	–

1.3.2 List of functions for editing in Ladder Diagram

The following tables show the functions for the ladder editor.

Edit (function for editing in Ladder Diagram)		Reference
Continuous Paste	Increment the device number of device in the cut/copied ladder block and paste it consecutively.	(Simple)
Delete	Delete the selected data.	
Restore After Ladder Conversion	Return the ladder program being edited to the last converted status.	
Insert Row	Insert a row at the cursor position.	
Delete Row	Delete the row at the cursor position.	
Insert Column	Insert a column at the cursor position.	
Delete Column	Delete the column at the cursor position.	
NOP Batch Insert	Insert an NOP in front of the ladder block at the cursor position.	
NOP Batch Delete	Batch-delete NOPs in the program being edited.	
Edit Line	Enter a line at the cursor position.	
Delete Line	Delete the line at the cursor position.	
Change TC Setting	Batch-change timer/counter setting values used in the program.	
Ladder Edit Mode		–
Read Mode	Switch the mode of the open window to "Read Mode".	(Simple)
Write Mode	Switch the mode of the open window to "Write Mode".	
Ladder Symbol		–
Open Contact	Insert F5 at the cursor position.	(Simple)
Close Contact	Insert F6 at the cursor position.	
Open Branch	Insert sF5 at the cursor position.	
Close Branch	Insert sF6 at the cursor position.	
Coil	Insert F7 at the cursor position.	
Application Instruction	Insert F8 at the cursor position.	
Vertical Line	Insert sF9 at the cursor position.	
Horizontal Line	Insert F9 at the cursor position.	
Delete Vertical Line	Insert cF10 at the cursor position.	
Delete Horizontal Line	Insert cF9 at the cursor position.	
Pulse Contact Symbol		–
Rising Pulse	Insert sF7 at the cursor position.	(Simple)
Falling Pulse	Insert sF8 at the cursor position.	
Rising Pulse Branch	Insert aF7 at the cursor position.	
Falling Pulse Branch	Insert aF8 at the cursor position.	
Rising Pulse Close	Insert saF5 at the cursor position.	
Falling Pulse Close	Insert saF6 at the cursor position.	
Rising Pulse Close Branch	Insert saF7 at the cursor position.	
Falling Pulse Close Branch	Insert saF8 at the cursor position.	
Invert Operation Results	Insert caF10 at the cursor position.	
Operation Result Rising Pulse	Insert aF5 at the cursor position.	
Operation Result Falling Pulse	Insert caF5 at the cursor position.	

Edit (function for editing in Ladder Diagram)			Reference
Inline Structured Text			–
	Insert Inline Structured Text Box	Insert an inline structured text box.	(Simple)
	Display Template	Insert a template corresponds to the instruction, function, or control syntax.	(Structured)
	Mark Template (Left)	Set an argument of the template in the selected status from the left by selecting the menu each time.	
	Mark Template (Right)	Set an argument of the template in the selected status from the right by selecting the menu each time.	
Edit FB Instance		Rename an FB instance name.	(FB)
Documentation			–
	Device Comment	Edit device comments.	Chapter 9
	Statement	Edit statements.	(Simple)
	Note	Edit notes.	
	Statement/Note Batch Edit	Batch-edit the statements/notes in the program.	
Easy Edit			–
	Connect Line to Right-Side Symbol	Connect a horizontal line to the instruction or the line at the right of the cursor position.	(Simple)
	Connect Line to Left-Side Symbol	Connect a horizontal line to the instruction or the line at the left of the cursor position.	
	Enter/Delete HLine Rightward	Enter/delete a line at the right of the cursor position.	
	Enter/Delete HLine Leftward	Enter/delete a line at the left of the cursor position.	
	Enter/Delete VLine Downward	Enter/delete a line at the downward of the cursor position.	
	Enter/Delete VLine Upward	Enter/delete a line at the upward of the cursor position.	
	Switch Open/Close Contact	Switch between an open contact and a closed contact.	Section 10.3.4
	Switch Statement/Note Type	Change the type of the statement/note.	(Simple)
	Instruction Partial Edit	Display the Enter Symbol screen in which the first argument is in the selected status.	
	Edit List for Ladder Block	Display/edit the ladder block in list format.	
Read from CSV File		Read a list format program from a CSV file and display it as a ladder program.	
Write to CSV File		Write a ladder program to a CSV file in list format.	

Find/Replace (function for editing in Ladder Diagram)		Reference
Change Module I/O No.	Replace the start module I/O number of the buffer memory address instruction.	(Simple)
Switch Statement/Note Type	Change the type (PLC/Peripheral) of a statement/note.	
Line Statement List	Display a list of line statements used in the program.	
Jump	Move the cursor to the specified step position.	
Jump to Next Ladder Block Start	Move the cursor from the current position to the start of the next ladder block.	
Jump to Previous Ladder Block Start	Move the cursor from the current position to the start of the previous ladder block.	
Next Device	Move the cursor to the same device as the one at the cursor position.	
Next Contact	Move the cursor to the contact where the same device as the one at the cursor position is used.	
Next Coil	Move the cursor to the coil where the same device as the one at the cursor position is used.	
Back	Return the cursor to the previous position before the [Next Device]/[Next Contact]/[Next Coil] function execution.	

Online (function for editing in Ladder Diagram)			Reference
Monitor			–
	Monitor Condition Setting	Set a condition to start monitoring.	(Simple)
	Monitor Stop Condition Setting	Set a condition to stop monitoring.	
	Entry Ladder Monitor	Register and monitor ladder blocks.	
	Delete All Entry Ladder	Delete all registered ladder blocks.	

View (function for editing in Ladder Diagram)			Reference
Comment		Display device comments or label comments.	Chapter 9
Statement		Display statements.	(Simple)
Note		Display notes.	
Display Lines of Monitored Current Value		Open the Options screen and display/hide the lines of monitored current value.	
Display Format for Device Comment		Open the Options screen and set the display format for device comment.	
Display Ladder Block			
	Hide Ladder Block	Hide the ladder block at the cursor position.	
	Display Ladder Block	Display the hidden ladder block at the cursor position.	
	Hide All Ladder Block	Hide all ladder blocks.	
	Display All Ladder Block	Display all hidden ladder blocks.	
Device Display			
	Device Display	Display the device assigned by compilation.	
	Batch Device Display	Batch-change the label display on the program editors to the device display.	
	Cancel All Device Display	Cancel the device display on the program editors, and display data in the format at the time of data entry.	
Display Compile Result		Display the compilation result of the program on the inline structured text box in a list format.	
Zoom		Change the display magnification of the ladder program.	
Text Size			–
	Bigger	Enlarge the text display size on the editing screen.	(Simple)
	Smaller	Reduce the text display size on the editing screen.	
Open Other Windows			–
	Open Reference Window	Open the reference window of the ladder editor.	(Simple)
	Update Reference Window	Apply the most recent ladder program to the reference window.	
	Open Reference Source Window	Display the source of the referenced ladder editor.	
	Tile FB Horizontally	Tile the ladder editor and the function block program editor horizontally.	(FB)
	Open Label Setting	Open the Local Label Setting screen for the program being edited.	(Simple)
	Open Zoom SFC Block	Display the SFC diagram of the Zoom editor window.	
Move SFC Cursor			–
	Up	Move the cursor on the SFC diagram upward.	(Simple)
	Down	Move the cursor on the SFC diagram downward.	
	Left	Move the cursor on the SFC diagram to the left.	
	Right	Move the cursor on the SFC diagram to the right.	
Open Instruction Help		Display the Instruction Help screen.	

1.3.3 List of functions for editing SFC diagrams

The following tables show the functions for editing SFC diagrams.

Edit (function for editing SFC diagrams)			Reference
Delete		Delete the selected data.	(Simple)
Arrange SFC		Redisplay the SFC diagram.	
Insert Row		Insert a row at the cursor position.	
Delete Row		Delete the row at the cursor position.	
Insert Column		Insert a column at the cursor position.	
Delete Column		Delete the column at the cursor position.	
Edit Line			–
	Vertical Line Segment	Insert aF5 at the cursor position.	(Simple)
	Selection Divergence	Insert aF7 at the cursor position.	
	Simultaneous Divergence	Insert aF8 at the cursor position.	
	Selection Convergence	Insert aF9 at the cursor position.	
	Simultaneous Convergence	Insert aF10 at the cursor position.	
Delete Line		Delete the line at the cursor position.	
Change TC Setting		Batch-change timer/counter setting values used in the program.	
Ladder Edit Mode			–
	Read Mode	Switch the mode of the open window to "Read Mode".	(Simple)
	Write Mode	Switch the mode of the open window to "Write Mode".	
SFC Step Attribute			–
	No Attribute	Set the step attribute to No Attribute.	(Simple)
	Stored Coil	Set the step attribute to Stored Coil.	
	Stored Operation (without Transition Check)	Set the step attribute to Stored Operation (SE).	
	Stored Operation (with Transition Check)	Set the step attribute to Stored Operation (ST).	
	Reset	Reset the step attribute.	
SFC Symbol			–
	[STEP] Step	Insert F5 at the cursor position.	(Simple)
	[B] Block Start Step (with END Check)	Insert F6 at the cursor position.	
	[BS] Block Start Step (without END Check)	Insert sF6 at the cursor position.	
	[JUMP] Jump	Insert F8 at the cursor position.	
	[END] END Step	Insert F7 at the cursor position.	
	[DUMMY] Dummy Step	Insert sF5 at the cursor position.	
	[TR] Transition	Insert F5 at the cursor position.	
	[--D] Selection Divergence	Insert F6 at the cursor position.	
	[==D] Simultaneous Divergence	Insert F7 at the cursor position.	
	[--C] Selection Convergence	Insert F8 at the cursor position.	
	[==C] Simultaneous Convergence	Insert F9 at the cursor position.	
	[|] Vertical Line	Insert sF9 at the cursor position.	–
Sort SFC Step No.		Sort the SFC step/transition numbers in ascending/descending order.	(Simple)
Documentation			–
	SFC Step/Transition Comment	Change to the SFC step/transition comment editing mode.	(Simple)

Find/Replace (function for editing SFC diagrams)		Reference
Jump	Move the cursor to the specified position.	(Simple)
Find Jump Step	Move to the jump source step.	
Change SFC Step No.	Replace the SFC step number.	

Compile (function for editing SFC diagrams)		Reference
Convert Block	Convert a single block.	(Simple)

View (function for editing SFC diagrams)		Reference
Program Display	Display MELSAP-L programs.	(Simple)
SFC Step/Transition Comment	Display the SFC step/transition comments.	
Zoom	Change the display magnification ratio of the SFC diagram.	
Text Size		
Bigger	Enlarge the text display size on the editing screen.	
Smaller	Reduce the text display size on the editing screen.	
SFC Row Setting	Set the number of rows of SFC diagram.	
Open SFC Blocklist	Display the SFC block list screen.	
MELSAP3 Display	Display SFC in MELSAP3 format.	
MELSAP-L (Instruction Format) Display	Display SFC in MELSAP-L (instruction format).	
MELSAP-L (Start Conditions Format) Display	Display SFC in MELSAP-L (start conditions format).	
Open Zoom/Start Destination Block	Display the Zoom editor window or the start destination block.	
Back to Start SFC Block	Display the SFC block of the start source.	–
Open Header	Open the Local Label Setting screen for the program being edited.	

Online (function for editing in SFC diagrams)		Reference
Monitor		–
Monitor Condition Setting	Set a condition to start monitoring.	(Simple)
Monitor Stop Condition Setting	Set a condition to stop monitoring.	

1.3.4 List of functions for editing SFC block list

The following tables show the functions for editing SFC block list.

Find/Replace (function for editing SFC block list)		Reference
Jump	Move the cursor to the specified block number.	(Simple)
Block Information Find Device	Search for a device.	

View (function for editing SFC block list)		Reference
SFC Block List Comment	Display comments of the SFC block list.	(Simple)
Device Display	Display devices.	
Open SFC Body	Open the SFC diagram.	
Open Header	Display the label setting editor.	

1.3.5 List of functions for editing in Structured Text

The following tables show the functions for the ST editor.

Edit (function for editing in Structured Text)		Reference
Delete	Delete the selected data.	–
List Operands	Display the screen for inserting a label by selecting an existing label.	(Structured)
Display Template	Insert a template corresponds to the instruction, function, or control syntax.	
Mark Template (Left)	Set an argument of the template in the selected status from the left by selecting the menu each time.	
Mark Template (Right)	Set an argument of the template in the selected status from the right by selecting the menu each time.	

Find/Replace (function for editing in Structured Text)		Reference
Jump	Jump to the specified line.	(Structured)
Bookmark		–
Toggle Bookmark	Set a bookmark at the cursor line. The bookmark is deleted when one is already set at the cursor line.	(Structured)
Bookmark List	Jump to the specified bookmark from the bookmark list.	
Next Bookmark	Display the next bookmark position.	
Previous Bookmark	Display the previous bookmark position.	
Delete All Bookmarks	Cancel all bookmarks.	

View (function for editing in Structured Text)		Reference
Display Compile Result	Display the compilation result in a list format.	(Structured)
Zoom		–
Set Zoom Factor	Change the display size of the program.	(Structured)
Increase Zoom		
Decrease Zoom		
Zoom Header/Body		–
Header	Open the label setting editor in the selected POU.	(Structured)
Body	Open the program editor in the selected POU.	
Open Header	Open the Local Label Setting screen for the program being edited.	

Online (function for editing in Structured Text)		Reference
Monitor		–
Start Monitoring	Start monitoring with the split window format that displays monitor data of numeric value and character strings.	(Structured)
Start Monitoring (Bit Type only)	Start monitoring only bit type devices/labels.	

1.3.6 List of functions for editing in Structured Ladder/FBD

The following tables show the functions for the Structured Ladder/FBD editor.

Edit (function for editing in Structured Ladder/FBD)			Reference
Delete		Delete the selected data.	–
Select Mode		Change to the contact and coil input mode.	(Structured)
Interconnect Mode		Change to the line drawing mode.	
Guided Mode			–
	Guided Editing	Change to the keyboard input mode.	(Structured)
	Overwrite Mode	Overwrite the element entered in Guided editing at the cursor position.	
	Insert Mode	Insert the element entered in Guided editing at the cursor position.	
	Line Mode	Change the input format to draw lines in Guided editing.	
	Auto Comment	Add a comment entry field at the start of the ladder block added in Guided editing.	
Auto Connect		Specify and connect the start and end points to draw a line.	
Recalculate Line		Arrange a line automatically to redraw it.	
Insert Row		Insert a row into the ladder program being edited.	
Insert Column		Insert a column into the ladder program being edited.	
New Ladder Block List			–
	Top	Insert a new ladder block at the start of all ladder blocks.	(Structured)
	Before	Insert a new ladder block in front of the ladder block being edited.	
	After	Insert a new ladder block after the ladder block being edited.	
	Bottom	Insert a new ladder block at the end of all ladder blocks.	
Input Instruction		Open the Input Instruction screen.	
Ladder Symbol			–
	Open Contact	Insert at the cursor position.	(Structured)
	Close Contact	Insert at the cursor position.	
	Coil	Insert at the cursor position.	
	Jump	Insert at the cursor position.	
	Return	Insert at the cursor position.	
	Open Branch	Insert at the cursor position.	
	Close Branch	Insert at the cursor position.	
	Input Label	Insert at the cursor position.	
	Output Label	Insert at the cursor position.	
	Horizontal Line Segment	Insert at the cursor position.	
	Vertical Line Segment	Insert at the cursor position.	
	Rising Pulse	Insert at the cursor position.	
	Falling Pulse	Insert at the cursor position.	
	Rising Pulse Close	Insert at the cursor position.	
	Falling Pulse Close	Insert at the cursor position.	
	Comment	Insert a comment entry field at the cursor position.	

Edit (function for editing in Structured Ladder/FBD)		Reference
Ladder Symbol		–
Ladder Block Label	Display the Ladder Block screen.	(Structured)
Left Power Rail	Display/hide the left power rail.	
List Operands	Display the screen for inserting a label by selecting an existing label.	(Structured)
Number of Pins		–
Increment	Increase the number of arguments of functions and function blocks.	(Structured)
Delete	Decrease the number of arguments of functions and function blocks.	
Ladder Block List	Display a list of ladder blocks in a program.	
Signal Configuration		–
Configure	Set the type of a contact and a coil.	(Structured)
Toggle	Change the contact and coil type per execution in the following order. • Contact: Open Contact → Close Contact • Coil: Normal → Negation → Set → Reset	

Find/Replace (function for editing in Structured Ladder/FBD)		Reference
Jump	Jump to the specified ladder block number.	(Structured)

View (function for editing in Structured Ladder/FBD)		Reference
View Mode		–
Label	Display variables by its entered format.	(Structured)
Device	Display devices/addresses in device format. Devices assigned to labels are displayed in device format.	
Address	Display devices/addresses in address format. Devices assigned to labels are displayed in address format.	
Comment	Display label comments.	
Change Label-Device-Address Mode	Switch the display format in order (label, device, address).	
Change Label-Comment Mode	Switch the display between label and comment.	
All Device Display	Batch-change all labels on the program editors to the device display.	
Cancel All Device Display	Cancel the device display on the program editors, and display data in the format at the time of data entry.	
Grid	Show a grid on the screen being edited to display the start/end positions of a line.	
Print Wrap Position	Display the wrapping position for printing.	
Display Compile Result	Display the compilation result in a list format.	
Zoom		–
Set Zoom Factor	Change the display size of the program.	(Structured)
Increase Zoom		
Decrease Zoom		
Zoom Header/Body		–
Header	Open the label setting editor in the selected POU.	(Structured)
Body	Open the program editor in the selected POU.	
Open Header	Open the Local Label Setting screen for the program being edited.	

1.3.7 List of functions for CC IE Field configuration window

The following tables show the functions for the CC IE Field configuration window.

CC IE Field configuration (function on the CC IE Field configuration window)			Reference
Change Module			–
	Replace General CC IE Field Module	Replace the general-purpose CC IE Field module to a specific module.	Section 6.3.2
	Change to General CC IE Field Module	Change the specific module to a general-purpose CC IE Field module.	
Change Transmission Path Method			–
	Line/Star	Change the transmission path method to line or star.	Section 6.3.2
	Ring	Change the transmission path method to ring.	
Supplementary Setting		Set the link scan mode setting, loopback function setting, block data assurance per station, and operation setting for returning.	
Equal Assignment		Assign the number of link device points of all stations equally.	
Identical Point Assignment		Assign the equal number of link device points based on the total number of set stations.	
Check			–
	System Configuration	Check whether the set equipment configuration of CC-Link IE Field Network is correct.	Section 6.3.2
Parameter Processing of Slave Station		Perform the parameter processing on a slave station.	
Command Execution of Slave Station		Perform commands on a slave station.	
Close with Discarding the Setting		Discard the settings and close the CC IE Field configuration window.	–
Close with Reflecting the Setting		Apply the settings and close the CC IE Field configuration window.	Section 6.3.2

Edit (function on the CC IE Field configuration window)		Reference
Copy	Copy the information of the slave station of the selected row.	Section 6.3.2
Paste	Paste the copied slave station to the last row of the list of stations.	
Select All	Select all cells on the list of stations.	
Delete	Delete the slave station of the selected row.	

View (function on the CC IE Field configuration window)			Reference
Docking Window			–
	Module List	Display/hide the Module List window of CC-Link IE Field Network.	Section 6.3.2
	Output	Display/hide the Output window.	
	Supplementary Information	Display/hide the Supplementary Information window.	

1.3.8 List of functions for CC-Link configuration window

The following tables show the functions for the CC-Link configuration window.

CC-Link configuration (function on the CC-Link configuration window)			Reference
Change Module			–
	Replace General CC-Link Module	Replace the general-purpose CC-Link module to a specific module.	Section 6.3.3
	Change to General CC-Link Module	Change the specific module to a general-purpose CC-Link module.	
Check			–
	System Configuration	Check whether the set equipment configuration of CC-Link is correct.	Section 6.3.3
Online			–
	Detect Now	Apply the actual system configuration to the CC-Link configuration window.	Section 6.3.3
	Parameter Processing of Slave Station	Perform the parameter processing on a slave station.	
	Command Execution of Slave Station	Perform commands on a slave station.	
Close with Discarding the Setting		Discard the settings and close the CC-Link configuration window.	–
Close with Reflecting the Setting		Apply the settings and close the CC-Link configuration window.	Section 6.3.3

Edit (function on the CC-Link configuration window)		Reference
Copy	Copy the information of the slave station of the selected row.	Section 6.3.3
Paste	Paste the copied slave station to the last row of the list of stations.	
Select All	Select all cells on the list of stations.	–
Delete	Delete the slave station of the selected row.	Section 6.3.3

View (function on the CC-Link configuration window)			Reference
Docking Window			–
	Module List	Display/hide the Module List window of CC-Link.	Section 6.3.3
	Output	Display/hide the Output window.	

1.3.9 List of functions for AnyWireASLINK configuration window

The following tables show the functions for the AnyWireASLINK configuration window.

AnyWireASLINK configuration (function on the AnyWireASLINK configuration window)			Reference
Change Module			–
	Replace General AnyWireASLINK Module	Replace the general-purpose AnyWireASLINK module to a specific module.	(Intelligent)
	Change to General AnyWireASLINK Module	Change the specific module to a general-purpose AnyWireASLINK module.	
Address Auto-Input		Enter the address of the slave module automatically.	
Check			–
	System Configuration	Check whether the set equipment configuration of AnyWireASLINK is correct.	(Intelligent)
Online			–
	Detect Now	Apply the actual system configuration to the AnyWireASLINK configuration window.	(Intelligent)
	Parameter Processing of Slave Module	Perform the parameter processing on a slave module.	–
Close with Discarding the Setting		Discard the settings and close the AnyWireASLINK configuration window.	
Close with Saving the Setting		Apply the settings and close the AnyWireASLINK configuration window.	(Intelligent)

Edit (function on the AnyWireASLINK configuration window)		Reference
Copy	Copy the information of the slave module of the selected row.	–
Paste	Paste the copied slave module to the last row of module information list.	
Select All	Select all cells on the module information list.	
Delete	Delete the slave module of the selected row.	

View (function on the AnyWireASLINK configuration window)			Reference
Docking Window			–
	Module List	Display/hide the Module List window of AnyWireASLINK.	
	Output	Display/hide the Output window.	

1.3.10 List of functions for the Sensor/Device Monitor screen

The following tables show the functions for the Sensor/Device Monitor screen.

Sensor/Device Monitor (function on the Sensor/Device Monitor screen)		Reference
Close	Close the Sensor/Device Monitor screen.	–

View (function on the Sensor/Device Monitor screen)		Reference
Docking Window		–
Monitor Information	Display/hide the Monitor Information window.	

Online (function on the Sensor/Device Monitor screen)		Reference
Parameter Processing of Slave Station	Perform the parameter processing on a slave station when monitoring the sensors and equipment of CC-Link.	–
Command Execution of Slave Station	Perform commands on a slave station when monitoring sensors and equipment of CC-Link.	
Parameter Processing of Slave Module	Perform the parameter processing on a slave module when monitoring sensors and equipment of AnyWireASLINK.	
Start Monitoring	Start monitoring sensors and equipment.	
Stop Monitoring	Stop monitoring sensors and equipment.	

1.3.11 List of functions for GX Simulator2 screen

The following tables show the functions for the GX Simulator2 screen.

Tool (function on the GX Simulator2 screen)		Reference
Backup Device Memory in Simulation		–
Save	Save device memory/buffer memory in simulation temporarily.	Section 15.2.1
Read	Read device memory/buffer memory saved temporarily.	Section 15.2.2
I/O System Setting	Execute simulation with the I/O system setting.	Section 19.1

Options (function on the GX Simulator2 screen)		Reference
Start in minimized status	Start the GX Simulator2 screen in the minimized status at starting simulation.	Section 15.2
Save device memory at stop	Save device memory/buffer memory in simulation automatically at stopping simulation.	Section 15.2.1

1.3.12 List of functions for I/O system setting screen

The following tables show the functions for the I/O System Setting screen.

File (function for the I/O system setting)		Reference
New	Create a new I/O system setting.	Section 19.8.1
Open	Open an existing I/O system setting.	Section 19.8.2
Save	Save an I/O system setting.	–
Save As	Name and save an I/O system setting.	Section 19.8.3
(Recently used I/O system setting files 1 to 4)	Display the recently used I/O system setting file names and open the selected I/O system setting file.	–
Execute I/O System Setting	Execute the I/O system setting and start simulation.	Section 19.6.1
Disable I/O System Setting	Disable execution of the I/O system setting.	Section 19.6.2
Exit I/O System Settings	Exit the I/O system setting.	–

Edit (function for the I/O system setting)		Reference
Cut	Cut the selected data.	Section 19.4.2
Copy	Copy the selected data.	
Paste	Paste the cut or copied data at the cursor position.	
Delete	Delete the selected data.	–
Enable/Disable Setting		–
Enable All	Enable all I/O system settings.	Section 19.4
Disable All	Disable all I/O system settings.	

View (function for the I/O system setting)		Reference
Toolbar	Display/hide the toolbar.	–
Statusbar	Display/hide the status bar.	

Online (function for the I/O system setting)		Reference
Target Simulator Setting	Set the target simulation with which the I/O system setting is executed.	Section 19.3
Start Monitoring	Start monitoring the I/O System Setting screen.	Section 19.7.1
Stop Monitoring	Stop monitoring the I/O System Setting screen.	

Window (function for the I/O system setting)		Reference
Cascade	Cascade windows.	–
Tile Vertically	Tile windows on the I/O System Setting screen vertically.	
Tile Horizontally	Tile windows on the I/O System Setting screen horizontally.	
Arrange Icons	Arrange the icons at the bottom of the I/O System Setting screen.	

1.3.13 List of functions for predefined protocol support function

The following tables show the functions for the predefined protocol support function.

File (function of the predefined protocol support function)		Reference
New	Create a new protocol setting file.	(Intelligent)
Open	Open an existing protocol setting file.	
Close	Close the open protocol setting file.	
Save	Save the protocol setting file.	
Save As	Name and save a protocol setting file.	
Print	Print such as protocol setting.	
Exit	Exit the predefined protocol support function.	

Edit (function of the predefined protocol support function)		Reference
Add Protocol	Add a protocol.	(Intelligent)
Change to Editable Protocol	Change the protocol selected from the predefined protocol library to an editable one.	
Protocol Detailed Setting	Set the protocol detailed setting such as the number of retries of protocol transmission and whether to clear OS area (receive data area).	
Add Receive Packet	Add a receive packet.	
Delete	Delete the protocol.	
Copy	Copy the protocol.	
Paste	Paste the protocol.	
Delete Multiple Protocols	Batch-delete multiple protocols.	
Copy Multiple Protocols	Batch-copy multiple protocols.	
Paste Multiple Protocols	Batch-paste multiple protocols.	
Device Batch Setting	Batch-set devices used in the protocol.	
Save User Protocol Library	Save the set protocol as a user protocol library.	

Module Read/Write (function of the predefined protocol support function)		Reference
Read from Module	Read protocol settings from the module.	(Intelligent)
Write to Module	Write registered protocol settings to the module.	
Module Verification	Compare protocol settings being opened with those written in the module.	

Tool (function of the predefined protocol support function)		Reference
Setting Device List	Display the list of devices used in protocols.	(Intelligent)
Register Predefined Protocol Library	Import predefined protocol library provided by Mitsubishi Electric Corporation.	

Debugging Support Function (function of the predefined protocol support function)		Reference
Module Selection	Select a module to be debugged.	(Intelligent)
Protocol Execution Log	Display the protocol execution logs and the protocol execution results.	
State Monitor	Monitor signals, communication error information, operation setting switches, and protocol execution status of the Q series C24N/L series C24 module.	

Window (function of the predefined protocol support function)		Reference
Cascade	Cascade windows.	(Intelligent)
Tile Horizontally	Tile windows horizontally.	
(Switch to other window)	Display the open window.	

MEMO

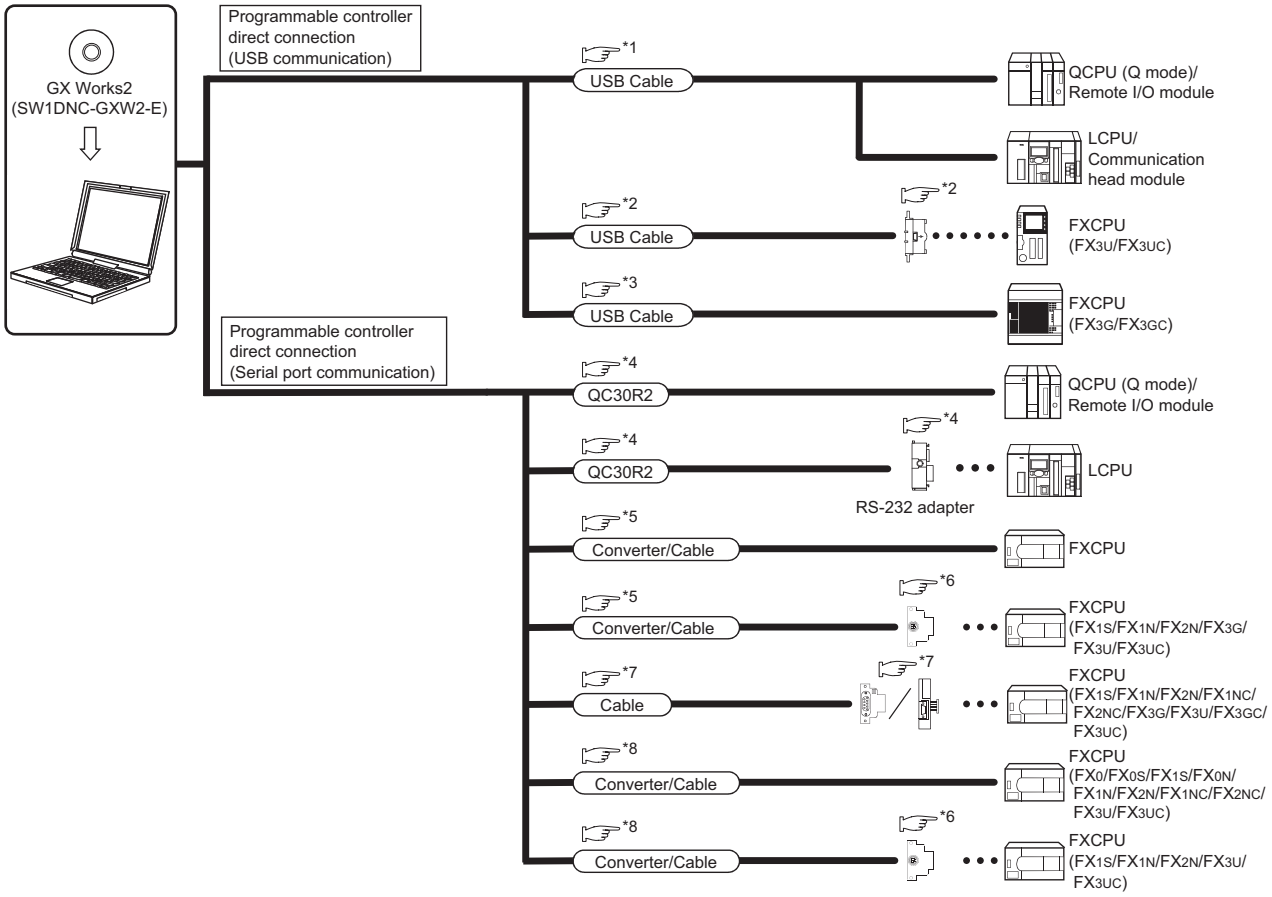
2 SYSTEM CONFIGURATION

This chapter explains the system configuration, configuration devices, and supported languages of GX Works2.

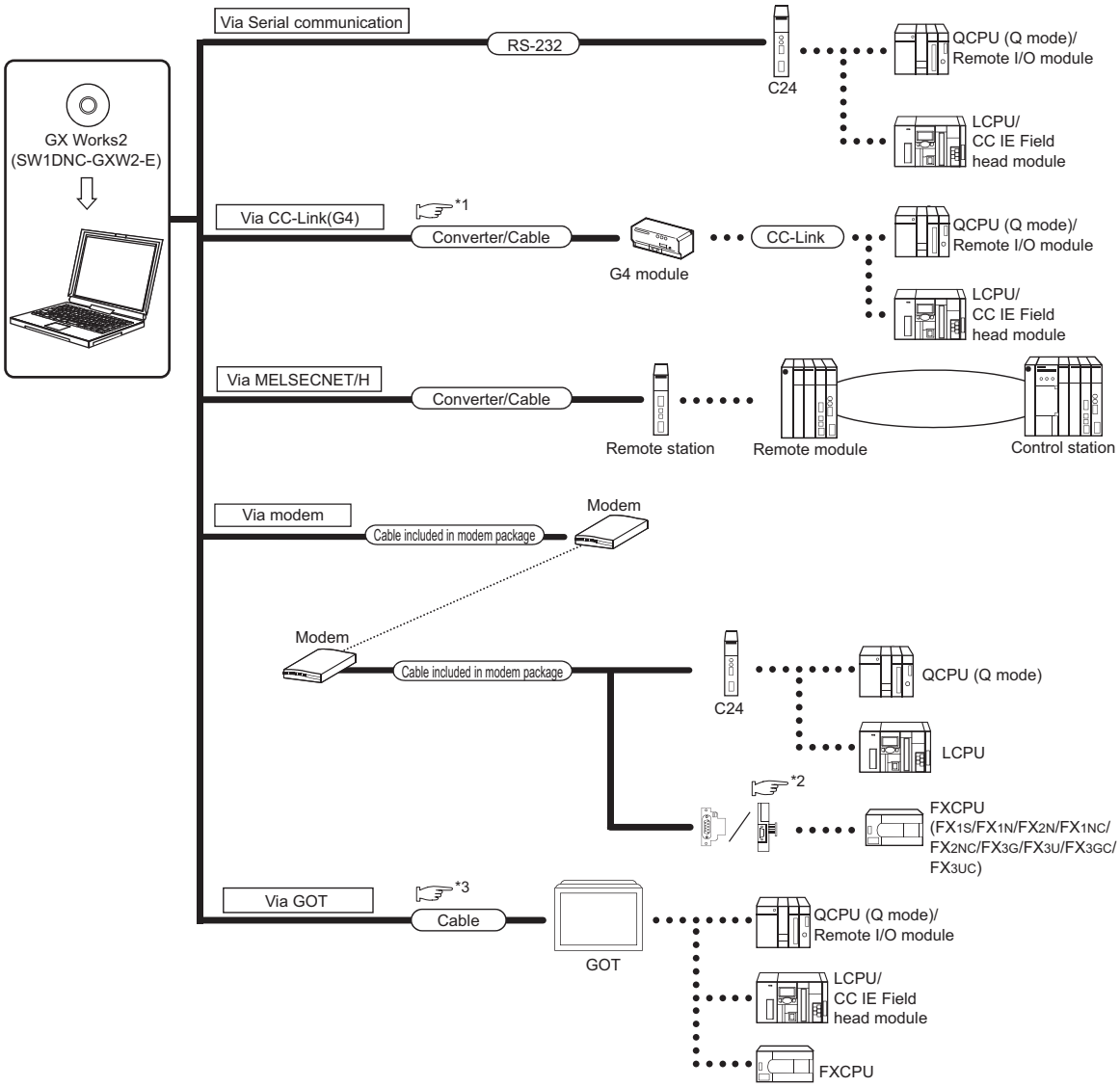
2.1 Connection from USB/Serial Port

Q CPU L CPU Remote Head FX

The following shows the possible system configuration for connecting to the programmable controller CPU using the USB/serial port of a personal computer.
For ACPU, use GX Developer. For details of the use of ACPU, refer to Appendix 14.



*1 : Section 2.1.1
*2 : Section 2.1.2
*3 : Section 2.1.3
*4 : Section 2.1.4
*5 : Section 2.1.5
*6 : Section 2.1.6
*7 : Section 2.1.7
*8 : Section 2.1.8



*1 : Section 2.1.9

*2 : Section 2.1.10

*3 : Section 2.1.11

2.1.1 USB cables (compatible with QCPU (Q mode), LCPU, and communication head module)

The following table shows USB cables and USB adapters whose operations have been confirmed by Mitsubishi Electric Corporation.

Product name	Model	Manufacturer
USB cable (USB A type - USB B type)*1	AU230	BUFFALO KOKUYO SUPPLY INC.
USB cable (USB A type - USB miniB type)*2	KU-AMB530	SANWA SUPPLY INC.
	U2C-M30BK	ELECOM Co., Ltd.
	MR-J3USBCBL3M	Mitsubishi Electric Corporation
	GT09-C30USB-5P	Mitsubishi Electric System & Service Co., Ltd.

*1 : For QCPU (Q mode) only
*2 : For Universal model QCPU/LCPU/communication head module only

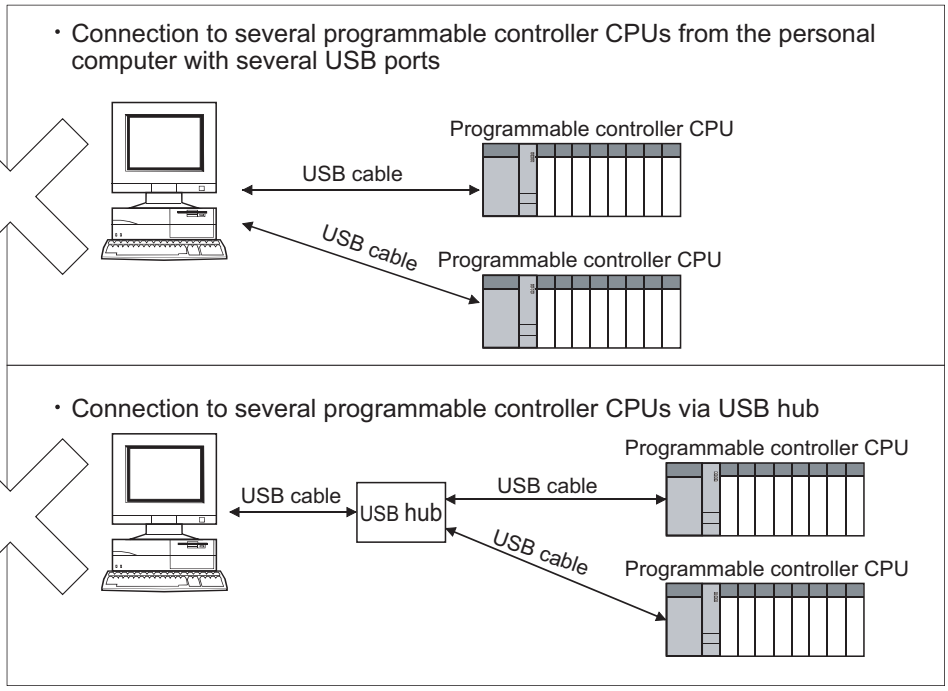
Point

- **Using a USB cable for the first time**
  Install the USB driver. (☞ Appendix 16)
- **Considerations and restrictions**
  For the considerations and restrictions when accessing a programmable controller CPU, refer to Section 11.11.
- **Using a USB/RS-232 conversion cable**
  For checking the COM port number as connecting a personal computer to a programmable controller CPU using such as USB/RS-232 conversion cable, refer to the user's manual of each cable.

■ Configurations for USB connection

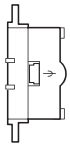
Only one programmable controller CPU can be connected to a personal computer using a USB cable. Connection to a programmable controller CPU is not applicable to the configuration examples below.

<Inapplicable configurations>

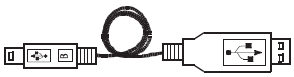


2.1.2 USB cables and function expansion boards (compatible with FX3U/FX3UC)

FX3U-USB-BD



USB cable (included)



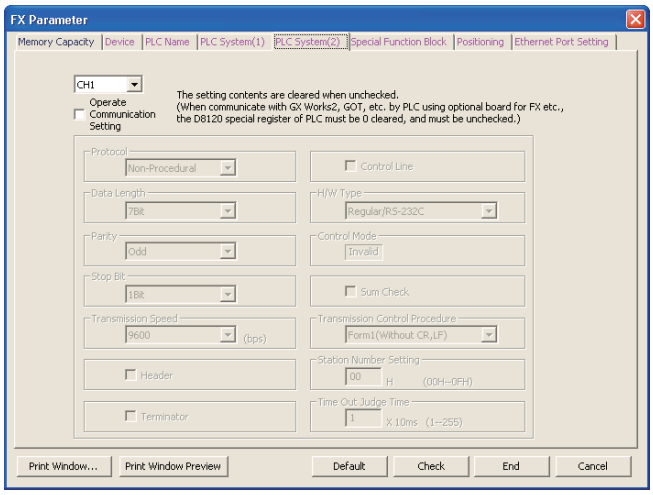
Point

● **Using a USB cable for the first time**

- Install the driver from the CD-ROM included with FX-USB-AW and FX3U-USB-BD.
- GX Works2 selects data from the Connection Destination view on the Navigation window and assigns a serial COM port number.

● **Considerations and restrictions**

- For the considerations and restrictions relating to FX3U-USB-BD, refer to the user's manual included.
- When "Operate Communication Setting" is selected on the <<PLC System (2)>> tab of PLC parameter, the corresponding port cannot communicate with the programmable controller CPU. Write the setting in which "Operate Communication Setting" is cleared from the built-in programming port of the programmable controller CPU.
  When the programmable controller type of the project is FX3U/FX3UC, the channel setting (CH1/CH2) combo box is displayed. Select 'CH1' to confirm the setting.



2.1.3 USB cables (compatible with FX3G and FX3GC)

For details of cables, refer to the following manuals.
☞ FX3G Series Programmable Controllers User's Manual [Hardware Edition]
☞ FX3GC Series Programmable Controllers User's Manual [Hardware Edition]
Only one programmable controller CPU can be connected to a personal computer using a USB cable.
(☞ Section 2.1.1 "■ Configurations for USB connection")

Point

● **Using a USB cable for the first time**
Install the USB driver. (☞ Appendix 16)
GX Works2 selects data from the Connection Destination view on the Navigation window and configures a USB.

2.1.4 RS-232 cables (compatible with QCPU (Q mode), LCPU, and remote I/O module)

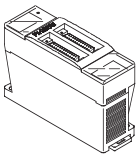
The following table shows RS-232 cables whose operations have been confirmed at Mitsubishi Electric. LCPU can be connected with an RS-232 adapters (L6ADP-R2).

Model	Product name
QC30R2 (Personal computer connector: 9-pin D-sub connector) 	Mitsubishi Electric Corporation RS-232 cable

Point

● **High-speed communication**
For high-speed communication (transmission speed: 115.2/57.6kbps), use a personal computer compatible with high-speed communication.
When a communication error occurs, retry the communication after reducing the transmission speed setting.

2.1.5 Converters/cables for RS-232 connection (compatible with FXCPU)

Personal computer side (RS-232 cable)	RS-232/RS-422 converter	Programmable controller CPU side (RS-422 cable)
 F2-232CAB (25-pin D-sub↔25-pin D-sub)	 FX-232AW	For FX1/FXU/FX2C  FX-422CAB (0.3 m) FX-422CAB-150 (1.5 m)
 F2-232CAB-1 (9-pin D-sub↔25-pin D-sub)	 FX-232AWC	For FX0/FX0S/FX0N/FX1S/FX1N/FX1NC/FX2N/FX2NC/ FX3G/FX3GC/FX3U/FX3UC  FX-422CAB0 (1.5 m)
 F2-232CAB-2 (Half pitch↔25-pin D-sub)		
 AC30N2A(25-pin↔25-pin)	 FX-232AWC-H	–

Point

● **Transmission speed**
When connecting to FX3G/FX3GC/FX3U/FX3UC using FX-232AWC-H, select any of 9.6kbps, 19.2kbps, 38.4kbps, 57.6kbps, or 115.2kbps for the transmission speed.
When connecting using FX-232AWC or FX-232AW, select either 9.6kbps or 19.2kbps for the transmission speed.

● **Connecting to FXCPU**
Be sure to use equipment shown in the table when connecting to FXCPU.

■ Considerations for using RS-422 interface cables/converters

For the specifications of an RS-422 interface conversion cable/converter and the considerations for using them, please read the following instructions as well as the manuals of each product for correct handling.

● **Connecting/disconnecting the conversion cable/converter**

When connecting/disconnecting a peripheral device, conversion cable or converter to/from the RS-422 interface, be sure to touch a grounding strap or grounded metal to discharge static electricity stored in the cable or in your body before the operation, regardless of whether electricity is being supplied or not. After doing this, follow the procedure below.
Turn the programmable controller CPU OFF before connecting/disconnecting a conversion cable/converter that receives 5VDC power supply from the RS-422 interface.

Operation

1. **Turn OFF the personal computer.**
2. **Turn OFF the conversion cable/converter. Ground the FG terminal if provided.**
3. **Connect/disconnect the conversion cable/converter to/from the personal computer and the programmable controller CPU.**
4. **Turn ON the conversion cable/converter.**
5. **Turn ON the personal computer.**
6. **Start up the software package.**

2.1.6 Connection using function expansion boards (compatible with FXCPU)

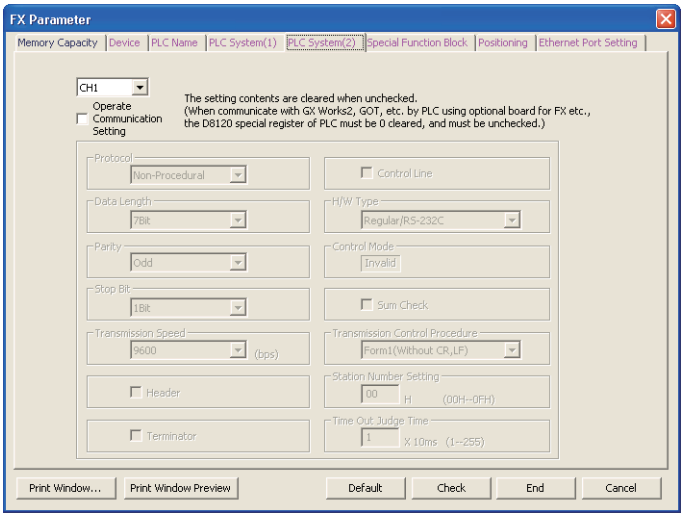
The following table shows the compatibility of FXCPU with function expansion boards.

Series	Function expansion board
FX3U, FX3UC (FX3UC-32MT-LT, FX3UC-32MT-LT-2 only)	FX3U-422-BD
FX3G	FX3G-422-BD
FX2N	FX2N-422-BD
FX1S, FX1N	FX1N-422-BD

Point

● **PLC parameter**

When "Operate Communication Setting" is selected on the <<PLC System (2)>> tab of PLC parameter, the corresponding port cannot communicate with the programmable controller CPU. Write the setting in which "Operate Communication Setting" is cleared from the built-in programming port of the programmable controller CPU.
When the programmable controller type of the project is FX3G/FX3GC or FX3U/FX3UC, the channel setting (CH1/CH2) combo box is displayed.
Select 'CH1' to confirm the setting.



2.1.7 Connection using RS-232 cables and function expansion boards (special adapters) (compatible with FXCPU)

The following table shows the compatibility of RS-232 cables with function expansion boards and special adapters according to the shape and pin configuration of the serial port of the personal computer.

Serial port shape of personal computer	Series	Function expansion board and special adapter	RS-232 cable
9-pin D-sub	FX3U, FX3UC	FX3U-232-BD*1	FX-232CAB-1
		Function expansion board (FX3U-***-BD)*2 + FX3U-232ADP	
	FX3G, FX3GC	FX3G-232-BD*3	FX-232CAB-1
		FX3G-CNV-ADP*4 + FX3U-232ADP	
	FX2N	FX0N-232ADP + FX2N-CNV-BD	F2-232CAB-1
		FX2N-232-BD	FX-232CAB-1
		FX2NC-232ADP + FX2N-CNV-BD	
	FX1NC, FX2NC	FX0N-232ADP	F2-232CAB-1
		FX2NC-232ADP	FX-232CAB-1
	FX1S, FX1N	FX0N-232ADP + FX1N-CNV-BD	F2-232CAB-1
		FX1N-232-BD	FX-232CAB-1
		FX2NC-232ADP + FX1N-CNV-BD	
Half pitch 14-pin	FX3U, FX3UC	FX3U-232-BD*1	FX-232CAB-2
		Function expansion board (FX3U-***-BD)*2 + FX3U-232ADP	
	FX3G, FX3GC	FX3G-232-BD*3	FX-232CAB-2
		FX3G-CNV-ADP*4 + FX3U-232ADP	
	FX2N	FX0N-232ADP + FX2N-CNV-BD	F2-232CAB-2
		FX2N-232-BD	FX-232CAB-2
		FX2NC-232ADP + FX2N-CNV-BD	
	FX1NC, FX2NC	FX0N-232ADP	F2-232CAB-2
		FX2NC-232ADP	FX-232CAB-2
	FX1S, FX1N	FX0N-232ADP + FX1N-CNV-BD	F2-232CAB-2
		FX1N-232-BD	FX-232CAB-2
		FX2NC-232ADP + FX1N-CNV-BD	
25-pin D-sub	FX3U, FX3UC	FX3U-232-BD*1	F2-232CAB-1
		Function expansion board (FX3U-***-BD)*2 + FX3U-232ADP	
	FX3G, FX3GC	FX3G-232-BD*3	F2-232CAB-1
		FX3G-CNV-ADP*4 + FX3U-232ADP	
	FX2N	FX0N-232ADP + FX2N-CNV-BD	F2-232CAB
		FX2N-232-BD	F2-232CAB-1
		FX2NC-232ADP + FX2N-CNV-BD	
	FX1NC, FX2NC	FX0N-232ADP	F2-232CAB
		FX2NC-232ADP	F2-232CAB-1
	FX1S, FX1N	FX0N-232ADP + FX1N-CNV-BD	F2-232CAB
		FX1N-232-BD	F2-232CAB-1
		FX2NC-232ADP + FX1N-CNV-BD	

*1 : For FX3UC series, only FX3UC-32MT-LT and FX3UC-32MT-LT-2 are connectable.

*2 : '***' of function expansion boards (FX3U-***-BD) indicates 232, 485, 422, USB, CNV, or 8AV.
Function expansion board (FX3U-***-BD) is not required for FX3UC (D, DS, DSS) series.

*3 : FX3GC series are not connectable.

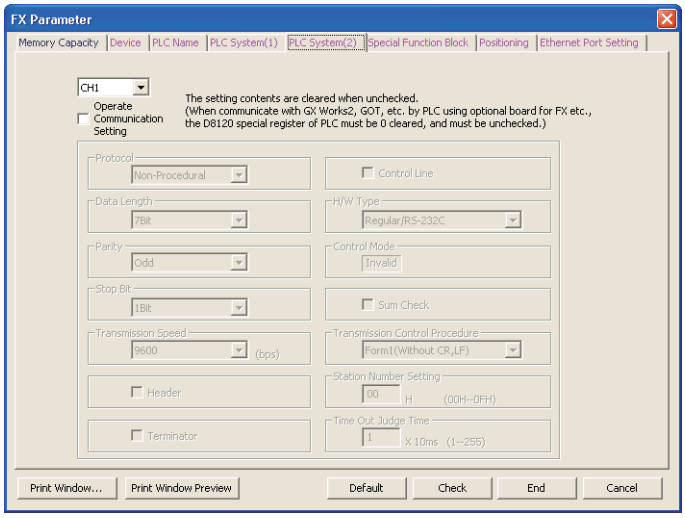
*4 : ADP (FX3G-CNV-ADP) for FX3U adapter connection is not required for FX3GC series.

Point

● PLC parameter

When "Operate Communication Setting" is selected on the <<PLC System (2)>> tab of PLC parameter, the corresponding port cannot communicate with the programmable controller CPU. Write the setting in which "Operate Communication Setting" is cleared from the built-in programming port of the programmable controller CPU.
When the programmable controller type of the project is FX3G/FX3GC or FX3U/FX3UC, the channel setting (CH1/CH2) combo box is displayed.

- FX3U/FX3UC (FX3UC-32MT-LT, FX3UC-32MT-LT-2) series
  When using the first adapter of FX3U-232ADP which is connected to FX3U-232-BD or FX3U-CNV-BD, specify 'CH1' and check the setting.
  When using FX3U-232ADP which is connected to a board other than FX3U-CNV-BD, or when using the second adapter of FX3U-232ADP which is connected to FX3U-CNV-BD, specify 'CH2' and check the setting.
- FX3UC (D, DS, DSS)/FX3GC series
  When using the first adapter of FX3U-232ADP which is connected to FX3UC (D, DS, DSS) or FX3GC series, specify 'CH1' and check the setting.
  When using the second adapter of FX3U-232ADP, specify 'CH2' and check the setting.
- FX3G series (14-/24-point type)
  When using FX3G-232-BD, or when using the first adapter of FX3U-232ADP which is connected to FX3G-CNV-ADP, specify 'CH1' and check the setting.
- FX3G series (40-/60-point type)
  When using FX3G-232-BD, or when using the first adapter of FX3U-232ADP which is connected to FX3G-CNV-ADP, specify 'CH1' and check the setting. In this case, when using the second adapter of FX3U-232ADP which is connected to FX3G-CNV-ADP, specify 'CH2' and check the setting.
  When using FX3G-232-BD and FX3U-232ADP which is connected to FX3G-CNV-ADP, specify 'CH1' and check the setting of FX3U-232ADP, and specify 'CH2' and check the setting of FX3G-232-BD.



2.1.8 Converters/cables for USB connection (compatible with FXCPU)

FX-USB-AW

USB cable (included)

Point

● **Using a USB cable for the first time**

- Install the driver from the CD-ROM included with FX-USB-AW and FX3U-USB-BD.
- GX Works2 selects data from the Connection Destination view on the Navigation window and assigns a serial COM port number.

● **Considerations and restrictions**

- For the considerations and restrictions relating to FX-USB-AW, refer to the user's manual included.

2.1.9 Connection via AJ65BT-R2N

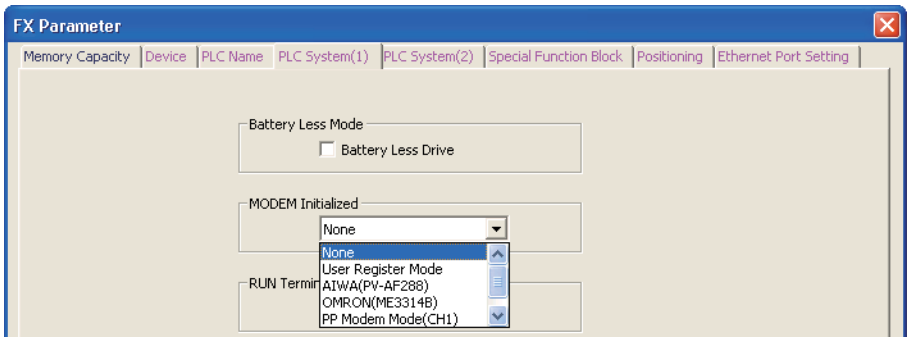
Use an RS-232 cable complies with the RS-232 standard within 15m.
For details, refer to the following manual.
☞ CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)

2.1.10 Function expansion board (special adapter)

Programmable controller side connector shape of cable included in modem package	Series	Function expansion board and special adapter
9-pin D-sub	FX3U, FX3UC	FX3U-232-BD*1
		Function expansion board (FX3U-***-BD)*2 + FX3U-232ADP
	FX3G, FX3GC	FX3G-232-BD*3
		FX3G-CNV-ADP*4 + FX3U-232ADP
	FX2N	FX2N-232-BD
		FX2NC-232ADP + FX2N-CNV-BD
	FX1NC, FX2NC	FX2NC-232ADP
	FX1S, FX1N	FX1N-232-BD
		FX2NC-232ADP + FX1N-CNV-BD
25-pin D-sub	FX2N	FX0N-232ADP + FX2N-CNV-BD
	FX1NC, FX2NC	FX0N-232ADP
	FX1S, FX1N	FX0N-232ADP + FX1N-CNV-BD

*1 : For FX3UC series, only FX3UC-32MT-LT and FX3UC-32MT-LT-2 are connectable.
*2 : '***' of function expansion boards (FX3U-***-BD) indicates 232, 485, 422, USB, CNV, or 8AV.
Function expansion board (FX3U-***-BD) is not required for FX3UC (D, DS, DSS) series.
*3 : FX3GC series are not connectable.
*4 : ADP (FX3G-CNV-ADP) for FX3U adapter connection is not required for FX3GC series.

Set "MODEM Initialized" on the <<PLC System (1)>> tab of PLC parameter according to the modem. For details, refer to Section 11.10.



2.1.11 Connection via GOT

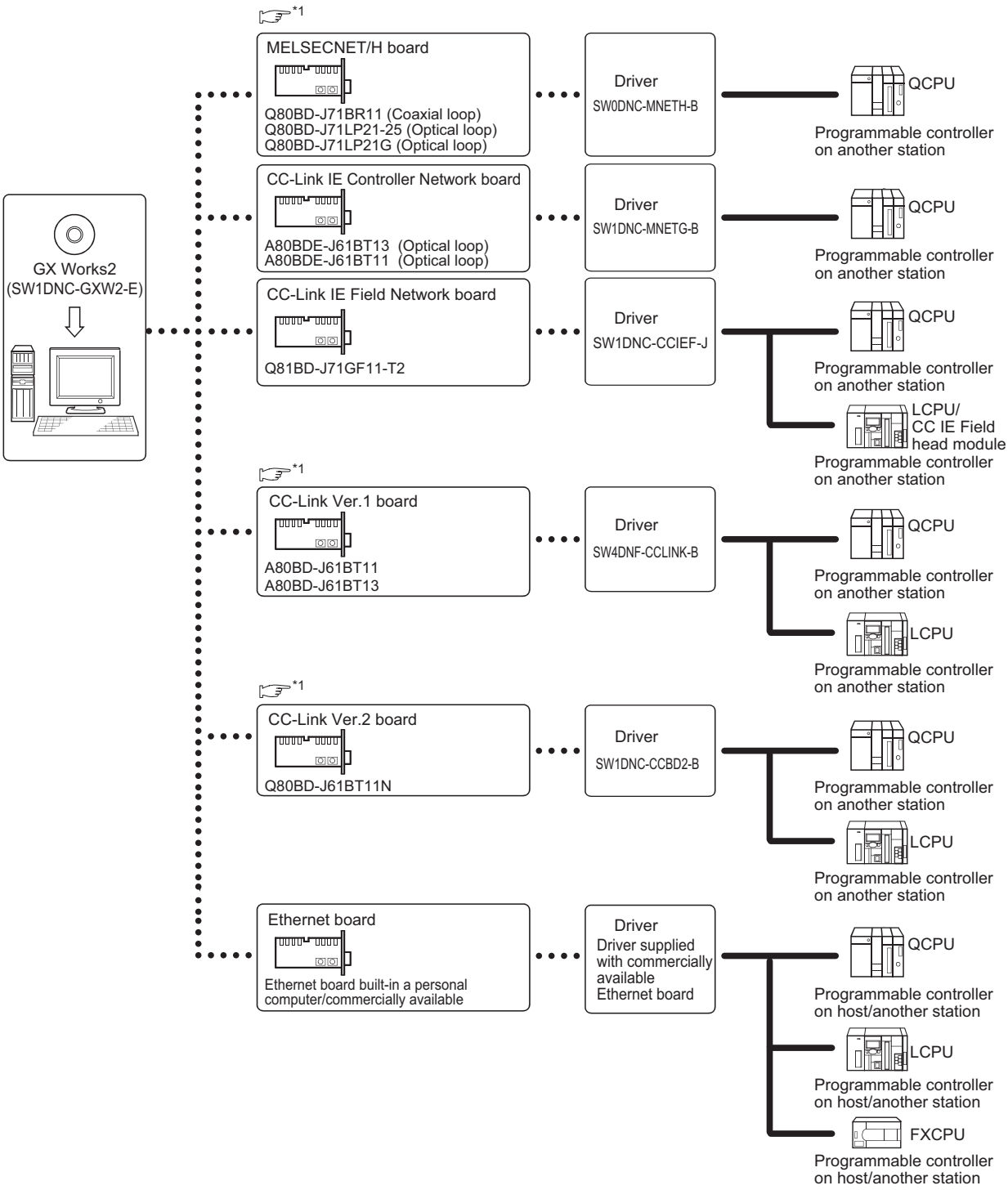
The use of the transparent function of GOT enables the access to a programmable controller CPU via GOT. (☞ Section 11.9)

2.2 Connection from I/F Boards

Q CPU | L CPU | Remote | Head *1 | FX

*1 : CC IE Field head module only

The following shows the system configuration for connecting to a programmable controller CPU using an I/F board installed on the personal computer.
For the methods for installing an I/F board and installing the driver, refer to the manual of each I/F board.



*1 : Section 2.2.1

2.2.1 I/F boards

This section explains applications of I/F boards.
For details, refer to the manual of each I/F board.

■ MELSECNET/H board

- For accessing Process CPU, use SW0DNC-MNETH-B version E or later.
- For accessing Redundant CPU, use SW0DNC-MNETH-B version K or later.

■ CC-Link Ver.1 board

- A80BD-J61BT11 can be used as a master or local station.
- A80BD-J61BT13 can be used as a local station.
- For accessing Process CPU, use SW4DNF-CCLINK-B version C or later.
- Set the board as a local station when connecting a Redundant CPU.
  Use SW4DNF-CCLINK-B version G or later.

■ CC-Link Ver.2 board

- Q80BD-J61BT11N can be used as a master or local station.
- Set the board as a local station when connecting a Redundant CPU.
- Use the communication driver SW1DNC-CCBD2-B version 1.04E or later for Windows Vista®, and version 1.08J or later for Windows® 7.

2.3 Interfaces and Connectable Modules

Q CPU L CPU Remote Head FX

This section explains details of the modules that can be connected from the USB port, serial port, and each I/F board.

■ Modules connectable from USB port

The following table shows the modules that can be connected from the USB port.

● Q series, L series

Programmable controller series	Module model
Q series	Q00UJ, Q00U, Q01U, Q02H, Q02PH, Q02U, Q03UD, Q03UDE, Q03UDV, Q04UDH, Q04UDEH, Q04UDV, Q06H, Q06PH, Q06UDH, Q06UDEH, Q06UDV, Q10UDH, Q10UDEH, Q12H, Q12PH, Q12PRH, Q13UDH, Q13UDEH, Q13UDV, Q20UDH, Q20UDEH, Q25H, Q25PH, Q25PRH, Q26UDH, Q26UDEH, Q26UDV, Q50UDEH, Q100UDEH
L series	L02S, L02, L02-P, L06, L26, L26-BT, L26-PBT, LJ72GF15-T2, LJ72MS15

● FX series

Module name	Connection route	Module model
Programmable controller main unit	FX-USB-AW*1	FX0, FX0S, FX0N, FX1S, FX1N, FX1NC, FX2N, FX2NC, FX3U, FX3UC
	USB direct connection	FX3G, FX3GC
USB expansion board	USB direct connection*1	FX3U-USB-BD

*1 : As FXCPU uses the serial ⇔ USB conversion driver software, specify the COM port number of the RS-232 in the connection destination setting.

■ Modules connectable from serial port

The following table shows the modules that can be connected from the serial port.

Programmable controller series	Module name	Module model
Q series	Programmable controller CPU module	Q00J, Q00UJ, Q00, Q00U, Q01, Q01U, Q02(H), Q02PH, Q02U, Q03UD, Q04UDH, Q06H, Q06PH, Q06UDH, Q10UDH, Q12H, Q12PH, Q12PRH, Q13UDH, Q20UDH, Q25H, Q25PH, Q25PRH, Q26UDH
	Serial communication module*1	QJ71C24, QJ71C24-R2, QJ71C24N, QJ71C24N-R2, QJ71C24N-R4
	MELSECNET/H network remote I/O module	QJ72LP25, QJ72BR15
	G4 module	AJ65BT-G4-S3, AJ65BT-R2N
L series	Programmable controller CPU module	L02S, L02*2, L02-P*2, L06*2, L26*2, L26-BT*2, L26-PBT*2
	Serial communication module*1	LJ71C24, LJ71C24-R2
	G4 module	AJ65BT-G4-S3, AJ65BT-R2N
FX series*3	Programmable controller main unit	FX0, FX0S, FX0N, FX1, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3GC, FX3U, FX3UC

*1 : When accessing the programmable controller CPU from a personal computer via serial communication modules, note that modules that can be connected to the personal computer are limited.
Even if a module cannot be directly connected to the personal computer, it may be usable as the nth module in multi-drop connection.
For details of the multi-drop connection, refer to the following manuals.
☞ Q Corresponding Serial Communication Module User's Manual (Basic)
☞ MELSEC-L Serial Communication Module User's Manual (Basic)

<Q series>

○: Applicable ×: Not applicable

Model	Interface		1:1 system configuration	Multi-drop connection	
				1st module	nth module
QJ71C24N QJ71C24	CH1	RS-232	○	○	×
	CH2	RS-422/485	×	×	○
QJ71C24N-R2 QJ71C24-R2	CH1	RS-232	○	×	×
	CH2	RS-232	○ (Function version B or later)	×	×
QJ71C24N-R4	CH1	RS-422/485	×	×	×
	CH2	RS-422/485	×	×	×

<L series>

○: Applicable ×: Not applicable

Model	Interface		1:1 system configuration	Multi-drop connection	
				1st module	nth module
LJ71C24	CH1	RS-232	○	○	×
	CH2	RS-422/485	×	×	○
LJ71C24-R2	CH1	RS-232	○	×	×
	CH2	RS-232	○	×	×

*2 : Connectable only with an RS-232 adapter (L6ADP-R2).
*3 : Connectable only with an RS-232 ⇔ RS-422 conversion board/adapter.

■ Modules connectable from MELSECNET/H board

The following table shows the modules that can be connected from the MELSECNET/H board.

I/F board model	Programmable controller series	Module model
Q80BD-J71LP21-25 Q80BD-J71LP21G Q80BD-J71BR11	Q series	QJ71LP21, QJ71LP21G, QJ71BR11, QJ71LP21-25, QJ71LP21S-25

■ Modules connectable from CC-Link IE Controller Network board

The following table shows the modules that can be connected from the CC-Link IE Controller Network board.

I/F board model	Programmable controller series	Module model
Q80BD-J71GP21-SX Q80BD-J71GP21S-SX	Q series	QJ71GP21-SX, QJ71GP21S-SX

■ Modules connectable from CC-Link IE Field Network board

The following table shows the modules that can be connected from the CC-Link IE Field Network board.

I/F board model	Programmable controller series	Module model
Q81BD-J71GF11-T2	Q series	QJ71GF11-T2
	L series	LJ72GF15-T2, LJ71GF11-T2

■ Modules connectable from CC-Link Ver.1 board

The following table shows the modules that can be connected from the CC-Link Ver.1 board.

I/F board model	Programmable controller series	Module model
A80BD-J61BT11 A80BD-J61BT13	Q series	QJ61BT11, QJ61BT11N

■ Modules connectable from the CC-Link Ver.2 board

The following table shows the modules that can be connected from the CC-Link Ver.2 board.

I/F board model	Programmable controller series	Module model
Q80BD-J61BT11N	Q series	QJ61BT11, QJ61BT11N
	L series	L26-BT, LJ61BT11

■ Modules connectable from Ethernet board

The following table shows the modules that can be connected from the Ethernet board.

I/F board model	Programmable controller series	Module model
Ethernet board built-in a personal computer or commercially available	Q series	QJ71E71, QJ71E71-B2, QJ71E71-100, QJ71E71-B5, Q03UDE, Q03UDV, Q04UDEH, Q04UDV, Q06UDEH, Q06UDV, Q10UDEH, Q13UDEH, Q13UDV, Q20UDEH, Q26UDEH, Q26UDV, Q50UDEH, Q100UDEH
	L series	LJ71E71, L02, L02-P, L06, L26, L26-BT, L26-PBT
	FX series	FX-ENET series

2.4 System Configuration with Memory Card on Personal Computer

Q CPU L CPU Remote Head FX

This section explains the system configuration when accessing from the personal computer with the memory card on the personal computer.

● **Installing memory card into PC card slot**

When installing a Q series memory card into the PC card slot, the following adapter is required.

Product name	Model	manufacturer
PC card adapter	Q2MEM-ADP	Mitsubishi Electric Corporation

● **Writing/reading data to/from memory card**

Using the following functions, even if a memory card cannot be installed into the programmable controller CPU, data can be written or read by installing the memory card to personal computer.

○: Applicable ×: Not applicable

Function	PLC series	Memory card	Windows®2000	Windows®XP	Windows Vista®	Reference
IC memory card data write/read	Q series*1	SRAM card*2	×	×	×	Section 12.11.1
		ATA card	○	○	○	
		Flash card	×	×	×	
	Q series*3 L series*4	SD memory card	○	○	○	
IC memory card data write/read (edit and data copy)	L series*4	SD memory card	○	○	○	Section 12.11.2

*1 : Not supported by Basic model QCPU, Q00UJ, Q00U, Q01U, and High-speed Universal model QCPU.

*2 : When using a SRAM card, set the driver to CONFIG.NT.
(For details, refer to HELP of Windows®)
When using an ATA card, Windows® recognizes it automatically.
If the ATA card cannot be recognized, select [Control Panel] ⇒ [System] to set the personal computer.
If the driver for SRAM card is set to CONFIG.NT, cancel the setting.

*3 : For High-speed Universal model QCPU only

*4 : Not supported by L02S

2.5 Supported Programming Languages

Q CPU L CPU Remote Head FX

This section explains details of the programming languages supported by GX Works2.

○: Supported ×: Not supported

Programming language	Description	Simple project		Structured project
		without labels	with labels	
Ladder Diagram (LD)	A graphic language using ladder programs composed of contacts and coils. Ladder diagrams are created in a similar way to existing GX Developer. In projects with labels, the Inline structured text function can be used to edit ST programs on the ladder editor.	○	○	○*1
Structured Text (ST)	A text language with grammatical structure similar to C language.	×	○*1	○
Sequential Function Chart (SFC)*2	A graphic language which defines the executing order or condition of a program.	○	○*1	○*1
Structured Ladder	A graphic language using ladder programs composed of contacts and coils.	×	×	○
Function Block Diagram (FBD)	A graphic language using ladder programs by connecting functions and/or function blocks with lines.	×	×	○

*1 : Not supported by FXCPU.

*2 : For QCPU (Q mode)/LCPU, the display format of SFC can be selected from "MELSAP3", "MELSAP-L (Instruction Format)", and "MELSAP-L (Start Conditions Format)".

3 SCREEN CONFIGURATION AND BASIC OPERATIONS

This chapter explains the screen configuration and basic operations of GX Works2.

3.1 Starting and Exiting GX Works2

Q CPU L CPU Remote Head FX

This section explains the operation methods for starting and exiting GX Works2.

■ Starting GX Works2

Start GX Works2.

Operating procedure

- **Select [Start] ⇒ [All Programs] ⇒ [MELSOFT Application] ⇒ [GX Works2] ⇒ [GX Works2].**

■ Exiting GX Works2

Exit GX Works2.

Operating procedure

- **Select [Project] ⇒ [Exit].**

3.2 Screen Configuration and Basic Operations

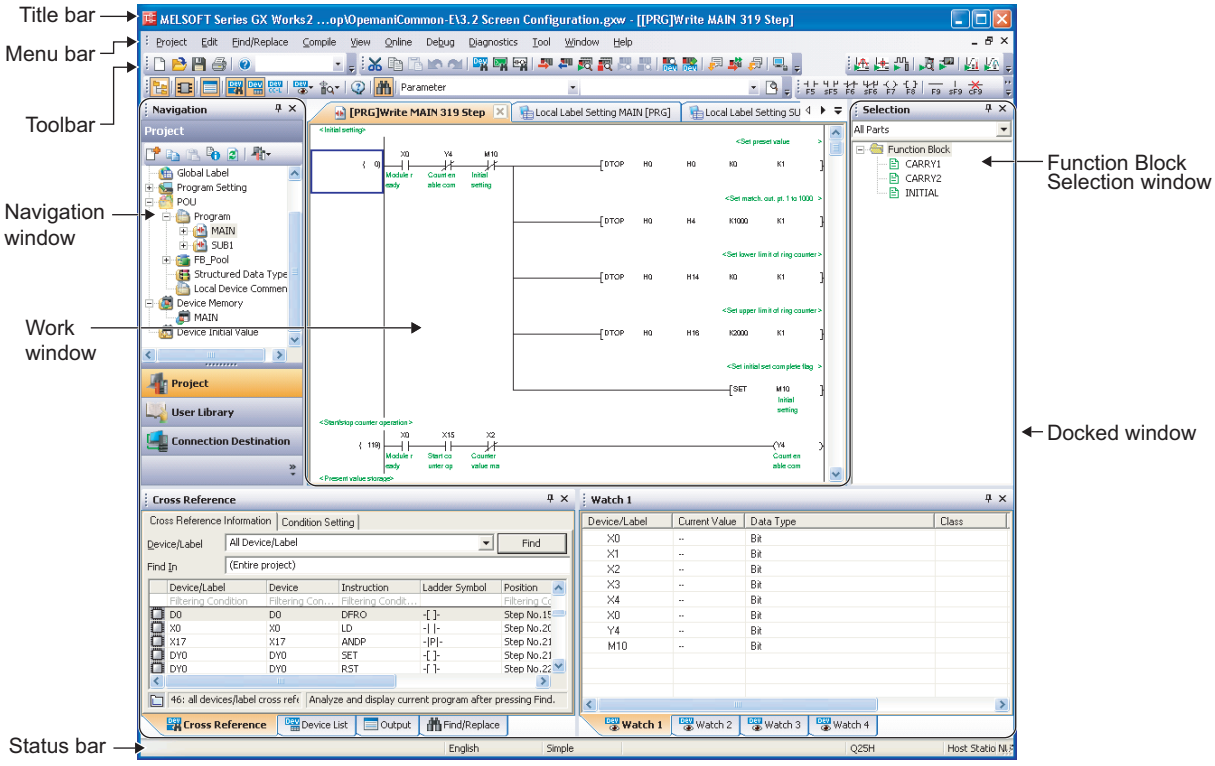
Q CPU | L CPU | Remote | Head | FX

This section explains the main frame (basic screen) of GX Works2 that is displayed when it is started up.

3.2.1 Main frame configuration

The following screen shows a main frame configuration on which a work window and docked windows are displayed.

Screen display



Display contents

Name	Description	Reference
Title bar	Display a project name.	–
Menu bar	Display menu options for executing each function.	–
Toolbar	Display tool buttons for executing each function.	Section 3.2.2
Work window	A main screen used for operations such as programming, parameter setting, and monitoring	Section 3.2.3
Docking window	A sub screen to support operations performed on a work window	Section 3.2.4
Navigation	Display contents of a project in tree format.	Section 3.2.5
Selection	Display a list of functions (such as function blocks) used for programming.	GX Works2 Version 1 Operating Manual (Simple Project, Function Block) (Structured Project)
Output	Display compilation and check results (errors and warnings).	GX Works2 Version 1 Operating Manual (Simple Project) (Structured Project)
Cross Reference	Display cross reference results.	Section 10.1
Device List	Display the device list.	Section 10.2
CC-Link Device Reference	Display assignments of refresh devices and link devices specified for the CC-Link parameter.	Section 6.3.5
Watch 1 to 4	A screen used for monitoring and changing current device values.	Section 14.6
Intelligent Function Module Monitor 1 to 10	Screens used for monitoring intelligent function modules.	GX Works2 Version 1 Operating Manual (Intelligent Function Module)
Find/Replace	A screen used for searching and replacing character strings in the project.	Section 10.3
Debug	A screen used for setting the debug which uses the simulation function.	Section 16.6.2 Section 16.6.3 Section 16.6.4
Status bar	Display information about a project being edited.	Section 3.2.6

Point

● **Focus point indication in Windows Vista® or Windows® 7**

When using Windows Vista® or Windows® 7, the focus point may not be indicated on the screen.
To display the focus point, set the following setting.

1) **For Windows Vista®, select [Start] ⇒ [Control Panel] ⇒ [Ease of Access] ⇒ [Ease of Access Center].**
   For Windows® 7, select [Start] ⇒ [Control Panel] ⇒ [Ease of Access Center].
2) **Select "Make the keyboard easier to use".**
3) **Select "Underline keyboard shortcuts and access keys".**

3.2.2 Toolbars

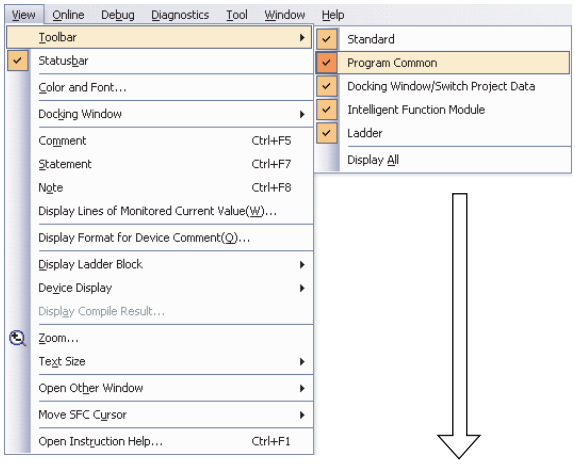
A toolbar is a block of on-screen buttons for executing frequently-used functions included in a menu. (☞ Appendix 1)
The toolbars to be displayed and their display positions on the screen can be set by the user.

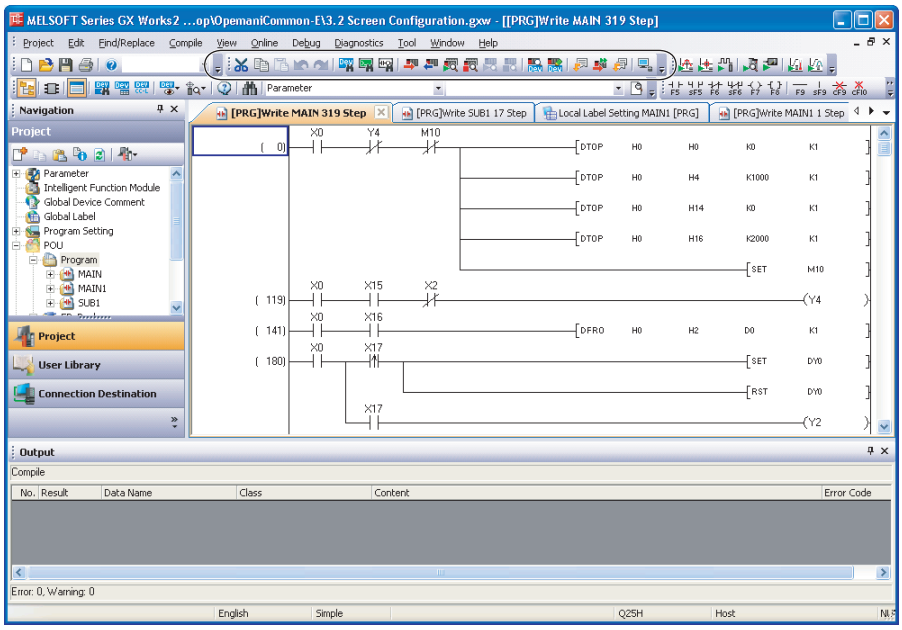
■ Displaying/hiding toolbars

Select a toolbar to be displayed.

Operating procedure

- **Select [View] ⇒ [Toolbar] ⇒ [(toolbar name)].**
  The selected toolbar is displayed on the screen.





■ Docking/floating toolbars

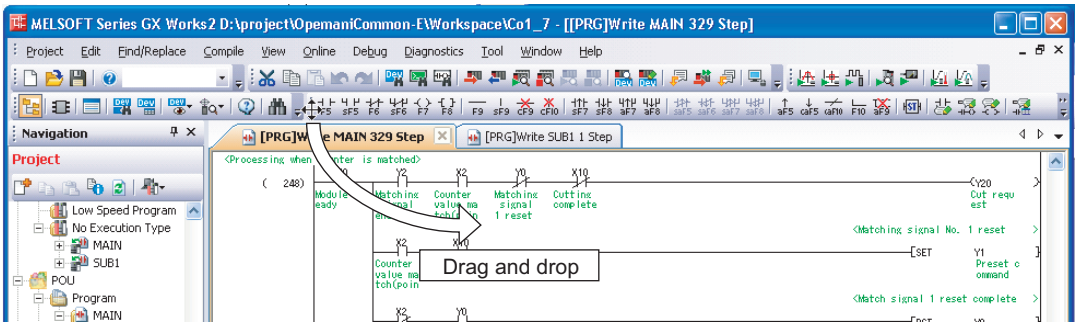
Switch the display format (docked/floating) of a toolbar.

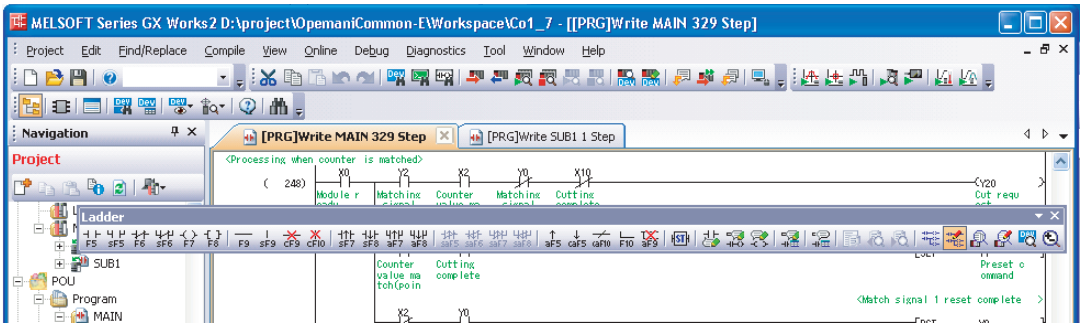
● Floating a toolbar

Display a toolbar floating from the main frame.

Operation

- **Drag a docked toolbar to the desired position for floating display.**



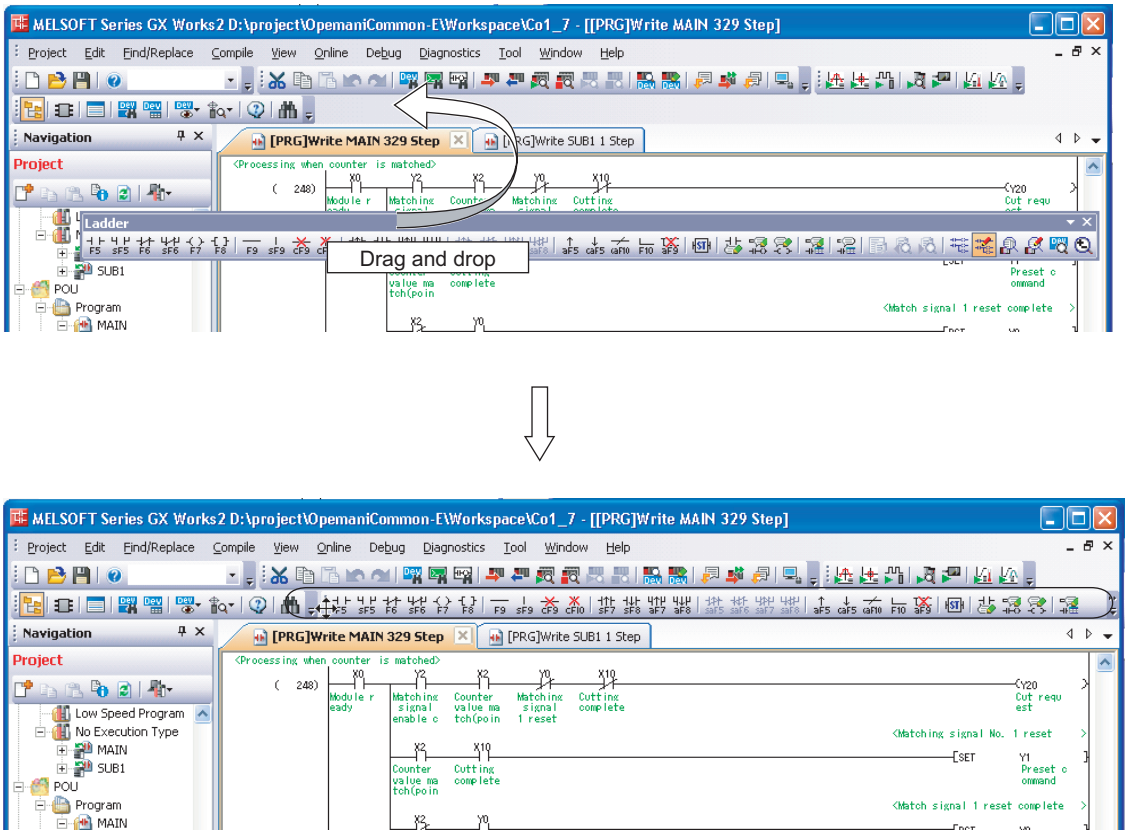


● **Docking a toolbar**

Display a toolbar docked to the main frame.

Operation

- **Drag the title bar of a floating toolbar and drop it in the main frame.**



Point

● **Method for docking a toolbar at the original position**

To dock a floating toolbar back at the original position, double-click on the title bar of the toolbar.

■ Displaying/hiding all toolbars

Display/hide all toolbars that are set to be displayed.
The display setting of toolbar can be saved by performing the following operation.

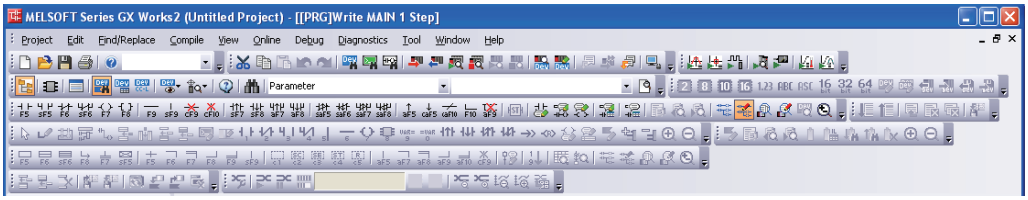
Operating procedure

- **Select [View] ⇒ [Toolbar] ⇒ [Display All].**

  The standard toolbars and all other toolbars are displayed.*1
  The changes of toolbar positions and the display setting of displaying/hiding toolbars are maintained.

  *1 : Inactive toolbars are included. Toolbars of inapplicable functions are grayed out.

  <When the [Display All] function is enabled>



  When the [Display All] function is disabled while all toolbars are displayed, only the active toolbars are displayed.
  <When the [Display All] function is disabled>

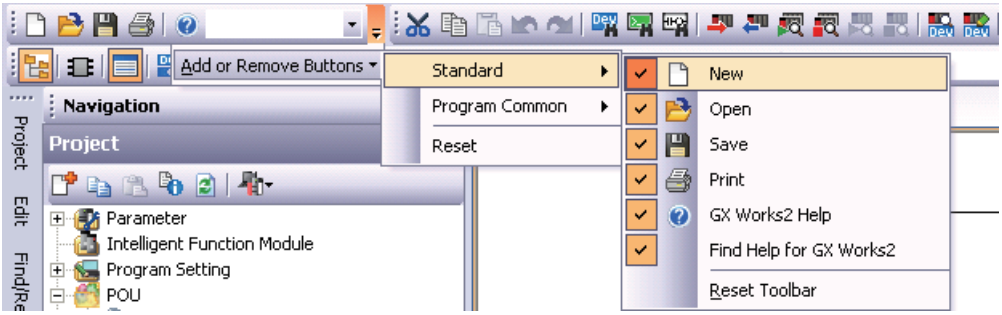
■ Customizing toolbars

Set the types of tool buttons to be displayed on each toolbar.

Operating procedure

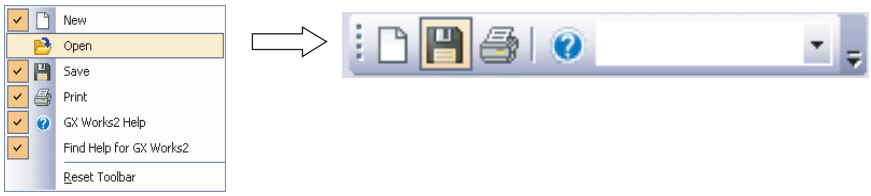
1. **Select the Toolbar options button ( ) ⇒ [Add or Remove Buttons].**

   A list of tool buttons is displayed.



2. **Select the check box in front of the tool button to be displayed on the screen.**

   The selected tool buttons are displayed on the screen.



The toolbar configuration returns to the default when [Reset Toolbar] is selected.

Restrictions

● **Restrictions when customizing toolbars**

The type of tool buttons for the following toolbars cannot be set.

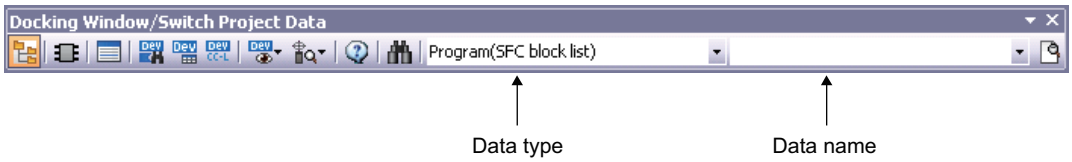
- Monitor status
- Debug function
- Sampling trace

■ Displaying editing screens with the toolbar

For Simple projects only, editing screens can be displayed with the toolbar.

Screen display

Select [View] ⇒ [Toolbar] ⇒ [Docking Window/Switch Project Data].



Operating procedure

1. **Select a data type to be displayed.**

2. **Select a data name to be displayed.**
   The editing screen of the selected data name is displayed.

Point

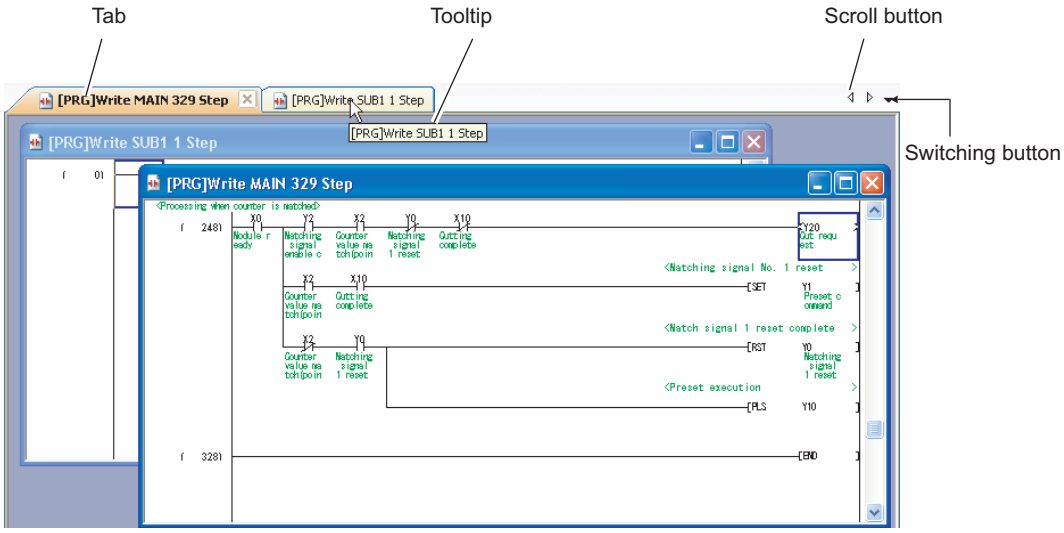
● **Display icon ( )**

The editing screen of the selected data type and data name can be displayed by clicking .

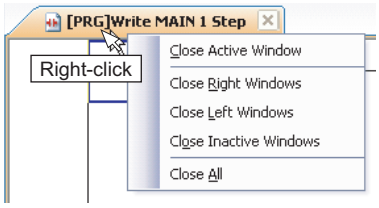
3.2.3 Work windows

A work window is a main screen used for operations such as programming, parameter setting, and monitoring in GX Works2.

Screen display



Display contents

Item	Description
Tab	Become active when selected. The tab order can be changed by dragging and dropping tabs. The window(s) can be closed from the menu displayed by right-clicking the tab. In the other way, the active window can be closed by clicking ☒ on the tab. 
Tooltip	Display a brief explanation when the cursor is placed on the selected tab.
Scroll button	Scroll the tab display to the left and right. Display hidden tabs.
Switching button	Display the list of windows being displayed. Select a data name displayed on the list to display its corresponding window on the top.
Display windows	Display screens such as the program editor, label setting editor, and monitoring screen.

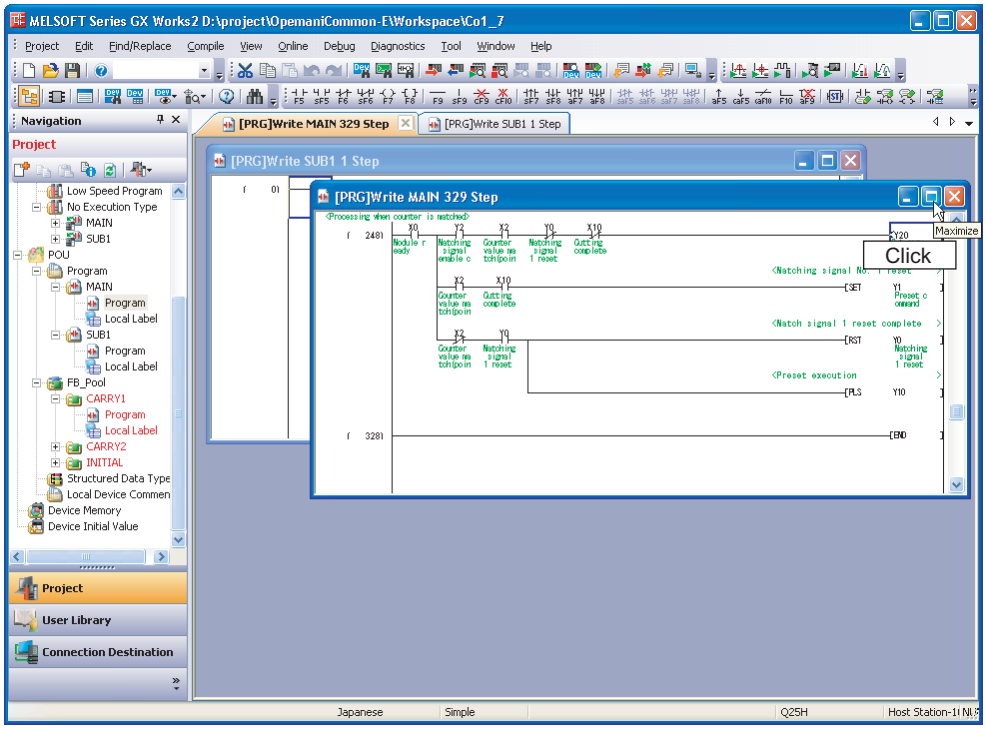
■ Maximizing/minimizing screens

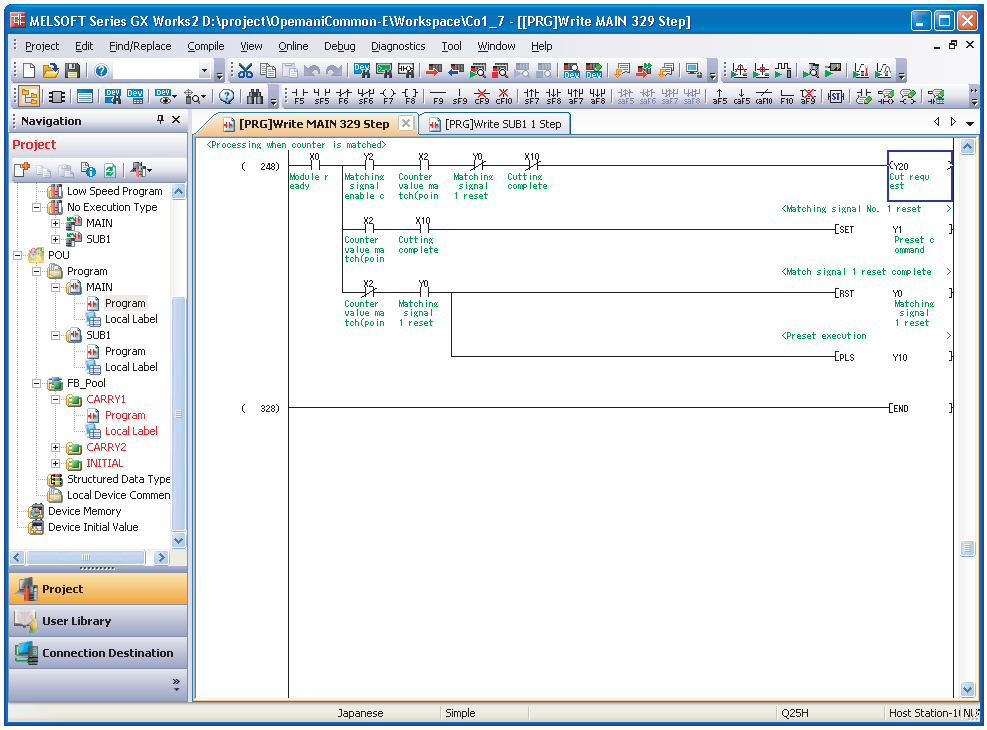
Maximize/minimize the screen size on the work window.

● **Maximizing the screen**

Operation

- **Click the Maximize button ( ).**

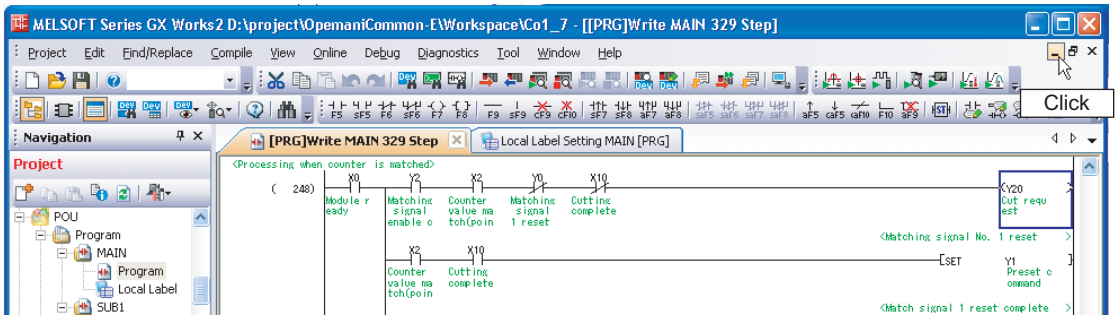


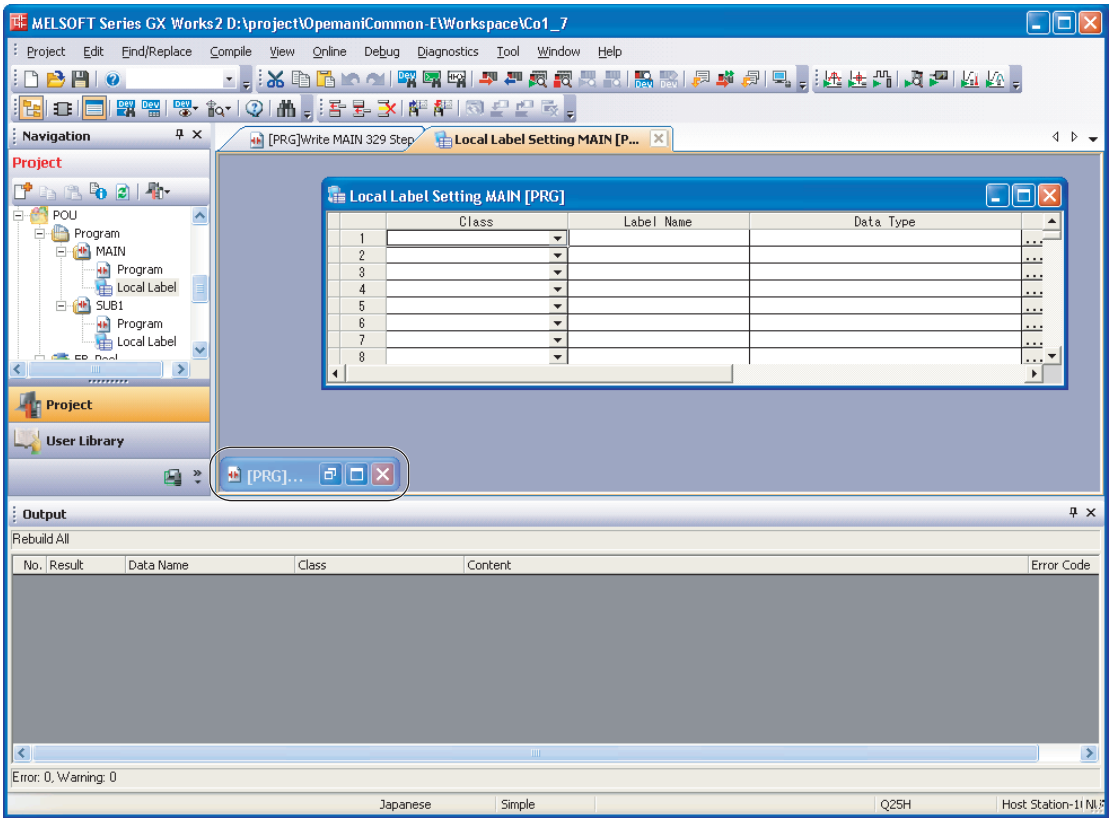


● Minimizing the screen

Operation

- **Click the Minimize button (-).**

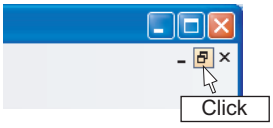




Point

● Restoring the screen size

Click to return the maximized/minimized screen to its previous size.



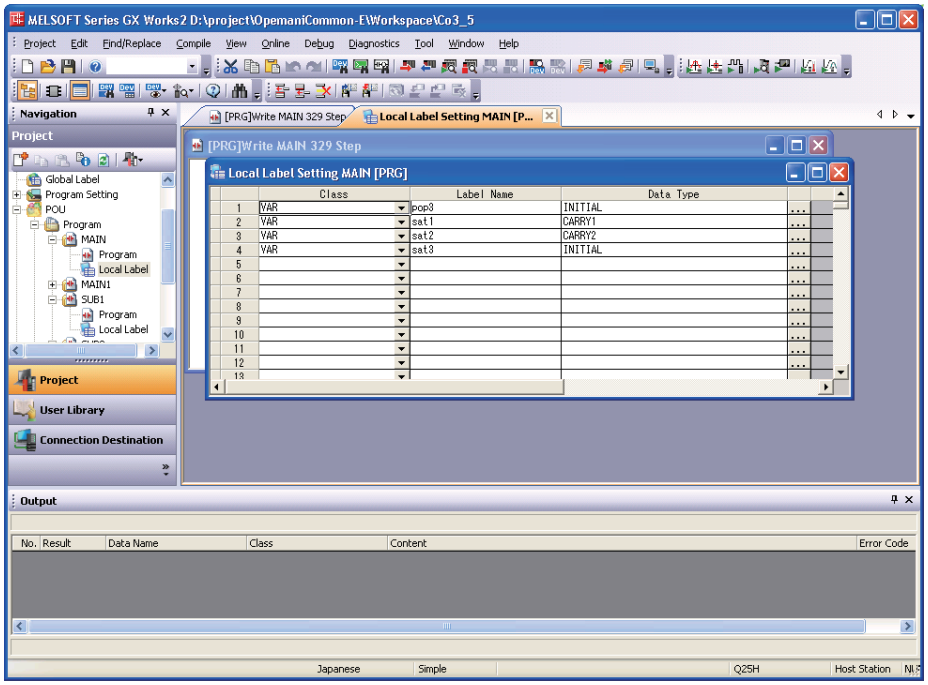
■ Arranging screens

Arrange screens to display on the work window.

● **Cascading screens**

Operation

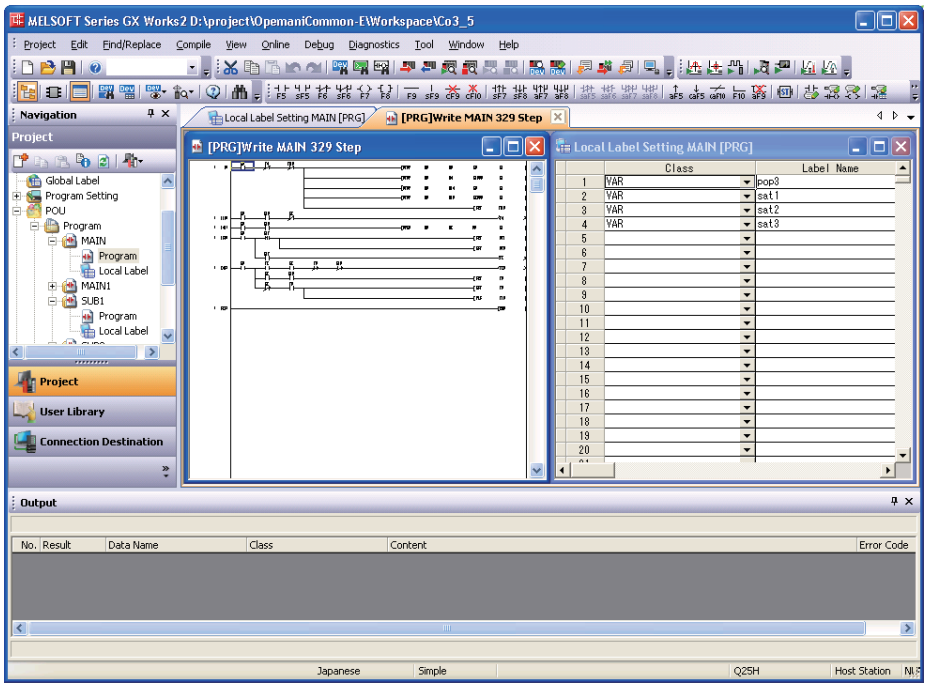
- **Select [Window] ⇒ [Cascade].**



● **Tiling screens vertically**

Operation

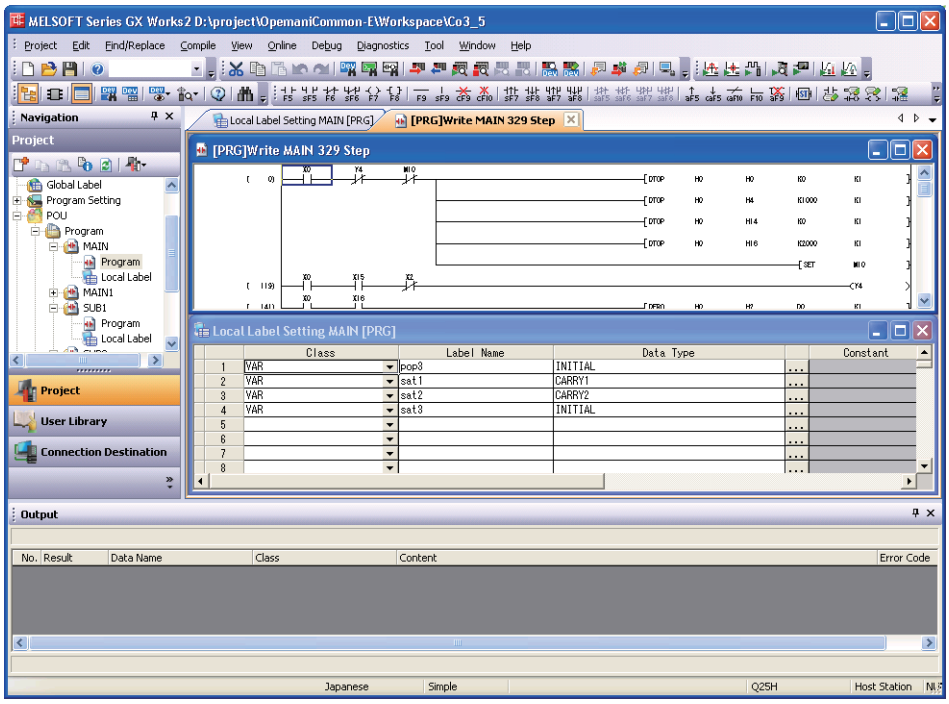
- **Select [Window] ⇒ [Tile Vertically].**



● **Tiling screens horizontally**

Operation

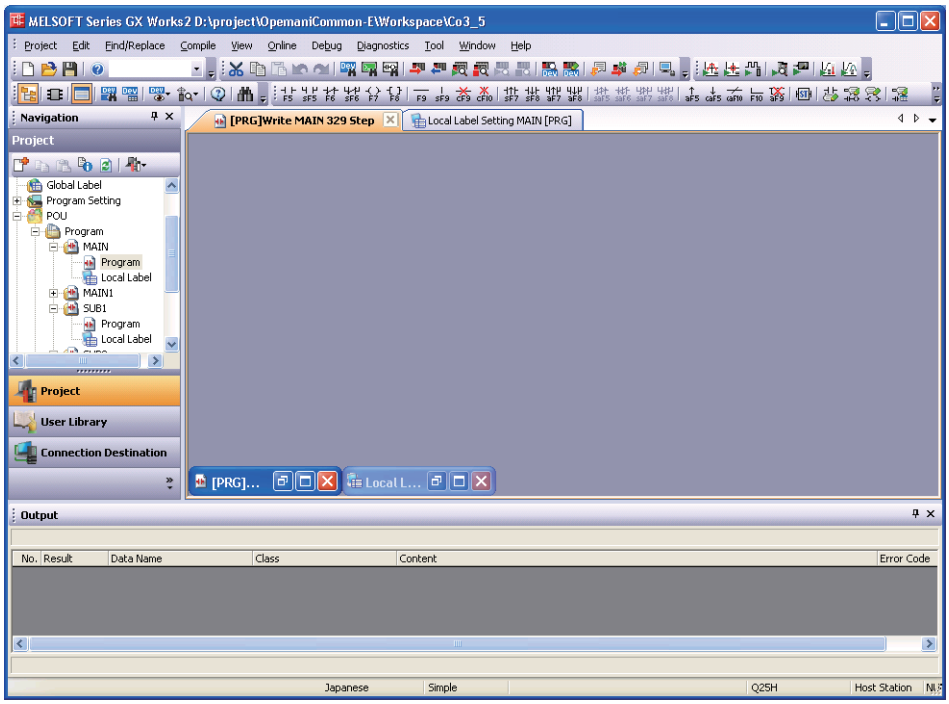
- **Select [Window] ⇒ [Tile Horizontally].**



● **Arranging icons (minimized windows) at the bottom of the work window**

Operation

- **Select [Window] ⇒ [Arrange Icons].**

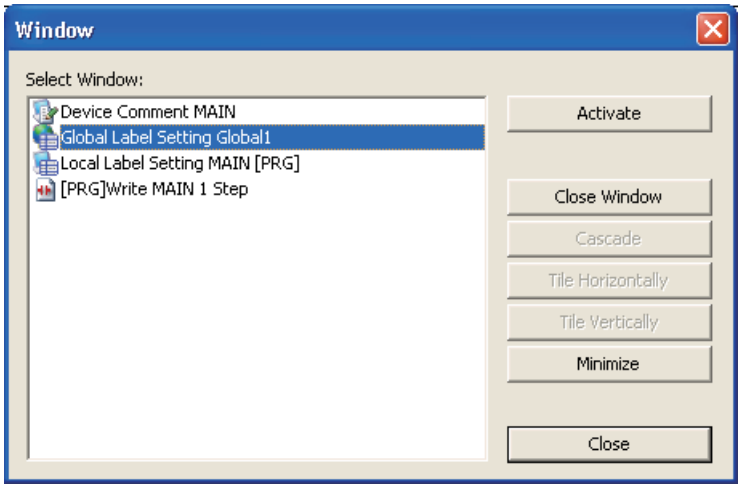


■ Arranging/displaying windows

Display a list of open windows, and also open and arrange specified windows.
This function is useful to display the desired window efficiently when multiple windows are open.

Screen display

Select [Window] ⇒ [Other Windows].



3.2.4 Docking windows

This section explains the operations common to dock windows.

■ Displaying/Hiding dockable windows

Display/hide a dockable window.

Operating procedure

- **Select [View] ⇒ [Docking Window] ⇒ [(target item)].**

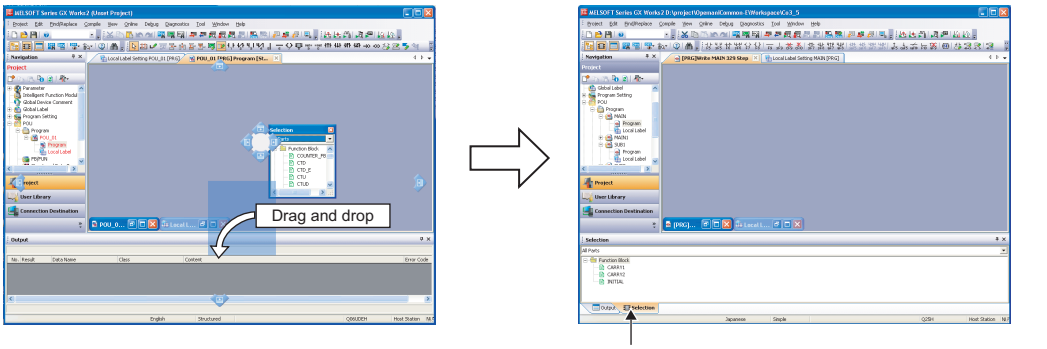
■ Docking/floating dockable windows

Switch the display format of a dockable window.

- **Docked display**
  Display a dockable window docked to the main frame.
- **Floating display**
  Display a dockable window floating from the main frame.

Operation

- **Drag the title bar of a floating dockable window and drop it to the guidance in the main frame.**



Drag a dockable window to the guidance.

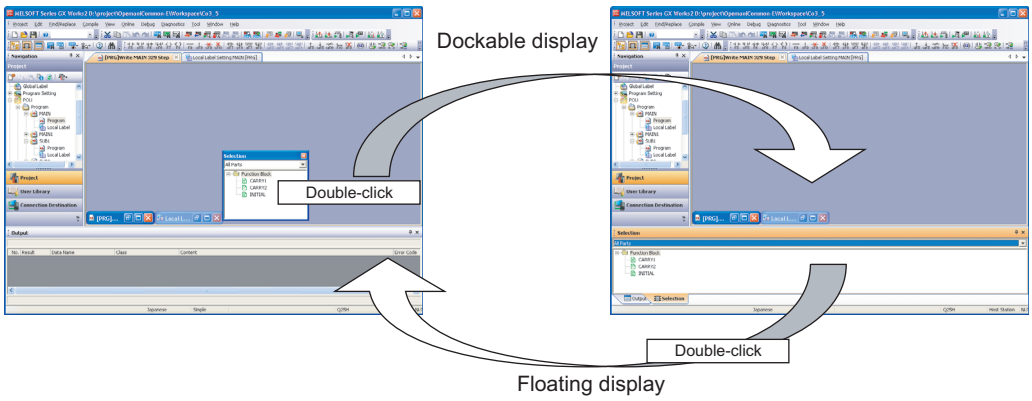
A new tab appears after the window is docked.

The docked window is floated by dragging the title bar to the desired position.

Point

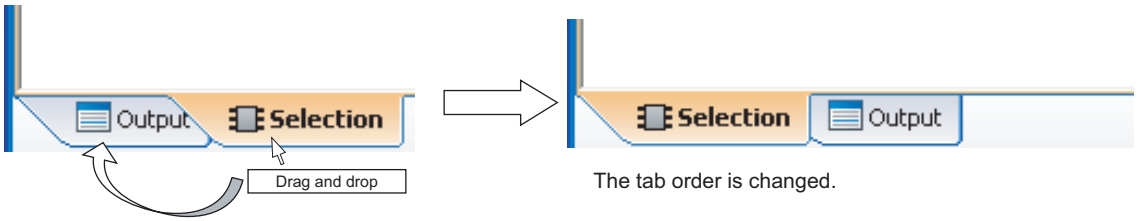
● **Operation of dockable windows**

Docked windows can be switched from docked to floating or vice versa by double-clicking the title bar.



● **Changing the tab order**

The tab order can be changed by dragging and dropping the desired tab to the left or right when multiple dockable windows are docked.

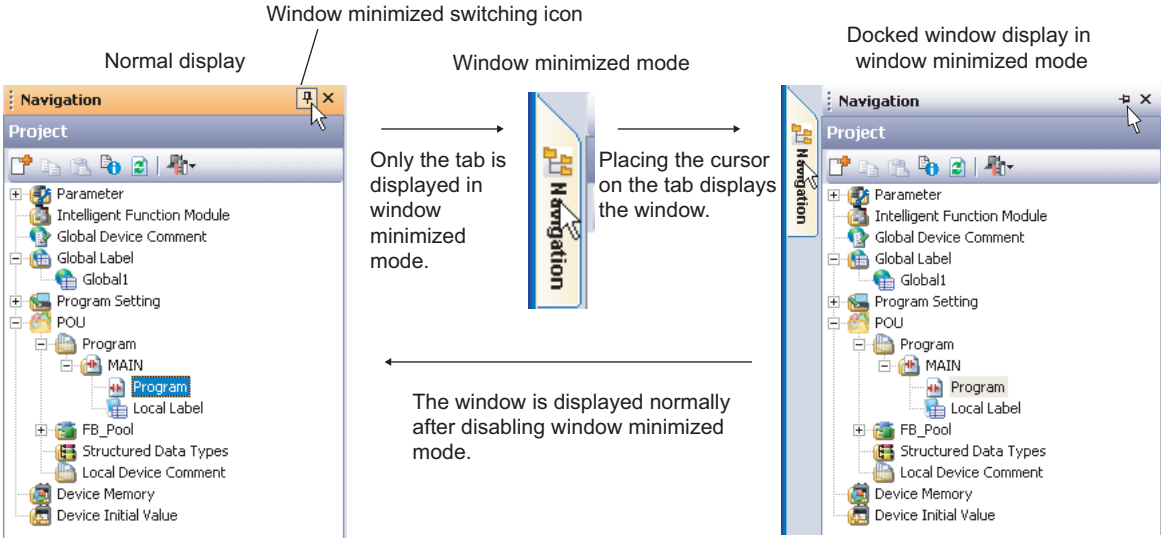


■ Window minimized mode

Minimize a docked window as a tab.
The window minimized mode can be set and disabled by the following procedure.

Operating procedure

- **Click the window minimized mode switching icon (/).**

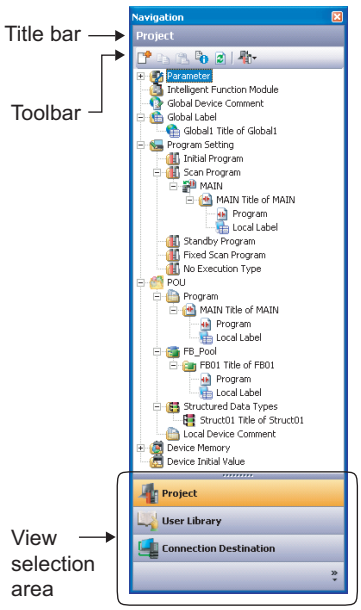


3.2.5 Navigation window

This section explains the Navigation window that displays the contents of a project in tree format. Operations such as creating new data and displaying editing screens can be performed on the Navigation window.
(☞ Chapter 4)

Screen display

Select [View] ⇒ [Docking Window] ⇒[Navigation].

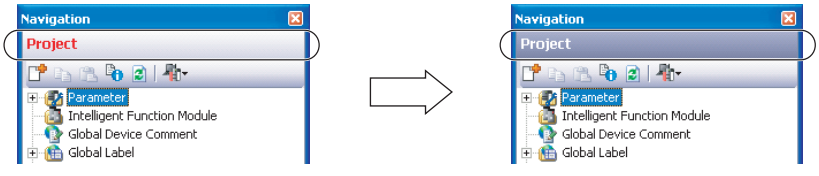


Display contents

Name	Description	Reference
Title bar	Display a title of a view being displayed.	–
Toolbar	Display tool buttons of functions to be executed on each view.	Appendix 1
View selection area	Area for selecting a view to display.	–
Project	Display the Project view.	Section 4.2.1
User Library	Display the User Library view.	GX Works2 Version 1 Operating Manual (Structured Project)
Connection Destination	Display the Connection Destination view.	Section 11.1.1

Point

● **Color of characters on title bar when uncompiled data exist**
The color of characters on the title bar becomes red when an uncompiled data exists on the Project view or User Library view.



Project with uncompiled data　　Project without uncompiled data

■ Sorting data

Sort data displayed in tree format.

Operating procedure

1. **Open a folder on the Navigation window and select the data for sorting.**

2. **Right-click and select [Sort] ⇒ [(sort type)] from the shortcut menu.**

   The data displayed in tree format are sorted in the ascending order.
   When the same operation is performed after sort execution, the sort order is switched between ascending and descending.
   The following table shows the sort types.

Type	Description
Execution Order*1	Sort data in the selected folder according to the execution order. When a program file is selected, tasks in the program file are sorted according to the execution order. When a task is selected, programs in the task are sorted according to the execution order.
Name	Sort the data in the selected folder according to the name.
Date	Sort the data in the selected folder according to the date modified.
Language*2	Sort the data in the selected folder according to the programming language type.
POU Type*3	Sort the data in the selected folder according to the POU type.

*1 : SFC programs of Simple project, and program files and tasks of Structured project only
*2 : Tasks, programs, and FB/FUN of Structured project only
*3 : FB/FUN of Structured project only

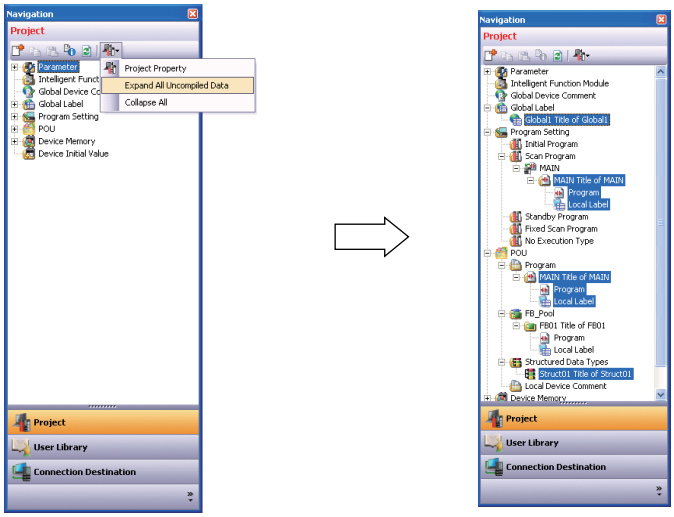
■ Expanding all uncompiled data

Expand all uncompiled data exist on the Project view and User Library view.

Operating procedure

1. **Click on the toolbar.**

2. **Select [Expand All Uncompiled Data].**
   All uncompiled data are expanded and become selectable status.



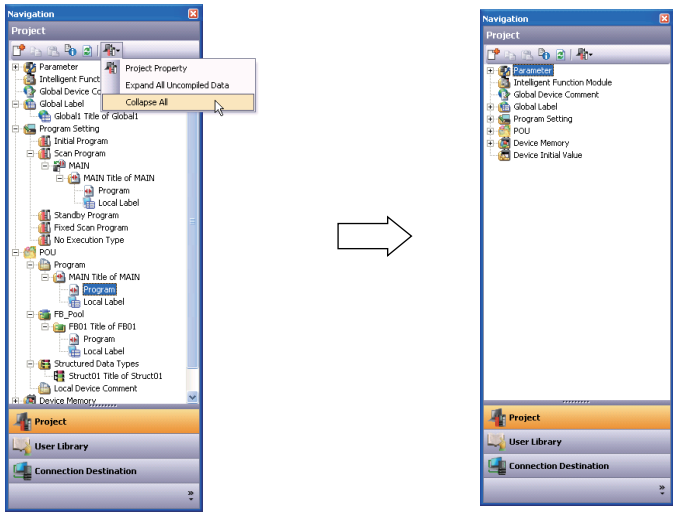
■ Collapsing tree

Collapse tree on the Project view and User Library view.

Operating procedure

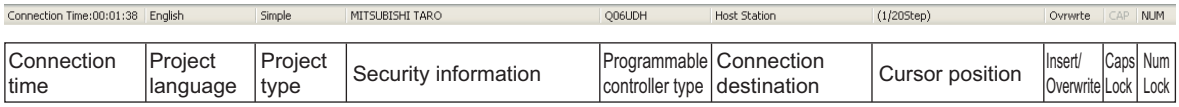
1. **Click on the toolbar.**

2. **Select [Collapse All].**
   The tree is collapsed.



3.2.6 Status bar

The status bar displays information about the current project at the bottom of the screen.



Connection time	Project language	Project type	Security information	Programmable controller type	Connection destination	Cursor position	Insert/ Overwrite	Caps Lock	Num Lock

The following shows the information to be displayed.

Item	Description
Connection time	Display the connection duration of the phone line.
Project language	Display the language set for the language selection.
Project type	Display the project type. • Unlabeled : Simple project (without labels) • Simple : Simple project (with labels) • Structured : Structured project
Security information	Display the login user name when security is set for the project.
Programmable controller type	Display the programmable controller type of the project.
Connection destination	Display the set content of the Transfer Setup screen. For Redundant CPU, the set content is displayed as shown below. 
Cursor position	Display the cursor position in the editing screen.
Insert/Overwrite	Display the current mode (insert or overwrite).
Caps Lock	Display the effective status of the Caps Lock.
Num Lock	Display the effective status of the Num Lock.

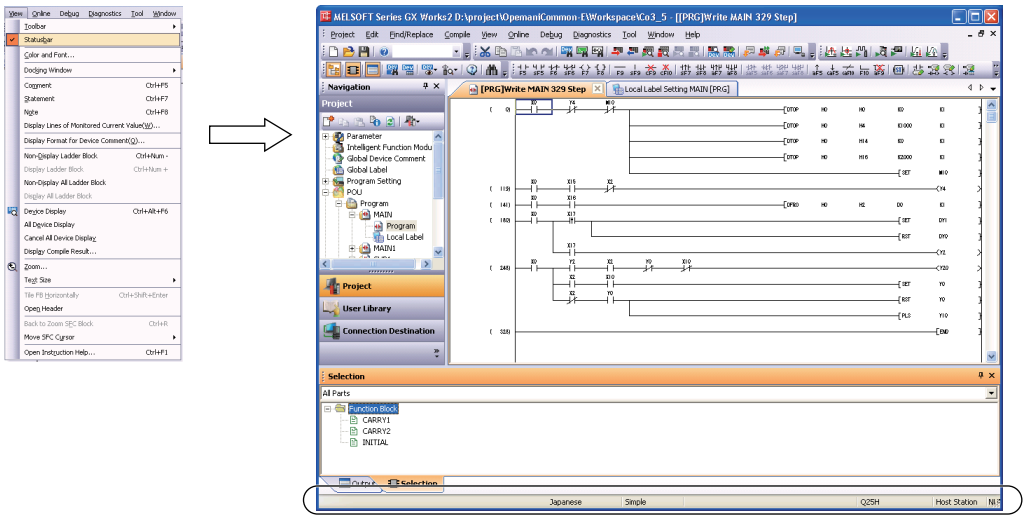
■ Displaying/hiding status bar

Display/hide the status bar.

Operating procedure

- **Select [View] ⇒ [Statusbar].**

  A check mark is appended in front of the menu option and the status bar is displayed on the screen.

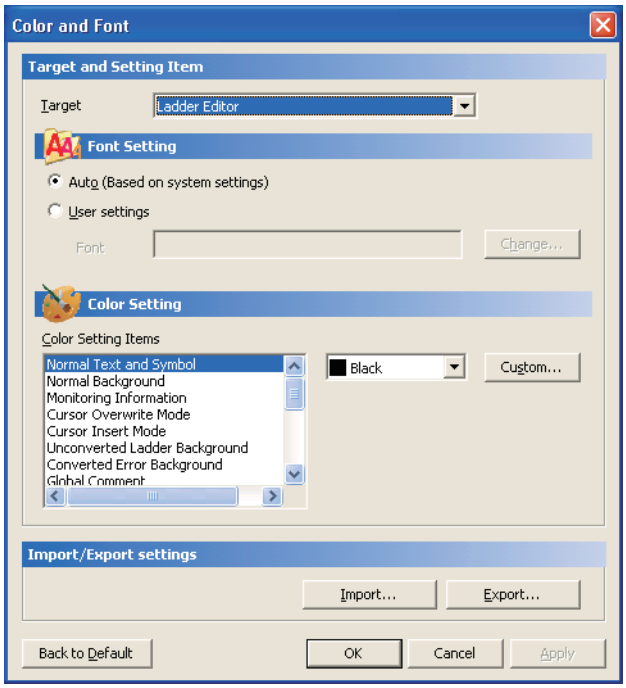


3.2.7 Changing colors and fonts

Change the color and font settings on program editors and label editors.

Screen display

Select [View] ⇒ [Color and Font].



Operating procedure

1. **Set the items on the screen.**

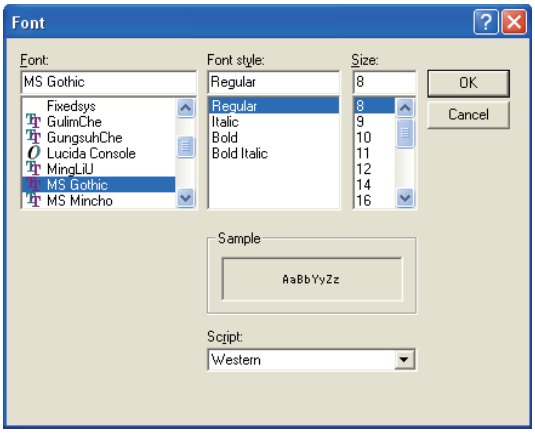
Item		Description
Target		Select the change target work window.
Font Setting		Change font settings.
	Auto (Based on system settings)	Select this to use the font settings in Windows®.
	User settings	Select this to customize the font settings. Click the Change... button to select the desired font.
Color Setting		–
	Color Setting Items	Select the change target item and color.

2. **Click the OK button.**

Screen button

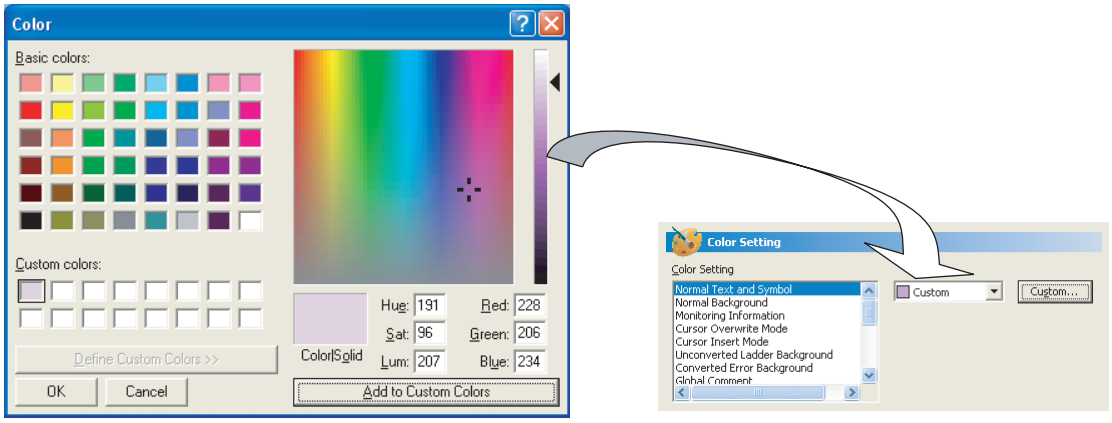
● Change...

Displays the Font screen.
The font type, style, and size can be customized.
Some font styles and sizes, however, cannot be set depending on target work windows.



● Custom...

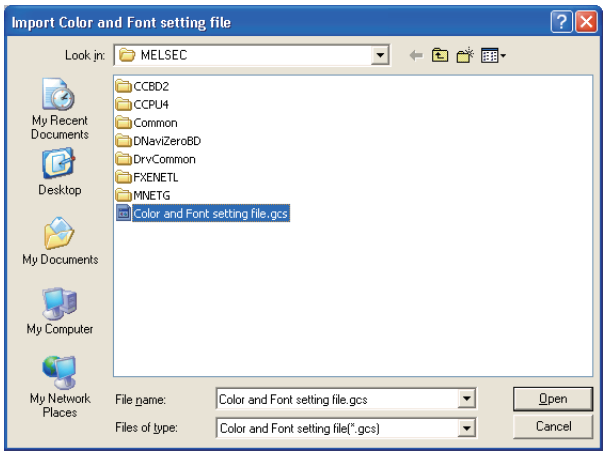
Displays the Color screen.
The color can be customized. The created color is added as "Custom" in the color selection field of the Color and Font screen. Only one color can be added as "Custom".



● Import...

Displays the Import Color and Font setting file screen.

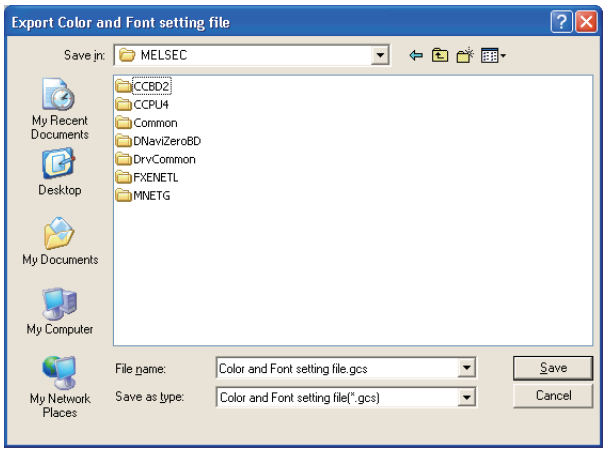
Select "Color and Font setting file (*.gcs)" and click the Open button to read the file.



● Export...

Displays the Export Color and Font setting file screen.
Set a save destination and a file name for the color and font setting file (*.gcs).

The content displayed on the Color and Font screen is saved on the file by clicking the Save button.



● Back to Default

Resets the color and font settings to default.

● Apply

Applies the changed color and font settings.

Point

● **Font setting**

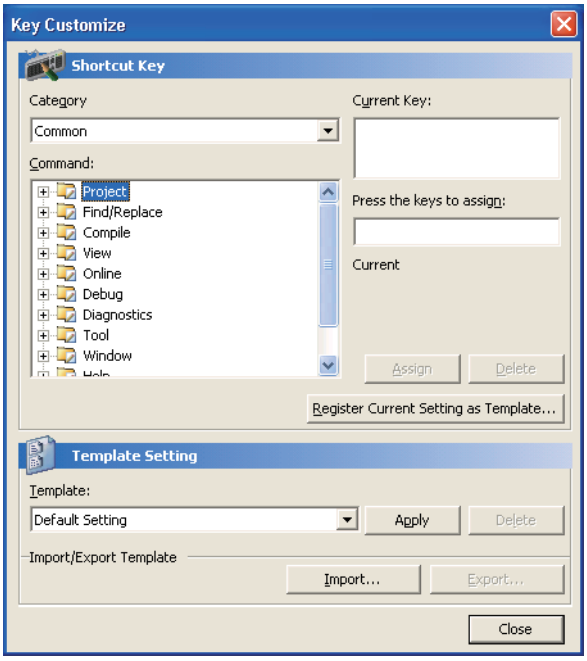
Some fonts may be displayed as garbled characters.
Change the setting to another font if this happens.

3.2.8 Customizing shortcut keys

Customize a shortcut key of each function.
Customized shortcut keys can be registered as a template and utilized.

Screen display

Select [Tool] ⇒ [Key Customize].



■ Setting shortcut keys

This function creates/changes/deletes a shortcut key.

Operating procedure

1. **Set the items on the screen.**

Item		Description
Shortcut Key		–
	Category	Select a category from the group list categorized by window.
	Command	Select a function name whose shortcut key to be changed.
	Current Key	Display the shortcut key assigned to the selected command.
	Press the keys to assign	Specify a new shortcut key to be assigned. Input it by pressing a key(s) on the keyboard. Example) Ctrl + 5
	Current	Display the menu name to which the entered shortcut key is assigned. When the key is already assigned to another function, the function name is displayed.

2. **Click the** Assign **button.**

The shortcut key is assigned.
The assigned shortcut key is displayed in "Current Key".

3. **Click the** Close **button.**

The shortcut key is created/changed.

Screen button

- Delete

Deletes the shortcut key selected in "Current Key".

- Register Current Setting as Template...

Displays the Enter Template Name screen.
Register the assigned shortcut keys as a template with a desired name.
The registered template is displayed in "Template".

Point

- **Assigning shortcut keys**
  Up to three shortcut keys can be assigned to one function. The shortcut key displayed on the top in "Current Key" is displayed on the menu.
- **Templates**
  The maximum file name length for a template is 24 characters.

■ Registering templates

This function registers/deletes a template of shortcut keys.

Operating procedure

1. **Set the item on the screen.**

Item	Description
Template	Select a template of shortcut keys from ▼. • Default Setting Change to the default setting. • GPPA Format Setting Batch change the shortcut key setting of ladder programming to the same setting of GPPA. • GPPW format setting Batch change the shortcut key setting of ladder programming and SFC programming to the same setting of GX Developer. • Setting of MEDOC Format Batch change the shortcut key setting of ladder programming to the same setting of MELSEC MEDOC.

2. **Click the [Apply] button.**

The selected template of shortcut keys is applied.

Screen button

● [Delete]
Deletes a template selected in "Template".

● [Import...]
Imports a pre-saved template file (*.gks) and adds it to "Template".

● [Export...]
Saves a template selected in "Template" as a template file (*.gks).

Restrictions

● **Templates with "MEDOC Format Setting"**
Any of the following symptoms occurs when the template with "MEDOC Format Setting" is imported to GX Works2 Version 1.95Z or earlier.
- Shortcut keys of the tool buttons on the "Ladder" toolbar are hidden.
- When the numeric key is pressed on the Find screen displayed by the simple search function, the display on the element selection field is changed.
- An operation according to the set shortcut keys is performed when a number is entered on the ladder editor, the Enter VLine screen, the Enter HLine screen, the Delete VLine screen, or the Delete HLine screen.

3.3 Selecting Language

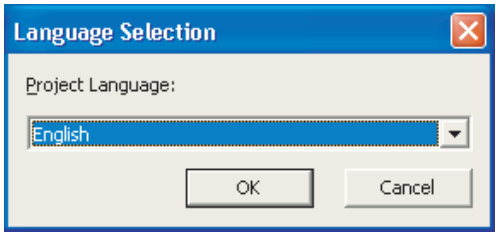
Q CPU L CPU Remote Head FX

This section explains how to select a language used for project data (such as device comments, statements, and notes).
By selecting a language of the project, data can be created in a language other than English.
Data created in another language can be displayed without character corruption.
For restrictions when selecting a project language, refer to Appendix 18.

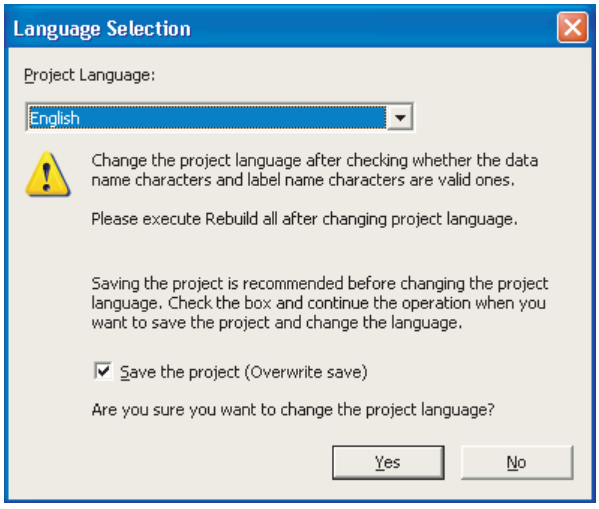
Screen display

Select [Tool] ⇒ [Language Selection].

< Before creating a new project >



< When editing a project >



Operating procedure

1. **Set the items on the screen.**

Item	Description
Project Language	Select the language of the project.
Save the project (Overwrite save)	Select this to save the project before changing the project language.

2. **Click the** Yes **button.**

The project data are displayed in the selected project language.

Point

● **Considerations when project language change is canceled**

If characters other than alphanumeric characters are used for data names and label names, the project language change may be canceled. In such case, change data names or label names according to the error message displayed on the Output window. In some cases, even after the project language is changed, characters other than the characters of the selected language may be used. Change the characters other than those of the selected language.
For data names which causes the cancellation of project language change when characters other than alphanumeric characters are used, refer to Appendix 17.1.

● **Considerations when changing project language**

The project language change function does not change the characters on setting menus and screens.
To display characters on setting menus and screens in another language, use the specific version of GX Works2 that supports the language.

3.4 Help Function

Q CPU L CPU Remote Head FX

This section explains the help function of GX Works2.

3.4.1 Displaying GX Works2 help

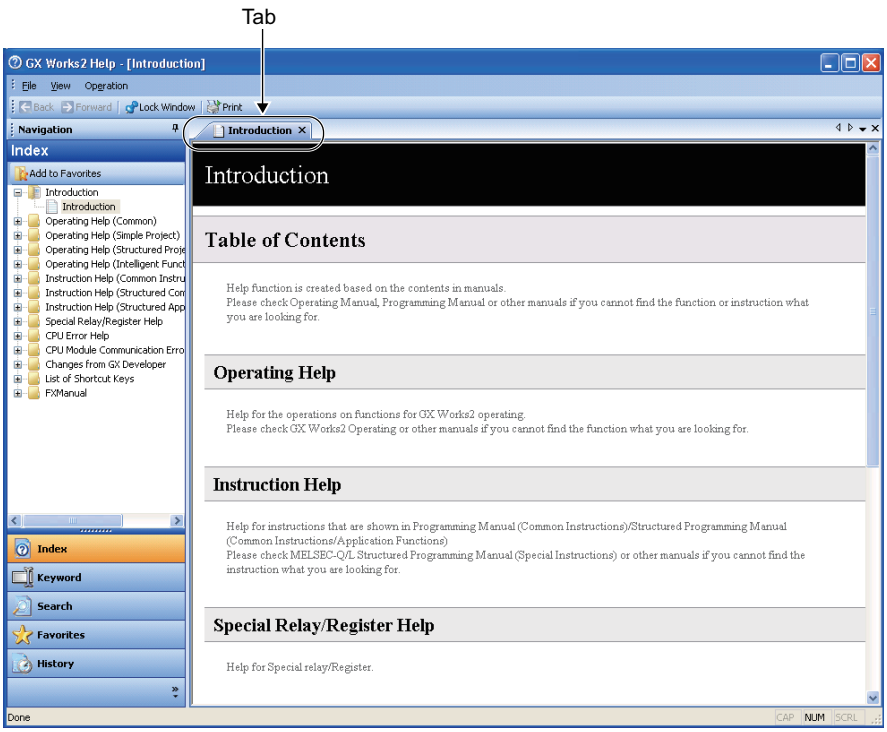
Use the GX Works2 help function to learn GX Works2 operations, understand functions, and check error codes of programmable controller CPU.
The following items can be checked with the GX Works2 help function.

- Help for operations
- Help for instructions
- Help for special relays/special registers
- Help for CPU errors
- Error codes for CPU module communication
- Changes from GX Developer
- List of shortcut keys
- FX manuals*1

*1 : For FXCPU, GX Works2 Help (for FXCPU) and Adobe® Reader® version 8 or later are required to view the help. For installing GX Works2 Help (for FXCPU), refer to the following section.
☞ ■ Installing GX Works2 help for FXCPU

Screen display

Select [Help] ⇒ [GX Works2 Help] ( ).



Point

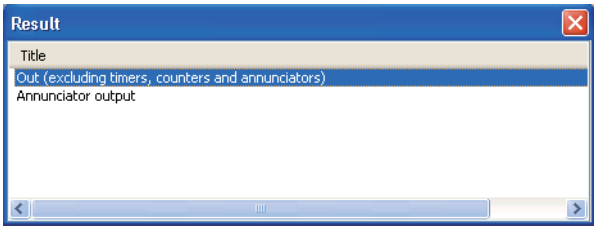
● Displaying GX Works2 help

Enter a keyword in the keyword entry field on the standard toolbar of GX Works2, and press the Enter key to display the help items searched by the keyword.

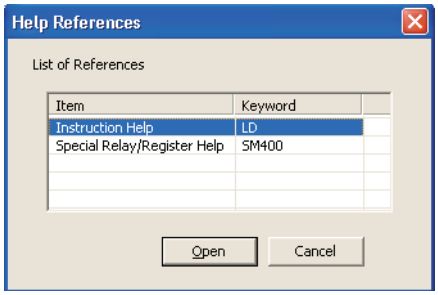
The help items can also be displayed by the screen title by pressing the F1 key with the selected screen such as Navigation window, program editor, and Function Block Selection window of GX Works2. (Some screens do not support the F1 key function.)
For FXCPU, when a special relay (M) or a special register (D) is searched, the head of the section which describes the special relay (M) or the special register (D) in the programming manual (PDF file) is displayed.

● Instruction help

- Instructions which are supported by the instruction help function are: common instructions and application functions for QCPU (Q mode)/LCPU, and sequence instructions and application functions for FXCPU.
- The SFC editor is not supported by the instruction help function.
- Operators and ST control syntax are not supported by the instruction help function.
- When the selected instruction is corresponded by multiple items, the Result screen (for QCPU (Q mode)/LCPU) or the Help Reference screen (for FXCPU) is displayed. Double-click the item to display the help.

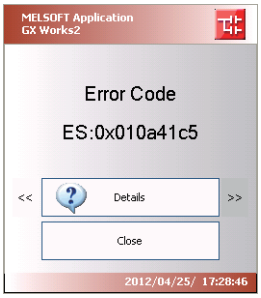


- When the selected instruction contains a special relay or special register, the Help References screen is displayed.
  Select a keyword displayed and click the Open button.



● Error codes when communicating with CPU module

When an error whose error code is in the range between 4000H and 4C09H occurs while communicating with the CPU module, the following pop-up screen is displayed on the right-bottom corner of the screen.
The pop-up help function is not supported by FXCPU.



Point

● Operation of the help function for FXCPU

- The "Add to Favorites" function on the Navigation window of GX Works2 help, and the "Keyword", "Search", "Favorites", and "History" functions under [View] ⇒ [Navigation] are not supported by the help function for FXCPU. For the search function, display the programming manual (PDF) and use the search function of Adobe® Reader®.
- If another PDF reader other than Adobe® Reader® is installed, the content of the help function may not be displayed. In this case, reinstall Adobe® Reader®.
- When an Adobe® Reader® error occurs while using the help function, the error may be solved by restarting a personal computer.

■ Installing GX Works2 help for FXCPU

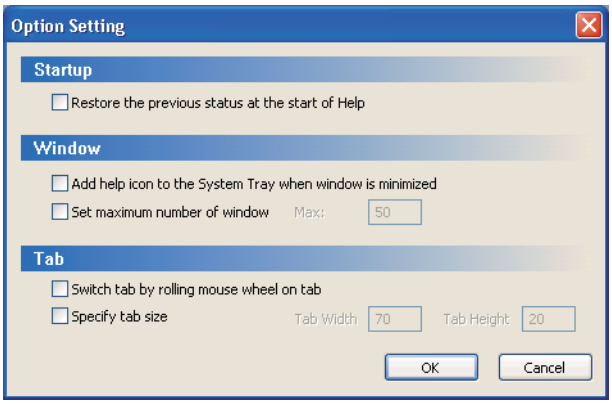
Double-click "setup.exe" in the "DocFX" folder on the CD-ROM (Disc 2) to install GX Works2 Help (for FXCPU).

■ Setting options for GX Works2 help function

Set options for "Startup", "Window", and "Tab" items of the GX Works2 help function.

Screen display

Select the GX Works2 help menu [Operation] ⇒ [Options].



Operating procedure

- **Set the items on the screen.**

Item		Description
Startup		–
	Restore the previous status at the start of Help	Select this to activate the GX Works2 help function with the state of previous operation.
Window		–
	Add help icon to the System Tray when window is minimized	Select this to set the GX Works2 help function in the task tray when the GX Works2 help window is minimized. When this item is selected and the GX Works2 help window is minimized, the GX Works2 help function can be activated from the task tray.
	Set maximum number of window	Select this to set a maximum number of windows to be displayed with the GX Works2 help function. Enter a maximum number of windows.
Tab		–
	Switch tab by rolling mouse wheel on tab	Select this to switch tabs with the mouse wheel when the cursor is on the tab.*1
	Specify tab size	Select this to specify the tab size. Enter a width and a height of the tab.

*1 : When the tab of FX manual is displayed in front, the tabs cannot be switched with the mouse wheel. Select a tab other than that of FX manual to switch tabs.

3.4.2 Displaying operating manuals

Display the operating manuals of GX Works2 Version 1.

Screen display

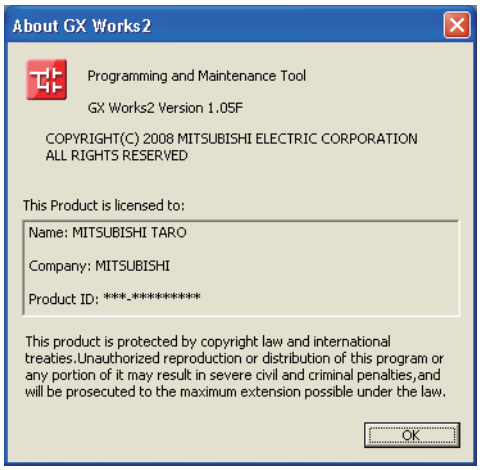
Select [Help] ⇒ [Operating Manual] ⇒ [(manual name)].

3.4.3 Checking version of GX Works2

Display information such as the software version of GX Works2.

Operating procedure

- **Select [Help] ⇒ [About].**



4 PROJECT MANAGEMENT

This chapter explains basic operations and management of projects.

4.1 GX Works2 Project Management

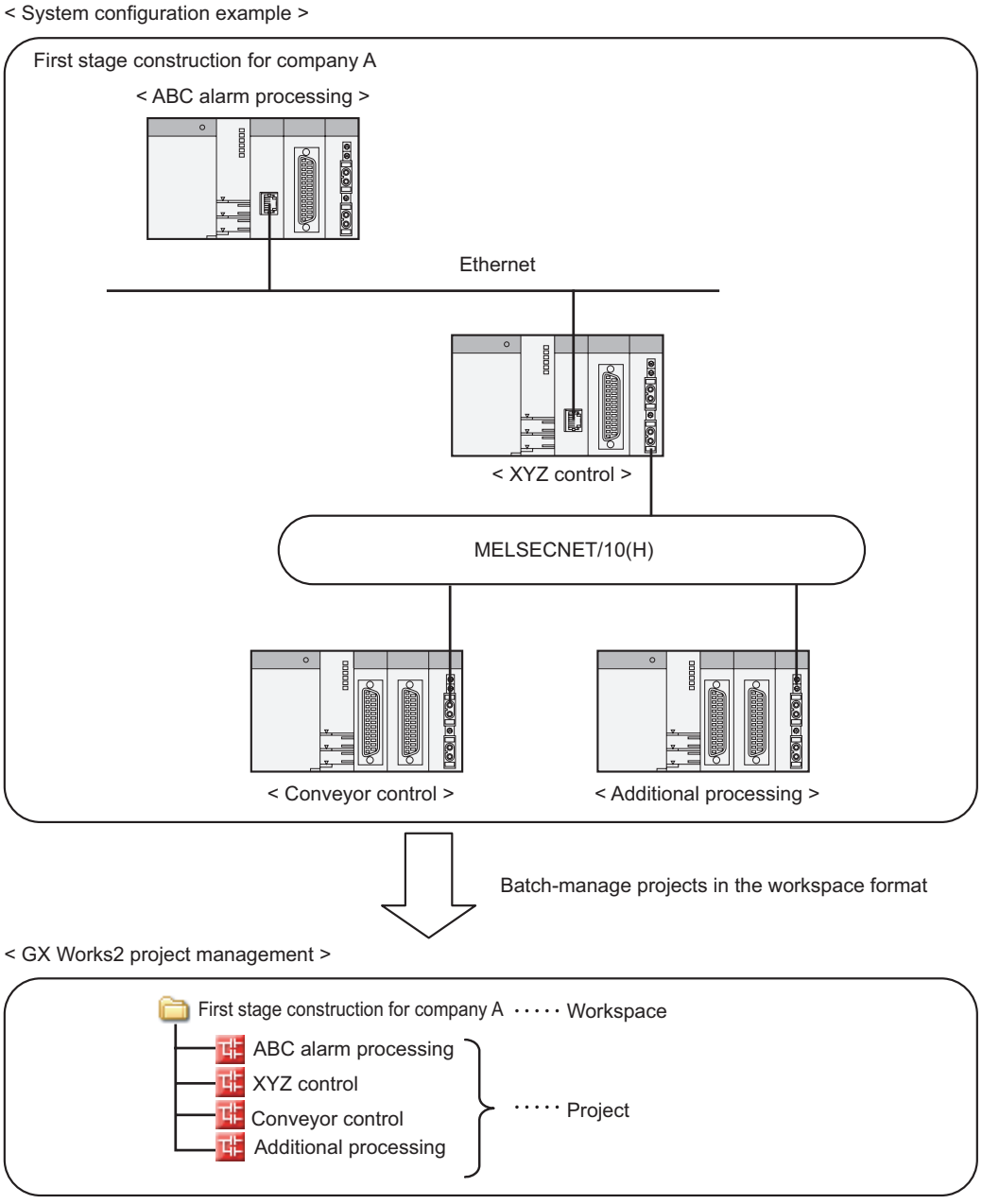
Q CPU L CPU Remote Head FX

This section explains the management of GX Works2 projects.
In GX Works2, created projects are saved in the workspace format or the single file format.

4.1.1 Workspace format

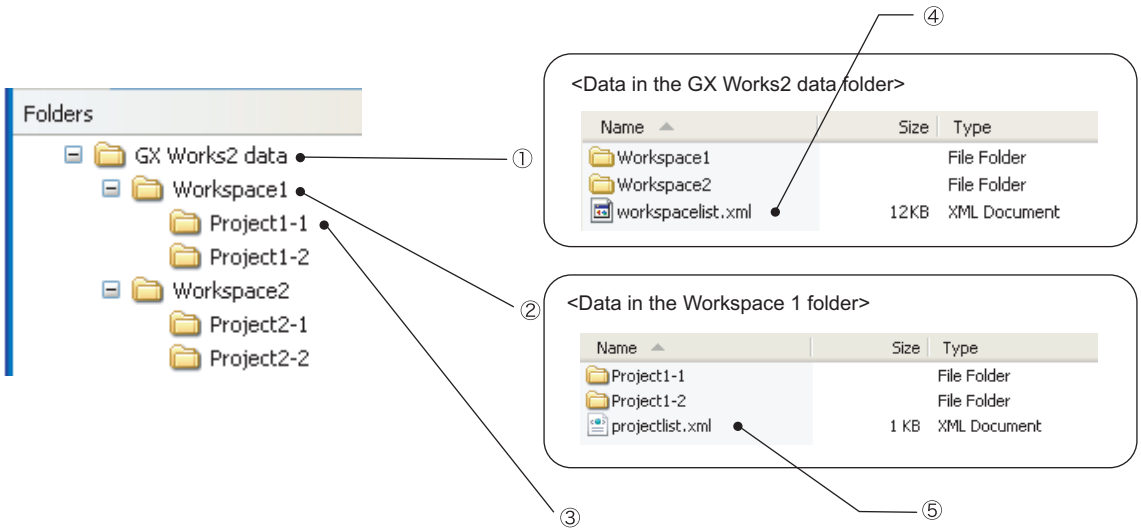
A workspace manages multiple projects at once.
When configuring a system containing multiple programmable controller CPUs, a project needs to be created for each programmable controller CPU. However, projects in the same system can be managed by saving projects created in a single workspace in the workspace format.
When using MELSOFT Navigator, save projects in the workspace format.

< System configuration example >



■ Configuration of workspace and project

The following explains the configuration of GX Works2 workspace and project.



①	Save destination folder	· · · A folder specified for the save folder path when the project is saved.
②	Workspace name folder	· · · A folder corresponds to the workspace name specified when the project is saved.
③	Project name folder	· · · A folder corresponds to the project name specified when the project is saved.
④	workspacelist.xml	· · · A file created automatically when the project is saved.
⑤	projectlist.xml	· · · A file created automatically when the project is saved.

Do not change or delete workspace configuration or project using an application such as Windows® Explorer.
If a data name is changed or deleted using an application such as Windows? Explorer and projects without containing actual data may remain in a project list of the function such as opening a project. Those faulty projects can be deleted from the project list by selecting [Project] ⇒ [Delete].

For copying GX Works2 project on Windows® Explorer, select either following operation to copy the project without breaking the configuration of workspace and project.

- Copy the entire save destination folder (① above).
- Copy the workspace name folder and "workspacelist.xml".

When "workspacelist.xml" (④ above) or "projectlist.xml" (⑤ above) does not exist in the folder by performing the copy operation other than above, the copied workspaces/projects are not displayed in "Workspace/Project List" on the Open screen.
However, note that the project can be opened forcibly by selecting "All Folders" for "Display" on the Open screen and displaying all folders.
When a file other than "workspacelist.xml" or "projectlist.xml" is missing, the project may not be opened.

Restrictions

● **Opening a project forcibly by selecting "All Folders"**
The following operations cannot be performed.

- Register, Restore, and Verify functions of project revision history
- Security user management
- Automatic project save

However, the above restrictions are invalidated by selecting [Project] ⇒ [Save As], and saving the project.

4.1.2 Single file format

The single file format is a format to handle project files as a single file.
Projects are managed without being aware of the folder configuration and the file configuration by saving projects in the single file format. Operations such as changing project names, copying and pasting projects, and sending and receiving data, can easily be performed on Explorer.

<Single file format project (*.gxw)>

Point

● **When using MELSOFT Navigator**
Projects saved in the single file format cannot be used in MELSOFT Navigator.
Save projects in the workspace format.

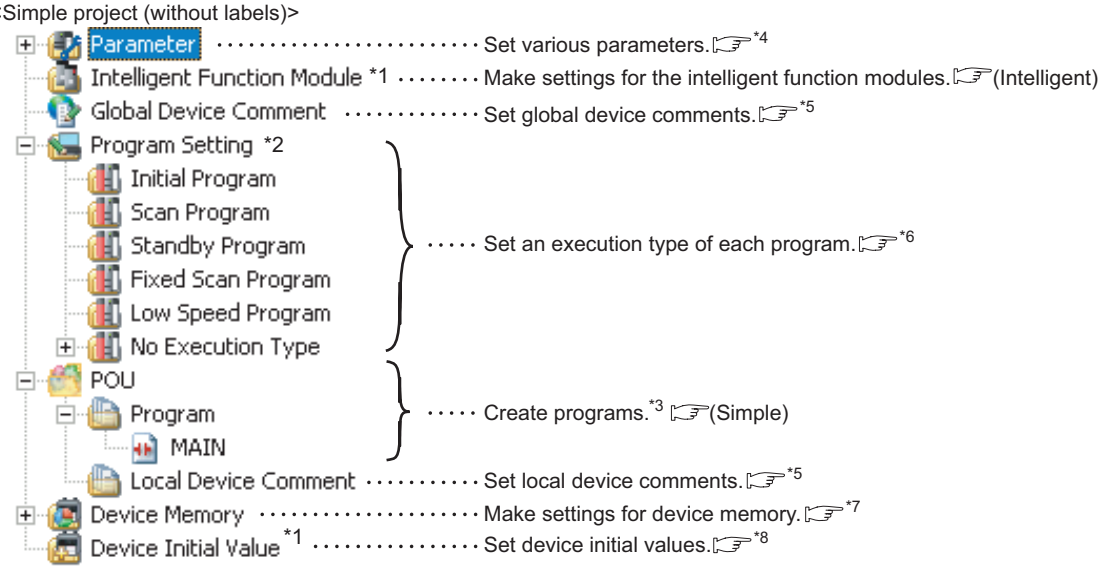
4.1.3 Project

Project contents displayed on the Project view in tree format are as shown below.
Contents displayed on the view differs according to the types of programmable controller and project.
For (Simple), (Structured), and (Intelligent) indicated in the reference destinations, refer to the following manuals respectively:

(Simple) ... GX Works2 Version 1 Operating Manual (Simple Project)
(Structured) ... GX Works2 Version 1 Operating Manual (Structured Project)
(Intelligent) ... GX Works2 Version 1 Operating Manual (Intelligent Function Module)

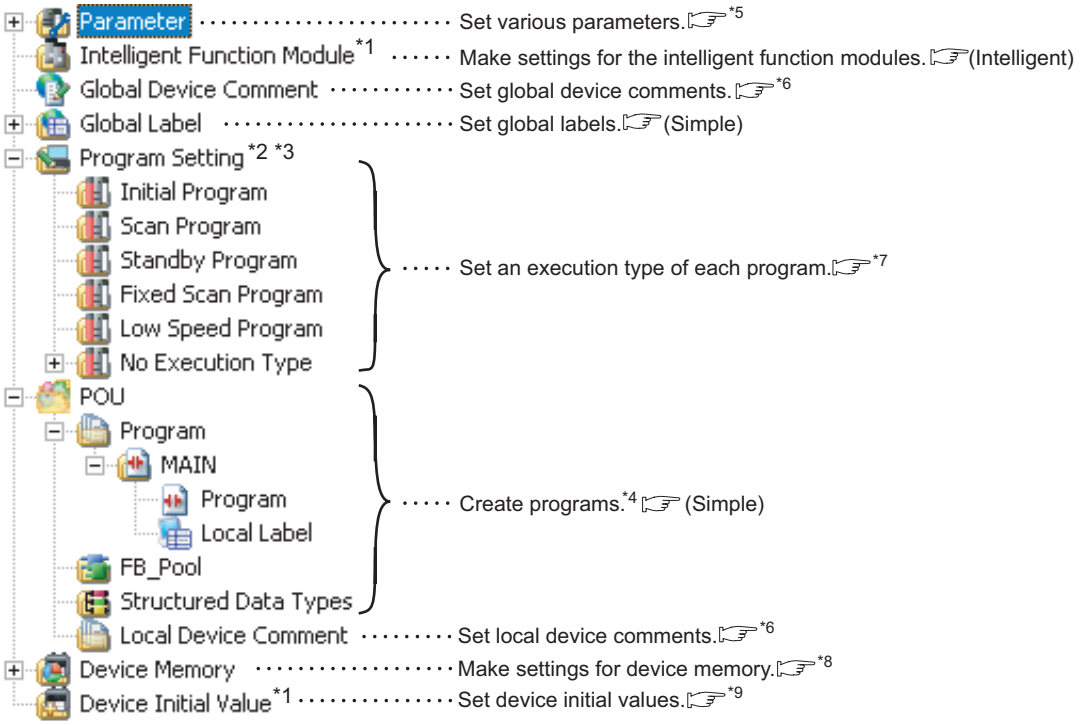
The following are examples for QCPU (Q mode).

<Simple project (without labels)>



*1 : For FXCPU, this item is not displayed.
*2 : For FXCPU, execution types are not categorized. The only one category 'Execution Program' is displayed.
*3 : For FXCPU, a single execution program can be created in either Ladder Diagram or Sequential Function Chart.
*4 : ☞ Chapter 6
*5 : ☞ Chapter 9
*6 : ☞ Section 6.1.1
*7 : ☞ Chapter 7
*8 : ☞ Chapter 8

<Simple project (with labels)>



*1 : For FXCPU, this item is not displayed.

*2 : For FXCPU, execution types are not categorized. The only one category 'Execution Program' is displayed.

*3 : For FXCPU, Simple project (with labels), the 'Execution Program' can be divided into multiple programs.

*4 : For FXCPU, the program is created in Ladder Diagram only.

*5 : ☞ Chapter 6

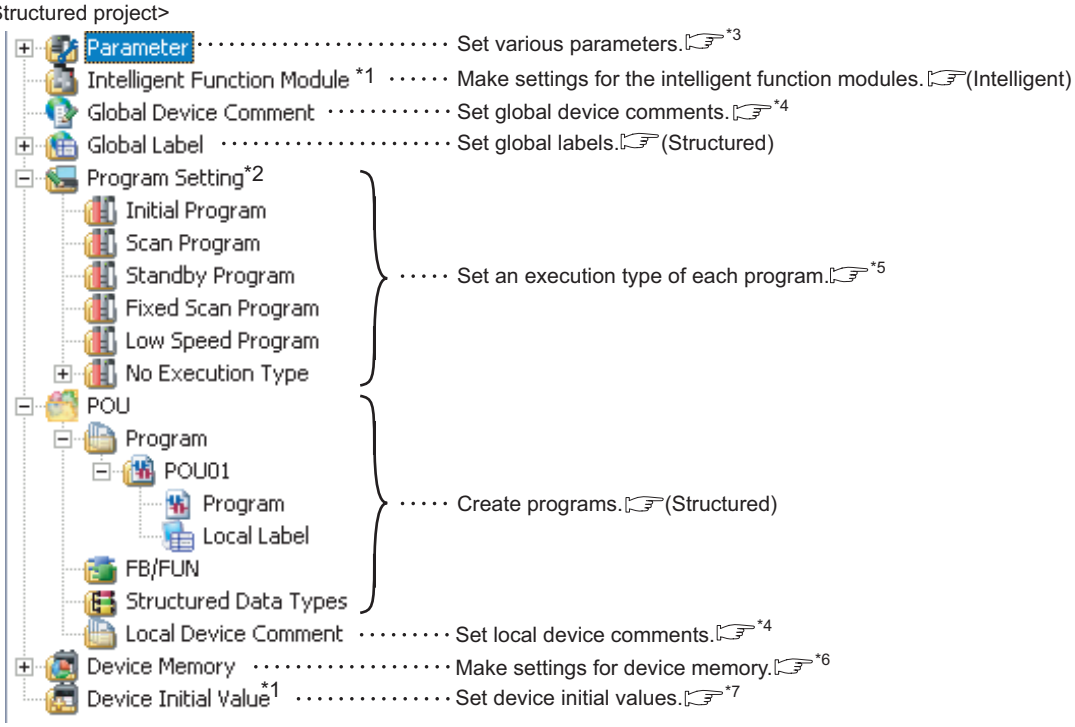
*6 : ☞ Chapter 9

*7 : ☞ Section 6.1.1

*8 : ☞ Chapter 7

*9 : ☞ Chapter 8

<Structured project>



*1 : For FXCPU, this item is not displayed.

*2 : For FXCPU, execution types are not categorized. The only one category 'Execution Program' is displayed.

*3 : ☞ Chapter 6

*4 : ☞ Chapter 9

*5 : ☞ Section 6.1.1

*6 : ☞ Chapter 7

*7 : ☞ Chapter 8

Point

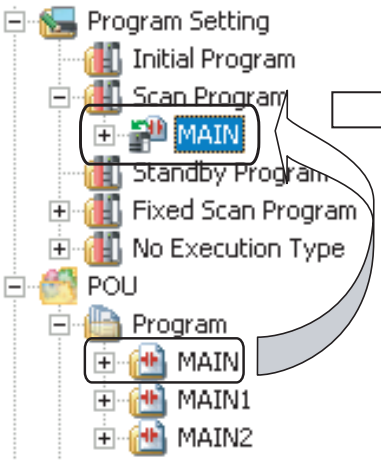
● **Program Setting**

On the Project view, an execution type of a program can be set by right-clicking the name of the program whose execution type is to be changed and selecting [Register Program] ⇒ [Initial]/[Scan]/[Standby]/[Fixed Scan]/[Low Speed] from the shortcut menu, or dragging and dropping it. The execution type set on the Project view is applied to the program setting of the PLC parameter.

(Program setting in PLC parameter ☞ Section 6.1.1)

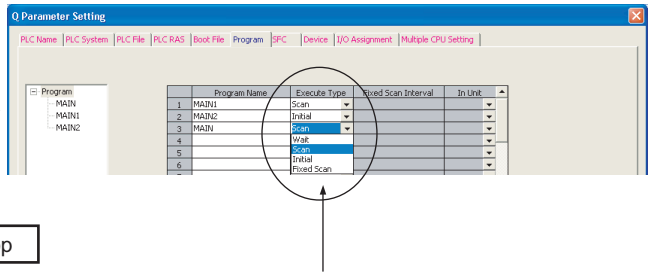
Example) Set the execution type of MAIN to 'Scan Program' with the drag-and-drop operation.

<Project view>



Drag & drop

<Setting screen for PLC parameter>



The setting made in the Project view is applied.

4.2 Project Operations

This section explains basic operations of GX Works2 such as creating, opening, and saving projects.

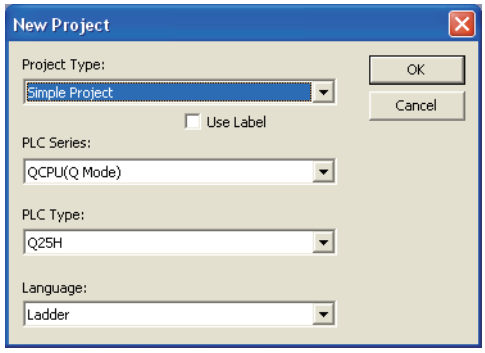
4.2.1 Creating projects

Q CPU | L CPU | Remote | Head | FX

Configure the settings to create a new project.

Screen display

Select [Project] ⇒ [New] ( ).



Operating procedure

- **Set the items on the screen.**

Item		Description
Project Type		Select the type of the project to be created. Select "Simple Project" or "Structured Project".
	Use Label	Select this to create a project using labels when "Simple Project" is selected.
PLC Series		Select the programmable controller series for the project.
PLC Type		Select the programmable controller type (programmable controller CPU model) used for the project. When a programmable controller type which is not supported by GX Works2 but is supported by GX Developer is selected, start GX Developer and create a new project. For a procedure to use unsupported programmable controller type, refer to Appendix 14.
Language		Select the language for the program data to be created when creating a new project.

Point

● **Considerations when using Windows Vista® or Windows® 7**

A new GX Works2 project may not be able to be created when using Windows Vista® or Windows® 7.
Set the access authority for a login user to the following folders to which the access authority has not been set.

- The folder to which GX Works2 is installed.
  Example) C:\Program Files\MELSOFT
- C:\Documents and Settings\(login user name)\Local Settings\Application Data\MITSUBISHI\SWnDNGPPW2
- The TEMP folder set by environment variable.
  Example) C:\Documents and Settings\(login user name)\Local Settings\Temp

If the access authority cannot be changed, right-click the GX Works2 program and select [Run as administrator]. To activate the program from the shortcut menu, open the property of the shortcut menu and select "Run this program as an administrator" under "Privilege Level" on the <<Compatibility>> tab.

● **Changing data such as workspace name after creating a new project**

Do not change the storage location and names of folders/files of a created workspace/project using an application such as Windows® Explorer.
For details of workspace/project configuration, refer to Section 4.1.1.

● **Common pointer number setting for projects with labels**

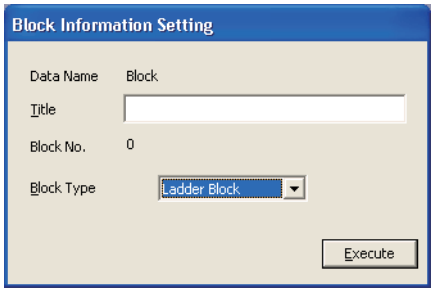
When a project with labels is created, the last half of the device range of pointer (P) is set for "Common Pointer No." on the <<PLC System>> tab of the PLC parameter. This range is set as a pointer range for the "Device/Label Automatic-Assign Setting" function.
For details of the "Device/Label Automatic-Assign Setting" function, refer to the following manuals.
☞ GX Works2 Version 1 Operating Manual (Simple Project)
☞ GX Works2 Version 1 Operating Manual (Structured Project)

● **Connection destination**

When creating a new project, the connection destination is set to the route set for "Current Connection" in the previously-edited project. Review the connection destination setting to change the previously-edited project and the connection destination.
When creating a new project after installing GX Works2 for the first time, the setting is set to access the programmable controller CPU directly.

● **Creating a new SFC project with FXCPU**

When 'SFC' is selected in "Language" with FXCPU, the Block Information Setting screen is displayed.
When an SFC project is created with FXCPU, a ladder program needs to be created using ladder blocks to start up an initial step of the SFC program. Select "Ladder Block" in "Block Type", and create a startup ladder program using ladder blocks.



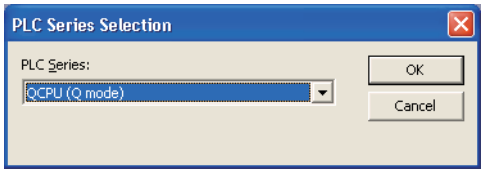
■ Creating new projects with data read from programmable controller CPU or intelligent function module (New project creation with data read from programmable controller CPU)

A new project can be created with data read from a programmable controller CPU or an intelligent function module when the Read from PLC function is executed without creating a new project.
When a programmable controller type which is not supported by GX Works2 but is supported by GX Developer is selected, start GX Developer and create a new project. For a procedure to use unsupported programmable controller types, refer to Appendix 14.

Operating procedure

1. **Start GX Works2 and select [Online] ⇒ [Read from PLC].**

   The PLC Series Selection screen is displayed.



2. **Set the item on the screen.**

Item	Description
PLC Series	Select the programmable controller series from which data are read.

3. **Click the OK button.**

   The Transfer Setup screen is displayed.

4. **Set a communication route to access to the programmable controller CPU.**

   For the method for setting a connection destination, refer to Chapter 11.
   The Online Data Operation screen is displayed when the setting of connection destination is completed.

5. **Execute the Read from PLC function on the Online Data Operation screen.**

   For the method for executing the Read from PLC function on the Online Data Operation screen, refer to Section 12.1.

Point

- **Considerations when creating a new project with data read from programmable controller CPU**
  When parameters are not read from the programmable controller CPU with data to create a new project, default parameters are set.
  Check the parameter setting.
- **Creating a new project with data read from intelligent function module**
  For the function to create a new project with data read from programmable controller CPU, when an intelligent function module is mounted on the same base unit as the connected programmable controller CPU, the project data are created according to the mounted module configuration. Thus, the data of intelligent function modules whose parameters are not written to the programmable controller CPU are also created.
- **Creating a new project with data read from Redundant CPU**
  Data cannot be read from a Redundant CPU by specifying a system, such as "Control System", "Standby System", "System A", or "System B" for "Target System" of redundant operation.
  When reading data from the Redundant CPU by specifying the system, read data after creating a project.

4.2.2 Opening existing projects

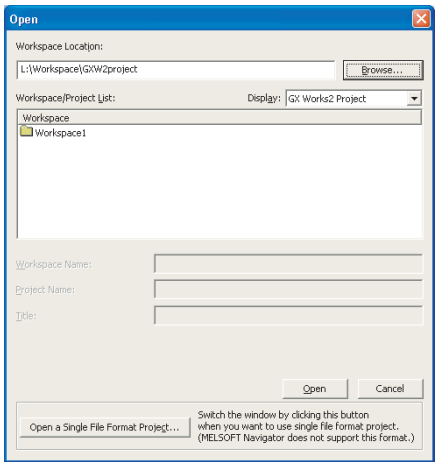
Q CPU L CPU Remote Head FX

Read a project saved on a hard disk of personal computer.

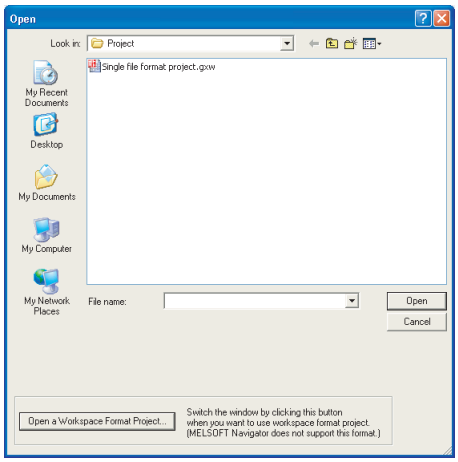
Screen display

Select [Project] ⇒ [Open] ( ).

< Opening a project in the workspace format >



< Opening a project in the single file format >



Operating procedure

1. **Set the items on the screen.**

Item	Description
Workspace Location	Enter the folder (drive/path) where the workspace is saved. The folder can be selected on the Browse For Folder screen by clicking the Browse... button.
Workspace/Project List	Select the workspace or project. The display is switched to the project list by double-clicking "Workspace".
Display	Select this to display folders for GX Works2 projects only, folders for GX Developer projects only, or all folders. By selecting "All Folders" also displays workspace folders and project folders copied/moved by the application such as Windows® Explorer.
Workspace Name	Display the selected workspace name.
Project Name	Display the selected project name.
Title	Display the title of the selected project.

2. **Click the Open button.**

The specified project is displayed.
When the GX Developer project is specified, GX Developer starts automatically and the project is displayed.

Screen button

● Browse...
Displays the Browse For Folder screen.

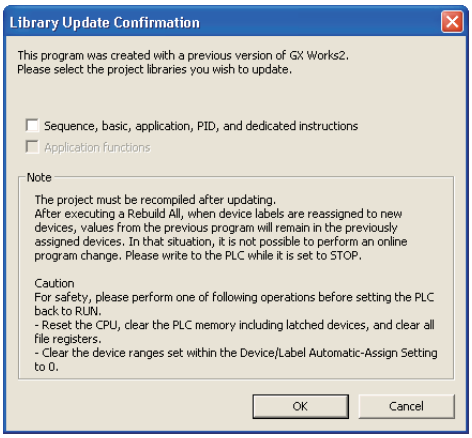
● Open a Single File Format Project...
Switches to the Open screen in the single file format.

● Open a Workspace Format Project...
Switches to the Open screen in the workspace format.

Point

● **Changing data such as workspace name**
Do not change the storage location and names of folders/files of a created workspace/project using an application such as Windows® Explorer.
For details of workspace/project configuration, refer to Section 4.1.1.

● **Opening Structured projects**
When a Structured project is opened in later version of GX Works2 than the one used for saving the project, the Library Update Confirmation screen may be displayed.
To modify the project and update the new instructions and/or application functions, select the corresponding check box(es).



All programs need to be compiled when instructions or application functions are updated.
Compiling all programs changes the device assignment to labels. Therefore, device values set before the program change remain on the device-assigned labels.
Perform the following operations for a precautionary measure.

- For QCPU (Q mode)/LCPU
  After writing data to the programmable controller CPU, reset the programmable controller CPU, clear all device memories including latches, clear all file registers, and switch the programmable controller CPU to RUN.
- For FXCPU
  After writing data to the programmable controller CPU, clear device memory using the PLC memory clear function, and switch the programmable controller CPU to RUN.
  (☞ Section 17.4)

For the considerations for compiling all programs, refer to the following manuals.
☞ GX Works2 Version 1 Operating Manual (Simple Project)/(Structured Project)

● **Opening projects being edited by other users**
The project being edited can be opened by other users as a read-only project. Note that the following functions cannot be used.

- Saving projects
- Project revision history
- Succeeding project revision when saving projects with a specific name
- Change PLC type function
- Security function

● **Opening projects created in other languages**
Characters in a project created in other languages may get garbled when it is opened.

● **Open screen**

- The Open screen with the initial setting opens a project in the single file format.
  Switch the screen by clicking the Open a Workspace Format Project... button to open the existing project in the workspace format.
- A programmable controller type and a title are not displayed on the Open screen in the single file format.
- If the file save destination path is long, the "Look in" field may be left blank when opening a project in the single file format. Even with the blank field, the selected folder/file can be opened normally.

● **Projects saved on the network drive or the removal storage device**
Do not open the project directly. Open it after saving it to the hard disk of the personal computer.

4.2.3 Saving projects

Q CPU L CPU Remote Head FX

Save a project on a personal computer or another data storage device.

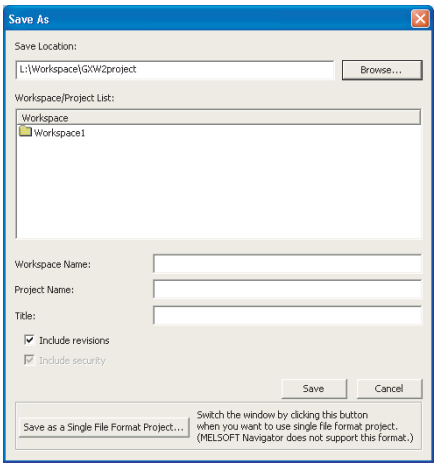
■ Saving projects under the specified name

Save the open project under the specified name.

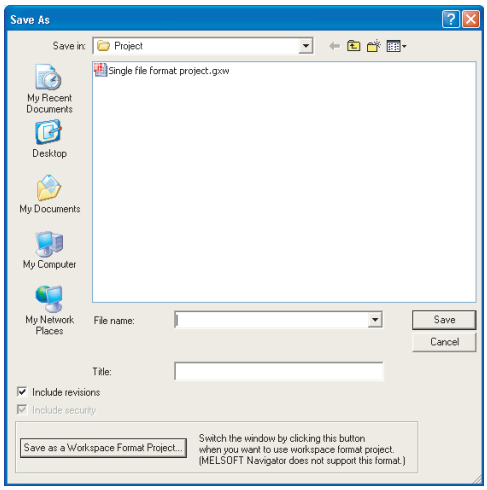
Screen display

Select [Project] ⇒ [Save As].

< Saving a project in the workspace format >



< Saving a project in the single file format >



Operating procedure

1. **Set the items on the screen.**

Item	Description
Save Location	Enter the folder (drive/path) where the workspace is saved. The folder can be selected in the Browse For Folder screen by clicking the Browse... button.
Workspace/Project List	Select the workspace or project. The display is switched to the project list by double-clicking "Workspace".
Workspace Name	Enter the workspace name.
Project Name	Enter the project name.
Title	Enter the title of the project.
Include revisions*1	Select this to succeed and save the project revision information. (☞ Section 4.6)
Include security*1	Select this to succeed and save the security information of the project. (☞ Section 4.10)

*1 : This setting can be set only when saving the already existing project with another name.

2. **Click the Save button.**

The project is saved in the specified folder under the specified workspace name, project name, and title.

Screen button

● Browse...
Displays the Browse For Folder screen.

● Save as a Single File Format Project...
Switches to the Save As screen in the single file format.

● Save as a Workspace Format Project...
Switches to the Save As screen in the workspace format.

Point

● **When saved workspace exists**
When the saved workspace or project exists, a folder to which the workspace is saved can be specified from "Workspace/Project List".

● **Number of characters used for workspace name, project name, and title**
The total number of characters used for the path name of the folder to which the project is saved, workspace name, and project name should not exceed 200 characters.
A title can be entered within 128 characters.

● **Saving a project contains Structured Ladder programs**
If multiple Structured Ladder editors are opened, the project may not be able to be saved.
In this case, start another GX Works2 and save the project by copying all data to the newly-created project.
(☞ Section 4.3.2 "Copying/pasting data in projects")

● **Save As screen**
- The Save As screen with the initial setting saves a project in the single file format.
  Switch the screen by clicking the Save as a Workspace Format Project... button to save the project in the workspace format.
- If the file save destination path is long, the "Save in" field may be left blank when saving a project in the single file format. Even with the blank field, the selected folder/file can be saved normally.

■ Saving projects

Overwrite and save the project being edited.

Operating procedure

- **Select [Project] ⇒ [Save] ( )**
  The data to be saved is overwritten on the existing project data.

Point

● **Registering project revision when overwriting**
By setting the option, the Revision Entry screen for registering the project revision is displayed when overwriting the project.
To display the Revision Entry screen when overwriting the project, select [Tool] ⇒ [Options] ⇒ "Project" and then select "Revision is Registered when Save Project" in "Change History". In addition, the revision title can be automatically set when overwriting by selecting "Automatically set revision titles".
(For details of project revision history ☞ Section 4.6)

● **Compilation status is not saved by overwriting data**
Performing compilation only and overwriting the project, and then opening the project again may cause the project to be in an uncompiled status.
In this case, overwrite the uncompiled project without performing compilation to save the compilation status normally.

4.2.4 Saving projects with compression and decompressing projects

Q CPU L CPU Remote Head FX

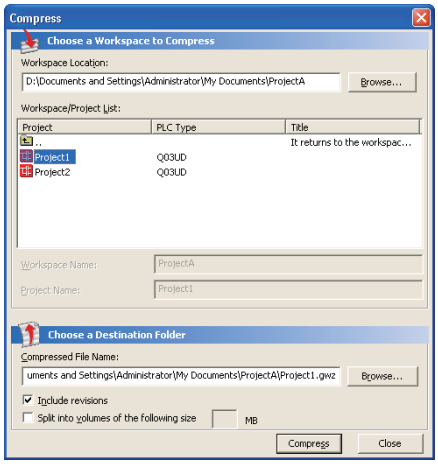
Save projects with compression, and decompress projects saved with compression.
Files can be saved with their sizes reduced by compressing the project. Files can also be saved by separating them in specific sizes. These functions produce easier project data passing.
These functions are not compatible with commercially available file compression and decompression tools.

■ Saving projects with compression

Save a desired project with compression.

Screen display

Select [Project] ⇒ [Compress/Unpack] ⇒ [Compress].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Choose a Workspace to Compress		
	Workspace Location	Enter the folder (drive/path) where the workspace is saved. The folder can be selected in the Browse For Folder screen by clicking the Browse... button.
	Workspace/Project List	Select the workspace and project.
	Workspace Name	Display the selected workspace name.
	Project Name	Display the selected project name.
Choose a Destination Folder		
	Compressed File Name	Enter the folder where the compressed file is saved, and the compressed file name. The compressed file name can be specified in the Compressed File Name screen by clicking the Browse... button.
	Include revisions	Select this to succeed and save the project revision information. (☞ Section 4.6)
	Split into volumes of the following size	Select this to save data in multiple compressed files. Specify the split size in the range from 1 to 999MB.

2. **Click the** Compress **button.**

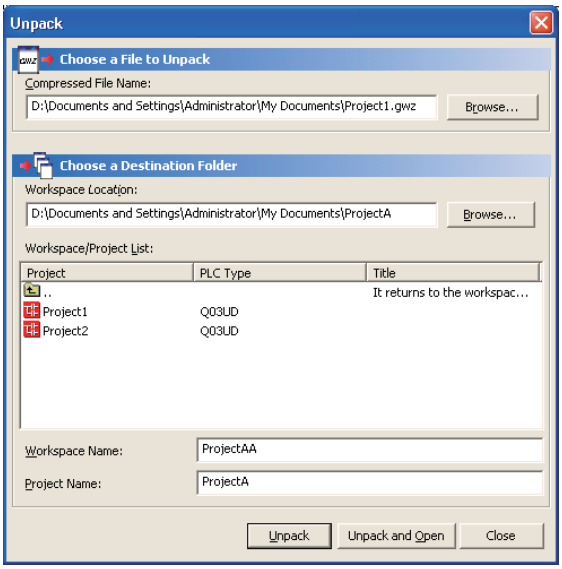
The compressed project file (*.gwz) is saved in the specified folder.

■ Decompressing projects saved with compression

Decompress a project saved with compression.

Screen display

Select [Project] ⇒ [Compress/Unpack] ⇒ [Unpack].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Choose a File to Unpack		
	Compressed File Name	Enter the folder (drive/path) in which the compressed file to be decompressed is saved, and the compressed file name. The compressed file name can be specified in the Compressed File Name screen by clicking the Browse... button.
Choose a Destination Folder		
	Workspace Location	Enter the folder (drive/path) to which the project to be decompressed is saved. The folder can be selected in the Browse For Folder screen by clicking the Browse... button.
	Workspace/Project List	Select the workspace and project.
	Workspace Name	Enter the name of the workspace to which the decompressed project is saved.
	Project Name	Enter the name of the project to which the decompressed project is saved.

2. **Click the** Unpack **button.**

The compressed project file is decompressed and saved in the specified folder.

Screen button

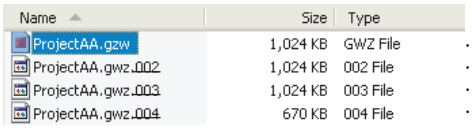
● Unpack and Open

Decompresses a compressed project file and opens the project.

Point

● **Decompressing compressed files**
A compressed file can also be decompressed on the Unpack screen which is displayed by double-clicking the compressed file (*.gwz) on Windows® Explorer.

● **Names of divided compressed files**
When a project is saved in divided compressed files, a number is automatically added after the extension in each name of the second or later compressed files as shown below.



● **Decompressing divided compressed files**
Select the first file (*.gwz) when decompressing a series of divided compressed files. To be decompressed, all of a series of divided files must be in the same folder.

4.2.5 Deleting projects

Q CPU | L CPU | Remote | Head | FX

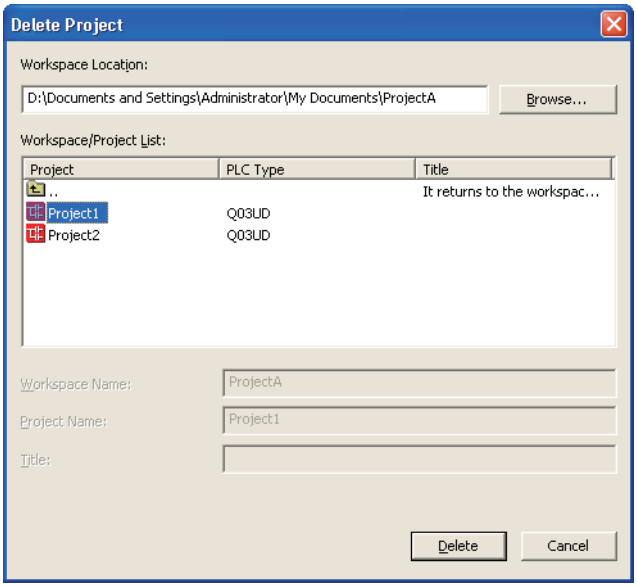
Delete a project saved on a personal computer or another data storage device.

Operating procedure

1. **Select [Project] ⇒ [Delete].**
   The Delete Project screen is displayed.

2. **Select the project to be deleted.**

3. **Click the** Delete **button.**
   The selected project is deleted.



Point

● **Deleting projects**
- Once a project is deleted, it cannot be restored again.
- The open project cannot be deleted. Delete the project after closing it.
- Projects that can be deleted using this function are the projects saved in the workspace format only. Delete projects saved in the single file format using Windows® Explorer.

4.2.6 Closing projects

Q CPU L CPU Remote Head FX

Close an open project.

Operating procedure

- **Select [Project] ⇒ [Close].**

4.2.7 Verifying project data

Q CPU L CPU Remote Head FX

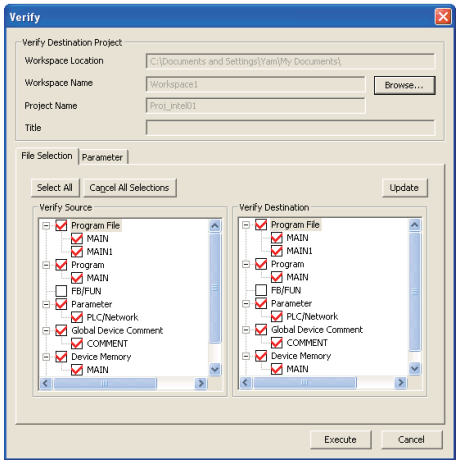
Verify data of an open project against data of another project.
Verification can be performed only when the programmable controller type and project type of the two projects are the same.
This function is used to compare the contents of two projects or to locate program changes made in projects.
To verify data against data on the programmable controller CPU, use the Verify with PLC function. (☞ Section 12.2)
The following data can be selected as verification targets for the project verification.

- Programs
- Parameters
- Intelligent function module parameters (initial setting/auto refresh)*1
- Device comments
- Device memory data
- QD75/LD75 positioning module*1

*1 : Not supported by FXCPU.

Screen display

Select [Project] ⇒ [Verify].

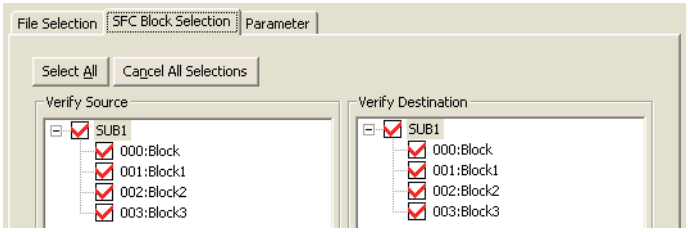
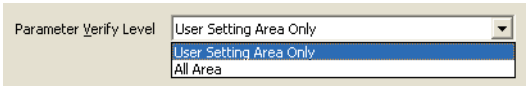


Operating procedure

1. Click the Browse... button to set the verify destination project.

Item		Description
Verify Destination Project	Workspace Location	Display the path to the workspace of the verify destination.
	Workspace Name	Display the workspace name of the verify destination. This field will be blank when a project in the single file format is specified for the verify destination project.
	Project Name	Display the project name of the verify destination.
	Title	Display the project title of the verify destination.

2. Set the items on the screen.

Item		Description
<<File Selection>>	Verify Source	Display project data of verify source (data being edited). Selects the data in the project data list.
	Verify Destination	Display project data of verify destination (saved project data). Selects the data in the project data list.
<<SFC Block Selection>>*1,*2		Select SFC blocks in the SFC Block list. 
<<Parameter>>*2		Select the parameter verification level. ☞ ■ Verifying parameters 

*1 : Simple projects only
*2 : Not supported by FXCPU.

3. Click the Execute button.

The verification result is displayed on the Verify Result screen.
☞ ■ Checking verification result details

Screen button

- Select All
  Selects all the data displayed in the project data list.
- Cancel All Selections
  Cancels the selection status of all the data selected in the project data list.
- Update
  Updates the data displayed in the project data list.

Point

● **Verifying programs**
The verification function verifies the data created by the compilation. If the program is edited after the compilation, compile the program again before performing the verification.

● **Data names of verification target data**
When multiple data are selected for verification, verification is performed between the source and destination data with the same name. However, device comments are verified only when their data names are same.
When only one source program is verified against one destination program, verification can be performed even with different names.

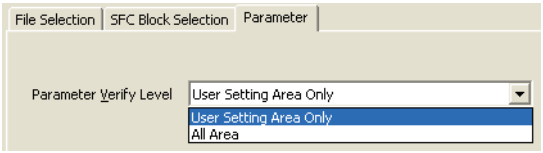
● **Security status of project**
Projects to which the security is set can be verified when both verify source data and verify destination data are not read-protected.

● **Verifying intelligent function module parameters (initial setting/auto refresh)**
Among modules without initial setting such as QD75/LD75 positioning modules, serial communication/modem interface modules, and AS-i master modules, only modules in which the auto refresh is set are the verification targets.

● **Verifying QD75/LD75 positioning modules**
One module each for verify source and verify destination can be selected.
The following data can be selected as verification targets.
- Parameter
- Servo parameter (For QD75M/MH only)
- Positioning data (Except for positioning comments and M code comments)
- Block start data

■ Verifying parameters

The verification level can be selected when verifying parameters.



The following table shows the verification details for each setting item.

Item	Description
User Setting Area Only	Verify only the parameter area set by the user.
All Area	Verify all the area including the parameter area set by the system.

● Mismatch in the system setting area

When a mismatch is detected in the parameter area set by the system in the verification set to "All Area", either of the following messages is displayed.
Take corrective action according to the message.

Message	Corrective action
The header information of the parameter blocks is inconsistent.	A mismatch is detected in other than user setting area. Write the parameters, having been written to the programmable controller CPU, to the programmable controller again. When a mismatch is detected on the block number AFFF, perform the following operation to reset the area which is set by the system. • Select Project view ⇒ Parameter ⇒ Network Parameter ⇒ Ethernet/CC IE/ MELSECNET. Click the End button on the displayed MELSECNET/CC IE/ Ethernet Module Configuration screen and write the parameters to the programmable controller CPU.
This parameter block can't analyze.	Versions of GX Works2, GX Developer, or GX IEC Developer used to create the projects differ between the verify source and the verify destination. The programmable controller CPU operation is not affected.

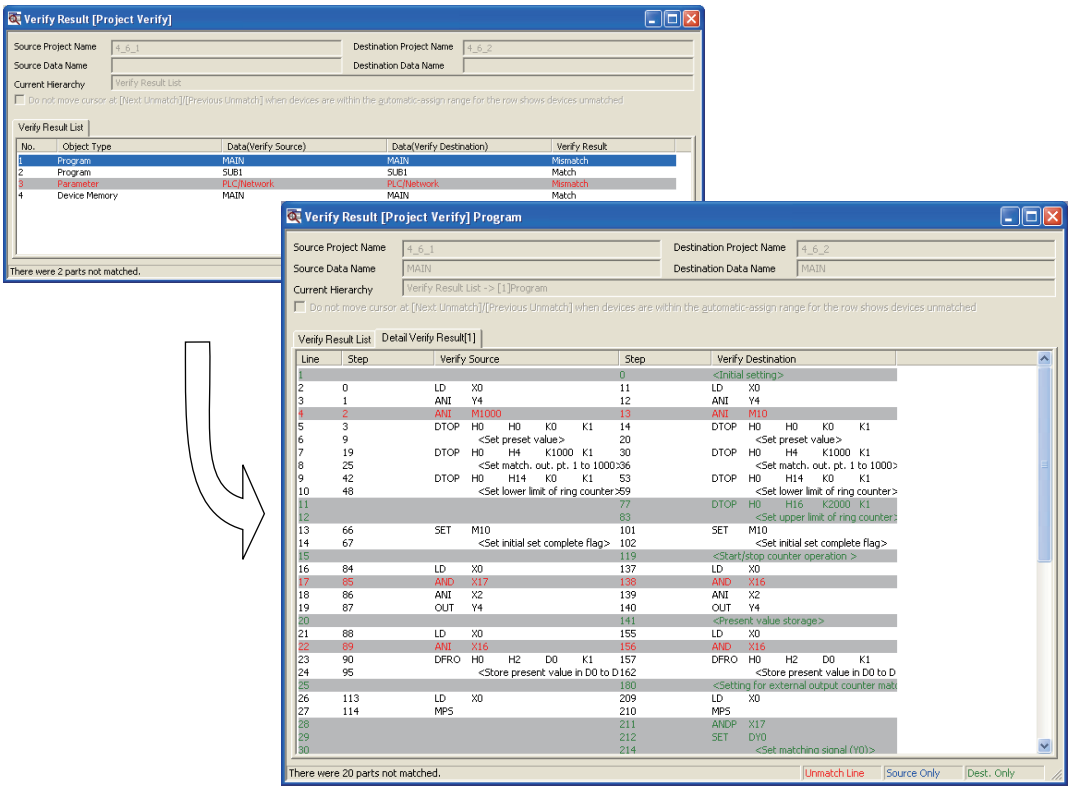
■ Checking verification result details

Details of mismatched data can be checked on the <<Verify Result List>> tab on the Verify Result screen.
Details of program verification result can be checked for ladder programs only.
For FXCPU, when a block password with the validated setting for "Read-protect the execution program" exists, matches and mismatches of the program file verification are displayed, however, a jump to the detailed verify result cannot be performed.

Operating procedure

1. Double-click the row of the data to display the details of the Verify Result screen.

The following are screens of project with labels.



2. Set the item on the screen.

Item	Description
Do not move cursor at [Next Unmatch]/[Previous Unmatch] when devices are within the automatic-assign range for the row shows devices unmatched*1	The following are the operations when searching for the result using the [Next Unmatch] ( )/[Previous Unmatch] ( ) function. • When this item is selected Among the rows with mismatches, the cursor skips the rows whose mismatched devices are within the range of devices automatically assigned to labels. This function excludes the rows with devices reassigned to other devices when a program is compiled. • When this item is not selected The cursor can be placed on all rows with mismatches.

*1 : For projects with labels only

3. Select [Find/Replace] ⇒ [Next Unmatch] ( )/[Previous Unmatch] ( ).

The cursor can only be placed on the rows with mismatches.

Point

● **Detail Verify Result tabs**

- The tab order can be changed by drugging and dropping <<Detail Verify Result>> tabs.
- The screen returns from the <<Detail Verify Result>> tab to the <<Verify Result List>> tab by selecting [View] ⇒ [Return to Result List] ( ).
- The selected <<Detail Verify Result>> tab can be closed by selecting [View] ⇒ [Close Detail Result] ( )/[Close All Detail Result] ( ).

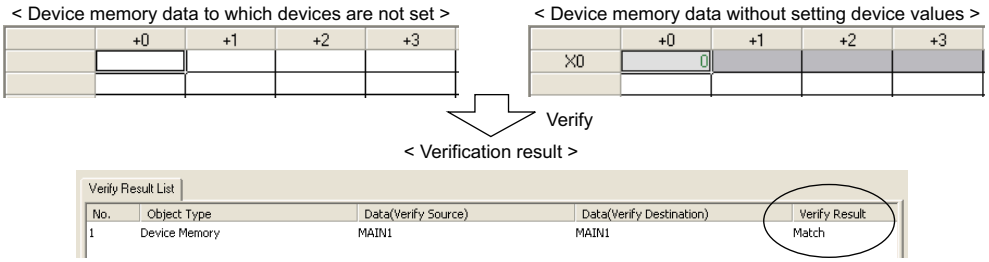
● **Verifying device memory data**

Device memory data are verified with the actual values.
Even when the display formats of data are different on the device memory editor, the verification result on the same value will be a match.
For FXCPU, the verification result is as follows:

- a result of internal relay (M) verification includes special device M.
- a result of data register (D) verification includes file register and special device D.

● **Devices to which a value is not set on the device memory editor**

Devices to which a value is not set on the device memory editor are verified as a value 0.
Therefore, if 'device memory data to which devices are not set' and 'device memory data to which devices are entered without setting device values' are verified, the verification result will be a match.



● **Direct input (DX) and direct output (DY)**

When verifying device comments or device memory data, check the verification result with input (X)/output (Y) for direct input (DX)/direct output (DY).

● **Number of verification results displayed**

If the number of mismatches exceeds 1,000, up to 1,000 mismatch results are displayed and verification is suspended after that.
For a ladder program of program (program file) and POU, since the function determines the difference of the number of lines between the verify source and the verify target in the list format as a mismatch, the verification is canceled in the middle of the process even before reaching 1,000 mismatches and the rest of the program is determined as a mismatch. The remaining part needs to be verified again after modifying the mismatched data.

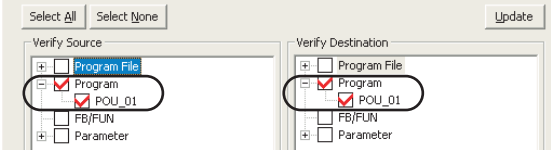
● **Copying verification results**

Verification results can be copied and pasted to a text file. Select rows of verification result to be copied, and select [Edit] ⇒ [Copy].
The copied data are pasted on a text file as data separated by tabs.

● **Jumping from verification result**

When "Enable calling function block and using inline ST" is selected under [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Basic Setting", function block program items with no difference may be indicated as a mismatch on the Verify Result screen.
In this case, check the mismatch part by any of the following methods.

- Checking labels/devices set to input/output variables of function block
  Open the source program from which function blocks are called, and check labels/devices.
- Checking mismatch parts with the program verification result
  Select items as shown below to verify programs.



Point

● **Jumping from verification result of intelligent function module parameter (initial setting/auto refresh)**
When different modes are set to the verify destination and the verify source for auto refresh of temperature control module, jumping to verification result is not performed.
For setting the auto refresh of temperature control module, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Intelligent Function Module)

■ Checking method when verify source data are modified

Updated verify source data are displayed in the verification result.
Therefore, the verification result of updated verify source data can be checked without executing the verification function again when mismatched data is modified.
Even when a data name of verify source is changed, the changed data name is displayed in the verification result.

Operating procedure

1. **Modify the verify source data.**

2. **Open the <<Verify Result List>> tab or the <<Detail Verify Result>> tab on the Verify Result screen.**

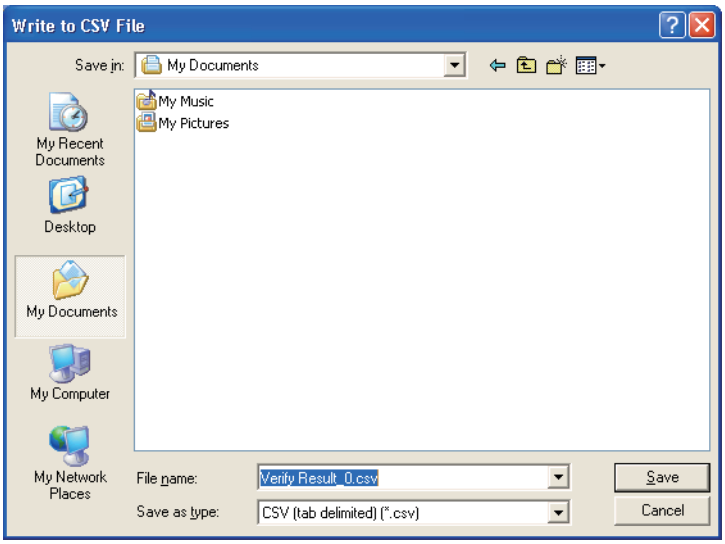
3. **Double-click the modified data on the <<Verify Result List>> tab or the <<Detail Verify Result>> tab.**
   The updated data is displayed in the verification result.

■ Writing verification results to CSV files

Output data displayed on the Verify Result screen to a CSV file.

Operating procedure

1. **Select [Edit] ⇒ [Write to CSV File] ( ).**
   The Write to CSV File screen is displayed.



2. **Enter a file name.**

3. **Click the Save button.**
   The verification results are saved on a personal computer.

● Formatting CSV file

The saved CSV file is displayed as shown below when it is opened by Excel.
<Display of the Verify Result screen>

Verify Result List

No.	Object Type	Data(Verify Source)	Data(Verify Destination)	Verify Result
1	Program File	MAIN	MAIN	Mismatch
2	Program File	SUB1	SUB1	Mismatch
3	Program File	SUB2	SUB2	Match
4	Program	MAIN	MAIN	Mismatch
5	Program	SUB2	SUB2	Match
6	FB_Pool	CARRY1	CARRY1	Mismatch
7	FB_Pool	SHOKIKA	SHOKIKA	Match
8	FB_Pool	CARRY2	CARRY2	Match
9	Parameter	PLC/Network	PLC/Network	Mismatch
10	Parameter		Intelligent Function Module(Initial Setting/Dest. Only	

<CSV file>

Verify Source:Project1				
Verify Destination:Project2				
Hierarchy:Verify Result List				
Verify Result:There were 7 parts not matched.				
No.	Object Type	Data(Verify Source)	Data(Verify Destination)	Verify Result
1	Program File	MAIN	MAIN	Mismatch
2	Program File	SUB1	SUB1	Mismatch
3	Program File	SUB2	SUB2	Match
4	Program	MAIN	MAIN	Mismatch
5	Program	SUB2	SUB2	Match
6	FB_Pool	CARRY1	CARRY1	Mismatch
7	FB_Pool	SHOKIKA	SHOKIKA	Match
8	FB_Pool	CARRY2	CARRY2	Match
9	Parameter	PLC/Network	PLC/Network	Mismatch
10	Parameter	Intelligent Function Module(Initial Setting/Auto Refresh)		Source Only

4.2.8 Changing programmable controller type of projects

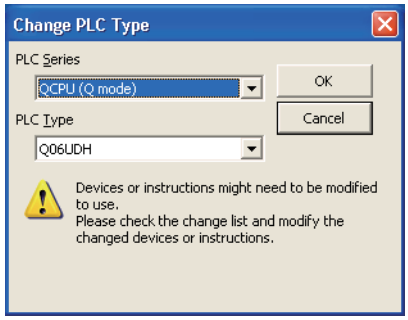
Q CPU | L CPU | Remote | Head *1 | FX

*1 : CC IE Field head module only

Change the programmable controller type of a project being edited.

Screen display

Select [Project] ⇒ [Change PLC Type].



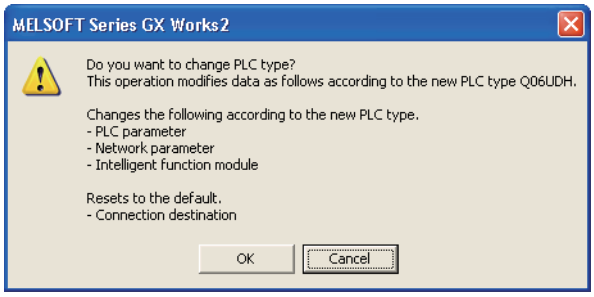
Operating procedure

1. **Set the items on the screen.**

Item	Description
PLC Series	Select the programmable controller series after change.
PLC Type	Select the programmable controller type after change.

2. **Click the OK button.**

The following confirmation message is displayed. Click the OK button to execute the function.



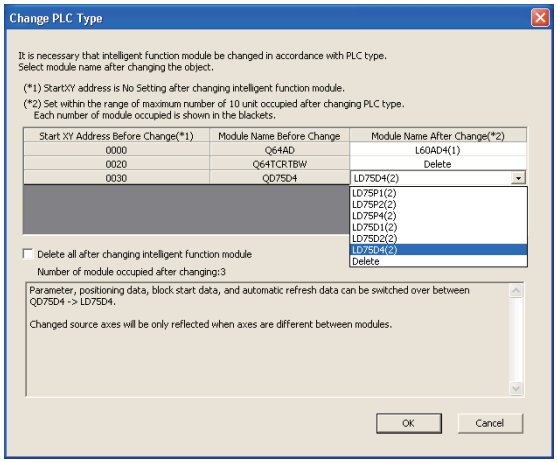
Point

● **Changing programmable controller type of projects which contain intelligent function modules (For QCPU (Q mode)/LCPU/CC IE Field head module)**

Basically intelligent function modules are deleted after the programmable controller series is changed, but certain intelligent modules can be changed to those which are applicable to the programmable controller series after change. For details of the shift of models of intelligent function modules associated with change of programmable controller series, refer to the following section.

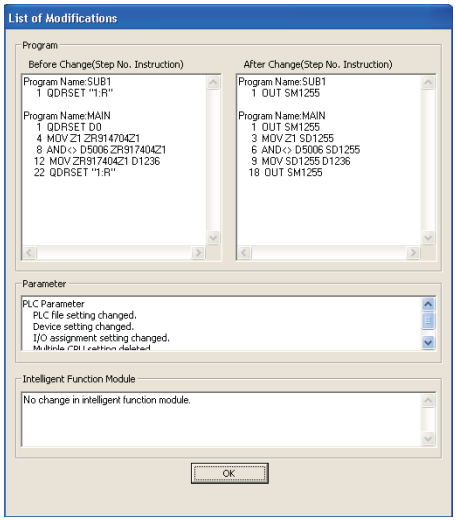
☞ ■ Changing intelligent function modules between programmable controller series

To change the model of an intelligent function module, select a module name in "Module Name After Change" on the following screen displayed at changing the programmable controller type.
To delete all intelligent function modules, select "Delete all after changing intelligent function module".



● **List of modifications (For QCPU (Q mode)/LCPU/CC IE Field head module)**

After the Change PLC Type function is completed, the following List of Modifications screen is displayed, and the changes of the program and parameters can be checked.
The items in the following screen can be copied and pasted to the text file using the Ctrl+C and Ctrl+V keys.



Point

● **Restrictions on the Change PLC Type function execution**
For the restrictions on the Change PLC Type function execution for each programmable controller series, refer to Appendix 10.

● **Interruption of processing**
If the project of change source includes the data which is neither supported nor able to be modified by any editing operations with the project of the programmable controller type after change, the processing is interrupted. If this happens, modify the data first to correspond with the programmable controller type after change, and then execute the Change PLC Type function.

● **Execution failure of the Change PLC Type function**
The Change PLC Type function cannot be executed in the following cases:
- During the execution of the monitoring function such as program monitoring and device/buffer memory batch monitoring.
- Security is set for the open project and the user does not belong to the 'Administrators' group.
- During the execution of the simulation function.

● **Data before changing the programmable controller type**
Restoring the data, after executing the Change PLC Type function, to the data before change is not possible. Execute the function after saving the project data. In addition, note that the project is in the unsaved status after the function execution.

■ Changing intelligent function modules between programmable controller series

Basically intelligent function modules are deleted after changing the programmable controller series, but a part of intelligent modules can be changed to those which are applicable to the programmable controller series after change.
The following table shows modules which can be changed.

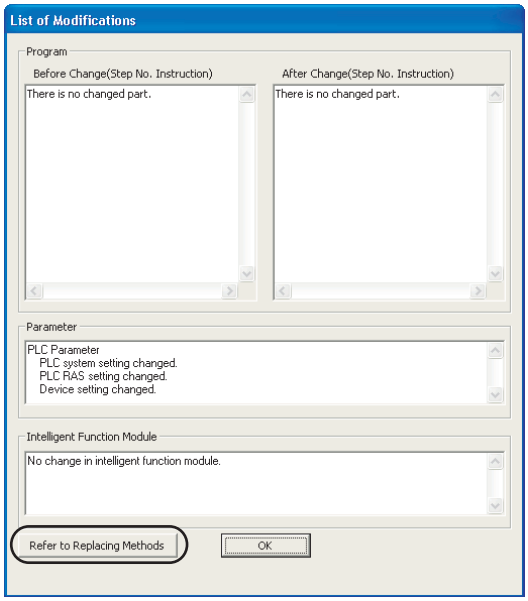
Module type	Module name	
	QCPU (Q mode)	LCPU/CC IE Field head module
Analog	Q64AD Q68ADV Q68ADI Q64ADH	L60AD4
	Q62DAN Q64DAN Q68DAVN Q68DAIN	L60DA4
Temperature control	Q64TCTTN	L60TCTT4
	Q64TCTTBWN	L60TCTT4BW
	Q64TCRTN	L60TCRT4
	Q64TCRTBWN	L60TCRT4BW
Counter	QD62 QD62D	LD62 LD62D
QD75/LD75 positioning	QD75P1 QD75P2 QD75P4 QD75P1N QD75P2N QD75P4N QD75D1 QD75D2 QD75D4 QD75D1N QD75D2N QD75D4N	LD75P1 LD75P2 LD75P4 LD75D1 LD75D2 LD75D4
Serial communication/ Modem interface	QJ71C24N QJ71C24N-R2	LJ71C24 LJ71C24-R2
AnyWireASLINK interface	QJ51AW12AL	LJ51AW12AL

■ Detailed replacement method screen for changing CPU to Universal model QCPU

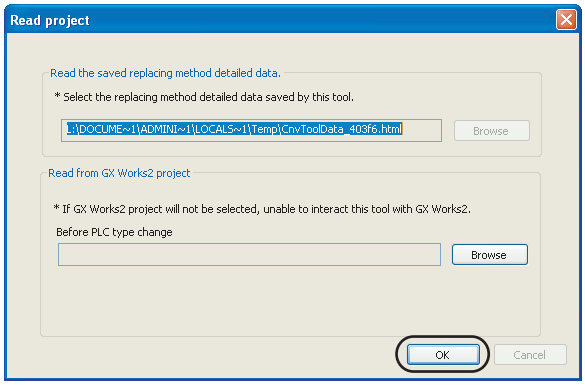
In GX Works2 with the installed QnH -> QnU Conversion Support Tool, the methods for replacing instructions and parameters can be displayed from the List of Modifications screen when the programmable controller type is changed from Basic model QCPU or High Performance model QCPU to Universal model QCPU.

Operating procedure

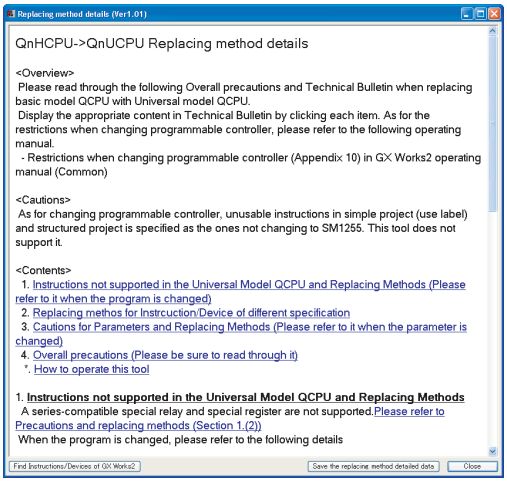
1. **Click the [Refer to Replacing Methods] button.**



2. **Specify the project before changing the programmable controller type, and click the [OK] button.**

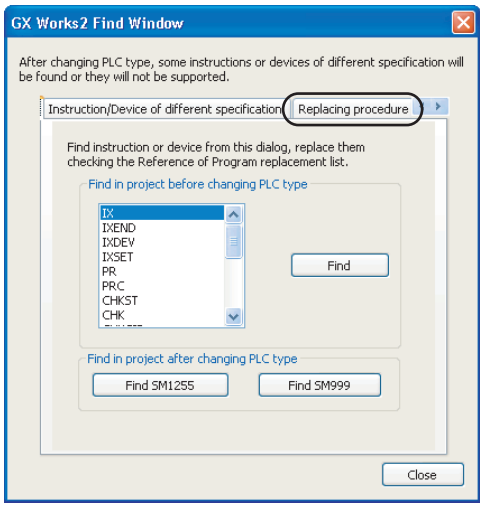


The overview of the replacement method regarding instructions and parameters which are changed by the PLC type change function can be checked on the displayed Detailed replacement method screen.
The Web browser is activated by clicking the link to check details of settings. Adobe® Reader® is required to view the detailed information.



3. **Click the [Find Instructions/Devices of GX Works2] button to search the instruction/device to be replaced.**

4. **Replace the instruction/device by following the instruction on the <<Replacing Procedure>> tab.**



4.3 Operations of Programmable Controller CPU Data

This section explains how to operate each data in a project.

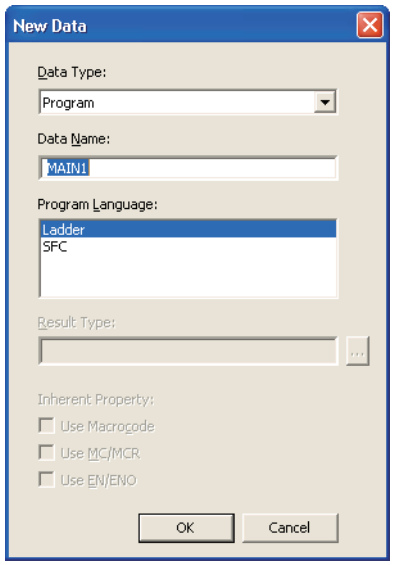
4.3.1 Adding new data to project

Q CPU | L CPU | Remote | Head | FX

Add new data to a project.
The data that can be added differs according to the type of programmable controller or project.

Screen display

Select [Project] ⇒ [Object] ⇒ [New].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Data Type	Select the type of the data to be added.
Data Name	Enter the name of the data to be created.
Program Language	Select the programming language for creating programs. Selection is allowed only when the data type is any of the following: • Program (program block), Function*1 or Function block*2.
Result Type*1	Set the data type of return value of the function.
Inherent Property*1	This item can be set when a function or function block is selected. For details of check box items, refer to the following manual. ☞ GX Works2 Version 1 Operating Manual (Structured Project)

*1 : For Structured projects only
*2 : For Simple projects (with labels) and Structured projects only

2. **Click the OK button.**

The editing screen for the created data is displayed.

Point

● **Number of characters for a data name**

The numbers of characters shown in the following table can be used for data names according to the selectable data type.

However, some operators such as "-" and "*", and some instruction names such as "MOV", cannot be used. For details of the characters which cannot be use for data names, refer to Appendix 9.

Data type name	Number of characters
Program (program file), local device comment, device memory, and device initial value	8 characters
Other data types	32 characters

● **Maximum numbers of data types that can be created**

The table below indicates the maximum numbers of data types that can be created.

Data type name	Maximum number
Connection destination	128
SFC block in Simple project*1	320 (128 for Q00UJ/Q00U/Q01U/Q02U, 25 for FXCPU)
Program in FXCPU Simple project (with labels)	64
Other data (structures, global labels, etc.)	800

*1 : SFC of Simple projects (with labels) is not supported by FXCPU.

● **FXCPU**

For FXCPU, the data of device initial values cannot be created.

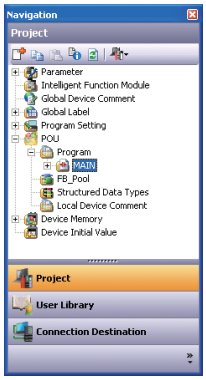
4.3.2 Copying/pasting data in projects

Q CPU | L CPU | Remote | Head | FX

Utilize data of a project being edited or other projects.

Operating procedure

1. **Select a data name to be copied on the Project view.**

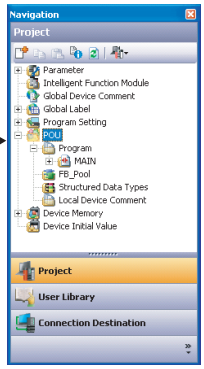


2. **Select [Project] ⇒ [Object] ⇒ [Copy].**
   The selected data name is copied.

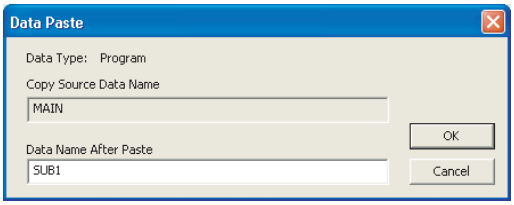
3. **Select a folder to paste the data name on the Project view.**

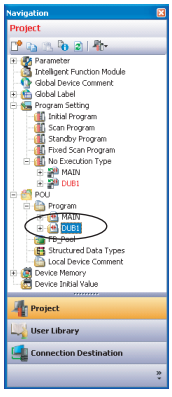
4. **Select [Project] ⇒ [Object] ⇒ [Paste].**
   If the same data name exists in the folder where the data is to be pasted or when the data name cannot be used for the project of the folder where the data is to be pasted because of the different project languages, the Data Paste screen is displayed.

Select a folder →



5. **Enter a new name in the "Data Name After Paste" field, and click the** OK **button.**
   The data name is pasted.





Point

● **Copying/pasting data**

- Data can be pasted only to the data that is of the same type as copied data. Data between different projects can be copied/pasted only when their project types or programmable controller types are the same.
- Multiple data can be copied by holding the Shift or Ctrl key and selecting the data.
- Data can be copied/pasted by right-clicking data to be copied/folder to be pasted and selecting [Copy]/[Paste] from the shortcut menu, or by dragging and dropping the data from the data to be copied to the folder to be pasted.
- The program is in an uncompiled status after data are pasted. Compile the program again.
- For projects with security, only users whose access level is 'Administrators' can copy/paste data.
- Copying and pasting PLC parameter or network parameter only are not possible. If they are copied individually, the whole parameter files are copied and the files in the folder where the data is to be pasted are overwritten.
- Pasting of global label data is canceled when the maximum number of labels described below is exceeded. Adjust the number of global labels in the copy destination and the copy source, and retry pasting data.
  - Global label (within a project): 20480
  - Global label (within a user library): 20480

● **Copying/pasting tasks in Structured project**

When tasks are pasted, the number of programs that can be set on the Task Setting screen may be exceeded. Compile the program and delete the unnecessary programs.

4.3.3 Changing project data names

Q CPU L CPU Remote Head FX

Change the data name of an open project.

Operating procedure

1. **Select the data name to be changed on the Project view.**
2. **Select [Project] ⇒ [Object] ⇒ [Rename].**
3. **Change the data name.**
4. **Press the Enter key.**
   The selected data name is changed.

4.3.4 Deleting project data

Q CPU L CPU Remote Head FX

Delete data in an open project.

Operating procedure

1. **Select the data name to be deleted on the Project view.**
2. **Select [Project] ⇒ [Object] ⇒ [Delete].**
   The selected data is deleted.

Point

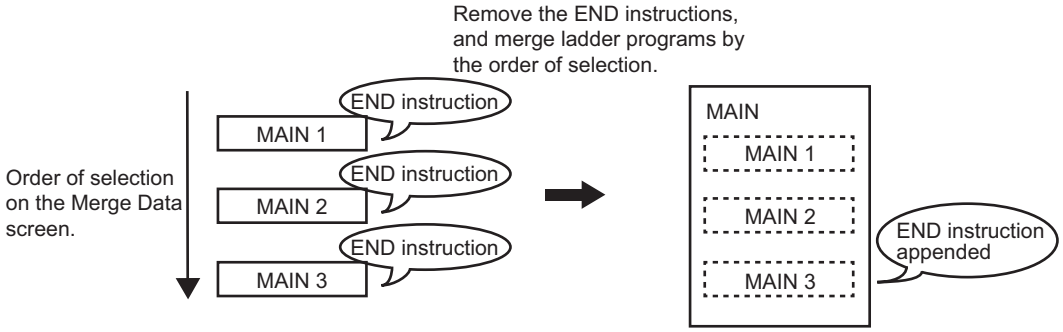
● **Deleting data**
- Multiple data can be selected and deleted.
- When data under the POU are deleted, data under the Program Setting are deleted simultaneously.

4.3.5 Merging data

Q CPU | L CPU | Remote | Head | FX

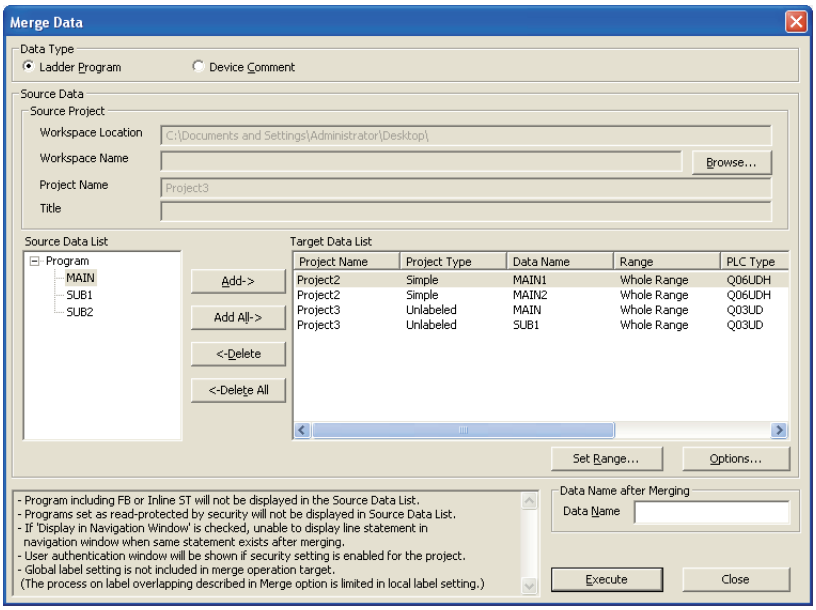
Merge ladder programs or device comment data of multiple projects, and add them to a project.
When the programmable controller series of the projects are the same, data can be merged even if data's programmable controller types or project types are different.

< Image of merging programs >



Screen display

Select [Tool] ⇒ [Merge Data].



Operating procedure

1. **Select the data type to be merged.**

Item		Description
Data Type		Specify the data type to be merged.
	Ladder Program	Select this to merge ladder programs.
	Device Comment	Select this to merge device comments.

2. Set the items on the screen.

Item			Description
Source Data			–
	Source Project		Click the Browse... button, and specify the source project.
		Workspace Location	Display the path to the workspace of the source project.
		Workspace Name	Display the workspace name of the source project. This field will be blank when a project in the single file format is specified for the source project.
		Project Name	Display the project name of the source project.
		Title	Display the project title of the source project.
	Source Data List		Display programs or device comments of the source project. Select data to be merged. Programs which contain function blocks or inline structured text programs are not displayed.
	Target Data List		Display data to be merged. Up to 128 data can be displayed. Data are merged in the displayed order.
Data Name after Merging			–
	Data Name		Specify a data name after merging.

3. Click the Execute button.

Data of "Target Data List" are merged and added to the project.

Screen button

- Add->

  Adds data selected in "Source Data List" to "Target Data List".

- Add All->

  Adds all data displayed in "Source Data List" to "Target Data List".

- <-Delete

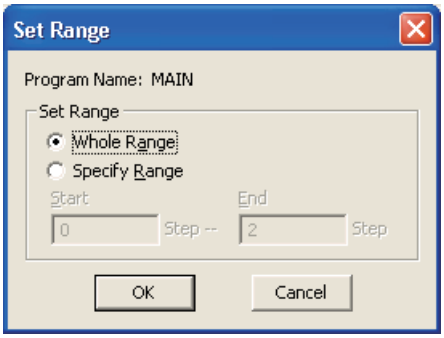
  Deletes data selected in "Target Data List".

- <-Delete All

  Deletes all data displayed in "Target Data List".

- Set Range...

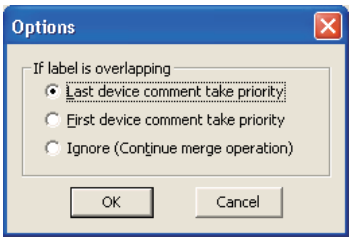
  Displays the Set Range screen.
  Set the range of programs selected in "Target Data List".
  The range cannot be set when the source project or the target project is a project with labels.



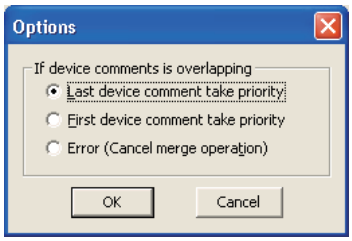
● Options...

Displays the Options screen.
Select the processing for label/device comment duplication when merging programs or device comments of projects with labels.

< Program of project with labels >



< Device comment >



Point

● **Data to be merged**

- Data saved on a personal computer are merged. Save the project data being edited in order to merge them.
- If the merged data exceeds the program capacity, the data are merged within the program capacity.

Example) When merging three programs: MAIN1, MAIN2, and SUB3
In the setting of the following screen, the programs are merged from MAIN1. After merging MAIN1 and MAIN2, if the result of merging SUB3 exceeds the program capacity, only MAIN1 and MAIN2 are merged.

Target Data List

Project Name	Project Type	Data Name	Range	PLC Type	Title
Project2	Simple	MAIN1	Whole Range	Q06UDH	
Project2	Simple	MAIN2	Whole Range	Q06UDH	
Project2	Simple	SUB3	Whole Range	Q06UDH	

● **Merging program data when the target project is a project without labels**
When the target project is a project without labels, data of program with labels are merged as a program of actual devices. Furthermore, uncompiled programs in a project with labels of source project are not displayed in "Source Data List".

● **Merging data during monitoring**
Data cannot be merged during monitoring. Stop monitoring to merge data.

● **Merging programs**
When the programmable controller types of the source project and the target project are different, instructions and devices which cannot be used for the programmable controller type of the target project are merged as the way they are.
Check the merged program for errors with the program check function or the compilation.
For projects with labels, the local label settings are also merged when programs with labels are merged. However, since the global label settings are not merged, set labels after programs are merged, or copy the global label data from the source project.

4.3.6 Displaying/editing properties

Q CPU | L CPU | Remote | Head | FX

Display data properties of folders, parameters, and programs. A title and/or comment can be set to each data.

Screen display

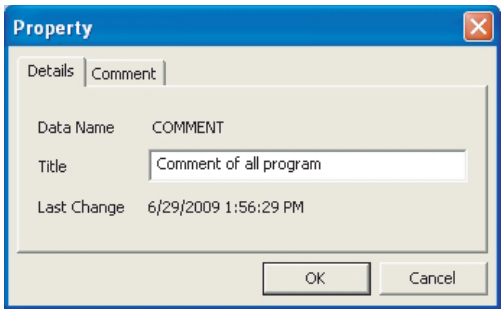
● **For property of project**

Click on the Project view.

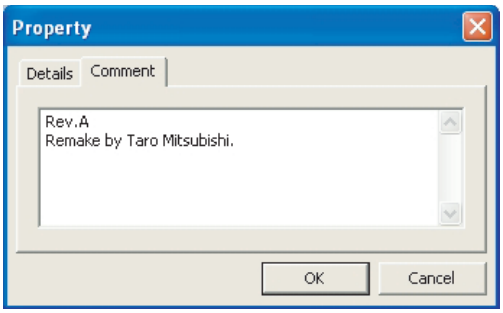
● **For property of each data**

Select [Project] ⇒ [Object] ⇒ [Property] ().

<<Detail>>



<<Comment>>



Operating procedure

- **Set the items on the screen.**

Item	Description
Data Name	Display the data name.
Title*1, *2	Set a title for the data. (The number of applicable characters is 128 for a project and 32 for other data.)
Last Change*1	Display the date when the data was updated.
Comment*1	Set a comment for the data. Press the Ctrl and Enter keys for a line feed. (The number of applicable characters is 5,120.)

*1 : For FXCPU Simple project (with labels), "Title", "Last Change", and <<Comment>> tab are not supported by the property of "MAIN" under Project view ⇒ "Program Setting" ⇒ 'execution program'.

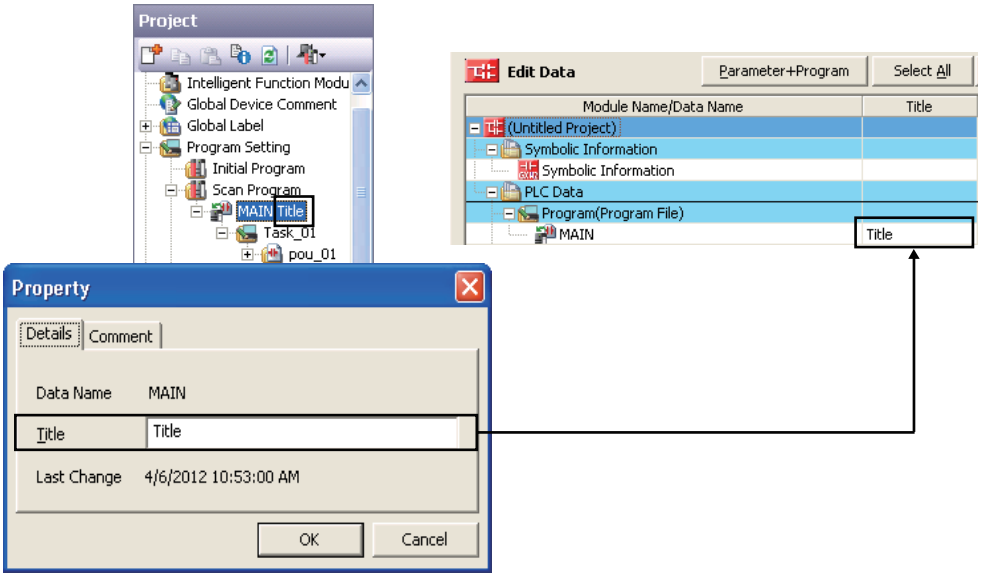
*2 : For titles of programs that are read from/written to a programmable controller CPU along with the program data, refer to Point in this section.

Point

● **Titles**

Set titles are displayed on each view with a corresponding data name.
For SFC project without labels, a device comment of BL device corresponds to the SFC block becomes a title. When the device comment of the reference target is read-protected by the security setting, the title is not displayed on the view.

Titles of programs that are read from/written to a programmable controller CPU along with the program data are titles of data created for each execution type in the program setting. Those titles are displayed on the Online Data Operation screen when reading/writing data from/to a programmable controller CPU.



● **Properties of Structured projects**

Properties of the following data can be set for Structured projects in addition to those indicated above.

Data	Setting
Task	Priority and executing condition of a task
Function/Function block	Whether to use EN/ENO, or MC/MCR for EN control
Library	Path to a help file

For details, refer to the explanations of each function.
(☞ GX Works2 Version 1 Operating Manual (Structured Project))

● **Destinations for saving properties**

The 'titles' and 'comments' set to the data properties can be saved as symbolic information.
(☞ Section 12.1.5)
When reading data from the programmable controller CPU, the symbolic information must be written to/read from the programmable controller CPU in order to restore the settings of the properties.
When data are read without the symbolic information from the programmable controller CPU, the settings of the properties are not restored.

4.4 Operations of Intelligent Function Module Data

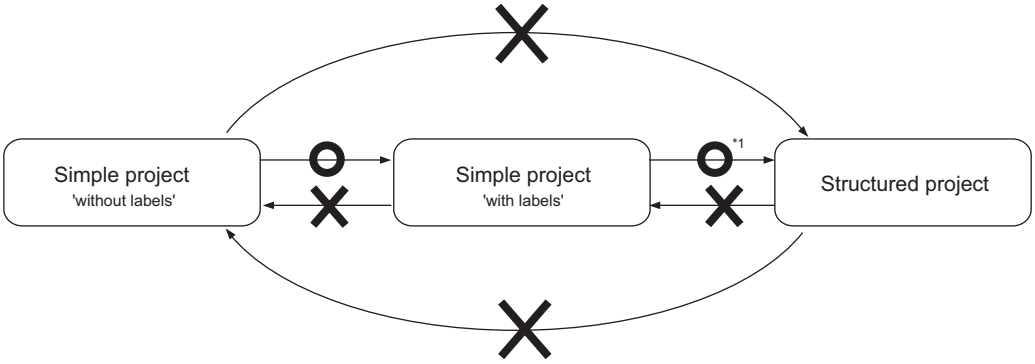
Q CPU L CPU Remote Head FX

For the method for setting the intelligent function module data, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Intelligent Function Module)

4.5 Changing Project Types

Q CPU L CPU Remote Head FX

This section explains how to change the type of an open project.
Using the method explained below, the type of a Simple project is changed from 'without labels' to 'with labels'. In addition, a Simple project 'with labels' can be changed to a Structured project.
Changing from a Simple project 'with labels' to a Simple project 'without labels' or changing a Structured project to a Simple project is not supported.



*1 : Not supported by FXCPU.

Operating procedure

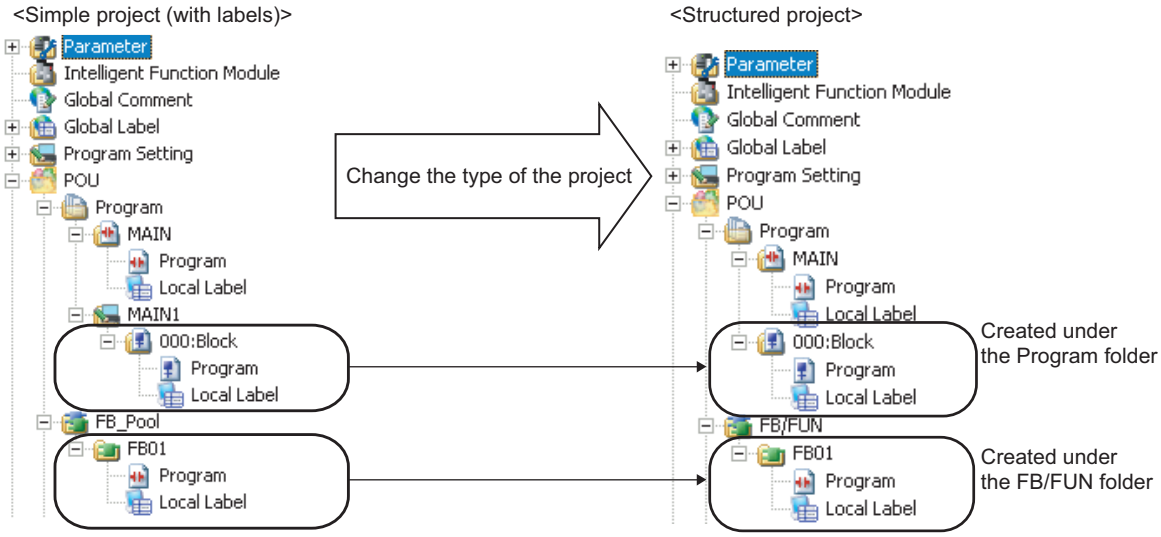
- **Select [Project] ⇒ [Change Project Type].**

Point

● Changing project types

When a Simple project (with labels) is changed to a Structured project, project data are stored in the following folder.

- SFC: Created under the Program folder.
- Function block: Created under the FB/FUN folder.



● Operation after changing project type

When the project type is changed, programs are in the uncompiled status.
Compile all programs again after changing the project type. (☞ Section 5.4)

4.6 Managing Project Revisions

Q CPU L CPU Remote Head FX

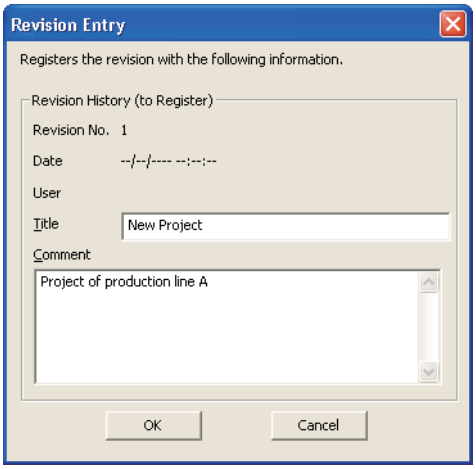
This section explains how to register a backup of the project with added revision information, and restoring the registered backup data (content of the past project).

4.6.1 Registering revision information (creating backup)

Create a backup of the project at the point of registration, and register it with the revision information.

Screen display

Select [Project] ⇒ [Project Revision] ⇒ [Revision Entry].



Operating procedure

- **Set the items on the screen.**

Item	Description
Revision No.	Display the revision number to be registered.
Date	Display "--/--/---- --:--:--" (month/date/year hour:minute:second).
User	Display the user name when using the project with security.
Title	Enter a title of the revision.
Comment	Enter comments for the revision.

Point

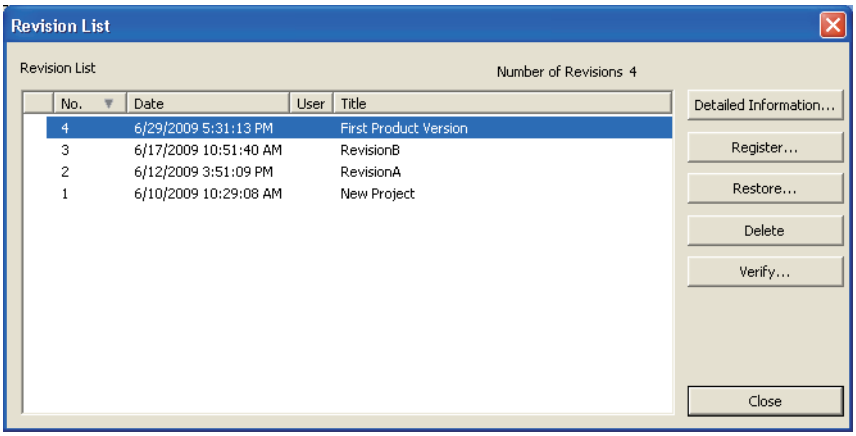
- **Revision number and the allowable number of revisions that can be registered**
  A revision number for the registered revision is automatically assigned from 1 to 9999.
  The maximum number of revisions that can be registered is 100. If the number of the registered revisions is to be exceeded 100, delete unnecessary revisions. The deleted revision numbers are unused.
  If the revision number is to be exceeded 9999, delete all the revision data, or save the project with a different name without succeeding the revision information. (☞ Section 4.2.3)
- **The allowable number of characters that can be entered for a title**
  The maximum number of characters that can be entered for a title is 32.
- **The allowable number of characters that can be entered for a comment**
  The maximum number of characters that can be entered for a comment is 256.
  A line feed is handled as 2 characters.
- **Registration of project revisions when overwriting and saving projects**
  By setting the option, the Revision Entry screen for the project revision is displayed when overwriting and saving the project.
  Select [Tool] ⇒ [Options] ⇒ "Project", and then select "Revision is Registered when Save Project" in "Change History".
  In addition, the revision title can be automatically set when overwriting by selecting "Automatically set revision titles".
- **Registration of project revisions for projects with security**
  For the projects with security, the revisions can be registered only when the user's access level is 'Administrators'.

4.6.2 Displaying revision list

Display registered revision information in the order of the revision number.
The revision list is used for registering, restoring, deleting, and verifying backups.

Screen display

Select [Project] ⇒ [Project Revision] ⇒ [Revision List].



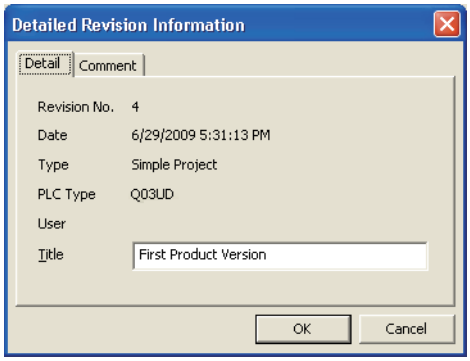
Display contents

Item	Description
No.	Display the revision numbers.
Date	Display the dates of revision registration.
User	For the projects with security, display the user names who have registered the revisions.
Title	Display the titles of the revisions.

Screen button

● Detailed Information...

Displays the detailed information of the revision which is selected in the list. "Title" and "Comment" can be edited.



● Register...

Registers the project being edited as a revision. (☞ Section 4.6.1)

● Restore...

Restores the backup data. (☞ Section 4.6.3)

● Delete

Deletes the revision information. (☞ Section 4.6.4)

● Verify...

Verifies the revision with other revisions or the projects being edited. (☞ Section 4.6.5)

Point

● **Revision List screen**

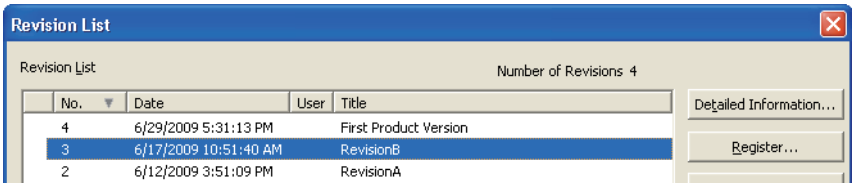
Each column can be sorted in ascending/descending order by clicking on the column header.

4.6.3 Restoring backup projects

Restore the backup revision information.
After restoring the backup, the project is in the status at the time of registering the revision information.

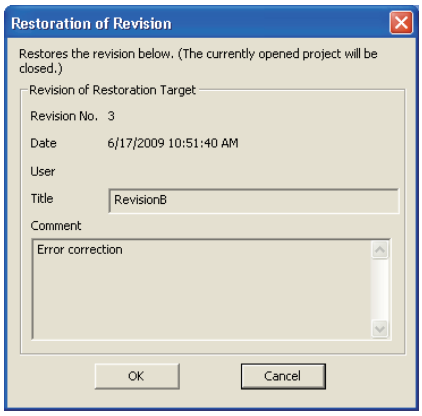
Operating procedure

1. **Select the revision to be restored on the Revision List screen (☞ Section 4.6.2).**



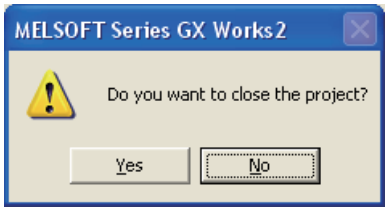
2. **Click the [Restore...] button.**

The revision information to be restored is displayed.



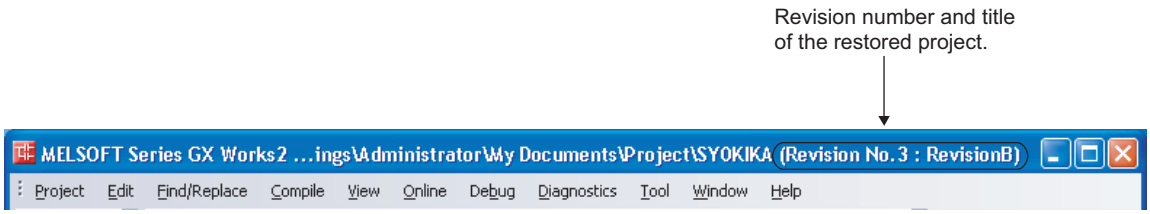
3. **Confirm the revision information to be restored. Click the [OK] button.**

The message as shown on the right is displayed.



4. **Click the [Yes] button.**

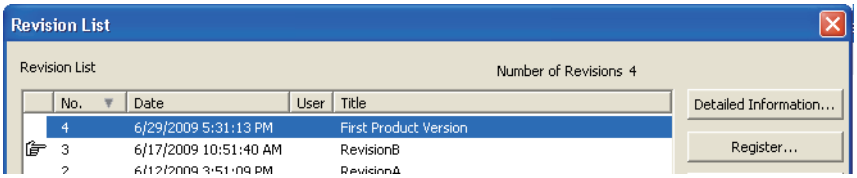
The backup of the selected revision information is restored.
The revision number and title of the restored project are displayed on the title bar.



Point

● **The Revision List screen after restoring a project**

After project restoration, ☞ is displayed on the row of the restored project on the Revision List screen.



● **Access level to be able to use the restoring function when using the projects with security**

For the projects with security, the revisions can be restored only when the user's access level is 'Administrators'.

● **Revisions for the project with security**

If the project being edited is the project with security, the registered security in the revision is deactivated when the security is deactivated. When the revision is restored in such situation, since the project is restored without security, all users can read the project including the revision data.
To protect the revision data after deactivating the security, delete the revision data in advance.

● **Considerations for restoring projects**

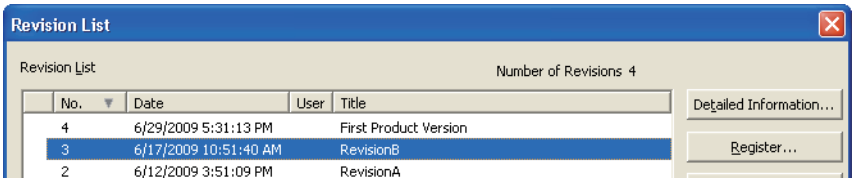
Register the revision of the project being edited before restoring a project.
When the other revision is restored and overwritten without registering the revision of the project being edited, the project before restoration is overwritten.

4.6.4 Deleting revision information

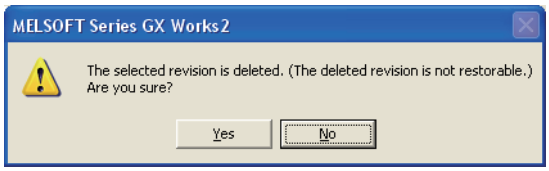
Delete the registered revision information.

Operating procedure

1. **Select the revision information to be deleted on the Revision List screen (☞ Section 4.6.2).**



2. **Click the Delete button.**
   The message on the right is displayed.



3. **Click the Yes button.**
   The selected revision information is deleted.

Point

- **Revision number**
  The deleted revision numbers are unused.
- **Revisions being restored**
  The revision of the project which has been restored from the revision cannot be deleted. To delete the revision, overwrite and save the project after restoring it.

4.6.5 Verifying revisions

Verify the revision information with other revision information or the project being edited.
The following data can be selected as verification targets for the revision verification.

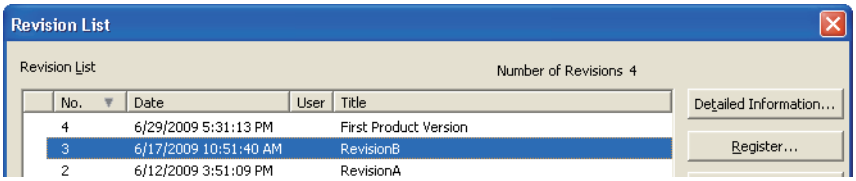
- Programs
- Parameters
- Intelligent function module parameters (initial setting/auto refresh)*1
- Device comments
- Device memory data
- QD75/LD75 positioning module*1

*1 : Not supported by FXCPU.

Operating procedure

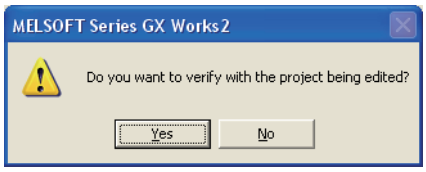
1. **Select the revision to be verified on the Revision List screen (☞ Section 4.6.2).**

   When the verification function is performed selecting only one revision, the selected revision information is verified with the project being edited.
   To verify two revisions, select two revisions with pressing the Shift key or Ctrl key.



2. **Click the Verify... button.**

   The message as shown on the right is displayed.
   This message is displayed when verifying the selected revision information with the project being edited.

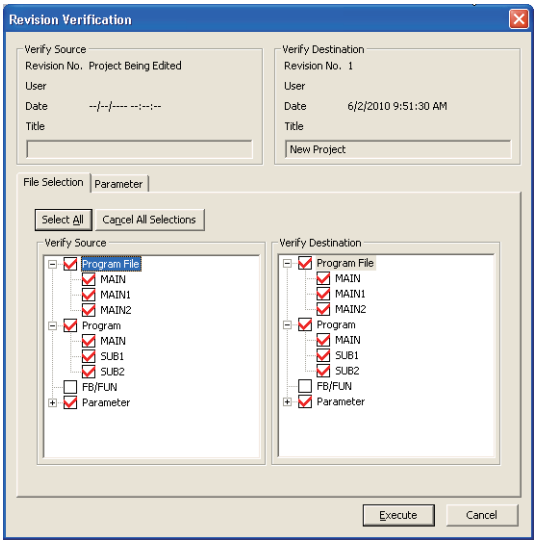


3. **Click the Yes button.**

   The Revision Verification screen is displayed.

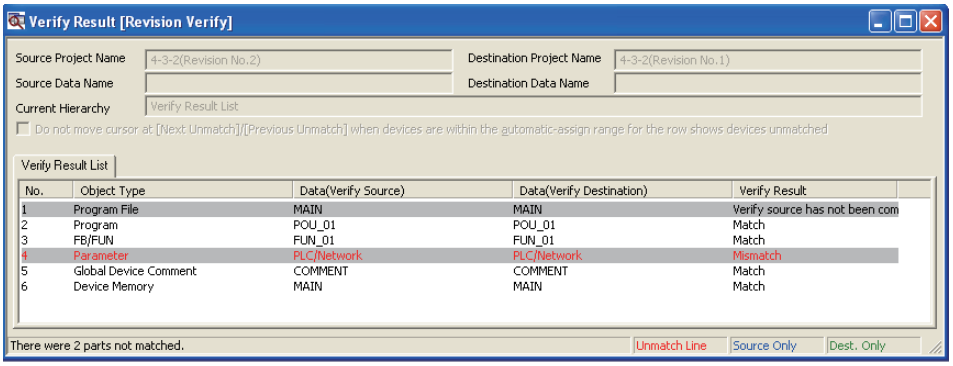
4. **Select the data to be verified.**

   For details of setting items, refer to the project verification. (☞ Section 4.2.7)



5. **Click the Execute button.**

   The verification result is displayed on the Verify Result screen.
   For details of the Verify Result screen, refer to the project verification.
   (☞ Section 4.2.7)
   The following is a screen of project with labels.

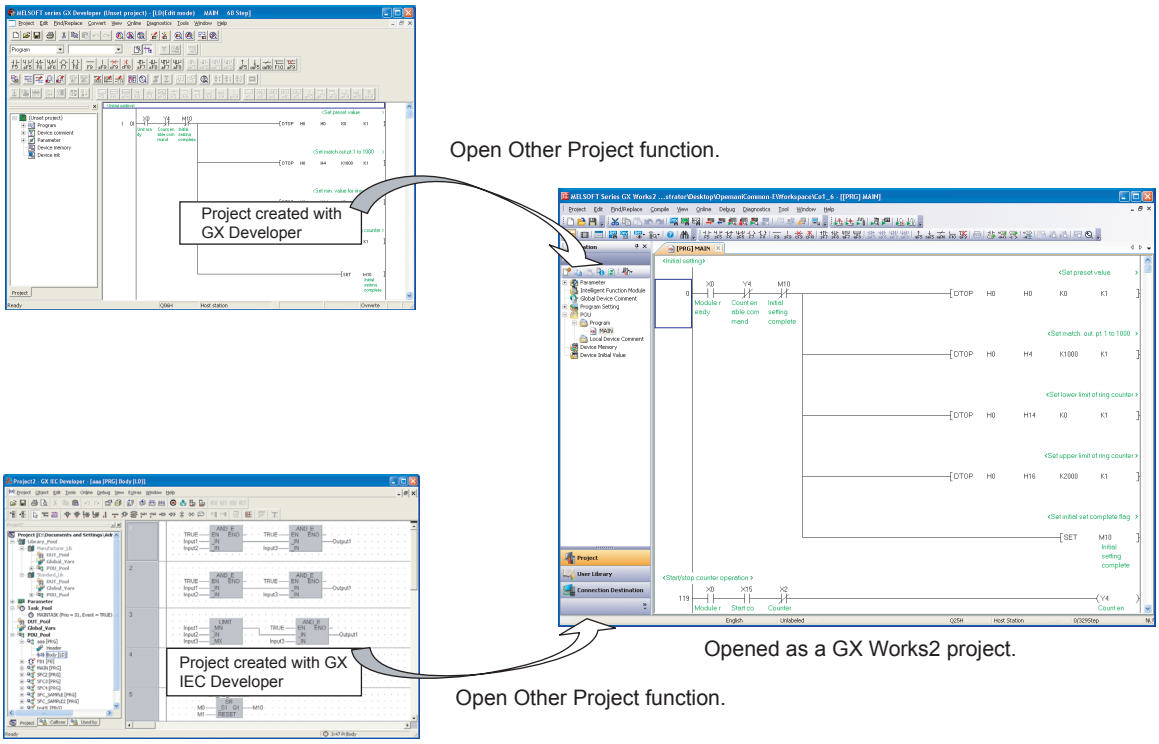


4.7 Utilizing Projects and Data in Other Formats

This section explains how to utilize projects created with GX Developer or GX IEC Developer, and files (ASCII files) created using the Export function of GX IEC Developer in GX Works2. Projects edited with GX Works2 can also be utilized in GX Developer.

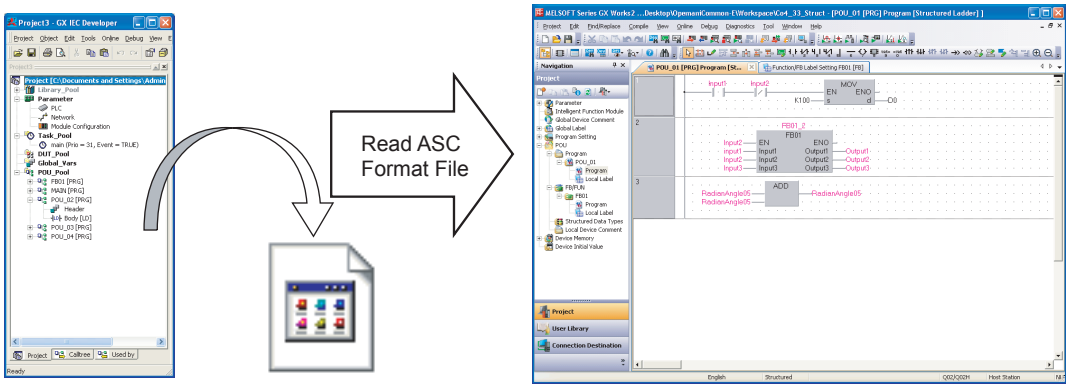
■ Utilizing projects and data created with GX Developer or GX IEC Developer in GX Works2

Projects created with GX Developer or GX IEC Developer can be utilized in GX Works2 by using the 'Open Other Project' function. (☞ Section 4.7.1)



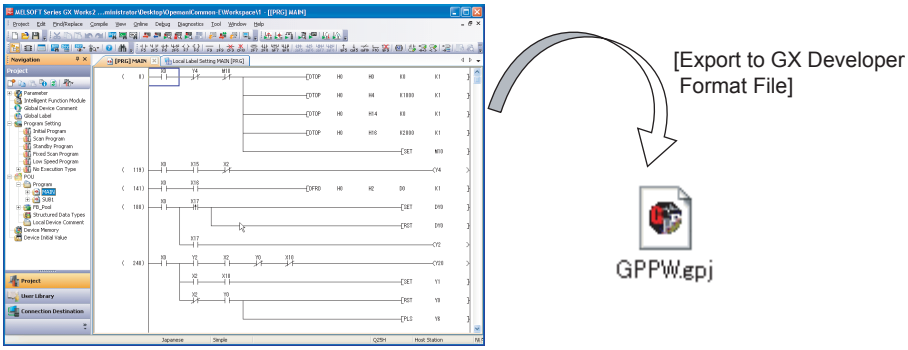
■ Utilizing files created using the Export function of GX IEC Developer

ASCII files created using the Export function of GX IEC Developer can be added as projects in GX Works2 by using the 'Read ASC Format File' function. (☞ Section 4.7.2)



■ Utilizing projects and data created with GX Works2 in GX Developer

Files created/edited in Simple project with GX Works2 can be utilized in GX Developer by using the 'Export to GX Developer Format File' function. (☞ Section 4.8)



■ Storage of utilized data in GX Works2

Each project and data created with GX Developer or GX IEC Developer are stored in the areas shown in the table below with GX Works2.
GX Developer projects are opened as Simple projects and GX IEC Developer projects, as Structured projects.

● Comparison of projects and data storage locations between GX Developer and GX Works2

GX Developer	GX Works2 (Simple project)	GX Works2 (Structured project)
Parameter	Parameter	Parameter
Device Comment	Global Device Comment	Global Device Comment
Global variables	Global Label	Global Label
Program	Program	POU
FB	FB_Pool	FB/FUN
Structure	Structured Data Types	Structured Data Types
Device memory	Device Memory	Device Memory
Device initial value	Device Initial Value	Device Initial Value

● Comparison of projects and data storage locations between GX IEC Developer and GX Works2

GX IEC Developer	GX Works2 (Structured project)
User Library	User Library
Parameter (Programmable controller parameter)	Parameter
DUT_Pool (Structure)	Structured Data Types
Global_Vars (Global variable)	Global Label
Task_Pool	POU
POU_Pool	POU

■ Security level of GX IEC Developer

The security level in the GX IEC Developer project is cleared after reading the project.
When the GX IEC Developer project is read using GX Works2, the following Enter Password screen is displayed.

■ Compatible applications

For 'Open Other Project' and 'Export to GX Developer Format File', the supported versions differ according to the CPU type.
For the application compatibility, refer to Appendix 5.

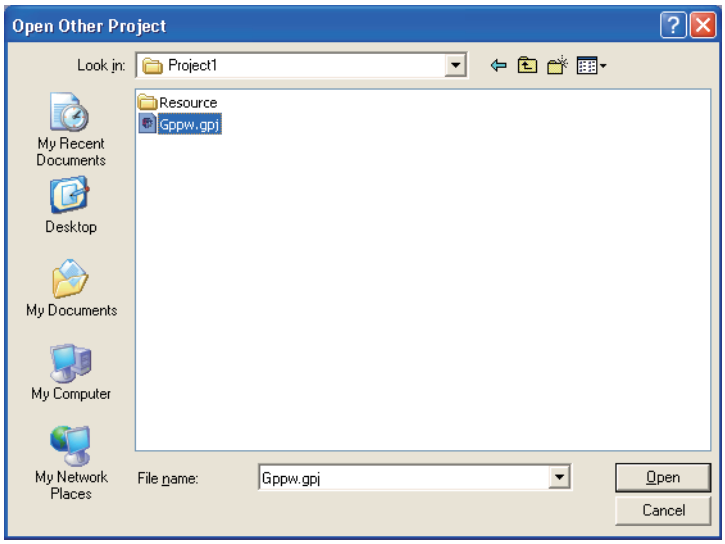
4.7.1 Opening projects in other formats

Q CPU L CPU Remote Head FX

Open a project created with GX Developer or GX IEC Developer in GX Works2.

Screen display

Select [Project] ⇒ [Open Other Data] ⇒ [Open Other Project].



Operating procedure

- **Specify the project, and click the Open button.**

  Select '*.gpj' for a GX Developer project and '*.pro' for a GX IEC Developer project.
  The selected project is opened.

■ Considerations for opening projects in other formats

● Status after opening a different format project with labels

When a different format project with labels is opened, the project is in the uncompiled status. Compile all programs in the project before executing online operations such as writing data and monitoring. When a compilation error occurs, correct the corresponding program according to the programming manual.

● When a programmable controller type of project which is created in GX Developer is not supported by GX Works2

Open the project by starting GX Developer.

● Opening different format projects that contain SFC programs

- Block information data such as: block information devices, block titles and block statements, are set in the block data property.
- When a GX Developer format project in which a ladder block contains an uncompiled SFC program is opened in GX Works2 Version 1.87R or later using the [Open Other Project] function, a 'Block' with a corresponding block name sequence number may be missed.

● **Opening different format projects that contain ST programs**

Since the argument type or the number of arguments in some ST instruction is different between GX Developer and GX Works2, an error may occur at compilation. When a compilation error occurs, correct the instruction according to the structured programming manuals.
Note that, however, programs can be compiled in GX Works2 by setting the following option.

- Select "Use Dedicated Instruction for GX Developer, GX IEC Developer" under [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Common Setting".

● **Setting common pointer number**

When the common pointer number is not set in the PLC parameter setting of GX Developer, a compilation error may occur at the compilation after opening the project in other format. In such case, change "Common Pointer No." on the <<PLC System>> tab of PLC parameter or change the pointer device range in the "Device/Label Automatic-Assign Setting" function.

● **Utilizing detailed settings for Write to PLC function**

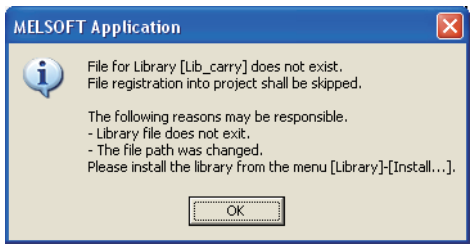
Values set in GX Developer are utilized to the secured steps for Online program change (☞ Section 12.1.1) and the writing range of device comment (☞ Section 12.1.3) which are set when writing data to programmable controller CPU.
Note that "PLC comment write format (CPU Format)" which is set along with the writing range of device comment in GX Developer is not utilized.
For a project in which the comment capacity is restricted by setting "PLC comment write format (CPU Format)" in GX Developer, the comment capacity may be exceeded when data are written to a programmable controller CPU using GX Works2.
In such a case, set "Comment Format (PLC Format)" (☞ Section 12.1.3) or reduce the writing range of device comment.

● **Utilizing option settings**

GX Developer option setting "Copy source/display source of reference during comment edit" is utilized to GX Works2 option setting "Program Editor" ⇒ "All Editors" ⇒ "Device Comment" ⇒ "Reference of Device Comment".

● **Opening a GX IEC Developer project**

When a GX IEC Developer project that contains a user library is opened, the following message may be displayed and the user library may not be read. If the following message is displayed, select [Project] ⇒ [Library] ⇒ [Install] in GX Works2 to obtain the user library.



When a GX IEC Developer project is read by selecting [Project] ⇒ [Open Other Data] ⇒ [Open Other Project], intelligent function module parameters are not reflected.

● **When a GX Developer data name contains a character that cannot be used in GX Works2**

A GX Developer project with a GX Works2 invalid character can be opened.
Note that, however, the invalid character in the data is replaced by an underscore (_).*1 Change the data name after opening the project.

*1 : For FXCPU, data which contains invalid characters in its data name is not read.

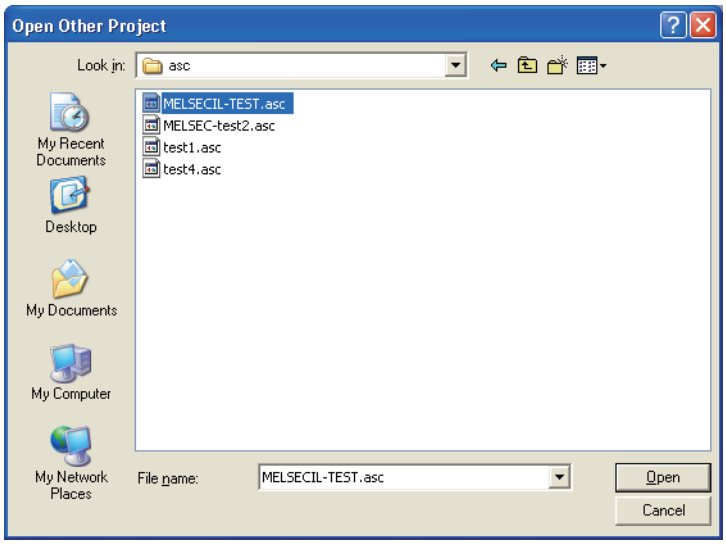
4.7.2 Reading ASC format data

Q CPU | L CPU | Remote | Head | FX

Add ASC format data created in GX IEC Developer to a GX Works2 project being edited.
Data can be added only when a new project is created or a project is opened in Structured project.

Screen display

Select [Project] ⇒ [Open Other Data] ⇒ [Read ASC Format File].



Operating procedure

- **Specify the file, and click the Open button.**
  Select '*.asc' for the file.
  The specified data is added to the project.

Point

- **Importing project data of different programmable controller type**
  Project data having a different programmable controller type can be imported to a project being edited.
  The programmable controller type of the project being edited is not changed even when data with the different programmable controller type are imported.
  In this case, since instructions and devices not supported by the open project are also imported, compile the programs to check and correct errors after importing data.
- **Importing data whose name already exists in the project**
  A number is appended in serial order (starting from one) to the end of the data name to be imported, and then the data is added to the project.
- **Importing global labels**
  When the global labels are imported, the "Device" column of the global label may be blank. If the "Device" column is blank, check the items on the <<Device>> tab of PLC parameter.
- **Importing FBD programs of GX IEC Developer**
  Imported FBD programs are converted to Structured Ladder programs.

4.8 Saving projects in other formats

Q CPU *1 | L CPU *2 | Remote | Head | FX

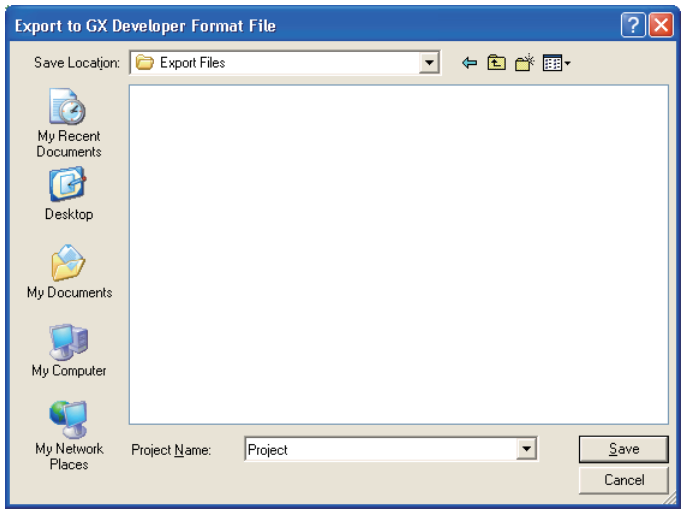
*1 : Not supported by High-speed Universal model QCPU

*2 : Not supported by L02S, L06 and L26.

This section explains how to save a Simple project of GX Works2 in the GX Developer format.

Screen display

Select [Project] ⇒ [Export to GX Developer Format File].



Operating procedure

1. **Select the save destination of the GX Developer format project.**

2. **Enter the project name, and click the** Save **button.**

Point

● **Considerations for saving projects**

For the restrictions other than the ones described below, refer to Appendix 8.

- Programs are saved in the uncompiled status.
- Data cannot be saved when the security access level is set to other than 'Administrators'. Change the access level before saving the data. (☞ Section 4.10.4)
- The data with a block password cannot be saved. Unlock the block password before saving the data. (☞ Section 4.12.3)
- Projects in which labels are used for FXCPU cannot be saved in the GX Developer format.
- When a GX Developer format project is saved to the folder in which a GX Developer format project with the same name exists, the previously saved project is overwritten.
  If the saving of the project failed, all data except for the data created by user will be deleted.

● **Considerations for handling projects in GX Developer**

- Since the program is saved uncompiled, the program needs to be compiled when it is opened in GX Developer. For projects with labels, the compilation results and device assignment may be different from those of GX Works2.
- For a maintenance work on the same programmable controller CPU using both GX Developer and GX Works2, programming with actual devices is recommended.

4.9 Starting GX Developer from GX Works2

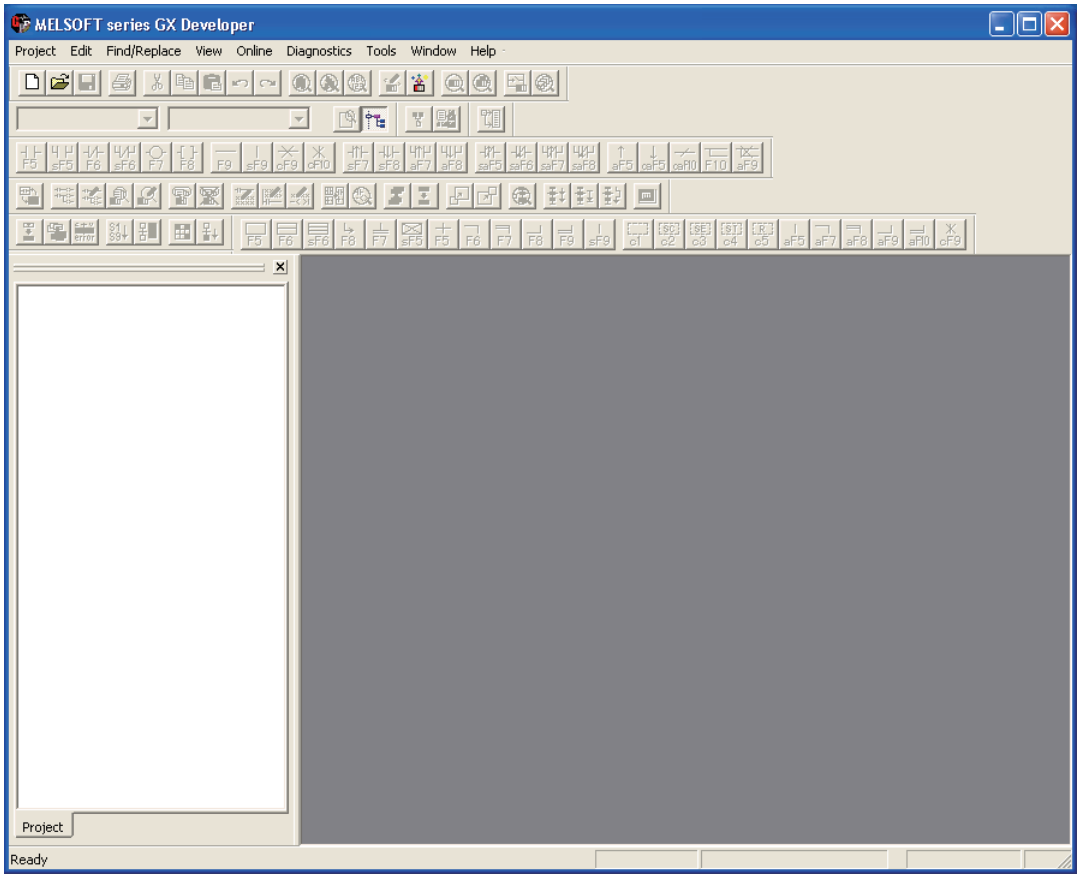
Q CPU L CPU Remote Head FX

Start a new GX Developer project from GX Works2.

GX Developer needs to be installed in advance to perform this function.
For details of GX Developer installation, refer to Appendix 14.
For details of GX Developer operation, refer to the following manual.
☞ GX Developer Version 8 Operating Manual

Operating procedure

- **Select [Project] ⇒ [Start GX Developer].**



4.10 Setting Security for Projects

Q CPU L CPU Remote Head FX

This section explains how to set security for projects to protect the projects themselves and the data in projects.

Setting security not only restricts an access to projects but also prevents the data, such as POUs, device comments, and parameters, that are created by the user from erroneous modification and/or disclosure to unauthorized users.

This function cannot restrict writing/reading of data to/from a programmable controller CPU. Use the online password function to protect the data on a programmable controller CPU. (☞ Chapter 13)

■ Access levels and access authority

An access to data can be restricted by setting an access level to the individual user.
An access level is an operating authority given to a login user of the project.
There are five access levels as shown below. The data that can be edited by a user having lower access level can also be edited by a user who has higher access level.

Access level		Operating authority
Higher ↑	Administrators	<Administrator level> All operations are possible.
	Developers (Level 3)	<Developer level> Security setting, data access, and a part of operations are restricted.
	Developers (Level 2)	
	Developers (Level 1)	
↓ Lower	Users	<Operator level> Only access to project data is possible. Data cannot be read from the programmable controller CPU.

Example) The data with access authority of Developers (Level 2) can be edited by a login user whose access level is Developers (Level 2) or higher (Administrators, Developers (Level 3) or Developers (Level 2)).

■ Access authority applicable data

The following tables show the data to which access authority can be applied.

● Simple project

○: Applicable ×: Not applicable

Items on Project view				Read	Write
Parameter				○	○
Intelligent Function Module*1				×	×
	Intelligent function module data			○	○
Global Device Comment				○	○
Global Label				×	×
	Global label data			×	○
Program Setting				×	×
	Program file data			×	×
POU				×	×
	Ladder program data			×	×
		Program		○	○
		Local Label		×	○
	ST program data*1			×	×
		Program		○	○
		Local Label		×	○
	SFC program data			×	×
		SFC block		×	×
			Program	○	○
			Local label*1	×	○
	FB_Pool			×	×
		Program		○	○
		Local label		×	○
	Structured Data Types			×	×
		Structure data		×	○
	Local Device Comment			×	×
		Comment data		○	○
Device Memory				×	×
	Device memory data			○	○
Device Initial Value*1				×	×
	Device initial value data			×	×

*1 : Not supported by FXCPU.

● **Structured project**

○: Applicable ×: Not applicable

Items on Project view				Read	Write
Parameter				○	○
Intelligent Function Module*1				×	×
	Intelligent function module data			○	○
Global Device Comment				○	○
Global Label				×	×
	Global label data			×	○
Program Setting				×	×
	Program file data			○	○
POU				×	×
	Program			×	×
		Ladder program data*1		×	×
			Program	○	○
			Local Label	×	○
		ST program data		×	×
			Program	○	○
			Local Label	×	○
		SFC program data*1		×	×
			Program	○	○
			Local Label	×	○
		Structured Ladder/FBD program data		×	×
			Program	○	○
			Local Label	×	○
	FB/FUN			×	×
		Program		○	○
		Local label		×	○
	Structured Data Types			×	×
		Structure data		×	○
	Local Device Comment			×	×
		Comment data		○	○
Device Memory				×	×
	Device memory data			○	○
Device Initial Value*1				×	×
	Device initial value data			×	×

*1 : Not supported by FXCPU.

4.10.1 Setting/resetting security of projects

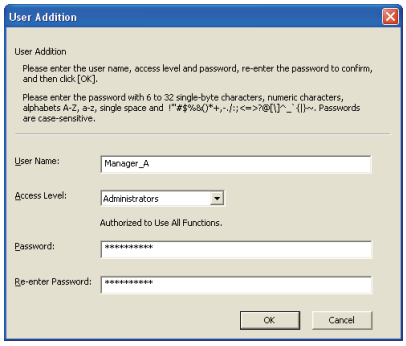
Set security for an open project and reset the security.

■ Setting security for projects

Set security for a project.
Once security is set for a project, user authentication is required when the project is opened once again. (☞ Section 4.10.3)

Screen display

Select [Project] ⇒ [Security] ⇒ [User Management].



Operating procedure

1. **Set the items on the screen.**

Item	Description
User Name	Enter a user name in 1 to 20 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 3) of 20H to 26H and 28H to 7EH. (Alphabets are case-sensitive.)
Access Level	Display 'Administrators'. (Fixed)
Password	Enter a password in 6 to 32 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 3) of 20H to 7EH. (Alphabets are case-sensitive.)
Re-enter Password	Set the same password again for confirmation.

2. **Click the OK button.**
   Security is set for the project.

Point

- **Setting security**
  When security is set for a project, the project is in the status logged in by the set user (Administrators). The current login user can be checked in the status bar. (☞ Section 3.2.6)
- **Loss of login password**
  If a user forgets the login password, logging in to the project is disabled. Remember the password securely. If the user whose access level is Developers (Level 3) or lower forgets the password, log in the project using the access level 'Administrators' and set the password again.

■ Resetting security of projects

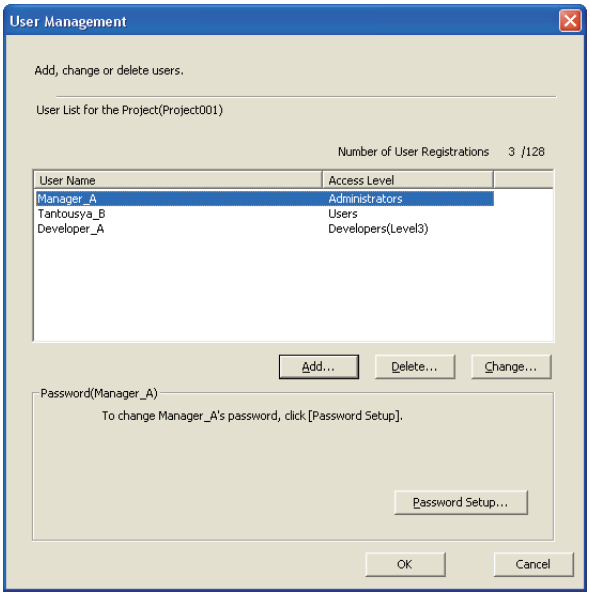
Reset the set security of a project by deleting all users, and returns the project to the status without security. (☞ Section 4.10.2)

4.10.2 Managing (adding/deleting/changing) users

Manage the registered status of users for a project with security. This function also adds/deletes/changes users.
This function is available only when a project is logged in by the user whose access level is 'Administrators' or 'Developers'.

Screen display

Select [Project] ⇒ [Security] ⇒ [User Management].



Display contents

Item	Description
Number of User Registrations	Display the number of registered users and the maximum number of registrations.
User Name	Display the registered user names.
Access Level	Display the access level of each registered user.

Screen button

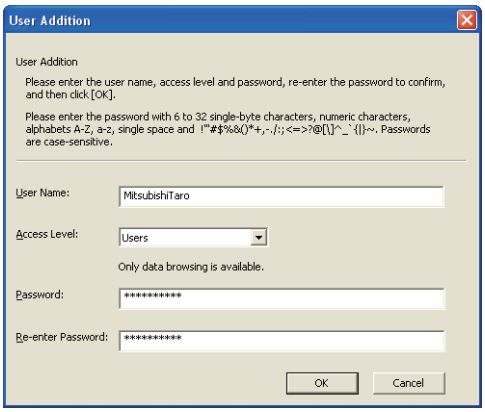
- Add...
  Adds a user. (☞ '■ Adding users')
- Delete...
  Deletes a user selected in the list.
  The current login user cannot be deleted. If registered users are only 'Administrators' and there are no other users to be deleted, deletion of the current login user is possible.
  If 'Administrators' level users are deleted, security is reset.
- Change...
  Changes the information of the user selected in the list. (☞ '■ Changing user information')
- Password Setup...
  Changes the password of the user selected in the list. (☞ '■ Changing passwords')
  The password of the current login user cannot be changed using this function. To change it, select [Project] ⇒ [Security] ⇒ [Change Password].

■ Adding users

Add a user to a project with security.
A user whose access level is higher than that of the login user cannot be added.

Operating procedure

1. **Click the Add... button on the User Management screen.**
   The User Addition screen is displayed.



2. **Set the items on the screen.**

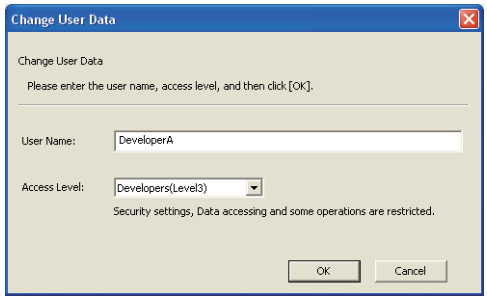
Item	Description
User Name	Enter a user name in 1 to 20 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 3) of 20H to 26H and 28H to 7EH. (Alphabets are case-sensitive.)
Access Level	Select the access level.
Password	Enter a password in 6 to 32 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (Appendix 3) of 20H to 7EH. (Alphabets are case-sensitive.)
Re-enter Password	Set the same password again for confirmation.

3. **Click the OK button.**
   The user is added.
   The added user is displayed in the User Management screen.

■ Changing user information

Change the user information (user name and access level) of registered users.
The information of the login user and the user whose access level is higher than that of login user cannot be changed.

Operating procedure



1. **Click the [Change...] button on the User Management screen.**
   The Change User Data screen is displayed.

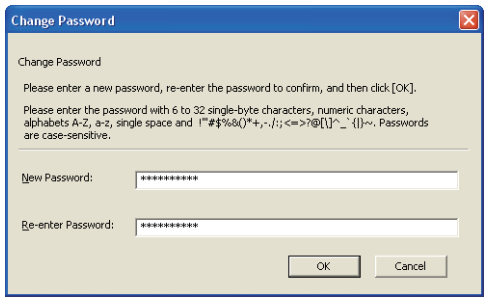
2. **Set the items on the screen.**
   Setting items ☞ Section 4.10.1

3. **Click the [OK] button.**
   The user information is changed.

■ Changing passwords

Change the password of the user selected in the list on the User Management screen.
The password of the login user and the user whose access level is higher than that of the login user cannot be changed. To change the password of the login user, use the Change password function by selecting [Project] ⇒ [Security] ⇒ [Change Password].

Operating procedure



1. **Click the [Password Setup...] button on the User Management screen.**
   The Change Password screen is displayed.

2. **Set "New Password" and "Re-enter Password".**

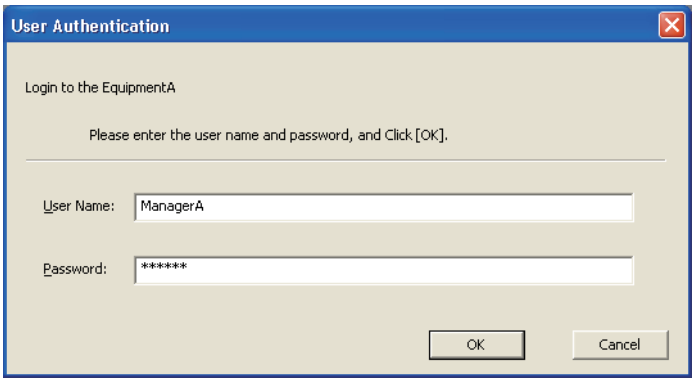
3. **Click the [OK] button.**
   The password is changed.

4.10.3 Logging in projects

A user authentication procedure is required when opening a project with security.

Screen display

Screen display when a project with security is opened.



Operating procedure

1. **Set the items on the screen.**

Item	Description
User Name	Enter the user name registered to the project to be logged in.
Password	Enter the password.

2. **Click the OK button.**

   Login authentication is performed with the entered user name and password. The project is opened when the entry is confirmed to be correct.

Point

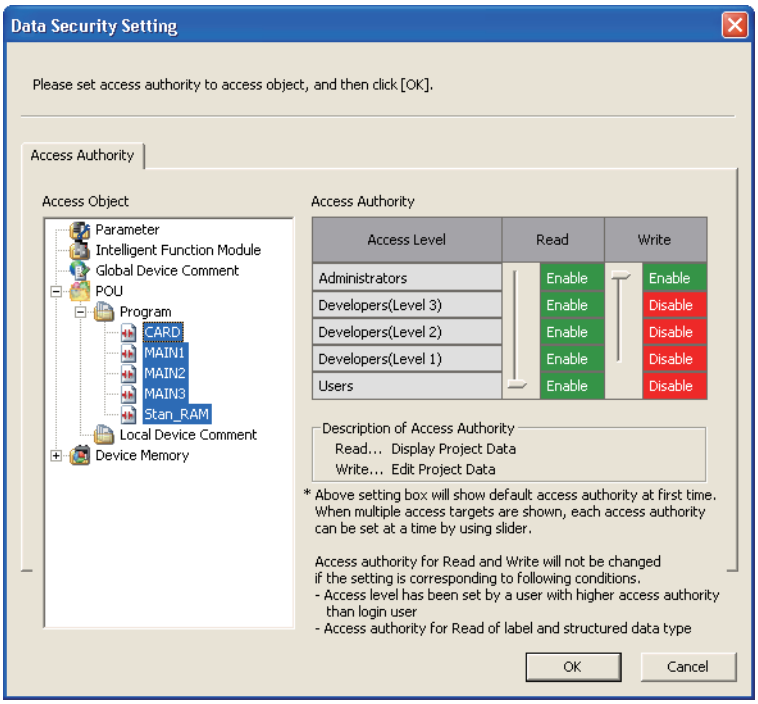
● **Checking login status**
The current login user can be checked in the status bar. (☞ Section 3.2.6)

4.10.4 Changing access authority of access level

Set an authorization of displaying/saving data for each access level.
The access authority of access levels higher than that of the login user cannot be changed.
If the access level of the current login user is 'Users', changing the access authority is not allowed.

Screen display

Select [Project] ⇒ [Security] ⇒ [Data Security Setting].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Access Object	Select one or more data for which access authority is changed.
Access Authority	Set 'enable/disable' of reading/writing data for each access level by moving the slider.*1

*1 : When multiple data are selected, the default access authority setting is displayed. Click the slider to set the displayed access authority as it is. The access authority will not be set by only selecting multiple data.

2. **Click the** OK **button.**

Point

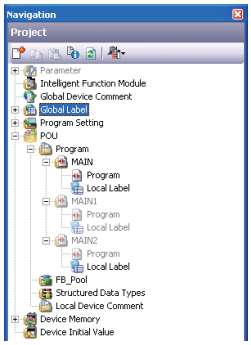
● **Setting access authority**
The access authority can also be set by right-clicking on a single data of which access authority is to be changed on the Project view and selecting [Data Security Setting] from the shortcut menu. When multiple data are selected, the shortcut menu is invalid.

4.10.5 Considerations for using the security function

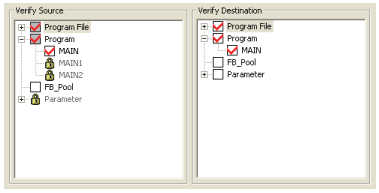
1) Read protected data

A name of read protected data is displayed in gray and cannot be opened.
On the screens of project verification and programmable controller verification, a lock mark icon is appended.
The following figures are an example for the case that "Parameter", programs and local labels of "MAIN1", and programs of "MAIN2" are read protected.

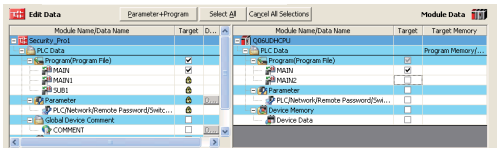
<Project view>



<Project verification>



<Programmable controller verification>



2) Write protected data

The write protected data can be opened as the read only data.

3) Properties of data

The properties of the read/write protected data can be displayed, but cannot be edited.

4) Device comment display on ladder editor and the Sampling Trace screen

If the data of the device comment is set as read protected, the device comment is not displayed on ladder editor or the Sampling Trace screen.

5) Reading symbolic information from programmable controller CPU using project with security

When symbolic information*1 is read from a programmable controller CPU, the security settings (settings on the Data Security Setting screen) of the data, which are not included in the symbolic information, are set to their default.
If the settings on the Data Security Setting screen are changed, make settings again after reading data from the programmable controller CPU.
Note that the block password*2 is not set to default even when the symbolic information is read. Therefore, setting a block password to each POU is recommended.

*1 : Symbolic information (☞ Section 12.1.5)
*2 : Block password (☞ Section 4.12)

4.11 Setting Security Key

Q CPU *1 | L CPU | Remote | Head | FX

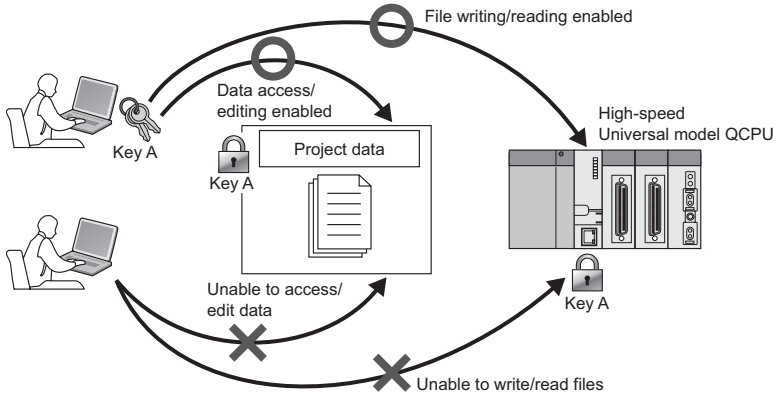
*1 : High-speed Universal model QCPU only

This section explains how to control the access with a security key.

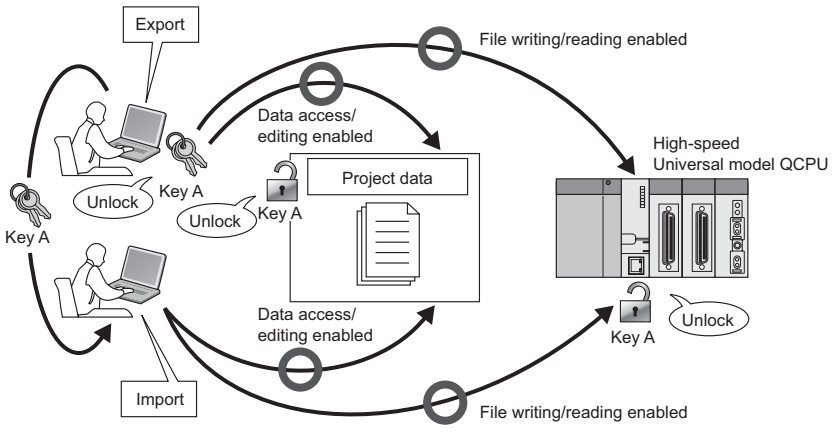
■ Security key

The security key locks/unlocks projects and a programmable controller CPU.
The lock can only be unlocked with a security key, and therefore project data and data in a programmable controller CPU can be protected.

- **For projects**
  Locked project can be opened or edited only by the users who registered the security key on the personal computer.
- **For programmable controller CPU**
  The following files can be written to/read from the locked programmable controller only by the users who registered the security key on the personal computer.
  - Symbolic information
  - Program
  - Parameter
  - Intelligent function module parameter
  - Device comment



Another user can unlock the locked project data or programmable controller CPU by importing/ exporting the security key.

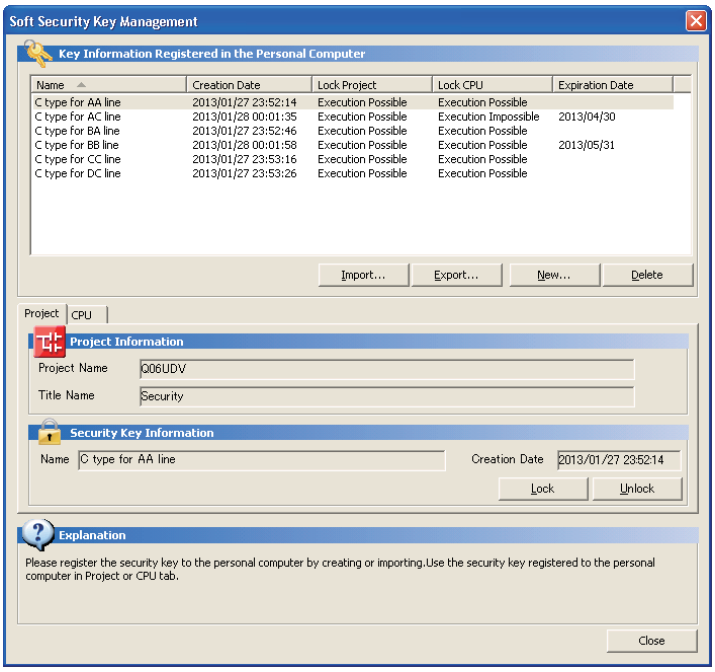


4.11.1 Managing security key

Create a security key, and import/export/delete the security key.

Screen display

Select [Project] ⇒ [Security] ⇒ [Soft Security Key Management].



Display contents

Item	Description
Key Information Registered in the Personal Computer	–
Name	Display the name of the security key.
Creation date	Display the date of creation of the security key.
Lock the project	Display the lock applicability for the project.
Lock the CPU	Display the lock applicability of the programmable controller CPU.
Expiration date	Display the expiration date when an expiration date is set on the security key.

Screen button

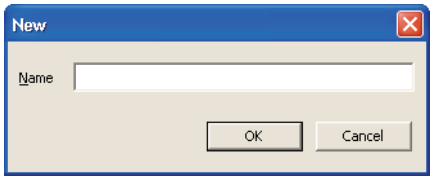
- Import...
  Imports the security key. (☞ "■ Importing security key")
- Export...
  Exports the security key. (☞ "■ Exporting security key")
- New...
  Creates a security key. (☞ "■ Creating a security key")
- Delete
  Deletes the security key. (☞ "■ Deleting security key")

■ Creating a security key

Create a security key.

Operating procedure

1. **Click the New... button.**
   The New screen is displayed.



2. **Enter a name and click the OK button.**
   The security key is created.

Point

- **Considerations of created security key**
  Created security keys can be registered only by the user who logged in the personal computer.
  The maximum number of security key registrations is 128 including created security keys and imported security keys for each login user of personal computer.

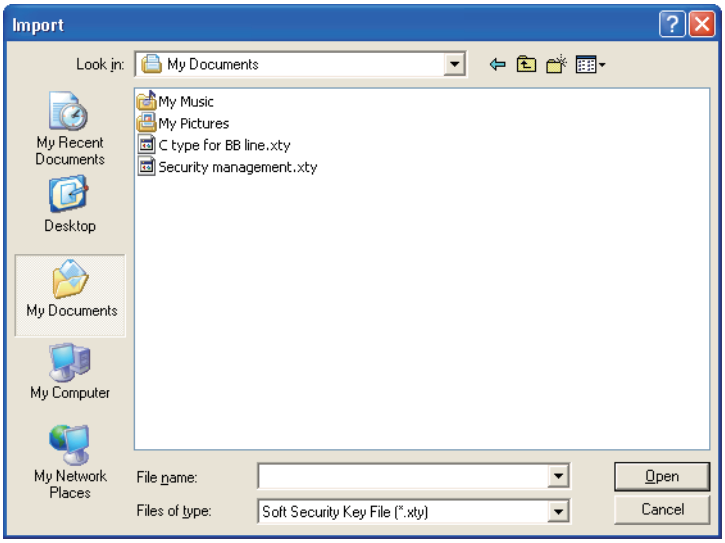
■ Importing security key

Import the security key which is exported previously to the personal computer.

Operating procedure

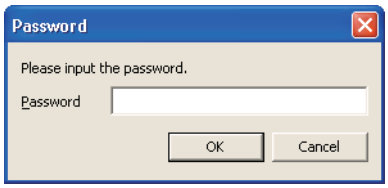
1. **Click the [Import...] button.**

   The Import screen is displayed.



2. **Select the security file to be imported, and click the [Open] button.**

   The Password screen is displayed.



3. **Enter the password set for the file when it was exported, and click the [OK] button.**

   The security key is imported to the personal computer.

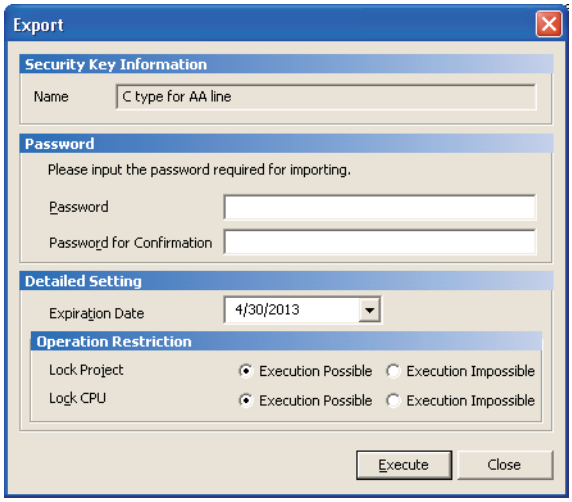
■ Exporting security key

Export the security key.

Operating procedure

1. **Select the security key to be exported, and click the Export... button.**

   The Export screen is displayed.

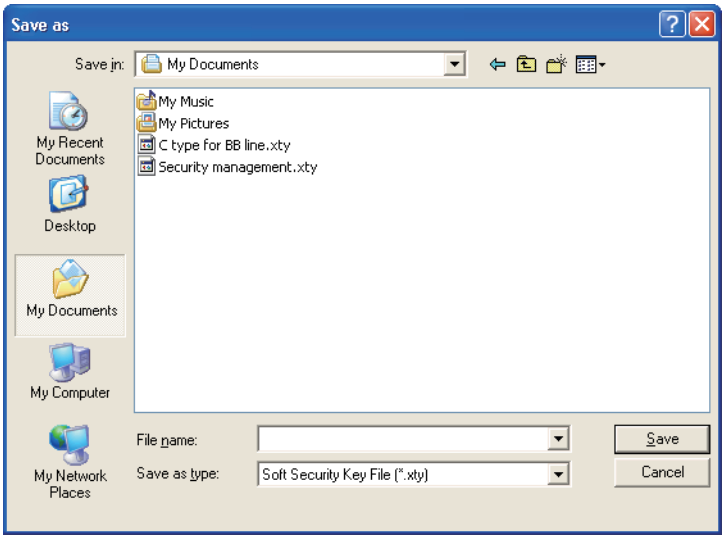


2. **Set the items on the screen.**

Item			Description
Security Key Information			–
	Name		Display the name of the security key.
Password			–
	Password		Enter a password for the security file to be exported. Set a password in 6 to 32 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (☞ Appendix 3) of 20H to 7EH.
	Re-enter password		Set the same password again for confirmation.
Detailed settings			–
	Expiration date		Set the expiration date of the security key.
	Operation limit		–
		Lock the project	Select whether to apply the security key setting to the project.
		Lock the CPU	Select whether to apply the security key setting to the programmable controller CPU.

3. **Click the [Execute] button.**

The Save As screen is displayed.



4. **Enter a name of the file to be saved.**

5. **Click the [Save] button.**

The security key file is saved.

Point

● **Considerations of exported security files**
Secure the exported security files strictly.

■ Deleting security key

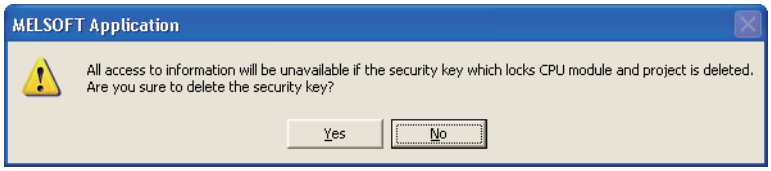
Delete the security key registered on the personal computer.

Operating procedure

- **Select the security key to be deleted, and click the [Delete] button.**

The following confirmation message is displayed.

Click the [Yes] button to delete the security key.



Point

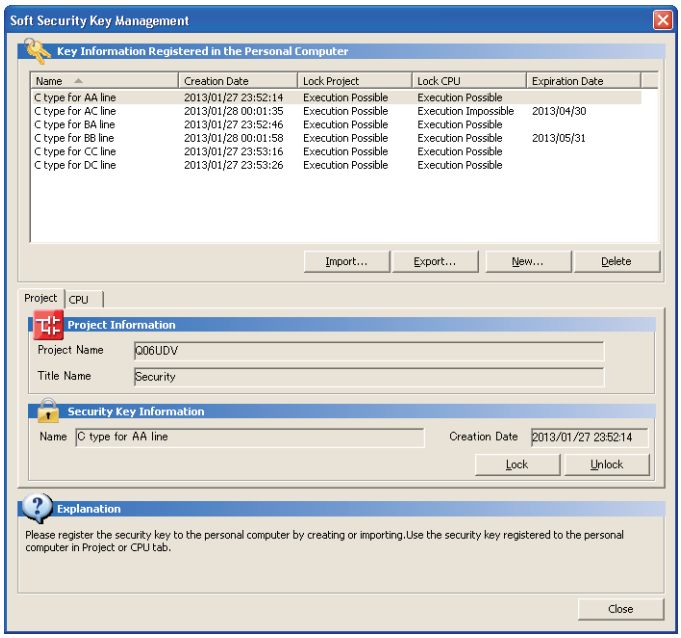
● **Considerations when deleting security key**
The project cannot be opened if the security key which is used to lock the project is deleted.
Even when the security key with the same name is recreated after deleting the security key, it will not be the same security key.
Take extra caution when deleting security keys.

4.11.2 Locking project with security key

Lock the project with a security key.

Screen display

Select [Project] ⇒ [Security] ⇒ [Soft Security Key Management].



Display contents

Item			Description
Key Information Registered in the Personal Computer			Display the information of selected security key. (☞ Section 4.11.1)
<<Project>>			Display the screen to lock/unlock the project.
	Project Information		–
		Project Name	Display the name of the project.
		Title	Display the project title.
	Security Key Information		–
		Name	Display the name of the security key which is used to lock the project.
		Creation date	Display the date of creation of the security key which is used to lock the project.
Explanation			Display the information when the cursor is placed on the button on the screen.

Operating procedure

1. **Select the security key to lock the project from "Key Information Registered in the Personal Computer".**

2. **Click the [Lock] button.**

   The project is locked with the selected security key.

Screen button

- [Unlock]

  Unlocks the locked project.

4.11.3 Considerations of security keys

1) When GX Works2 is uninstalled

Security keys are not deleted even when GX Works2 is uninstalled.

2) Security status

When the security key is "Executable" at the point of opening the project, the security key is handled under the authority of "Executable" while the project is being opened.
For example, even when the security key of the opened project is deleted and the "Inexecutable" security key is imported, the security key is handled under the authority of "Executable" while the project is being opened.

3) Project locked with security key

The following operations cannot be performed.

- Write to PLC/Read from PLC/Verify with PLC function with symbolic information, programs, parameters, intelligent function module parameters, or device comments when "Memory Card (SD)" is specified for the target memory
- Online program change function when "Memory Card (SD)" is specified for the write target.
- Write to PLC function with parameters when "Memory Card (SD)" is specified for the target memory of "Comment File Used in a Command" on the <<PLC File>> tab of PLC parameter.
- Write IC Memory Card function

4) CPU module locked with security key

The following operations cannot be performed.

- Backup data creation function of PLC Module Change
- Data restoration function of PLC Module Change
- Write PLC User Data/Read PLC User Data function with latch data backup file created with the Latch Data Backup function

4.12 Protecting POUs in Projects

Q CPU L CPU Remote Head FX

This section explains how to set a block password to a POU in a project with labels.
Setting a block password to a POU disables browsing of program content. To browse program content, the block password must be unlocked.

The following table shows the POUs to which a block password can be set.

Project type	POU to which a block password can be set
Simple project (without labels)	None
Simple project (with labels)	Function block
Structured project	Program block Function block Function

Point

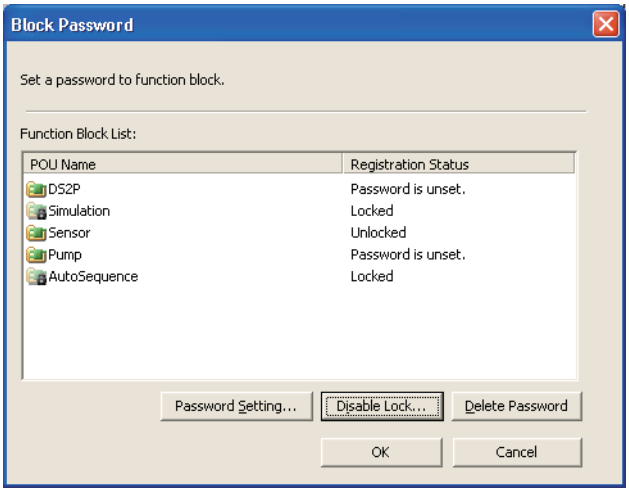
- **Effective range of block passwords**
  A block password is the function that protects POUs, not execution programs.
  To protect execution programs, use the security function or online password function.
  For FXCPU, however, whether to protect execution programs with a block password can be selected. (Setting block passwords ☞ Section 4.12.2)
- **Considerations of project with security**
  To set/unlock/delete a block password in a project with security, a user who has a security access authority to read/write the program needs to log in. (Security ☞ Section 4.10)
- **Reading symbolic information from programmable controller CPU**
  Even when the symbolic information is read from a programmable controller CPU, the set status of block password does not change.
- **Considerations when using FXCPU**
  A memory cassette to which the execution program with a block password is written can be used on FX3U/FX3UC version 3.00 or later only.

4.12.1 Managing (setting/unlocking/deleting) block passwords

Manage the block password setting status of a POU.
In addition, this function sets/unlocks/deletes a block password.

Screen display

Select [Tool] ⇒ [Block Password].



Display contents

Item	Description
POU Name	Display POUs.
Registration Status	Display the status of block password for each POU.

Screen button

- Password Setting...
  Sets a block password to a POU. (☞ Section 4.12.2)
- Disable Lock...
  Unlocks the block password set to the POU. (☞ Section 4.12.3)
- Delete Password
  Deletes the registered block password. The block password of the POU must be unlocked before deleting it.

Point

● Selecting multiple POUs
Multiple POUs of "Function Block List" can be selected and the password can be set/disabled in batch.
The following is the consideration when the block password settings of selected POUs are different.

- POUs whose block password is different from the entered password are not unlocked.

4.12.2 Setting/changing block passwords

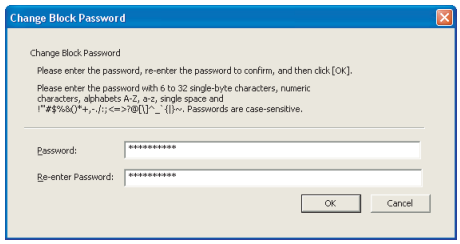
Set a block password to a POU.

Operating procedure

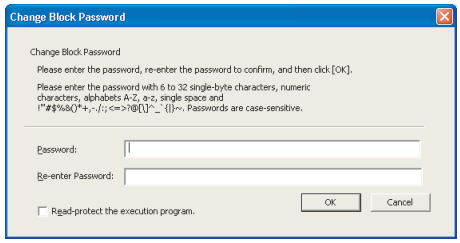
1. **Select a POU to set a block password on the Block Password screen and click the Password Setting... button.**

   The Change Block Password screen is displayed.

<QCPU (Q Mode)/LCPU>



<FXCPU>



2. **Set the items on the screen.**

Item	Description
Password	Enter a password in 6 to 32 characters, using alphabets, numerals, and/or symbols corresponding to the ASCII codes (☞ Appendix 3) of 20H to 7EH. (Alphabets are case-sensitive.)
Re-enter Password	Set the same password again for confirmation.
Read-protect the execution program*1	Select this to disable reading execution programs. Whenever this item is selected or cleared, the program must be compiled.

*1 : Supported by FX3U/FX3UC version 3.00 or later only.

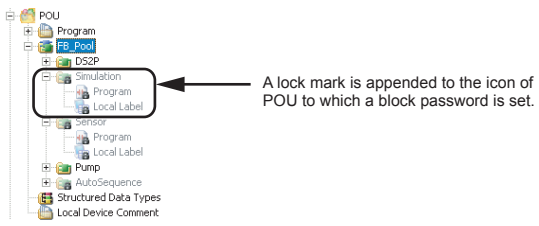
3. **Click the OK button.**

   The block password is set to the selected POU.
   Lock of the POU by the block password becomes effective when the project is opened once again.

Point

● **Display on the Project view**

A POU with a block password is displayed on the Project view as shown below.



● **Changing block passwords**

To change a block password, simply set a new password for the POU to which a block password has already been set.
However, the block password must be unlocked before changing it.

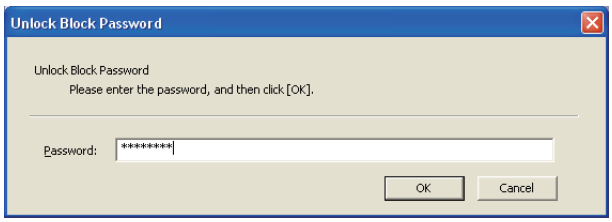
4.12.3 Unlocking block passwords

Unlock the block password set to a POU.
Browsing of POUs is enabled by unlocking block passwords.

Operating procedure

1. **Select a POU to unlock the block password on the Block Password screen and click the Disable Lock... button.**

   The Unlock Block Password screen is displayed.



2. **Set the item on the screen.**

Item	Description
Password	Enter the block password to be unlocked.

3. **Click the OK button.**

   The block password of the selected POU is unlocked.
   The unlock of the POU by the block password is valid while the project is being opened. To lock the POU again, reopen the project.

5 EDITING PROGRAMS

This chapter explains the functions of the program editors used to edit sequence programs.

5.1 Programming

Q CPU L CPU Remote Head FX

For programming in each project, refer to the following manuals:
☞ GX Works2 Version 1 Operating Manual (Simple Project)
☞ GX Works2 Version 1 Operating Manual (Structured Project)

5.2 Label Programming

Q CPU L CPU Remote Head FX

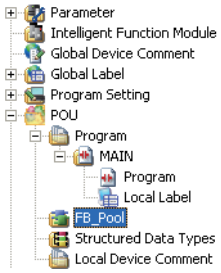
Programs can be standardized by using the label programming.
This function is available when a new program is created with the selection of "Use Label".
For projects without labels, the programming can be changed to the label programming by changing the project type. (☞ Section 4.5)

■ Features of label programming

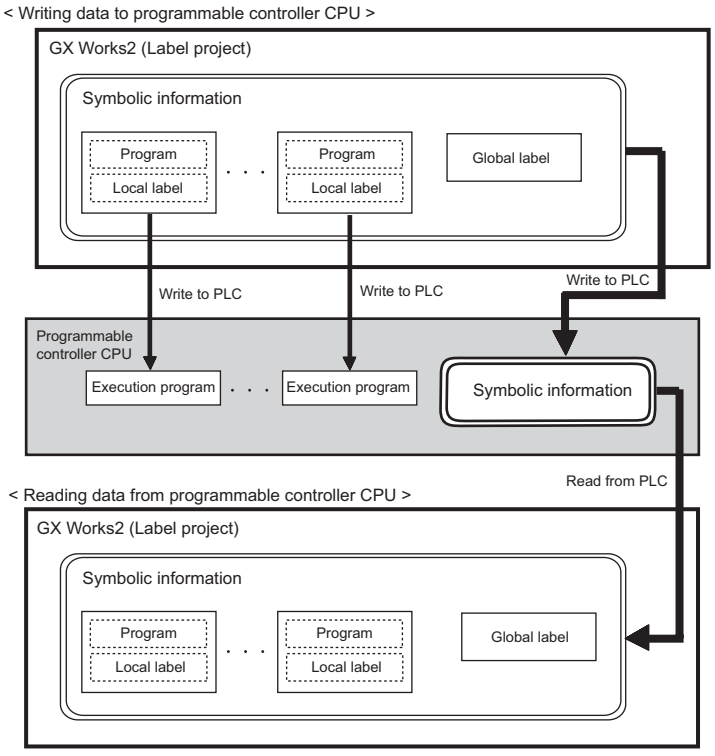
- **Since device assignment can be changed according to the equipment configuration by creating general-purpose programs with the label programming, the programs with labels can simply be utilized for other programs.**
- **Programs can be created using labels without knowing the equipment configuration.**
- **Labels and actual devices are associated as the equipment configuration is determined. This function allows easier creation of execution programs.**
- **By simply specifying a label assignment method, devices are assigned automatically with the program compilation function without being aware of device names/device numbers.**
- **Debugging can be performed effectively by monitoring/debugging programs without changing label names.**

■ Terms used in label programming

The following are the terms used in the label programming.

Project view	Term	Description
	Label project	New projects created with the selection of "Use Label" on the New Project screen. (☞ Section 4.2.1)
	Symbolic information	Data of information such as programs, global labels, and local labels, required for label programming. (☞ Section 12.1.5) These data are restored by writing/reading symbolic information to/ from a programmable controller CPU.
	Program	Program data written with applicable programming languages. For label projects, these are data included in symbolic information even when a program is created using devices only.
	Execution program	Programs executed on programmable controller CPUs. Devices are assigned to labels with compilation, and execution programs are created.
	Actual device	Devices assigned to labels after compilation, or devices not written with labels.
	Global label	Labels available for all program data when multiple program data are created in a project.
	Local label	Labels available for each program data only. Labels and each program data are set one to one.
	Device/label automatic-assign setting	A setting of types and ranges of devices assigned to labels. ☞ GX Works2 Version 1 Operating Manual (Simple Project) ☞ GX Works2 Version 1 Operating Manual (Structured Project)
	Compilation	An operation in which programs are converted to execution programs.

The following is an image of writing/reading label project data to/from a programmable controller CPU in GX Works2.



5.3 Considerations for Using Label Projects

Q CPU L CPU Remote Head FX

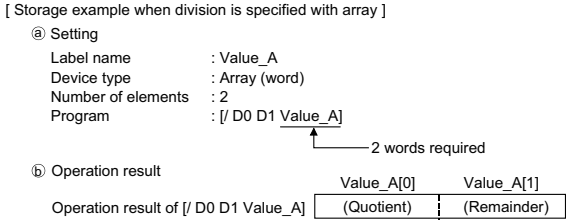
This section explains the considerations for using label projects.

5.3.1 Editing programs

1) **Label comments set on the label setting editor are displayed as comments to labels. Comments created on the device comment editor are not displayed.**
   Up to 1024 characters can be set for label comments, however, the number of characters that can be displayed is 32.
2) **When the same label is set for global label/local label, the label comment set for local label setting is displayed.**
3) **The index setting cannot be set when labels are used. Use actual devices to set the index setting.**

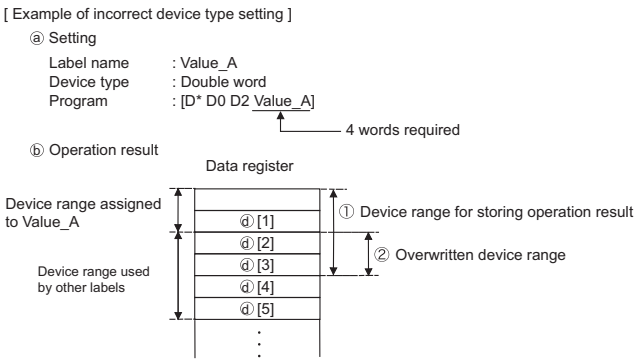
■ Considerations when editing programs

1) **When an instruction in which data are stored to multiple word devices is used as shown below, specify an array for the label in the storage destination of operation result.**
   - Division (Storing values such as quotient and remainder of division)
   - Instructions such as the block data transfer instruction (BMOV)



2) When setting arrays, be aware of device types and the number of elements in the data storage destination.

If the setting is incorrect, the content of devices assigned to other labels may be overwritten.



For the above example, assign 4 words to the label (Value_A) in the storage destination of operation result.

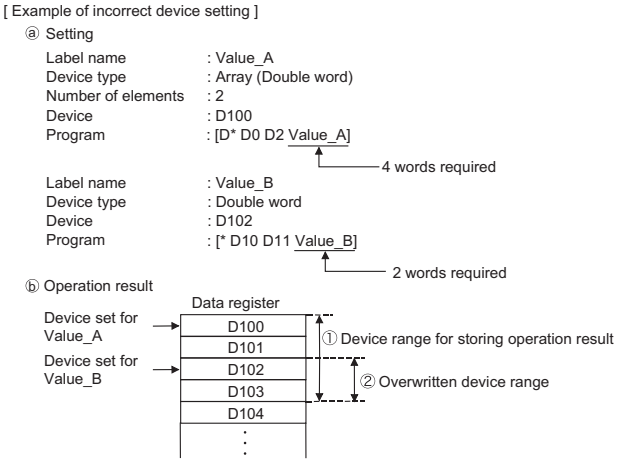
To assign 4 words, set the following setting on the label setting editor.

Device type: Array (double word) Number of elements: 2

After compilation, the consecutive device ranges for 4 words are secured.

3) Do not overlap the device ranges which are stored as execution result of instruction when assigning devices with global labels.

If the setting is incorrect, the content of devices assigned to other labels may be overwritten.



For the above example, assign the device of label (Value_B) to D104.

5.3.2 Writing programs to programmable controller CPU (Write to PLC/Online program change)

■ Writing symbolic information

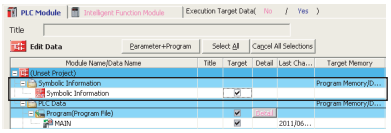
1) In order to restore programs by reading symbolic information from the programmable controller CPU, write symbolic information.

Symbolic information can be written by selecting the following item on the execution screen of Write to PLC/Online program change.

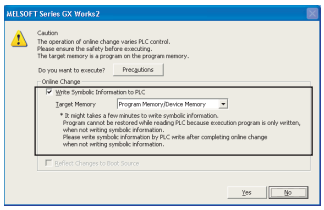
- Write to PLC: Symbolic Information
- Online program change: Write Symbolic Information to PLC

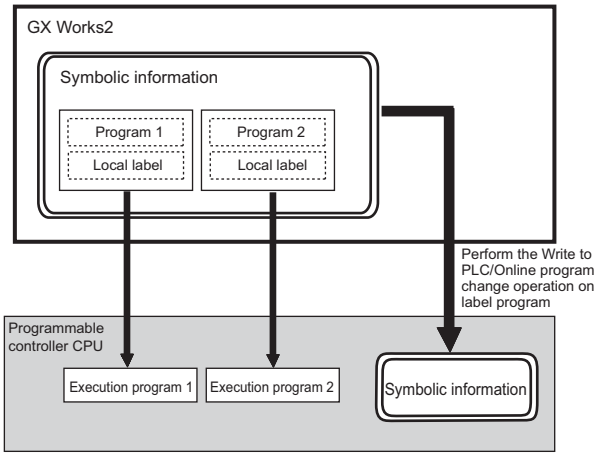
Note that symbolic information and execution programs can be written to separate memories. Specify the write destination memory for "Target Memory". The default setting of write destination memory for symbolic information can be changed in the option setting. Set "Setting for Save Destination of Symbolic Information to PLC" under [Tool] ⇒ [Options] ⇒ "Symbolic Information".

< Write to PLC >
Symbolic information and all execution programs are selected when "Symbolic Information" is selected. The program which is consistent with the symbolic information can be written to the programmable controller CPU.



< Online program change >





When the Write to PLC/Online program change operation is performed on execution programs only, program inconsistency occurs. This operation must be performed on both symbolic information and execution programs.

2) When writing data to a programmable controller CPU, the confirmation message asking "Do you want to overwrite?" may be displayed as corresponding to the execution programs. The symbolic information will not be written normally if "No" was selected. Perform the data write operation again, and complete the operation normally.

■ Writing execution programs only

1) When an area to store symbolic information cannot be secured on the programmable controller CPU, write execution programs only.

Projects contain symbolic information must be kept securely on a personal computer.

2) Write execution programs without selecting the following item.

- Write to PLC: Symbolic Information
- Online program change: Write Symbolic Information to PLC

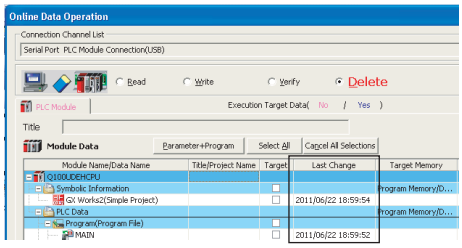
5.3.3 Reading programs from programmable controller CPU (Read from PLC)

■ Reading symbolic information

1) **Execute the Read from PLC operation with a label project.**

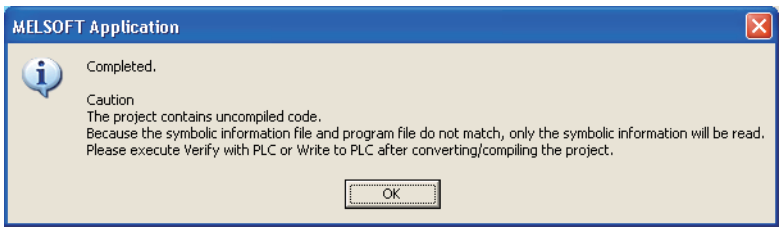
2) **When reading data from a programmable controller CPU, specify the memory to which the symbolic information is stored for "Target Memory" of symbolic information.**

3) **Do not perform the Read from PLC operation on the symbolic information when the symbolic information and the execution programs on the programmable controller CPU are not consistent.**
When the symbolic information is read with program inconsistency, the execution programs which are running on the programmable controller CPU cannot be restored. Check the date of the Write to PLC operation which was performed on the symbolic information and the execution programs, and prevent from performing the Read from PLC operation with program inconsistency. Date of the data write operation can be checked with the column of "Last Change" on the Online Data Operation screen for "Delete PLC Data".



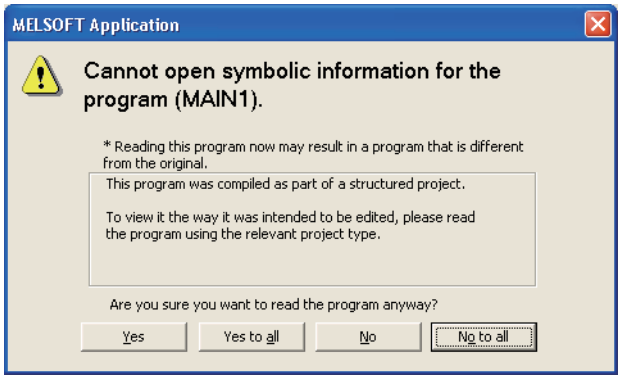
The following are the considerations when symbolic information needs to be read with program inconsistency.

- Create backup data of symbolic information on a personal computer before performing the Read from PLC operation.
  Symbolic information on a personal computer will be overwritten with symbolic information on a programmable controller CPU. To prevent from erasing the latest symbolic information, save the project and create backup data of symbolic information.
- The following message is displayed when the Read from PLC operation is performed with program inconsistency.
  Follow the instruction described in the message.



■ Reading execution programs only

1) Do not read execution programs only.
When only the execution programs needs to be read, read them with a project without labels.
The following warning message is displayed when the execution programs created from the symbolic information are read with a project without labels.



5.3.4 Verifying programs

Symbolic information cannot be verified. The program verification operation can be performed on execution programs only.

5.3.5 Monitoring programs

Programs created with labels can be monitored.
Programs with labels registered to the Watch window can be monitored.

5.4 Converting/Compiling Projects

Q CPU L CPU Remote Head FX

This section explains how to convert/compile an edited project to convert it into the code executable on the programmable controller CPU.

The type of conversion/compilation differs according to the project type as shown in the table below.

Project type	Conversion/compilation type	Description
Simple project (without labels)	Build	Fix changes.
	Online Program Change	Fix changes, and simultaneously, write the difference between the fixed programs and the programs stored on the programmable controller CPU to the programmable controller CPU.
	Rebuild All	Convert all programs.
Simple project (with labels)/ Structured project	Build	Convert and compile uncompiled data (programs, structures, labels and functions/function blocks).
	Online Program Change	Convert and compile data, and simultaneously, write the difference between the fixed programs and the programs stored on the programmable controller CPU to the programmable controller CPU.
	Rebuild All	Convert and compile all data (programs, structures, labels and functions/ function blocks).

For details, refer to the following manuals:

☞ **Section 12.9 "Online Program Change"**

☞ **GX Works2 Version 1 Operating Manual (Simple Project)**

☞ **GX Works2 Version 1 Operating Manual (Structured Project)**

MEMO

6 SETTING PARAMETERS

This chapter explains the setting items, operations on the setting screens, and common notes on parameter settings.
For necessary information and details of settings, refer to the manuals of each module to be used.

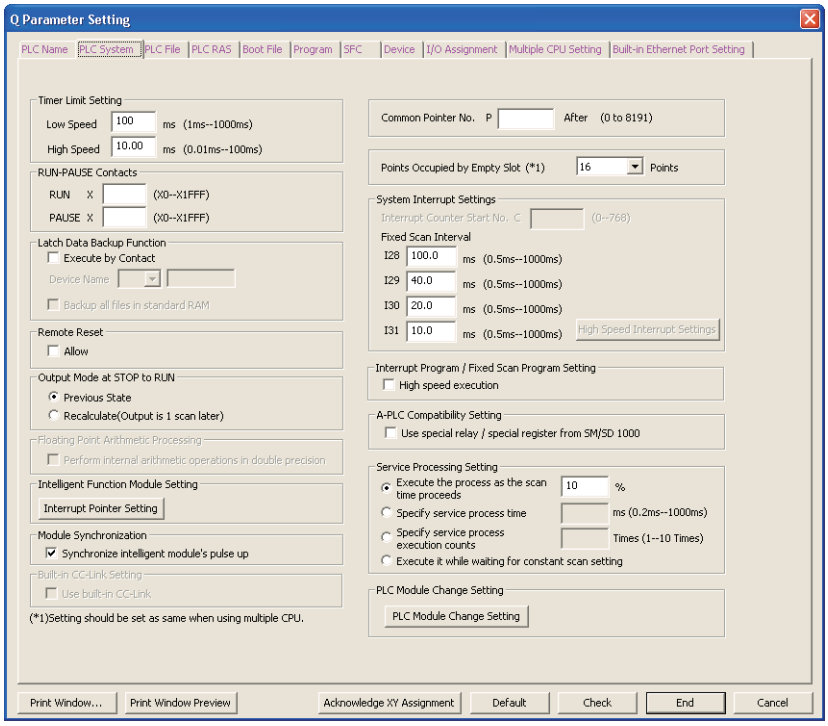
6.1 Setting PLC Parameters

Q CPU L CPU Remote Head FX

This section explains how to set PLC parameters.

Screen display

Select Project view ⇒ "Parameter" ⇒ "PLC Parameter".



Display contents

Item	Description
Tab	The setting items are categorized under tabs according to their purpose. • The parameter setting status is displayed by different font colors of the tab names. **Font color** / **Setting status** Red: Status that data is not set under the tab (Data must be set under the tab for operation.) Blue: Status that data is set under the tab (A red tab name changes to blue after data is set.) Magenta: Default values (The user settings are not set under the tab.) Dark blue: Values other than default values (A magenta tab name changes to dark blue after data is set.) • Details of the setting items ☞ Section 6.1.1

Screen button

- Print Window...
  Executes printing. (☞ Section 20.7)
- Print Window Preview
  Executes print preview. (☞ Section 20.9)
- Acknowledge XY Assignment **(Not supported by FXCPU)**
  Checks the X/Y setting made on the <<I/O Assignment>> tab of PLC parameter or in the network parameter.
- Default
  Resets all setting items on the screen being open to their defaults.
- Check
  Checks whether the user-set parameters on the screen being open are correct.

Point

- **Considerations when changing PLC parameters**
  For QCPU (Q mode)/LCPU, all programs need to be compiled when the following PLC parameters are changed.
  - "Common Pointer No." and "Timer Limit Setting" on the <<PLC System>> tab
  - "File Register" and "File for Local Device" on the <<PLC File>> tab
  - Settings on the <<Device>> tab

  Compiling all programs changes the device assignment to labels. Therefore, device values set before the program change remain on the device-assigned labels.
  Perform the following operations for a precautionary measure.
  - For QCPU (Q mode)/LCPU
    After writing data to the programmable controller CPU, reset the programmable controller CPU, clear all device memories including latches, clear all file registers, and switch the programmable controller CPU to RUN.
  - For FXCPU
    After writing data to the programmable controller CPU, clear device memory using the PLC memory clear function, and switch the programmable controller CPU to RUN.

  (☞ Section 17.4)
  For the considerations for compiling all programs, refer to the following manuals.
  ☞ GX Works2 Version 1 Operating Manual (Simple Project)/(Structured Project)
- **Function to apply the parameters of MELSOFT Navigator**
  - When GX Works2 is started up from MELSOFT Navigator, parameters that can be set by MELSOFT Navigator are displayed with green background.
  - A parameter set by the function to apply the parameters of MELSOFT Navigator cannot be edited.
    To edit it, select [Tool] ⇒ [Options] ⇒ "iQ Works Interaction" and select "Enable an editing of parameters set in MELSOFT Navigator".

6.1.1 PLC parameter item list

The following table shows the applicable PLC parameter items for each programmable controller type. For details of each item, refer to the following manuals.
(☞ User's manuals and programming manuals of each CPU)

○: Applicable –: Not applicable

Setting tab name	Q series				L series		FX series
	Basic model QCPU	High Performance model QCPU/ Universal model QCPU/ Process CPU	Redundant CPU	Remote I/O module	LCPU	Communication head module	FXCPU
Communication Head Setting	–	–	–	–	–	○	–
PLC Name	○	○	○	–	○	○	○
PLC System*1	○	○	○	○	○	○	○
PLC File	○	○	○	–	○	–	–
PLC RAS	○	○	○	○	○	○	–
Boot File	○	○*2	○	–	○*3	–	–
Program	–	○	○	–	○	–	–
SFC	○	○	○	–	○	–	–
Device	○	○	○	–	○	–	○
I/O Assignment	○	○	○	○	○	○	–
Multiple CPU Setting	○*4	○*4	–	–	–	–	–
Built-in Ethernet Port Setting	–	○*5	–	–	○*3	–	–
Ethernet Port Setting	–	–	–	–	–	–	○*6
Built-in I/O Function Setting	–	–	–	–	○	–	–
Serial Communication	○*7	○*8	–	–	○*9	–	–
Memory Capacity	–	–	–	–	–	–	○
Special Function Block	–	–	–	–	–	–	○
Positioning	–	–	–	–	–	–	○
Operation Setting	–	–	–	○	–	○	–

*1 : For FXCPU, PLC System is separated into PLC System (1) and PLC System (2).
*2 : Not supported by Q00UJ/Q00U/Q01U.
*3 : Not supported by L02S.
*4 : Not supported by Q00J/Q00UJ.
*5 : For Built-in Ethernet port QCPU only
*6 : For FX3G, FX3GC, FX3U, and FX3UC only
*7 : For Q00/Q01 only
*8 : For Q00UJ/Q00U/Q01U/Q02U/QnUD(H)CPU only
*9 : For L02S only

■ PLC parameter setting items for QCPU (Q mode)/LCPU

1) PLC Name

Item	Description	Remarks
Label	Set a label (name and application) of the programmable controller CPU.	–
Comment	Set a comment for the label of the programmable controller CPU.	–

2) PLC System

Item	Description	Remarks
Timer Limit Setting	Set the time limit of the low-speed/high-speed timer.	–
RUN-PAUSE Contacts	Set the contacts for controlling RUN/PAUSE of the programmable controller CPU. PAUSE contact only setting is not available. (RUN contact only or RUN contact + PAUSE contact setting is available.)	–
Latch Data Backup Operation Valid Contact	Set the contact device for executing a latch data backup operation.	Universal model QCPU/ LCPU only
	Set whether to back up all files on the standard RAM when executing a latch data backup operation.	High-speed Universal model QCPU only
Remote Reset	Set whether to allow a remote reset operation from GX Works2.	–
Output Mode at STOP to RUN	Set the status of output (Y) when the programmable controller is switched from STOP to RUN.	–
Floating Point Arithmetic Processing	Set whether to perform floating-point processing in double precision.	High Performance model QCPU only
Intelligent Function Module Setting	Set the interrupt pointer assignment of the module. Set the start I/O number and start SI number of the module.	–
Module Synchronization	Set whether to synchronize the start-up of the programmable controller CPU with that of the intelligent function module.	–
Built-in CC-Link Setting	Set whether to set the built-in CC-Link.	L26-BT/L26-PBT only
Common Pointer No.	Set the start number of the common pointers used in the program.	Not applicable to Basic model QCPU
Points Occupied by Empty Slot	Set the number of points occupied by empty slots for the main base unit/extension base unit/block.	–
System Interrupt Settings	Set the start number of the interrupt counters. Set the execution interval for the interrupt pointers.	–
	Set the fixed scan interval for high-speed interrupt pointers, high-speed I/O refresh, and high-speed buffer transfer.	High Performance model QCPU/High-speed Universal model QCPU only
Interrupt Program/Fixed Scan Program Setting	Set whether to perform high-speed execution of an interrupt program.	–
A-PLC Compatibility Setting	Set whether to use the MELSEC-A series special relays/special registers (SM1000/SD1000 to SM1299/SD1299).	Not applicable to Basic model QCPU/ Redundant CPU
Service Processing Setting	Set the processing time and the number of times of service processing.	Universal model QCPU/ LCPU only
PLC Module Change Setting	Set this to replace the CPU module using a memory card.	Universal model QCPU/ LCPU (except for L02S) only

3) PLC File

Item	Description	Remarks
File Register	Set the file register file to be used in the program.	–
	Set whether to transfer data to the standard ROM when executing a latch data backup operation.	Universal model QCPU (except for High-speed Universal model QCPU)/LCPU only
Comment File Used in a Command	Set the device comment file to be used in the program.	Not applicable to Basic model QCPU
Initial Device Value	Set the device initial value file to be used on the programmable controller CPU.	–
File for Local Device	Set the local device file to be used in the program.	Not applicable to Basic model QCPU
File used for SP.DEVST/ S.DEVLD Instruction	Set the device data ROM write/read instruction file to be used in the program.	Universal model QCPU/ LCPU only

4) PLC RAS

Item	Description	Remarks
WDT (Watchdog Timer) Setting	Set the WDT of the programmable controller CPU.	–
	Set the WDT for an initial execution type program.	–
	Set the WDT for a low-speed execution type program.	High Performance model QCPU only
Error Check	Set whether to detect specified errors.	–
Operating Mode When There is an Error	Set the programmable controller CPU operation mode when an error is detected.	–
Constant Scanning	Set the constant scan time.	–
Error History	Set the storage destination for error histories of the programmable controller CPU.	High Performance model QCPU only
Low Speed Program Execution Time	Set the execution time of a low-speed program in every scan.	High Performance model QCPU only
Module Error History Collection (Intelligent Function Module)	Set whether to collect the error history of the intelligent function module.	Universal model QCPU/ LCPU only
Memory Check	Set whether to check the memory of the program.	Process CPU/ Redundant CPU only

5) Boot File

Item	Description	Remarks
Boot Option	Set whether to clear the program memory when booting up.	Not applicable to Basic model QCPU
	Set whether to write data in the memory card automatically to the standard ROM when booting up.	Not applicable to Basic model QCPU
Boot File Setting	Set the type, data name, transfer source drive, and transfer destination drive of the boot file.	Not applicable to Basic model QCPU
	Set whether to boot up with the standard ROM.	Basic model QCPU only

6) Program

Item	Description	Remarks
Program	Set the file name and execution type (executing condition) for programs when several programs are written to the programmable controller CPU. Set the fixed scan interval (the execution interval of a fixed scan execution type program).	Not applicable to Basic model QCPU
File Usability Setting button	Display the File Usability Setting screen.	Not applicable to Basic model QCPU
I/O Refresh Setting button	Display the I/O Refresh Setting screen.	High Performance model QCPU only

7) SFC

Item	Description	Remarks
SFC Program Start Mode	Set the start-up mode of an SFC program.	–
Start Conditions	Set the start-up condition of an SFC program.	–
Output Mode When the Block is Stopped	Set the SFC program output mode at block stop.	–

8) Device

Item	Description	Remarks
Device Points	Set the number of points used for each device of the programmable controller CPU.	–
Latch (1) Start/End	Set the latch range (start device number/end device number) clearable with the RESET/L.CLR switch or a remote latch clear operation.	–
Latch (2) Start/End	Set the latch range (start device number/end device number) not clearable with the RESET/L.CLR switch or a remote latch clear operation.	–
Local Device Start/End	Set the range (start device number/end device number) of devices used as a local device.	–
File Register Extended Setting	Set the extended data register and extended link register.	Universal model QCPU/ LCPU only
Indexing setting for devices*1	Set the start number of Z to be 32-bit indexed, or use the index register ZZ for 32-bit index setting.	Universal model QCPU/ LCPU only
Latch interval	Set the device latch interval to be performed by the set interval or by each scan.	High-speed Universal model QCPU only

*1 : "Indexing Setting for ZR Device" is displayed for the programmable controller CPU other than High-speed Universal model QCPU.

9) I/O Assignment

Item	Description	Remarks
I/O Assignment	Set the type, model, number of occupied I/O points, and start I/O number of each module mounted on the base unit/block.	–
	Set the switch settings of the programmable controller CPU.	Universal model QCPU/ LCPU only
	Set the switch settings of the intelligent function module.	–
Base Setting	Set the model and the number of slots of the base unit, the model of the power supply module, and the model of the extension cable.	Not applicable to LCPU

10) Multiple CPU Setting

Item	Description	Remarks
No. of PLC	Set the number of programmable controller CPUs used in the multiple CPU system.	–
Operation Mode	Set the operation mode of the multiple CPU system when a stop error occurs in any of the programmable controller CPU No. 2 to No. 4. The multiple CPU system stops when a stop error occurs in the CPU No. 1.	
Host Station	Set the CPU number for the host CPU.	Universal model QCPU (excluding Q00UJ/ Q00U/Q01U/Q02U) only
Multiple CPU Synchronous Startup Setting	Select the CPU modules to be started up synchronously.	
Online Module Change	Set whether to allow Online module change in the multiple CPU system.	Not applicable to Q00U/ Q01U/Q02U
I/O Sharing When Using Multiple CPUs	Set whether to retrieve the I/O status of the I/O module or intelligent function module controlled by other programmable controller CPUs.	–
Communication Area Setting (Refresh Setting)	Set the CPU shared memory to enable data sharing among multiple CPUs. (Usable devices: B, M, Y, D, W, R, and ZR)	–
Multiple CPU High Speed Transmission Area Setting	Set the user setting area, auto refresh, assignment confirmation, and system area.	Universal model QCPU (excluding Q00U/Q01U/ Q02U) only

11) Built-in Ethernet Port Setting

Item	Description	Remarks
IP Address Setting	Set the IP address and the input format of the IP address.	Built-in Ethernet type CPU only
Communication Data Code	Select the Binary code or ASCII code for communication.	
Open Setting button	Set the protocol, open system, and host station port number.	
FTP Setting button	Select whether to use the FTP function.	
Time Setting button	Set whether to use the SNTP function, and set the timing of setting the time.	
Simple PLC Communication Setting	Set the communication pattern and the communication settings.	LCPU only
IP Packet Transfer Setting	Set whether to use the IP Packet Transfer function.	Universal model QCPU (except for Q00UJ/ Q00U/Q01U/Q02U)/ LCPU (except for L02S) only

12) Built-in I/O Function Setting

Item	Description	Remarks
Positioning	Set the parameters of the positioning axis 1 setting and positioning axis 2 setting.	LCPU only
High-speed Counter	Set the operation mode of high-speed counter CH1 setting and high-speed counter CH2 setting.	
Input Signal	Set the input signal function, input response time, and interrupt processing condition.	
Output Signal	Select the output signal function and error time output mode.	

13) Serial Communication

Item	Description	Remarks
Transmission Speed	Set the transmission speed.	–
Sum Check	Set the sum check.	
Transmission Wait Time	Set the transmission wait time.	
Online Change	Set whether to allow Online program change.	

■ PLC parameter setting items for communication head module

1) Communication Head Setting

Item	Description	Remarks
CC-Link IE Field Network Setting	Set the operation mode of the network.	CC IE Field head module only
	Set the network number of the module.	
	Set the station number of the module.	
	Set whether to hold (store) the error history and system error history on a flash ROM at power OFF or reset.	
SSCNET III/H Network Setting	Set the operation mode of the network.	SSCNET III/H head module only
	Set whether to hold (store) the error history and system error history on a flash ROM at power OFF or reset.	

2) PLC Name

Item	Description	Remarks
Label	Set a label (name and application) of the programmable controller CPU.	–
Comment	Set a comment for the label of the programmable controller CPU.	

3) PLC System

Item	Description	Remarks
Remote Reset	Set whether to allow a remote reset operation from GX Works2.	–

4) PLC RAS

Item	Description	Remarks
Module Error History Collection (Intelligent Function Module)	Set whether to collect the error history of the intelligent function module.	–

5) Operation Setting

Item	Description	Remarks
Assignment Method	Select the assignment method of devices to be transferred.	–
Forwarding Parameter between Devices	Set transmission source devices and transmission destination devices.	

6) I/O Assignment

Item	Description	Remarks
I/O Assignment	Set the type, model, number of occupied I/O points, and start I/O number of each module mounted on the base unit.	–
	Set the switch settings of the programmable controller CPU.	
	Set the switch settings of the intelligent function module.	

■ PLC parameter setting items for remote I/O module

1) PLC system

Item	Description	Remarks
Module Synchronization	Set whether to synchronize the start-up of the programmable controller CPU with that of the intelligent function module.	–
Points Occupied by Empty Slot	Set the number of points occupied by empty slots for the main base unit/extension base unit.	–

2) PLC RAS

Item	Description	Remarks
Error Check	Set whether to detect specified errors.	–
Operating Mode When There is an Error	Set the programmable controller CPU operation mode when an error is detected.	–

3) Operation Setting

Item	Description	Remarks
Assignment Method	Select the assignment method of devices to be transferred.	–
Forwarding Parameter between Devices	Set transmission source devices and transmission destination devices.	

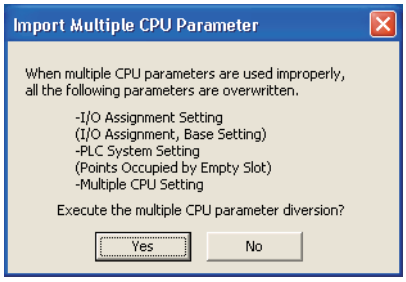
4) I/O Assignment

Item	Description	Remarks
I/O Assignment	Set the type, model, number of occupied I/O points, and start I/O number of each module mounted on the base unit.	–
	Set the switch settings of the programmable controller CPU.	
	Set the switch settings of the intelligent function module.	
Base Setting	Set the model and the number of slots of the base unit, the model of the power supply module, and the model of the extension cable.	–

Point

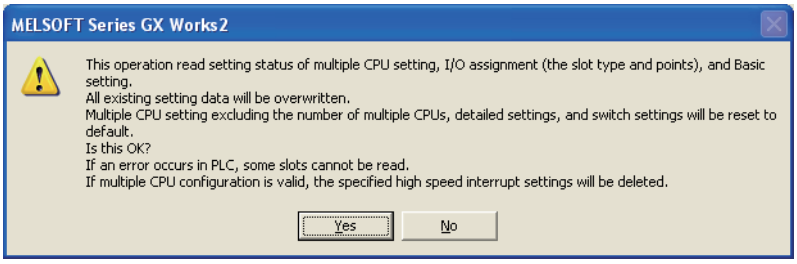
● **Utilizing existing data to set parameters of multiple CPU**

Parameters for multiple CPU can be set by utilizing existing data by clicking the Import Multiple CPU Parameter button on the <<I/O Assignment>>/<<Multiple CPU Setting>> tab.
Specify the project to be utilized, read the message, and then execute the function.



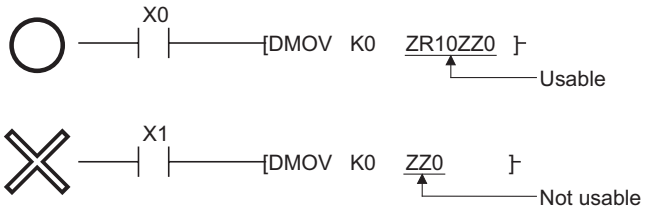
● **Reading mounting status of programmable controller CPU**

The mounting status of the programmable controller CPU can be read and overwritten to the current parameters by clicking the Read PLC Data button on the <<I/O Assignment>> tab. Read the message and execute the function.



● **"Index Setting for ZR Device" on the <<Device>> tab.**

When "Use ZZ" is set for the 32-bit index setting, the ZZ device cannot be used or monitored independently in the program.

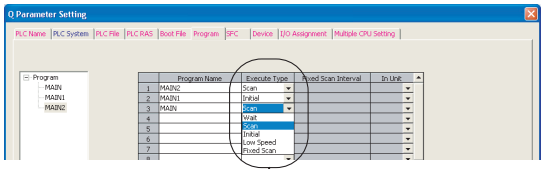


To confirm the current value of the ZZ device, specify Z and set the display format to 32-bit integer, on the Device/Buffer Memory Batch Monitor screen.

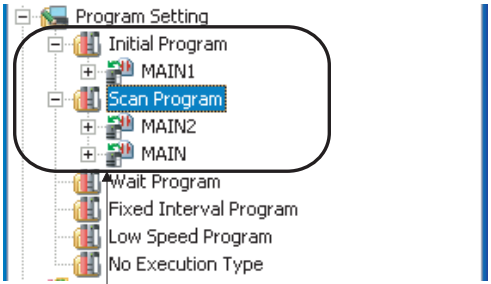
● **Program settings**

Executing conditions set in the program setting of the PLC parameter are applied to "Program Setting" on the Project view. Program settings can also be set on the Project view.
For details of program setting on the Project view, refer to ☞ Section 4.2.1

<Setting screen for PLC parameter>



<Project view>



Execution types set in the Program can be confirmed.

■ PLC parameter setting items for FXCPU

For FXCPU, PLC parameter setting items differ according to the programmable controller type.

1) PLC Name

Item	Description	Remarks
Title	Set a program title to be stored on the programmable controller CPU.	FX1, FX0N, FX1S, FX1N, FXU, FX2N, FX3G, FX3U, FX1NC, FX2C, FX2NC, FX3GC, and FX3UC only

2) PLC System (1)

Item	Description	Remarks
Battery Less Mode	Set this to operate the programmable controller CPU without the memory backup battery.	FX2N, FX3U, FX2NC, and FX3UC only
Battery Mode	Set this to operate the programmable controller CPU with the memory backup battery.	FX3G and FX3GC only
MODEM Initialized	Select the modem initialization command for the remote access to the programmable controller CPU.	FX1S, FX1N, FX2N, FX3G, FX3U, FX1NC, FX2NC, FX3GC, and FX3UC only
RUN Terminal Input	Select the input number to use the input (X) of the programmable controller CPU as the external RUN/STOP terminal.	FX1S, FX1N, FX2N, FX3G, FX3U, FX1NC, FX2NC, FX3GC, and FX3UC only

3) PLC System (2)

Item	Description	Remarks
Channel selection	Select a channel to be the connection target. Applicable to FX3G, FX3GC, FX3U, and FX3UC only.	FX1S, FX1N, FX2N, FX3G, FX3GC, FX3U, FX1NC, FX2NC, and FX3UC only
Operate Communication Setting	Set whether to enable the communication setting.	
Protocol*1	Select the communication protocol.	
Data Length*1	Select the data length.	
Parity*1	Select the parity.	
Stop Bit*1	Select the stop bit.	
Transmission Speed*1	Select the transmission speed.	
Header*1	Set the header.	
Terminator*1	Set this to enable the terminator.	
Control Line*1	Set this to enable the control line.	
H/W Type*1	Select the cable type used in the communication.	
Control Mode	Display the control mode.	
Sum Check*1	Set this to add the sum check.	
Transmission Control Procedure*1	Select the transmission control procedure.	
Station Number Setting*1	Set the station number.	
Time Out Judge Time*1	Set the timeout period.	

*1 : Not applicable when "Operate Communication Setting" is OFF.

4) Device

Item	Description	Remarks
Device	Set the latch range.	FX1, FXU, FX2N, FX3U, FX2C, FX2NC, and FX3UC only

5) Memory Capacity

Item	Description	Remarks
Memory Capacity*1	Select the memory capacity of the programmable controller CPU. Not applicable to FX0, FX0S, FX0N, and FX1S.	FX0S, FX0, FX1, FX0N, FX1S, FX1N, FXU, FX2N, FX3G, FX3U, FX1NC, FX2C, FX2NC, FX3GC, and FX3UC only
Symbolic Information Capacity*2	• Display the symbolic information capacity of a built-in memory based on the setting value of the memory capacity. • Display the symbolic information capacity of a memory cassette by clicking the Check Other Items button.	FX3U and FX3UC only
Comments Capacity	Set the comment capacity. Not applicable to FX0 and FX0S.	FX0S, FX0, FX1, FX0N, FX1S, FX1N, FXU, FX2N, FX3G, FX3U, FX1NC, FX2C, FX2NC, FX3GC, and FX3UC only
File Register Capacity	Set the file register capacity. Not applicable to FX0, FX0S, and FX1.	
Program Capacity	Set the capacity for sequence programs.	
Special Function Memory Capacity	Set whether to use the Special Function Block Settings, Positioning Instruction Settings, and Built-in CC-Link/LT. Applicable to FX3G, FX3GC, FX3U, and FX3UC only.	

*1 : When the symbolic information is saved in a built-in memory or a memory cassette, the symbolic information is deleted by changing the memory capacity and writing the parameters. In this case, write the symbolic information again.

*2 : This item is not printed with the batch print function or the print window function.

6) Special Function Memory Capacity

Item	Description		Remarks
Special Function Block	Set the initial value of special extension modules/blocks. Set the Built-in CC-Link/LT Setting.		FX3U and FX3UC only
	Special Function Block Settings	Set the initial value of BFM.	
Positioning	• Set the bias speed, max. speed, creep speed, zero return speed, acceleration time, deceleration time, and interruption input of DVIT instruction for each axis. • Set the details of the positioning table for each axis.		FX3G, FX3U, FX3GC, and FX3UC only

7) Ethernet Port Setting

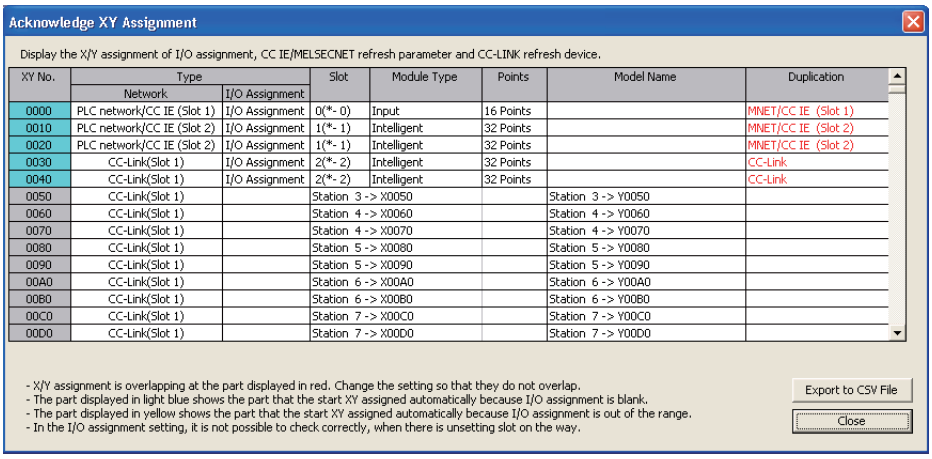
Item	Description	Remarks
Channel	Select whether to connect the Ethernet port, and if the port is connected, select a channel.	FX3G, FX3U, FX3GC, and FX3UC only
IP Address Setting	Set the IP address and the input format of the IP address.	
Communication Data Code	Select the Binary code or ASCII code for communication.	
Disable direct connection to MELSOFT	Select whether to disable the direct connection with MELSOFT.	
Do not respond to search for CPU on network	Select whether to respond to the CPU search on the network.	
Open Setting button	Set the protocol, open system, and host station port number.	
Time Setting button	Set whether to use the SNTP function, and set the timing of setting the time.	
Log Record Setting button	Set the storage location for error logs on the Log Record Setting screen.	

6.1.2 Checking duplications of X/Y assignment among parameters

Check duplications of X/Y assignment among parameters.

Screen display

Select Project view ⇒ "Parameter" ⇒ "PLC Parameter" ⇒ Acknowledge XY Assignment **.**



Display contents

<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">XY No.</td><td>Display the I/O number.</td></tr>
<tr><td rowspan="2">Type</td><td>Network</td><td>Display the content set in the network parameter.
n: Slot number of the module (excluding Ethernet)
<table>
<tr><th>Display on Network column</th><th>Description</th></tr>
<tr><td>PLC network/CC IE (Slot n)</td><td>MELSECNET, CC-Link IE</td></tr>
<tr><td>Remote I/O Net (Slot n)</td><td>MELSECNET/H (Remote Master)</td></tr>
<tr><td>CC-Link (Slot n)</td><td>CC-Link</td></tr>
<tr><td>Blank</td><td>Not set.</td></tr>
</table></td></tr>
<tr><td>I/O Assignment</td><td>Display whether the I/O assignment setting is set in the PLC parameter.
<table>
<tr><th>Display on I/O Assignment column</th><th>Description</th></tr>
<tr><td>I/O Assignment</td><td>I/O assignment is set.</td></tr>
<tr><td>Blank</td><td>I/O assignment is not set.</td></tr>
</table></td></tr>
<tr><td colspan="2">Slot
Module Type
Points
Model Name</td><td>Display the slot, module type, number of occupied I/O points, and model name when the I/O assignment setting is set in the PLC parameter.
Display the I/O assignment status as shown in the table below when the I/O assignment setting in the PLC parameter is not set and X/Y devices are assigned in the network parameter.
<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>"Slot" to "Points"</td><td>Assignment of X devices</td></tr>
<tr><td>"Model Name"</td><td>Assignment of Y devices</td></tr>
</table></td></tr>
<tr><td colspan="2">Duplication</td><td>Display the module in which the first duplication is detected by parameter check.
<table>
<tr><th>Display on Duplication column</th><th>Description</th></tr>
<tr><td>MNET/CC IE (Slot 1)
to
MNET/CC IE (Slot 16)</td><td>Network parameter of MELSECNET or CC-Link IE (slot 1 to slot 16)</td></tr>
<tr><td>CC-Link</td><td>CC-Link remote I/O</td></tr>
</table></td></tr>
</table>

Screen button

- Export to CSV File

  Writes data on the Acknowledge XY Assignment screen to a CSV file. (☞ Section 6.6)

Point

- **When a setting screen other than PLC parameter setting screen is being opened**

  When the MELSECNET/CC IE/Ethernet Module Configuration screen or the CC-Link Module Configuration screen is displayed, since the setting is not completed, set data of the previous setting are checked for duplications.

- **Priority in the parameter check**

  The following table shows the priority in when GX Works2 checks the parameter settings.

Priority	Display
1	I/O assignment
2	MELSECNET or CC-Link IE Controller Network (slot 16) network refresh parameter
3	MELSECNET or CC-Link IE Controller Network (slot 15) network refresh parameter
. . .	. . .
17	MELSECNET or CC-Link IE Controller Network (slot 1) network refresh parameter
18	CC-Link remote I/O

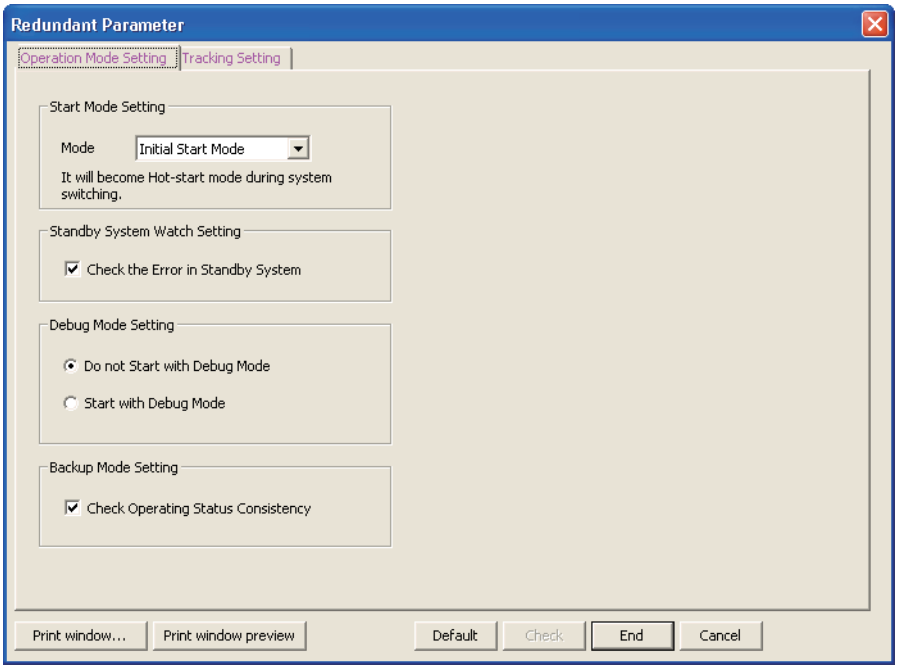
6.2 Setting Redundant Parameters

*1 : Redundant CPU only

This section explains how to set redundant parameters.

Screen display

Select Project view ⇒ "Parameter" ⇒ "Redundant Parameters".



Screen button

For the screen buttons, refer to Section 6.1.

■ Redundant parameter setting items

1) Operation mode setting

Item	Description
Start Mode Setting	Set the device status when the system is powered ON or reset.
Standby System Watch Setting	Set whether to check errors on the standby system. If an error occurs, the error can be checked with the PLC diagnostics function.
Debug Mode Setting	Set whether to start an operation in the debug mode.
Backup Mode Setting	Set whether to check the operating status consistency.

2) Tracking setting

Item	Description
Tracking Device Setting	Select a setting method for the tracking device.
Tracking Characteristics Setting	Set the tracking transfer mode.

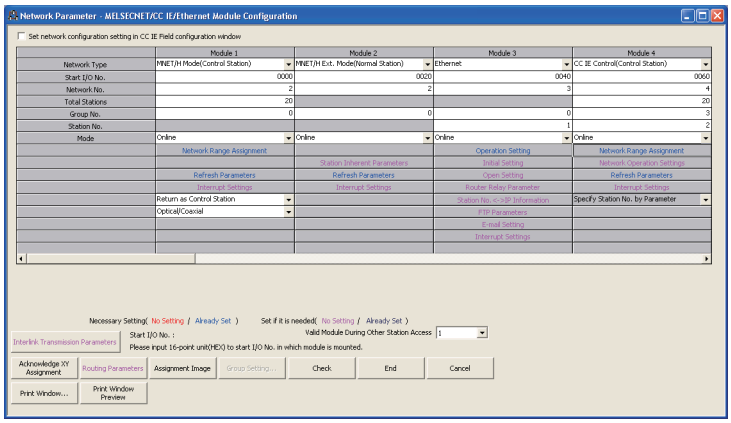
6.3 Setting Network Parameters

This section explains how to set the network parameters.
Only the parameter settings of the following network are supported for LCPU and FXCPU.
LCPU : CC-Link IE Field Network, Ethernet, and CC-Link
FXCPU: CC-Link

■ Ethernet/CC-Link IE/MELSECNET parameter setting

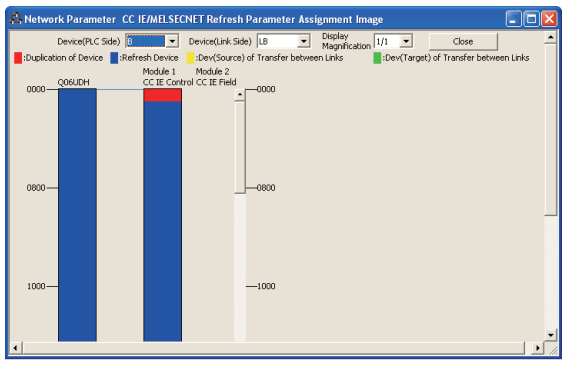
Screen display

Select Project view ⇒ "Parameter" ⇒ "Network Parameter" ⇒ "Ethernet/CC IE/MELSECNET"/ "CC IE Field" .
The screen below is a screen for MELSECNET/CC-Link IE/Ethernet module configuration.

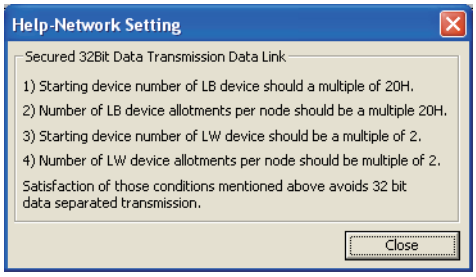


Screen button

- Interlink Transmission Parameters **(Not supported by LCPU)**
  Displays the Interlink Transmission Parameters screen.
- Acknowledge XY Assignment
  Checks the I/O assignment setting set in the PLC parameter and the status of X/Y devices assigned in the network parameter. (☞ Section 6.1.2)
- Routing Parameters
  Displays the Routing Information screen.
- Assignment Image
  Displays the Assignment Image screen of the refresh parameters.



- Group setting... **(Redundant CPU only)**
  Displays the Group Setting screen.
- Help-Network Setting
  Displays the Help - Network Setting screen for network range assignment.

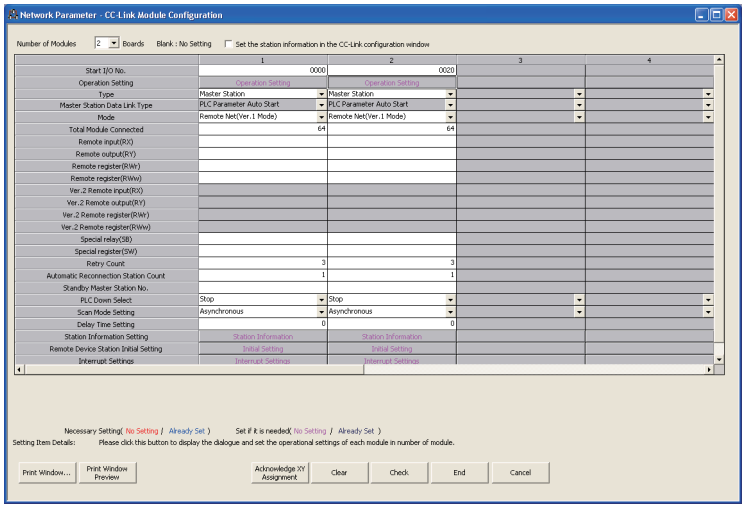


- Clear
  Deletes the set parameters.
- Check
  Checks whether the set parameters are correct.
- Print Window...
  Executes printing. (☞ Section 20.7)
- Print Window Preview
  Executes print preview. (☞ Section 20.9)

■ CC-Link parameter setting

Screen display

Select Project view ⇒ "Parameter" ⇒ "Network Parameter" ⇒ "CC-Link".
The following is an example of setting screen when QCPU (Q mode) is selected.



Screen button

● Print Window...
Executes printing. (☞ Section 20.7)

● Print Window Preview
Executes print preview. (☞ Section 20.9)

● Acknowledge XY Assignment **(Not supported by FXCPU)**
Displays the details of the I/O assignment settings. (☞ Section 6.1)

● Clear
Deletes the set parameters.

● Check
Checks whether the set parameters are correct.

Point

● **Function to apply the parameters of MELSOFT Navigator**

- Parameter items which can be set from MELSOFT Navigator are displayed in green when GX Works2 is started from MELSOFT Navigator.
- Parameters which are set by the function to apply the parameters of MELSOFT Navigator cannot be edited. To edit, select "Enable an editing of parameters set in MELSOFT Navigator" under [Tool] ⇒ [Options] ⇒ "iQ Works Interaction".

● **Number of columns displayed on the CC-Link Module Configuration screen (QCPU (Q mode)/LCPU only)**
A number of columns can be changed by selecting 4 or 2 columns for "Display number of columns for CC-Link list setting" under [Tool] ⇒ [Options] ⇒ "Parameter".

6.3.1 Network parameter item list

Q CPU L CPU Remote Head*1 FX

*1 : CC IE Field head module only

The following table shows the applicable network parameter types for each programmable controller type.
For details of each item, refer to the following manuals.
(☞ User's manuals and reference manuals of each module)

○: Applicable –: Not applicable

Network type	Q series				L series		FX series
	Basic model QCPU	High Performance model QCPU/ Process CPU/ Redundant CPU	Universal model QCPU	Remote I/O module	LCPU	CC IE Field head module	FXCPU
CC-Link IE Controller Network*1	○	○	○	–	–	–	–
CC-Link IE Field Network	–	–	○	–	○	–	–
MELSECNET/10	○	○	○	–	–	–	–
MELSECNET/H	○	○	○	–	–	–	–
MELSECNET/H Remote I/O	–	○	○	–	–	–	–
Ethernet	○	○	○	○	○	–	–
CC-Link	○	○	○	○	○	○	○*2

*1 : CC-Link IE Controller Network modules with the function version D and a serial number whose first 5 digits are '10041' or higher are supported.
For Process CPU and Redundant CPU, CC-Link IE Controller Network modules with a serial number whose first five digits are '10042' or higher is required.

*2 : Supported by FX3G, FX3GC, FX3U, and FX3UC only.

■ CC-Link IE setting

Item		Description
Network Type		Specify the network type (CC-Link IE) whose parameters are to be set.
Start I/O No.		Set the start I/O number.
Network No.		Set the network number.
Total Stations		Set the total number of (slave) stations.
Group No.*1		Set the group number.
Station No.		Set the station number of a module.
Mode		Set the mode.
Network Range Assignment/ Network Configuration Settings (Common parameters)	Specify I/O Master Station*1	Set the I/O master station.
	Specify Reserved Station*1	Specify the reserved station.
	Equal Assignment	Assign the number of link device points of all stations equally.
	Identical Point Assignment	Assign the equal number of link device points based on the total number of set stations.
	Shared Group Setting*2	Set the shared group of the group cyclic function.
	Supplementary Setting	Set the link scan mode setting, loopback function setting, block data assurance per station, and operation setting for returning.
Network Operation Settings*3		Set the parameter name, data link faulty station setting, output setting during CPU STOP, IP address setting, and other settings.
Refresh Parameters		Set refresh parameters.
Interrupt Settings		Set the device code, detection method, interrupt condition, interrupt (SI) number, and other settings.
Specification method for station number		Set whether to set a station number by program or by parameter. The station number can be specified by program only when the normal station or the local station is selected in a project for Universal model QCPU/LCPU.
Operate with parameter of host/ master station*4		Set whether to operate link device points and assignments of the slave station with the parameter set on the host station or the parameter set on the master station. This item can be set for sub-master station only.
Redundant Setting		Set the system B mode.

*1 : For CC-Link IE Controller Network only
*2 : For CC-Link IE Controller Network of Universal model QCPU only
*3 : For CC-Link IE Controller Network of Universal model QCPU (except for Q00UJ/Q00U/Q01U/Q02U), IP address setting only
*4 : For CC-Link IE Field Network only

■ MELSECNET/10 and MELSECNET/H setting

Item		Description
Network Type		Specify the network type (MELSECNET/10 mode or MELSECNET/H mode) whose parameters are to be set.
Start I/O No.		Set the start I/O number.
Network No.		Set the network number.
Total Stations		Set the total number of (slave) stations.
Group No.		Set the group number.
Mode		Set the mode.
Network Range Assignment (Common parameters)	Specify I/O Master Station	Set the I/O master station.
	Specify Reserved Station	Specify the reserved station.
	Equal Assignment	Assign the number of link device points of all stations equally.
	Identical Point Assignment	Assign the equal number of link device points based on the total number of set stations.
	Supplementary Setting	Set the transient setting, low-speed cyclic setting, and other settings.
	Station Inherent Parameters	Set station inherent parameters.
Refresh Parameters		Set refresh parameters.
Interrupt Settings		Set the device code, detection method, interrupt condition, interrupt (SI) number, and other settings.
Operation at reconnection*1		Set whether to operate the station as a control station or a normal station when the line is reconnected.
Baud Rate Setting*1		Set the baud rate on modules that support the twist bus.
Redundant Setting		Set the system B mode.

*1 : For MELSECNET/H (control station) and MELSECNET/H extended mode (control station) only

■ MELSECNET/H Remote I/O setting

Item		Description
Network Type		Set "MELSECNET/H (remote master)".
Start I/O No.		Set the start I/O number.
Network No.		Set the network number.
Total Stations		Set the total number of (slave) stations.
Mode		Set the mode.
Network Range Assignment (Common parameters)	Specify Reserved Station	Specify the reserved station.
	Equal Assignment	Assign the number of link device points of all stations equally.
	Supplementary Setting	Set the constant scan time and the maximum number of return stations in one link scan.
Refresh Parameters		Set refresh parameters.
Interrupt Settings		Set the device code, detection method, interrupt condition, interrupt (SI) number, and other settings.
Redundant Setting		Set the system B mode.

■ Ethernet setting

Item		Description
Network Type		Specify "Ethernet".
Start I/O No.		Set the start I/O number.
Network No.		Set the network number.
Group No.		Set the group number.
Station No.		Set the station number.
Mode		Set the mode.
Operation Setting		Set the common items for the module.
Initial Setting		• Set data communication timer values. • Set IP addresses for DNS servers.
Open Setting		Set parameters required for the open processing.
Router Relay Parameter		Set parameters for the router relay function of Ethernet.
Station No. ⇔ IP Information		Set information to link network number and station number with IP address for communication target station or relay station when communicating with another station programmable controller CPU via Ethernet.
FTP Parameters*1		Set FTP parameters such as the login name, password, command input monitoring timer, and PLC monitoring timer.
E-mail Setting*1	General Setting	Set the password, e-mail address, and inquiry interval for receiving mails.
	Mail Server Name	Set the SMTP server, POP server, and IP addresses for both servers.
	Send Mail Address Setting	Set addresses of send mail.
	News Setting	Set the notifying condition.
Interrupt Settings*1		Set the device code, detection method, interrupt condition, interrupt (SI) number, and other settings.
Redundant Setting*2		Set the system B, system switching settings when communication error occurs, and other settings.

*1 : Not supported by remote I/O module.

*2 : The redundant setting cannot be set when "Ethernet (Extension Base)" is selected. (Different IP addresses cannot be assigned to each system.)

Point

● **Connecting MELSOFT products via Ethernet**
When connecting a MELSOFT product (such as GX Works2) via Ethernet, select "MELSOFT Connection" for "Open System" on the Ethernet Open Setting screen. For details of the setting, refer to Ethernet Interface Module User's Manual.
'MELSOFT Connection' is supported by Q series-compatible E71 function version B modules with a serial number whose first 5 digits are '02122' or higher.

■ QCPU (Q mode)/LCPU CC-Link setting

Item	Description
Number of Modules	Set the number of CC-Link master/local modules.
Set the station information in the CC-Link configuration window	Select this to set station information on the CC-Link configuration window.
Start I/O No.	Set the start I/O number.
Operation Setting	Set the Parameter Name, Data Link Disorder Station, Case of CPU Stop Setting, Number of Exclusive Station, Expanded Cyclic Setting, Block Data Assurance per Station, and Auto Detect Setting of the Connected Device.
Type	Set the station type such as a master/local/standby master station.
Station No.*1	Set the station number.
Master Station Data Link Type	The setting is fixed to "PLC Parameter Auto Start" for the master station.
Mode	Set the mode.
Transmission Speed*1	Set the transmission speed.
Total Module Connected	Set the total number of remote stations, local stations, intelligent device stations, and/or standby master stations connected to the master station.
Remote Input (RX)	Set the devices to refresh the data of RX, RY, RWr, and RWw.
Remote Output (RY)	
Remote Register (RWr)	
Remote Register (RWw)	
Ver.2 Remote Input (RX)	Set the devices to refresh the data of RX, RY, RWr, and RWw for the remote network additional mode.
Ver.2 Remote Output (RY)	
Ver.2 Remote Register (RWr)	
Ver.2 Remote Register (RWw)	
Special Relay (SB)	Set the devices to refresh the data of SB and SW.
Special Register (SW)	
Retry Count	Set the number of retries in case a communication error occurs.
Automatic Reconnection Station Count	Set the number of remote stations, local stations, intelligent device stations, and/or standby master stations that can be returned to the system in one link scan.
Standby Master Station No.	Specify the station number of the standby master station.
PLC Down Select	Specify the data link status when an error occurs on the programmable controller CPU on the master station.
Scan Mode Setting	Specify whether to synchronize the link scan with the sequence scan.
Delay Time Setting	Set the link scan interval delay time.
Station Information Setting*2	The setting screen and the setting items differ according to the selected/cleared status of "Set the station information in the CC-Link configuration window". • Cleared Set station information on the CC-Link Station Information screen. Set the settings such as the station type and the number of occupied stations. A number of rows can be changed by selecting 16 or 8 rows for "Display number of rows for CC-Link station information" under [Tool] ⇒ [Options] ⇒ "Parameter". • Selected Set station information on the CC-Link configuration window. In addition to the setting items on the CC-Link Station Information screen, settings such as the module type are set. The equipment configuration is displayed graphically.
Remote Device Station Initial Setting	Set the target station number and procedure registration (such as operating condition and executing condition).
Interrupt Settings*3	Set the device code, detection method, interrupt condition, interrupt (SI) number, and other settings.

*1 : For LCPU and CC IE Field head module only.

*2 : With the station information set on the CC-Link configuration window, only the corresponding setting items on the CC-Link Station Information screen are printed when executing the batch print or print window function. The equipment configuration on the CC-Link configuration window is not printed.

*3 : Not supported by CC IE Field head module and remote I/O module.

■ FXCPU CC-Link setting

This parameter setting is supported by FX3G, FX3GC, FX3U, and FX3UC only.

Item	Description
Connection Block	Select "Set" to set a CC-Link master block.
Special Function Block No.	Specify the special function block number (0 to 7).
Operation Setting	Set the Parameter Name, Data Link Disorder Station, and Case of CPU Stop Setting.
Type	This setting is fixed to "Master Station" when "Set" is selected for "Connection Block".
Master Station Data Link Type	This setting is fixed to "PLC Parameter Auto Start" when "Set" is selected for "Connection Block".
Mode	Set the mode.
Total Module Connected	Set the total number of remote I/O stations, remote device stations, and/or intelligent device stations (including reserve stations) connected to the master station.
Retry Count	Set the number of retries in case a communication error occurs.
Automatic Reconnection Station Count	Set the number of remote I/O stations, remote device stations, and/or intelligent device stations that can be returned to the system in one link scan.
PLC Down Select	Specify the data link status when an error occurs on the programmable controller CPU on the master station.
Station Information Setting	Set the station type, exclusive counts, and other settings. A number of rows can be changed by selecting 16 or 8 rows for "Display number of rows for CC-Link station information" under [Tool] ⇒ [Options] ⇒ "Parameter".
Remote Device Station Initial Setting	Set the target station number and procedure registration (such as operating condition and executing condition).

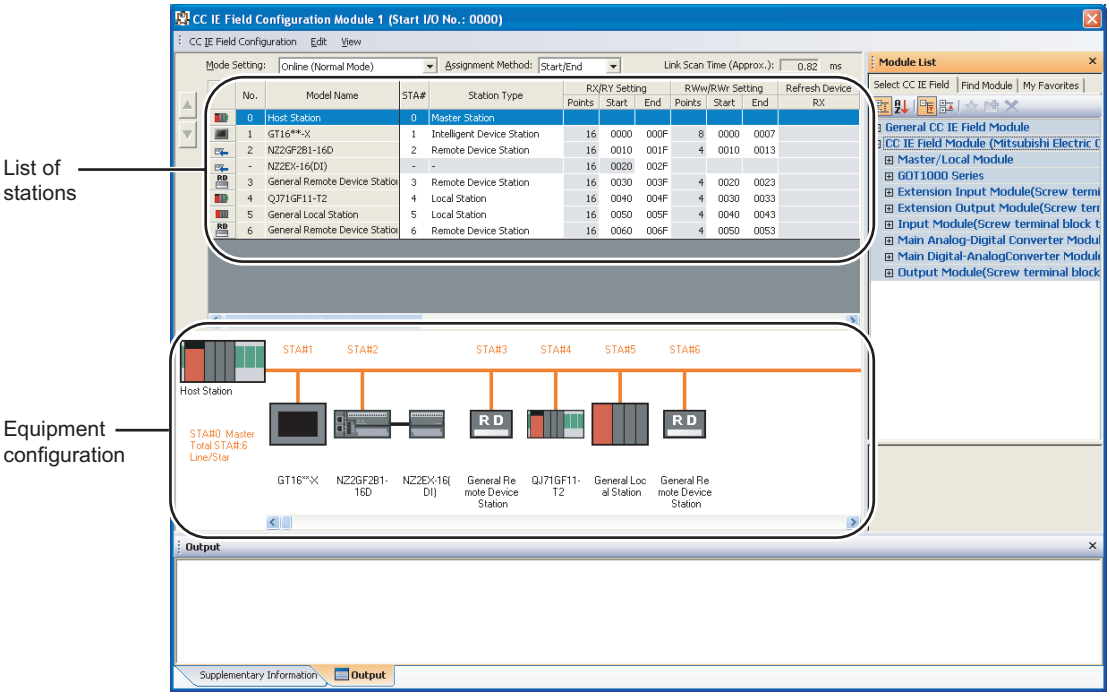
6.3.2 Setting station information on CC IE Field configuration window

Q CPU L CPU Remote Head FX

Network configuration and equipment configuration of CC-Link IE Field Network can be set when "CC IE Field (Master Station)" or "CC IE Field (Sub-Master Station)" is set in the CC-Link IE Field Network parameter.
Select "Set the network configuration setting in the CC IE Field configuration window" on the MELSECNET/CC-Link IE/Ethernet Module Configuration screen in advance.

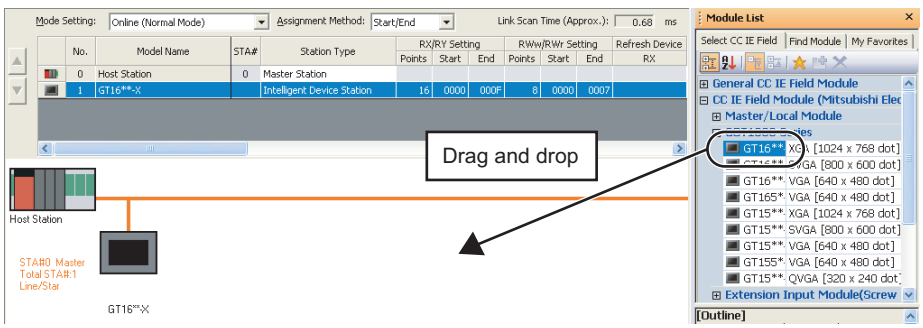
Screen display

Click the [CC IE Field Configuration Setting] button on the MELSECNET/CC-Link IE/Ethernet Module Configuration screen.



Operating procedure

1. **Select the module from the module list, and drag and drop it to the 'list of stations' or 'equipment configuration'.**
   The slave station is added to the 'list of stations'.
   The added module is displayed on the 'equipment configuration'.



2. Set the items on the screen.

Item		Description
Mode Setting		Select the mode by clicking ▼.
Assignment Method		Specify the assignment method by clicking ▼.
Link Scan Time (Approx.)		Display the approximate value of link scan time.
List of stations		Display the list of stations which configure CC-Link IE Field Network.
	Module No.	"0" is displayed for master station, and 'slave station number' is displayed for slave station.
	Model Name	Display the module type of master station/slave station. When the module information does not exist, "Module without profile" is displayed. Set this item after registering the profile.
	Station No.	Set the station number of the master station/slave station in the range from 1 to 120.
	Station Type	Display the station type of master station/slave station. Click the cell and select the station type displayed by clicking ▼.
	RX/RY Setting	Set the RX/RY assignment for each slave station. Set RX/RY in 16-point unit.
	RWw/RWr Setting	Set the RWw/RWr assignment for each slave station. Set RWw/RWr in 4-point unit.
	Refresh Device	Display devices of the CPU module to which link devices of master/local module are link-refreshed. This item is displayed only when the refresh parameter is set.
	Reserved/Error Invalid Station	Display the setting status of reserved station/error invalid station for slave station. Click the cell and select the reserved station/error invalid station displayed by clicking ▼.
	Alias	Display the device name.
	Comment	Display the information set to comment 1 on the Property screen.
	Station-specific mode setting	Display the station-specific mode of the module.
Equipment configuration		Display the equipment configuration of CC-Link IE Field Network graphically.

3. Select [CC IE Field Configuration] ⇒ [Close with Reflecting the Setting].

Exit the settings of the CC-Link configuration window.

Screen button

- ▲/▼

  Moves the position of the module selected in the 'list of stations' up/down. The station number does not change even when the position of the module is moved.

Point

● **Considerations when the selected status of "Set the network configuration setting in the CC IE Field configuration window" is changed**

The following are the considerations when editing the network configuration by changing selected/cleared status.

- Selecting the item
  The network configuration of "CC IE Field (Master Station)" or "CC IE Field (Sub-Master Station)" set on the MELSECNET/CC-Link IE/Ethernet Module Configuration screen is set on the CC IE Field configuration window automatically.
  Note that, all modules of the network configuration are changed to general-purpose CC IE Field modules. The file size of parameter to be written to the programmable controller CPU increases.
- Clearing the item
  The network configuration set on the CC IE Field configuration window is set on the MELSECNET/CC-Link IE/Ethernet Module Configuration screen automatically.

● **Setting general-purpose CC IE Field modules**

When a non-Mitsubishi module or a module which is not displayed on the module list is used, drag and drop a general-purpose CC IE Field module.
A general-purpose CC IE Field module can be replaced with a specific module.
(☞ ■ Replacing general-purpose CC IE Field module)

● **Display of module name on the 'equipment configuration'**

"Object Name" on the Properties screen is displayed for each module name on the 'equipment configuration'.

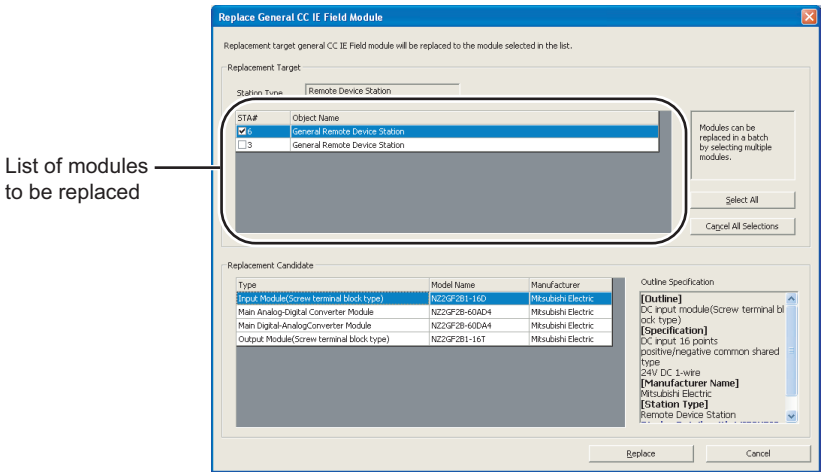
■ Replacing general-purpose CC IE Field module

Replace a general-purpose CC IE Field module of slave station with a specific module.

Operating procedure

1. **Select the general-purpose CC IE Field module to be replaced in the 'list of stations' on the CC IE Field configuration window.**

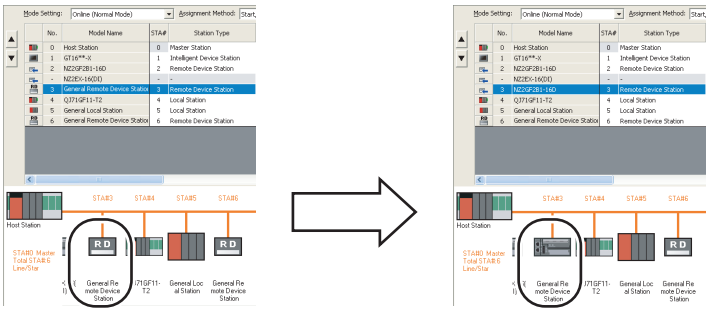
2. **Select [CC IE Field Configuration] ⇒ [Change Module] ⇒ [Replace General CC IE Field Module].**
   The Replace General CC IE Field Module screen is displayed.



3. **Set the items on the screen.**

Item		Description
Replacement Target		–
	Station Type	Display the station type selected on the CC IE Field configuration window.
	List of modules to be replaced	Display modules with the same condition as the one selected for "Replacement Target". Select the check box(es) on the "Station Number" column of the module to be replaced. Two or more modules can be selected.
Replacement Candidate		Select the module to be replaced with.

4. **Click the** Replace **button.**
   The general-purpose CC IE Field module in the list of stations is replaced with the module selected for "Replacement Candidate".
   The general-purpose CC IE Field module displayed on the 'equipment configuration' is replaced with the module selected for "Replacement Candidate".



The general-purpose module is replaced with the selected module.

Screen button

- Select All
  Selects all modules displayed on "Replacement Target".
- Cancel All Selections
  Cancels the selected status of all modules selected for "Replacement Target".

■ Replacing to general-purpose CC IE Field module

Replace a module of slave station to a general-purpose CC IE Field module.

Operating procedure

1. **Select a module to be replaced in the 'list of stations' on the CC IE Field configuration window.**

2. **Select [CC IE Field Configuration] ⇒ [Change Module] ⇒ [Change to General CC IE Field Module].**
   The module is replaced to the corresponding general-purpose CC IE Field module.

■ Changing transmission path method

Change the transmission path method to line/star or ring.

Operating procedure

- **Select [CC IE Field Configuration] ⇒ [Change Transmission Path Method] ⇒ [Line/Star]/[Ring].**
  The transmission path method is changed to the selected transmission path method.

Point

● **Transmission path method and loopback function setting**
The change of transmission path method and the loopback function setting on the CC IE Field Supplementary Setting screen are linked.
When line/star is selected, the loopback function setting is disabled.
When ring is selected, the loopback function setting is enabled.

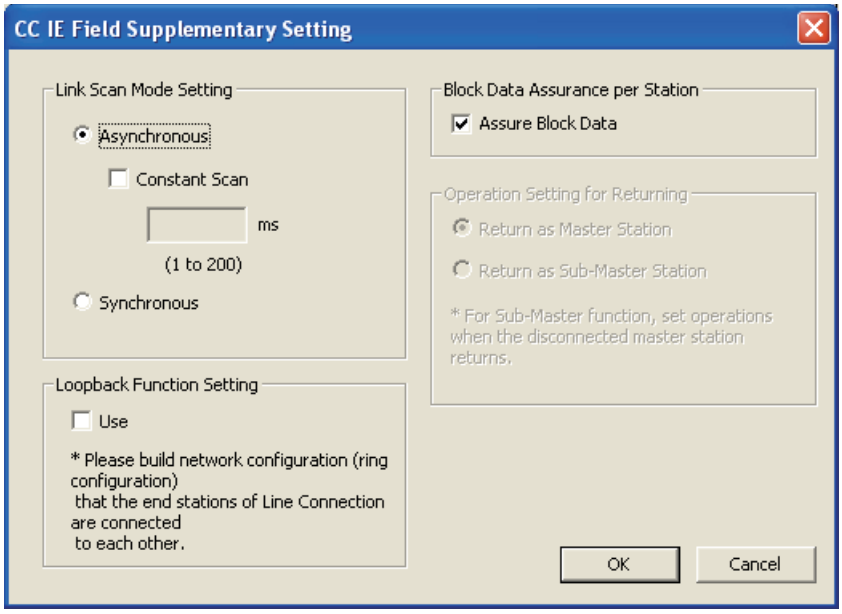
■ Setting supplementary functions

Set the link scan mode setting, loopback function setting, block data assurance per station, and operation setting for returning.

Operating procedure

1. **Select [CC-IE Field Configuration] ⇒ [Supplementary Setting].**

   The CC IE Field Supplementary Setting screen is displayed.



2. **Set the items on the screen.**

Item	Description
Link Scan Mode Setting	Set the link scan mode.
Loopback Function Setting	Set whether to use the loopback function. Select this item when the transmission path method is ring.
Block Data Assurance per Station	Set whether to assure block data per station for link refreshes between the CPU module and the master/local module. Select this when including a remote device station in the network configuration.
Operation Setting for Returning	Set whether to operate the station as a master station or a sub-master station when the station is reconnected.

3. **Click the** OK **button.**

   The settings are applied to the CC IE Field configuration window.

Point

● **Transmission path method and loopback function setting**

The change of transmission path method and the loopback function setting on the CC IE Field Supplementary Setting screen are linked.

When "Use" is cleared for the loopback function setting, line/start is selected for the setting under [CC IE Field Configuration] ⇒ [Change Transmission Path Method].

When "Use" is selected for the loopback function setting, ring is selected for the setting under [CC IE Field Configuration] ⇒ [Change Transmission Path Method].

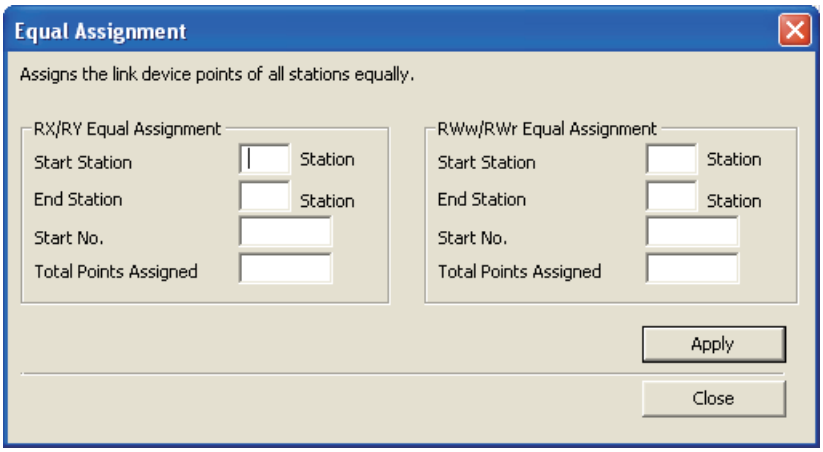
■ Assigning link devices equally

Assign link device points of all stations equally.

Operating procedure

1. **Select [CC IE Field Configuration] ⇒ [Equal Assignment].**

   The Equal Assignment screen is displayed.



2. **Set the items on the screen.**

Item		Description
RX/RY Equal Assignment		
	Start Station	Set the start station number to be assigned equally.
	End Station	Set the last station number to be assigned equally.
	Start No.	Set the start number of the link device to be assigned equally.
	Total Points Assigned	Set the total number of link device points to be assigned equally.
RWw/RWr Equal Assignment		
	Start Station	Set the start station number to be assigned equally.
	End Station	Set the last station number to be assigned equally.
	Start No.	Set the start number of the link device to be assigned equally.
	Total Points Assigned	Set the total number of link device points to be assigned equally.

3. **Click the [Apply] button.**

   Link devices are assigned equally to the slave stations within the set range.

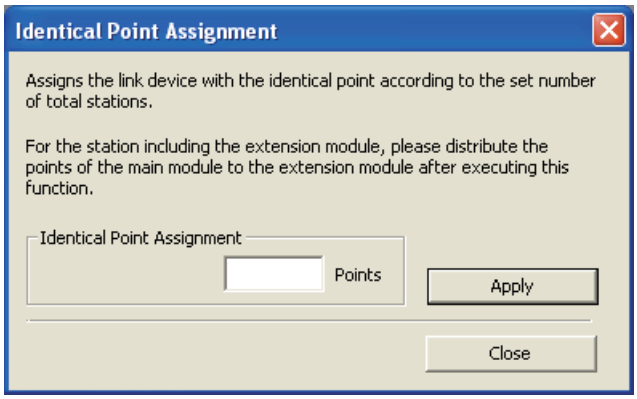
■ Assign the equal number of link device points

Assign the equal number of link device points based on the total number of set stations.

Operating procedure

1. **Select [CC IE Field Configuration] ⇒ [Identical Point Assignment].**

   The Identical Point Assignment screen is displayed.



2. **Enter the number of points to be assigned.**

3. **Click the** Apply **button.**

   The equal number of points is assigned per stations.

■ Checking system configuration of CC-Link IE Field Network

Check whether the equipment configuration of CC IE Field is correct after setting the network configuration on the CC IE Field configuration window.

Operating procedure

- **Select [CC IE Field Configuration] ⇒ [Check] ⇒ [System Configuration].**

  The system configuration of CC-Link IE Field Network is checked.
  Check the result of the system configuration check on the Output window.

■ Performing parameter processing of slave station

Perform the processing relates to parameters of slave stations.
The applicable parameter processing differs according to the target slave station.
The setting status and setting values of the Parameter Processing of Slave Station screen can be saved in the CSV file format.

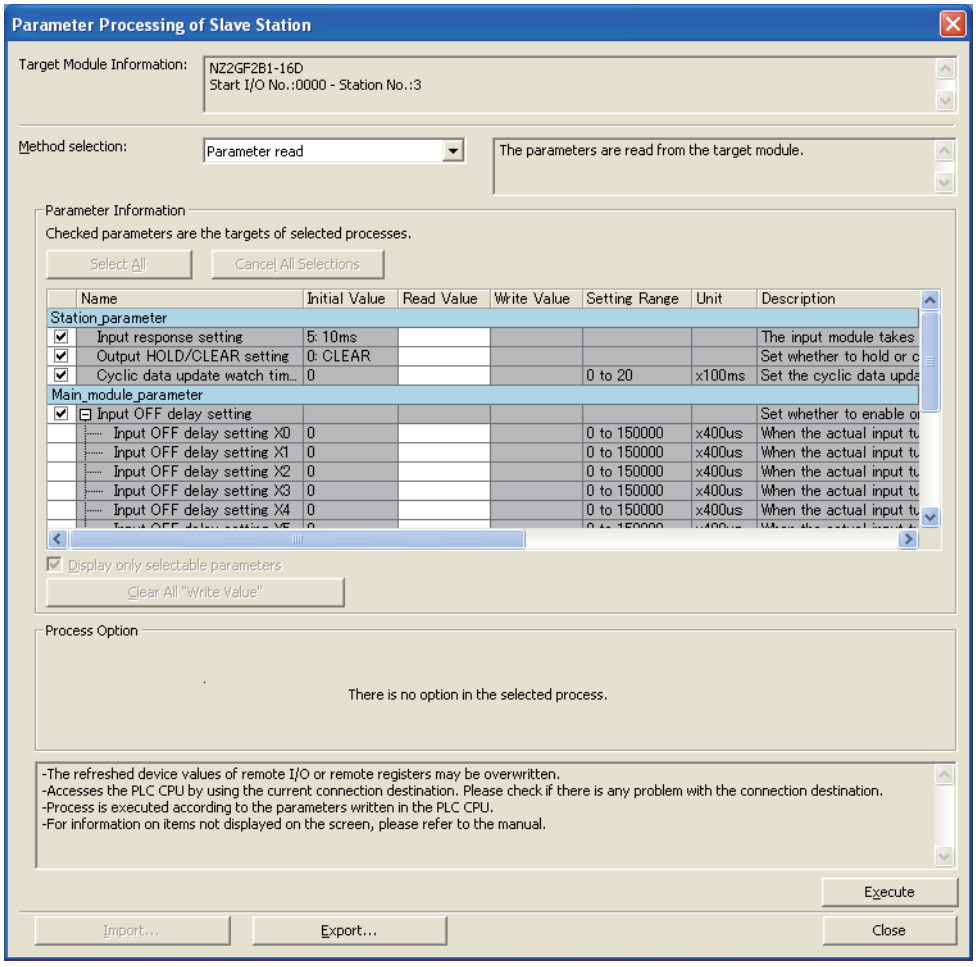
Point

● Considerations when performing parameter processing
Check the following before performing the parameter processing.
- The programmable controller CPU set as a connection target is in STOP status.
- The network parameter of master station matches with the start I/O number of PLC parameter.
- The network parameter of programmable controller CPU matches with the actual CC IE Field configuration.

Operating procedure

1. **Select a module to which parameters are applied from the 'list of stations' on the CC IE Field configuration window.**

2. **Select [CC IE Field Configuration] ⇒ [Parameter Processing of Slave Station].**
   The Parameter Processing of Slave Station screen is displayed.
   The following is a screen of NZ2GF2B1-16D.



3. Set the items on the screen.

Item	Description
Target Module Information	Display the slave stations on which the parameter processing is performed.
Method selection	Select a processing to be performed from the list displayed by clicking ▼.
Parameter Information	Display the parameters of the slave station. The selected parameters are the targets of the selected process to be executed.
Process Option	Set this for the processing selected for "Method selection".

4. Click the Execute button.

The parameter processing is performed.

Screen button

- Select All

  Selects all parameters of "Parameter Information".
- Cancel All Selections

  Cancels the selected status of all the parameters selected for "Parameter Information".
- Import...

  Imports the selected status and writing values of "Parameter Information" saved in the CSV file format in advance.
- Export...

  Saves the selected status and writing values of "Parameter Information" in the CSV file format.

■ Performing commands for slave stations

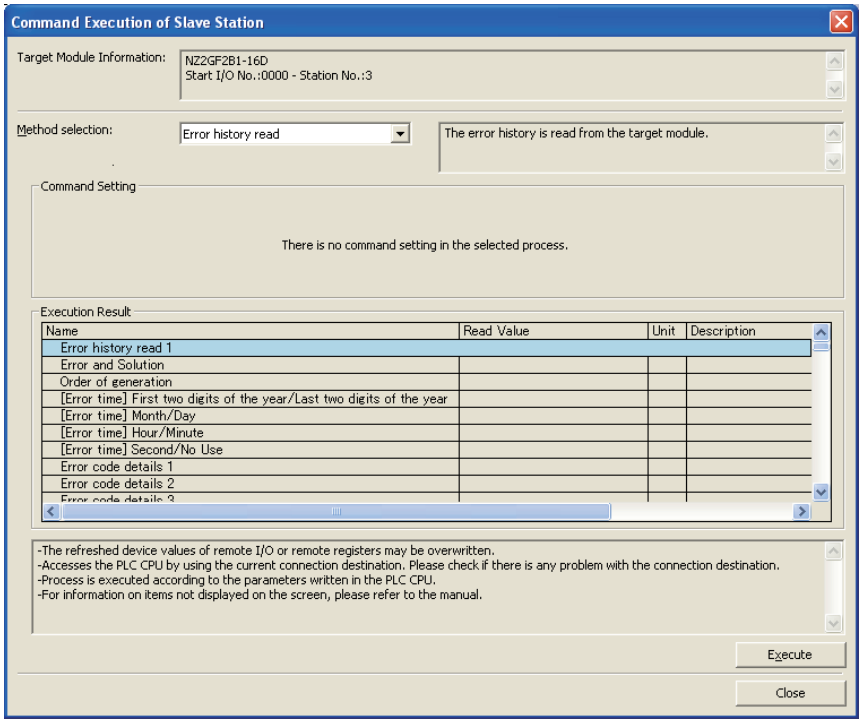
Perform commands for slave stations.
Applicable commands differ according to the target slave station.

Operating procedure

1. **Select a module on which a command is performed from the 'list of stations' on the CC IE Field configuration window.**

2. **Select [CC IE Field Configuration] ⇒ [Command Execution of Slave Station].**

   The Command Execution of Slave Station screen is displayed.
   The following is a screen of NZ2GF2B1-16D.



3. **Set the items on the screen.**

Item	Description
Target Module Information	Display the information of target module on which the command is performed.
Method selection	Select a processing to be performed from the list displayed by clicking ▼.
Command Setting	Set the writing values set for the processing selected for "Method selection". For details, refer to the manual of the slave station being used.

4. **Select the** Execute **button.**

   The command processing is performed.
   The result of the processing is displayed on "Execution Result".

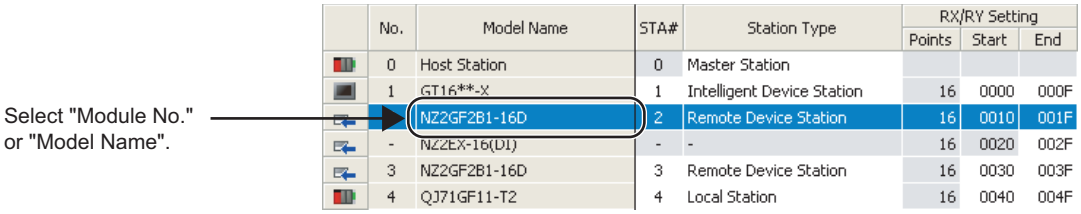
■ Copying/pasting modules

Copy/paste a selected module.

Operating procedure

1. **Select "Module No." or "Model Name" of the CC-Link module to be copied from the 'list of stations'.**

   The corresponding row is selected.



2. **Select [Edit] ⇒ [Copy].**

   The selected module is copied.

3. **Select [Edit] ⇒ [Paste].**

   The copied module is added to the last row of the 'list of stations'.

Point

● **Selected status of modules**

All cells on the 'list of stations' can be selected by selecting [Edit] ⇒ [Select All].

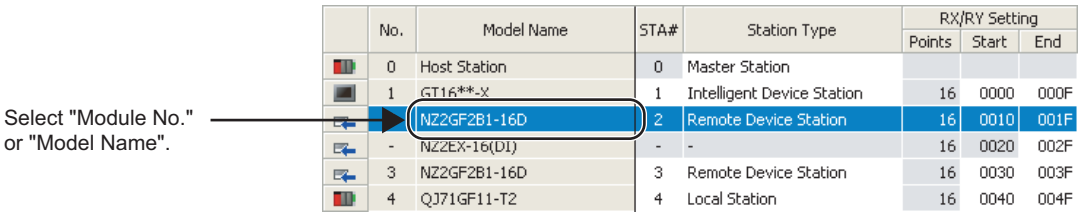
■ Deleting modules

Delete a selected module.

Operating procedure

1. **Select "Module No." or "Model Name" of the module to be deleted from the 'list of stations'.**

   The corresponding row is selected.



2. **Select [Edit] ⇒ [Delete].**

   The selected module is deleted.

■ Displaying/hiding Module List/Output/Supplementary Information window

Display/hide the Module List/Output/Supplementary Information window.

Operating procedure

- **Select [View] ⇒ [Docking Window] ⇒ [Module List]/[Output]/[Supplementary Information].**

Point

● **Displaying Module List/Output/Supplementary Information window**
The Module List/Output/Supplementary Information window can be displayed as a docked display/floating display.
(☞ Section 3.2.4 "Docking windows")

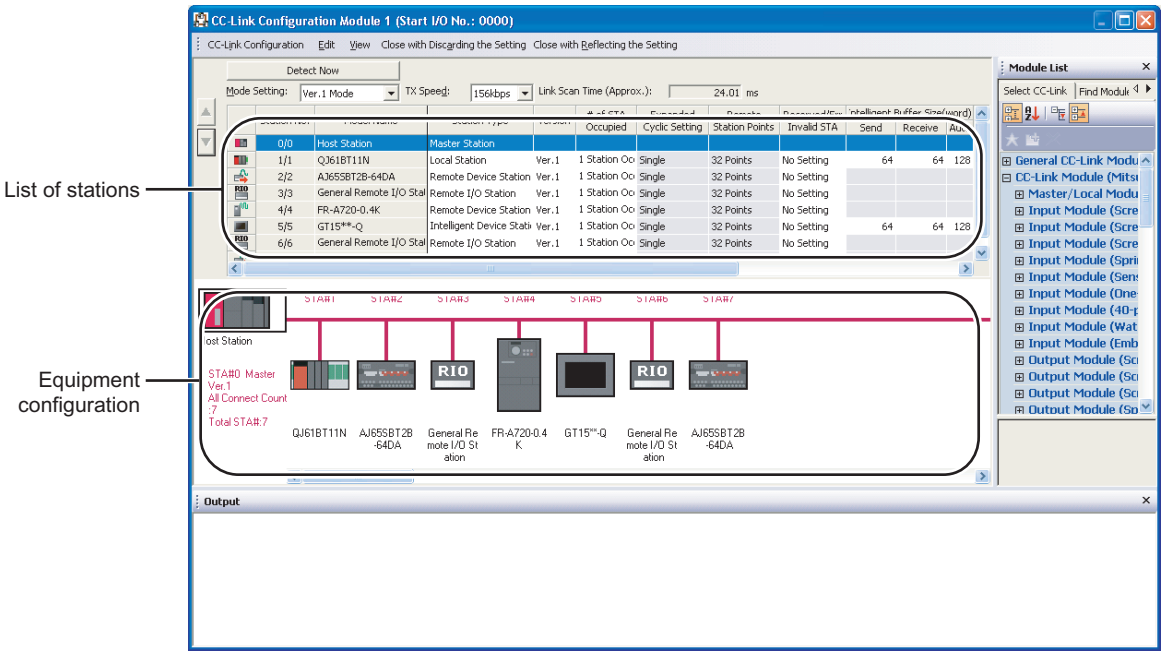
6.3.3 Setting station information on CC-Link configuration window

Q CPU L CPU Remote Head FX

Station information and equipment configuration of CC-Link can be set when master station or master station (duplex function) is set in the CC-Link network parameter.
Select "Set the station information in the CC-Link configuration window" on the CC-Link network parameter screen in advance.

Screen display

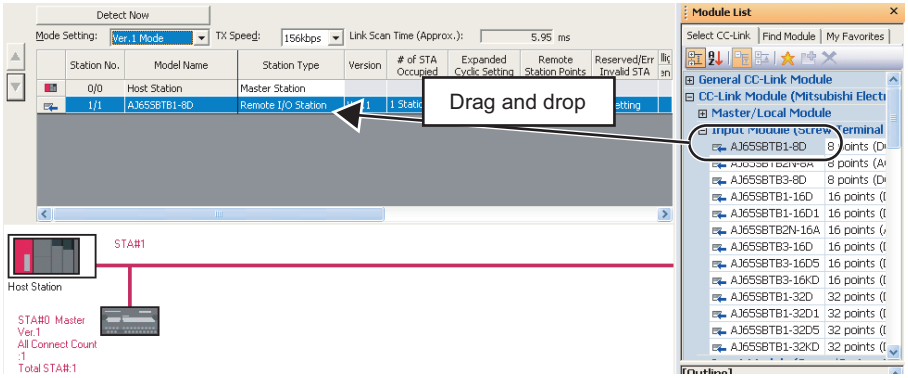
Click CC-Link Configuration Setting on the network parameter screen of CC-Link.



Operating procedure

1. **Select a module from the module list, and drag and drop it to the 'list of stations' or 'equipment configuration'.**

   A slave station is added to the 'list of stations'.
   The added module is displayed on the 'equipment configuration'.



2. Set the items on the screen.

Item		Description
Mode Setting		Select the mode by clicking ▼.
TX Speed		Set the transmission speed by clicking ▼.
Link Scan Time (Approx.)		Display the approximate value of link scan time.
List of stations		Display the list of stations which configure CC-Link network.
	Module No./Station No.	Display the number of slave stations and station numbers set to the master station. "0/0" is displayed for master station, and 'slave station number/station number' is displayed for slave station. Example: For a module set as the 3rd module of the slave station and its station number is 6: 3/6
	Model Name	Display the module type of master station/slave station. When the module information does not exist, "Module without profile" is displayed.
	Station Type	Display the station type of master station/slave station. Click the cell and select the station type displayed by clicking ▼.
	Version	Display the module version of slave station. Click the cell and select the version displayed by clicking ▼.
	# of STA Occupied	Display the number of occupied stations of slave station. Click the cell and select the number of occupied stations displayed by clicking ▼.
	Expanded Cyclic Setting	Display the expanded cyclic setting of slave station.
	Remote Station Points	Display the number of remote station points of slave station.
	Reserved/Err Invalid STA	Display the setting status of reserved station/error invalid station for slave station. Click the cell and select the reserved station/error invalid station displayed by clicking ▼.
	Intelligent Buffer Size (word)	Display buffer memory for Send/Receive/Auto when the salve station is an intelligent device station. Click the cell and enter the value.
	Station-specific mode setting	Display the setting when the station-specific mode setting is supported by the slave station. Click the cell and select the station-specific mode displayed by clicking ▼.
Equipment configuration		Display the equipment configuration of CC-Link network graphically.

3. Select [Close with Reflecting the Setting].

Exit the settings of the CC-Link configuration window.

Screen button

- Detect Now **(LCPU only)**

  Acquires the station information and equipment configuration from the actual system configuration and displays them on the CC-Link configuration window.
  For operations and considerations of setting station information and equipment configuration with the Detect Now, refer to the following manual.
  ☞ iQ Sensor Solution Reference Manual

- ▲/▼

  Moves the position of the module selected in the 'list of stations' up/down.

Point

● **Considerations when the selected status of "Set the station information in the CC-Link configuration window" is changed**

The following are the considerations when editing the station information by changing selected/cleared status.

- Selecting the item
  The station information set on the CC-Link Station Information screen is set on the CC-Link configuration window automatically.
  Note that, all modules of the station information are changed to general-purpose CC-Link modules. The file size of parameter to be written to the programmable controller CPU increases.
- Clearing the item
  The station information set on the CC-Link configuration window is set on the CC-Link Station Information screen automatically.

● **Setting general-purpose CC-Link modules**

When a non-Mitsubishi module or a module which is not displayed on the module list is used, drag and drop a general-purpose CC-Link module.
A general-purpose CC-Link module can be replaced with a specific module.
(☞ ■ Replacing general-purpose CC-Link module)

● **Display of module name on the 'equipment configuration'**

"Object Name" on the Properties screen is displayed for each module name on the 'equipment configuration'.

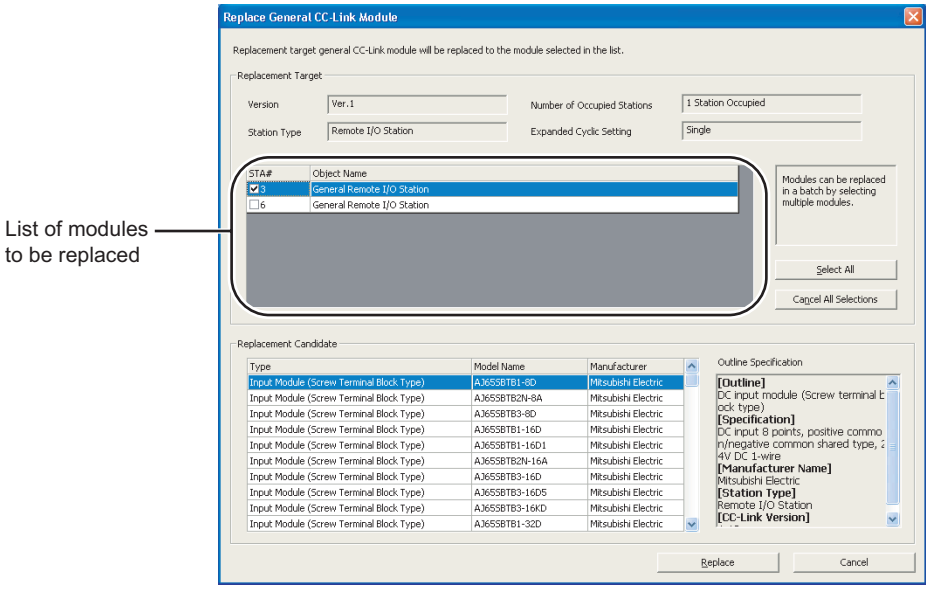
■ Replacing general-purpose CC-Link module

Replace a general-purpose CC-Link module of slave station with a specific module.
A description of link device is displayed on the CC-Link Device Reference window by replacing a general-purpose CC-Link module with a specific module.

Operating procedure

1. **Select a general-purpose CC-Link module to be replaced in the 'list of stations' on the CC-Link configuration window.**

2. **Select [CC-Link Configuration] ⇒ [Change Module] ⇒ [Replace General CC-Link Module].**
   The Replace General CC-Link Module screen is displayed.

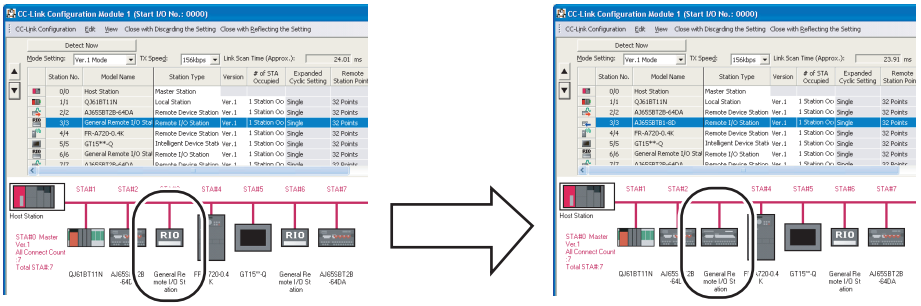


3. **Set the items on the screen.**

Item		Description
Replacement Target		Display the version, the number of occupied stations, station type, and expanded cyclic setting of the module selected on the CC-Link configuration window.
	List of modules to be replaced	Display modules with the same condition as the module selected for "Replacement Target". Select the check box(es) on the "Station Number" column of the module to be replaced. Two or more modules can be selected.
Replacement Candidate		Select a module to be replaced with.

4. **Click the** Replace **button.**

The general-purpose CC-Link module in the list of stations is replaced with the module selected for "Replacement Candidate". The general-purpose CC-Link module displayed on the 'equipment configuration' is replaced with the selected module.



The general-purpose module is replaced with the selected module.

Screen button

- Select All

Selects all modules displayed on "Replacement Target".

- Cancel All Selections

Cancels the selected status of all modules selected for "Replacement Target".

■ Changing to general-purpose CC-Link module

Change a module of slave station to a general-purpose CC-Link module.

Operating procedure

1. **Select a module to be changed in the 'list of stations' on the CC-Link configuration window.**

2. **Select [CC-Link Configuration] ⇒ [Change Module] ⇒ [Change to General CC-Link Module].**

The module is changed to the corresponding general-purpose CC-Link module.

■ Checking system configuration of CC-Link

Check whether the equipment configuration of CC-Link is correct after setting the station information on the CC-Link configuration window.

Operating procedure

- **Select [CC-Link Configuration] ⇒ [Check] ⇒ [System Configuration].**

The system configuration of CC-Link is checked.
Check the result of the system configuration check on the Output window.

■ Performing parameter processing of slave station

Perform the processing relates to parameters of slave stations.
The applicable parameter processing differs according to the target slave station.
The setting status and setting values of the Parameter Processing of Slave Station screen can be saved in the CSV file format.

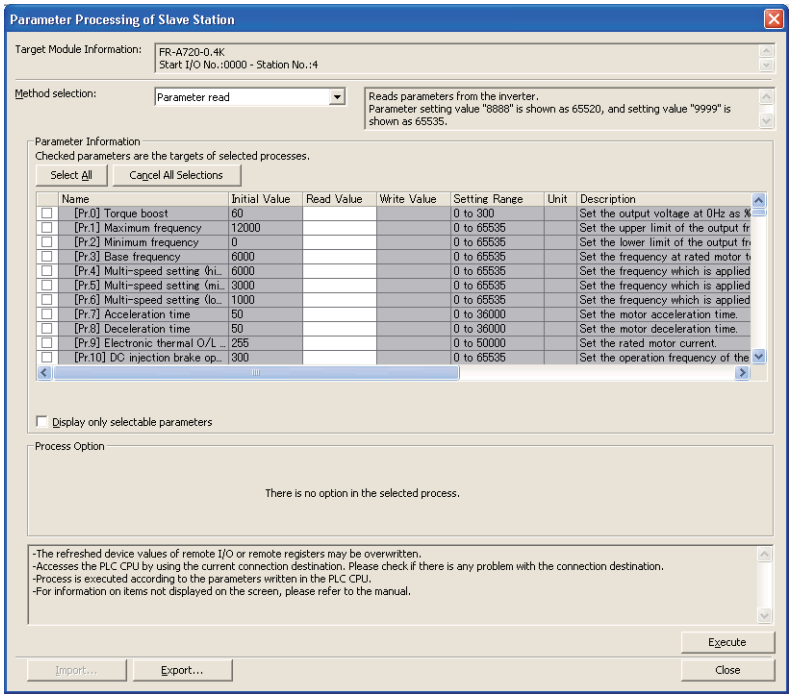
Point

● **Considerations when performing parameter processing**
Check the following before performing the parameter processing.
- The programmable controller CPU set as a connection target is in STOP status.
- The network parameter of master station matches with the start I/O number of PLC parameter.
- The network parameter of programmable controller CPU matches with the actual CC-Link configuration.
- A refresh device is set on the CC-Link parameter of programmable controller CPU.

Operating procedure

1. **Select a module to which parameters are applied from the 'list of stations' on the CC-Link configuration window.**

2. **Select [CC-Link Configuration] ⇒ [Online] ⇒ [Parameter Processing of Slave Station].**
   The Parameter Processing of Slave Station screen is displayed.
   The following is a screen of FR-A720-0.4K.



3. Set the items on the screen.

Item	Description
Target Module Information	Display the information of target equipment on which the parameter processing is performed.
Method selection	Select a processing to be performed from the list displayed by clicking ▼.
Parameter Information	Select the parameter(s) to perform the processing and enter settings such as a writing value.
Display only selectable parameters	Select this to display only parameters to which the processing selected for "Method selection" can be performed.
Process Option	Set this for the processing selected for "Method selection".

4. Click the Execute button.

The parameter processing is performed.

Screen button

- Select All

  Selects all parameters of "Parameter Information".
- Cancel All Selections

  Cancels the selected status of all the parameters selected for "Parameter Information".
- Import...

  Imports the selected status and writing values of "Parameter Information" saved in the CSV file format in advance.
- Export...

  Saves the selected status and writing values of "Parameter Information" in the CSV file format.

■ Performing commands for slave stations

Perform commands for slave stations.
Applicable commands differ according to the target slave station.

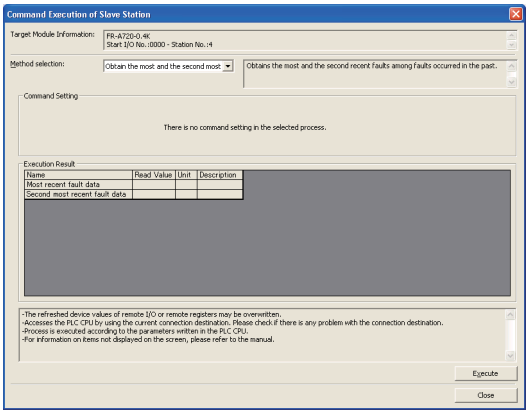
Point

● **Considerations when performing commands**
Check the following before performing commands.
- The programmable controller CPU set as a connection target is in STOP status.
- The network parameter of master station matches with the start I/O number of PLC parameter.
- The network parameter of programmable controller CPU matches with the actual CC-Link configuration.
- A refresh device is set on the CC-Link parameter of programmable controller CPU.

Operating procedure

1. **Select a module on which a command is performed from the 'list of stations' on the CC-Link configuration window.**

2. **Select [CC-Link Configuration] ⇒ [Online] ⇒ [Command Execution of Slave Station].**
The Command Execution of Slave Station screen is displayed.
The following is a screen of FR-A720-0.4K.



3. **Set the items on the screen.**

Item	Description
Target Module Information	Display the information of target module on which the command is performed.
Method selection	Select a processing to be performed from the list displayed by clicking ▼.
Command Setting	Set the writing values for the processing selected for "Method selection".

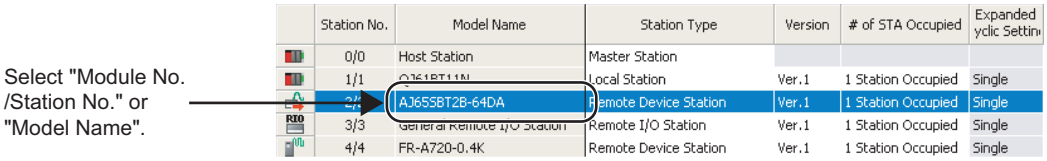
4. **Click the Execute button.**
The command processing is performed.
The result of the processing is displayed on "Execution Result".

■ Copying/pasting modules

Copy/paste a selected module.

Operating procedure

1. **Select "Module No./Station No." or "Model Name" of the module to be copied from the 'list of stations'.**
   The corresponding row is selected.



2. **Select [Edit] ⇒ [Copy].**
   The selected module is copied.

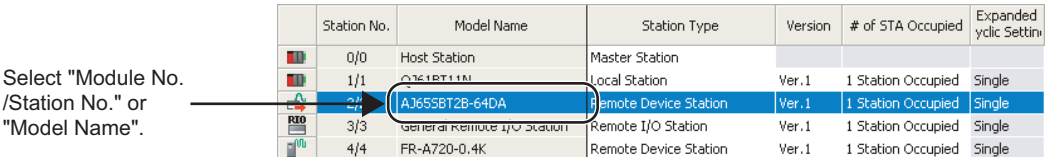
3. **Select [Edit] ⇒ [Paste].**
   The copied module is added to the last row of the 'list of stations'.

■ Deleting modules

Delete a selected module.

Operating procedure

1. **Select "Module No./Station No." or "Model Name" of the module to be deleted from the 'list of stations'.**
   The corresponding row is selected.



2. **Select [Edit] ⇒ [Delete].**
   The selected module is deleted.

Point

● **Selected status of modules**
All cells on the 'list of stations' can be selected by selecting [Edit] ⇒ [Select All].

■ Displaying/hiding Module List/Output window

Display/hide the Module List/Output window.

Operating procedure

- **Select [View] ⇒ [Docking Window] ⇒ [Module List]/[Output].**

Point

● **Displaying Module List/Output window**
The Module List/Output window can be displayed as a docked display/floating display.
(☞ Section 3.2.4 "Docking windows")

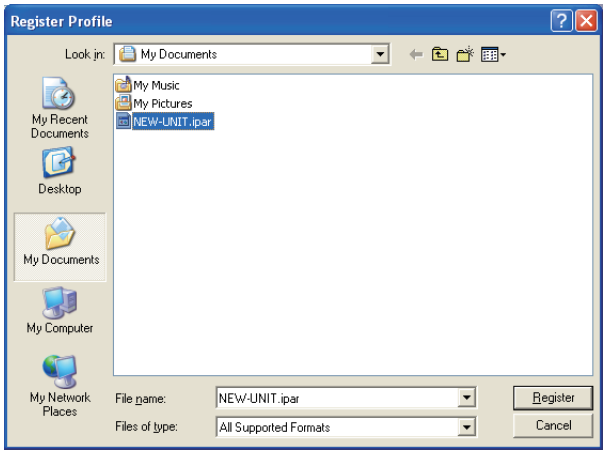
6.3.4 Registering profiles

Q CPU | L CPU | Remote | Head | FX

Register profiles in GX Works2.
Profiles are data in which equipment information (module models, number of occupied stations, station types, etc.) of CC IE Field modules and CC-Link modules is stored.
CC IE Field modules or CC-Link modules of slave stations are added to the module list on the CC IE Field configuration window or the CC-Link configuration window by registering profiles. The previously registered module information is also updated.
Close the project in advance when registering profiles.

Screen display

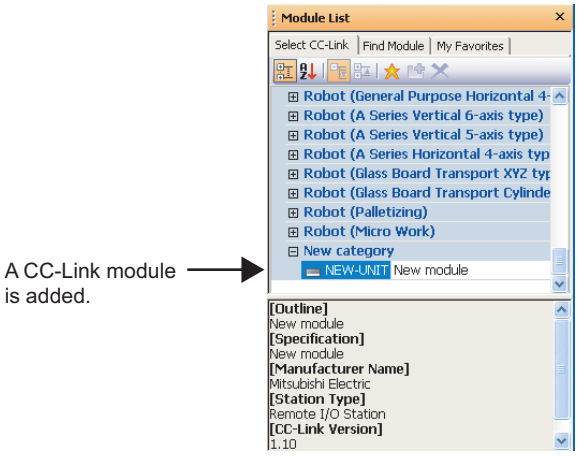
Select [Tool] ⇒ [Register Profile].



Operating procedure

- **Select the profile, and click the Register button.**

  The profile is registered.
  The added module can be found in the module list on the CC IE Field configuration window or the CC-Link configuration window when the project is opened next time.
  The following is the display of the CC-Link configuration window.



Point

● **Managing profiles**
Profiles are managed by each personal computer, and shared within GX Works2 and MELSOFT Navigator. Therefore, profiles registered in GX Works2 are applied to MELSOFT Navigator.

6.3.5 Checking devices assigned to CC-Link modules

Q CPU | L CPU | Remote | Head | FX

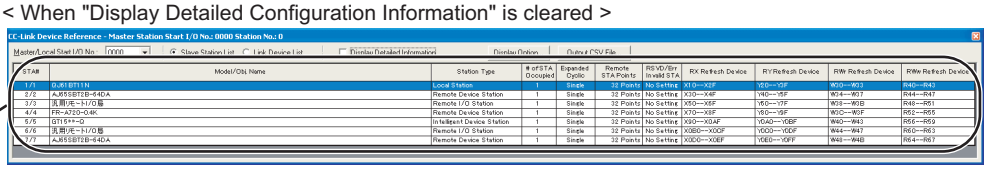
Display a list of refresh devices assigned to CC-Link modules.
Set the CC-Link parameters in advance.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [CC-Link Device Reference] ( ).

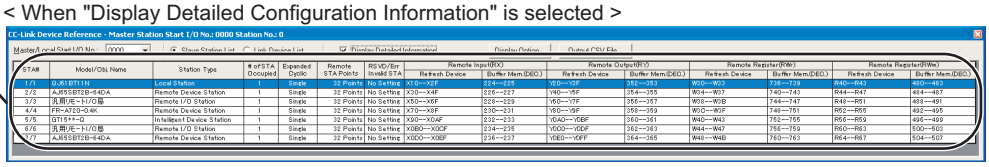
● **List of slave stations**

< When "Display Detailed Configuration Information" is cleared >



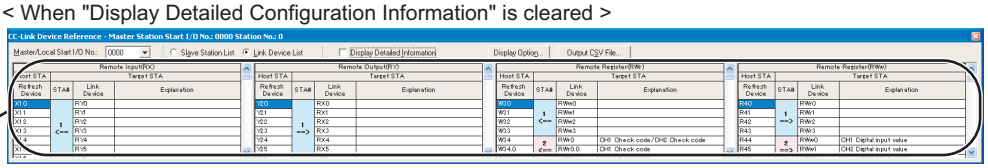
List of slave stations

< When "Display Detailed Configuration Information" is selected >



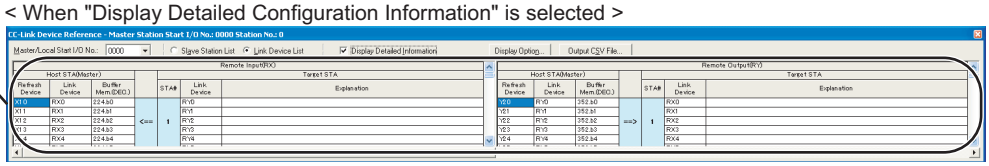
● **List of link devices**

< When "Display Detailed Configuration Information" is cleared >



List of link devices

< When "Display Detailed Configuration Information" is selected >



Operating procedure

- **Set the items on the screen.**

Item	Description
Master/Local Start I/O No.	Select the start I/O number of master station or local station from the list displayed by clicking to display the list of slave stations or link devices.
Slave Station List	Switch the display between the list of slave stations and the list of link device stations.
Link Device List	
Display Detailed Configuration Information	Select this to display the detailed information of the list of slave stations or list of link devices.

Display contents

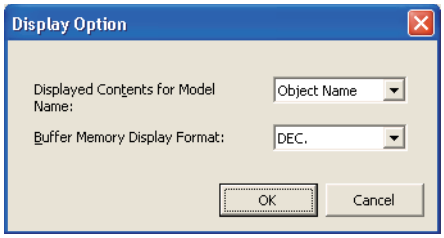
Item		Description
Slave Station List		This item is displayed when 'list of slave stations' is selected.
	List of slave stations	Display the information of the slave stations and the range of the refresh devices assigned to the host station. When "Display Detailed Configuration Information" is selected, the range of the buffer memory is also displayed. When refresh devices are not assigned, the cells of the refresh device range will be blank.
Link Device List		This item is displayed when 'list of link device stations' is selected.
	List of link device stations	Display the assignment status of refresh devices on the host station and link devices on the target station. When "Display Detailed Configuration Information" is selected, link devices and buffer memory are also displayed on the host station side. When profiles are not registered, the "Explanation" cells will be blank.

Screen button

● Display Option...

Opens the screen to set the display options.

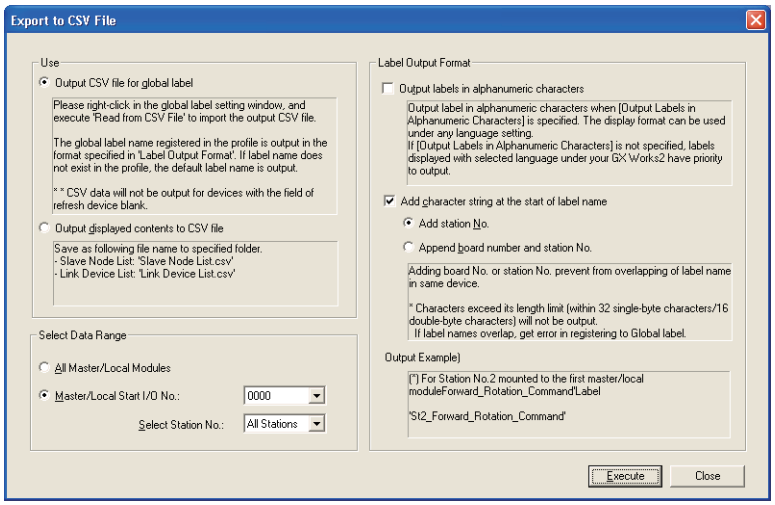
Select the item displayed by clicking for "Module Name/Object Name" and "Buffer Memory Display Format", and click the OK button.



● Output CSV File...

Opens the screen to set the purpose and the output format of CSV file output.

Set "Use", "Select Data Range", and "Label Output Format", and click the Execute button.



When "Output CSV file for global label" is selected for "Use", the output CSV file can be imported on the Global Label Setting screen.

(☞ GX Works2 Version 1 Operating Manual (Simple Project))

(☞ GX Works2 Version 1 Operating Manual (Structured Project))

Point

● **Display content of CC-Link Device Reference window**

All items are displayed on the CC-Link Device Reference window when the station information is set on the CC-Link configuration window.

When the station information is set on the CC-Link Station Information screen, the model name or object name of the target module is not displayed. When a local station, master station (duplex function), or standby master station is set for the type, the assignment status of refresh devices is not displayed.

● **Checking refresh devices supported by master station and local station**

With a CC-Link configuration containing a local station, when checking refresh devices supported by refresh devices which are set on the master station, open the project of the local station and check them on the CC-Link Device Reference window.

Example: When checking refresh devices of local station which supports refresh device D2008 of the master station

< Project of master station >

The value of RWw3 is refreshed by the value of D2008.

Host STA(Master)				
Refresh Device	Link Device	Buffer Mem.(DEC.)		STA#
D2005	RWw0	480	==>	1
D2006	RWw1	481		
D2007	RWw2	482		
D2008	RWw3	483		

< Project of local station >

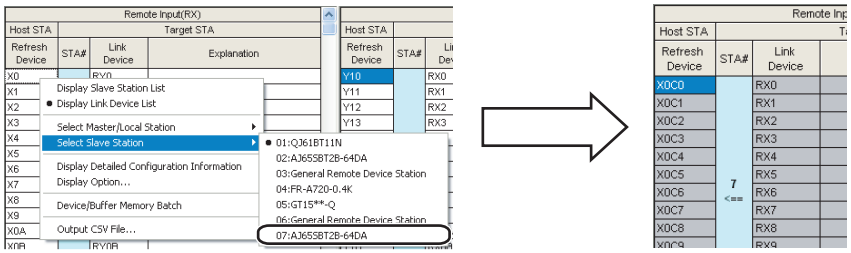
The value of D3008 is refreshed by the value of RWr3.

Host STA(Master)				
Refresh Device	Link Device	Buffer Mem.(DEC.)		STA#
D3005	RWr0	736	<==	1
D3006	RWr1	737		
D3007	RWr2	738		
D3008	RWr3	739		

When a value is stored to D2008 on the master station, a value is stored to D3008 on the local station.

● **Displaying list of link devices**

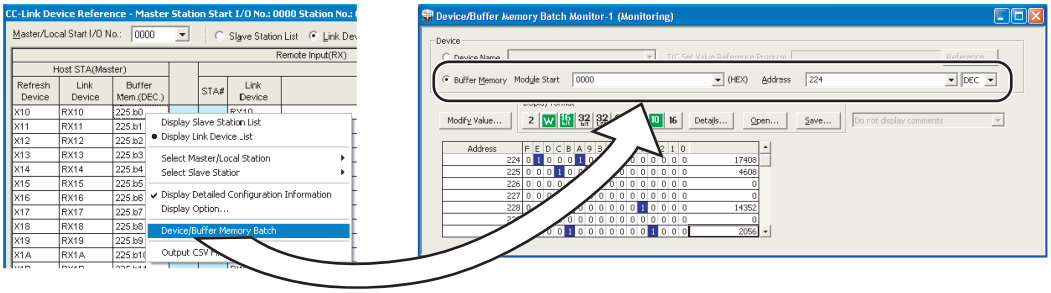
- The selected slave station can be displayed on top of the cell by right-clicking 'list of link devices' and selecting [Select Slave Station] from the shortcut menu.



Select the station number 7 of the slave station.

The station number 7 is displayed at the top.

- The Device/Buffer Memory Batch Monitor screen is displayed by right-clicking a refresh device or buffer memory selected from the 'list of link devices' and selecting [Device/Buffer Memory Batch] from the shortcut menu. For details of the device/buffer memory batch monitoring, refer to Section 14.3.



6.4 Setting Remote Password

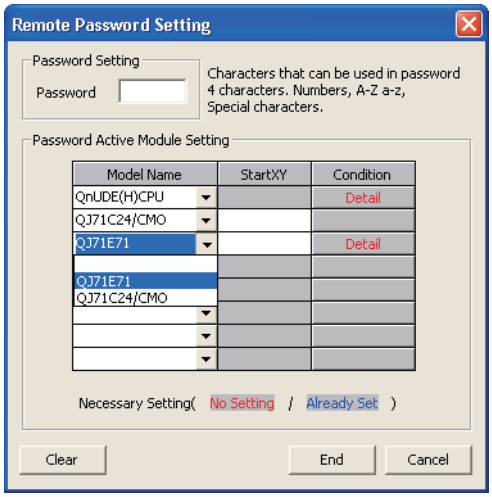
Q CPU | L CPU | Remote | Head | FX *1

*1 : CC IE Field head module only

This section explains how to set a password to prevent illegal access from remote users to the QCPU (Q mode)/LCPU via a Q series-compatible E71 module, C24 module, or Built-in Ethernet type CPU.

Screen display

Select Project view ⇒ "Parameter" ⇒ "Remote Password".
The following is an example of setting screen when QCPU (Q mode) is selected.



Operating procedure

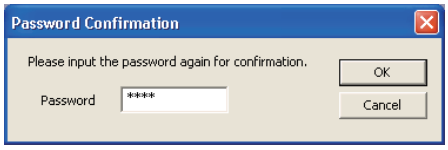
1. **Set the items on the screen.**

Item		Description
Password		Set the password.
Password Active Module Setting	Model Name	Set the model of the routing programmable controller CPU or module. For the programmable controller CPU, select "Built-in Ethernet type CPU".
	Start XY	Set the start I/O number.
	Condition	Set the details when selecting Built-in Ethernet type CPU or QJ71E71. ● **User connection No. valid setting** Set whether to enable the remote password for the user connection No. 1 to No. 16. ● **System connection valid setting** Set whether to enable the remote password for the system connections.

2. **Click the** End **button.**

   The Password Confirmation screen is displayed.

3. **Enter the set password again.**



4. Click the OK button.

The remote password setting ends.
To set the password on the programmable controller CPU, write the parameter to the programmable controller CPU using the Write to PLC function.
(☞ Section 12.1)

Point

● **Modules that support remote password setting**
For the modules that support the remote password setting and the details of the remote password setting, refer to the user's manual of the programmable controller CPU, Q series-compatible E71 module or C24 module to be used.

● **Characters for password**
Enter the password in 4 characters, using alphabets, numerals, and symbols corresponding to ASCII codes 20H to 7EH (☞ Appendix 3).

6.5 Checking Parameters

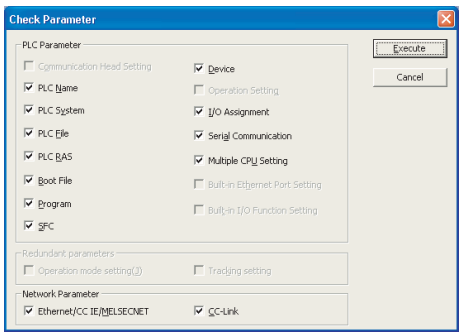
Q CPU L CPU Remote Head FX

This section explains how to check errors in the PLC parameter and the network parameter which are set in the project.
The result of the parameter check is displayed on the Output window.

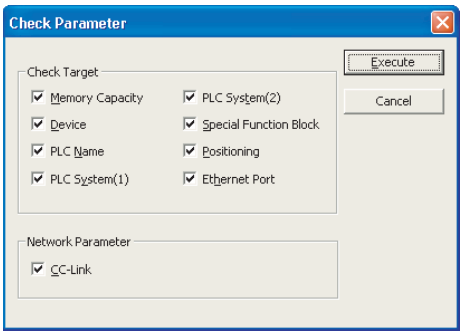
Screen display

Select [Tool] ⇒ [Check Parameter].

<QCPU (Q mode)/LCPU>



<FXCPU>



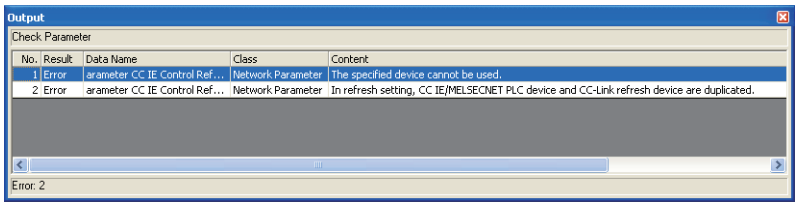
Operating procedure

1. **Set the items on the screen.**

Item	Description
Check Target	Select the items for the check parameter.

2. **Click the Execute button.**

The check parameter is performed, and the result is displayed on the Output window.



6.6 Outputting Parameters to CSV Files

Q CPU L CPU Remote Head FX

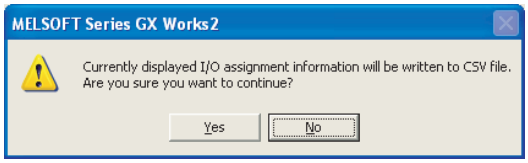
The following parameters can be written to CSV files.

- **I/O assignment setting**
  Project view ⇒ "Parameter" ⇒ "PLC Parameter" ⇒ <<I/O Assignment>>
- **Acknowledge XY assignment**
  Project view ⇒ "Parameter" ⇒ "PLC Parameter" ⇒ Acknowledge XY Assignment
  Project view ⇒ "Parameter" ⇒ "Network Parameter" ⇒ "(network parameter)" ⇒ Acknowledge XY Assignment

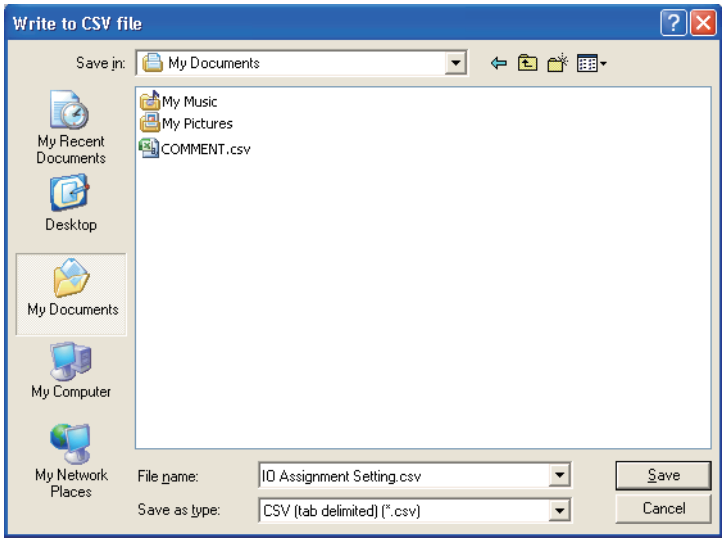
Operating procedure

1. **Click the Export to CSV File button.**
   The confirmation message for writing data is displayed.

< I/O assignment setting >



2. **Click the Yes button.**
   The Write to CSV file screen is displayed.



3. **Enter a file name of the data to be saved.**

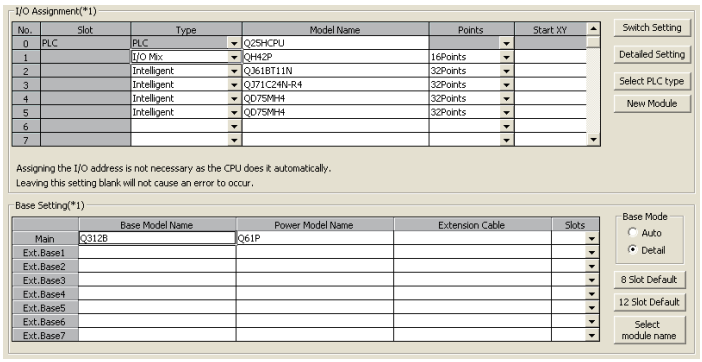
4. **Click the Save button.**
   Parameters are saved to a CSV file.

■ CSV file format

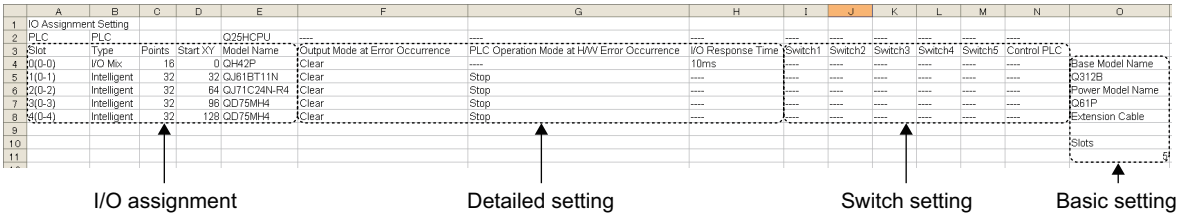
The following is an image of the saved CSV file opened with Excel.

- Example of CSV file for I/O assignment setting

< I/O Assignment setting >

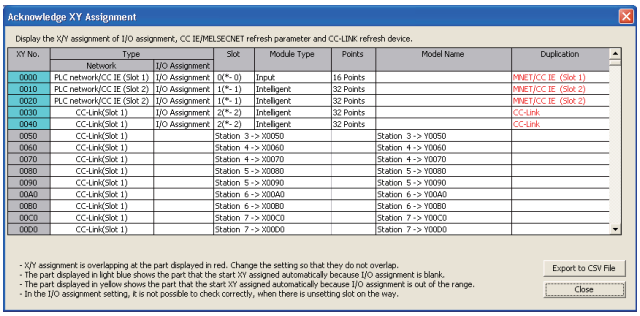


< CSV file >



- Example of CSV file for acknowledge XY assignment

< Acknowledge XY Assignment screen >



< CSV file >

	A	B	C	D	E	F	G	H	I
1	Acknowledge XY Assignment								
2	'X/YNo.'	'Type'	'Slot'	'Module Type'	'Points'	'Model Name'	'Network Assignment X'	'Network Assignment Y'	'Overlap Error'
3	0	I/O Assignment	0(*- 0)	Input	16 Points				MNET/CC IE (Slot 1)
4	16	I/O Assignment	1(*- 1)	Intelligent	32 Points				MNET/CC IE (Slot 2)
5	32	I/O Assignment	1(*- 1)	Intelligent	32 Points				MNET/CC IE (Slot 2)
6	48	I/O Assignment	2(*- 2)	Intelligent	32 Points				CC-Link
7	64	I/O Assignment	2(*- 2)	Intelligent	32 Points				CC-Link
8	80	CC-Link(Slot 1)					Station 3 -> X0050	Station 3 -> Y0050	
9	96	CC-Link(Slot 1)					Station 4 -> X0060	Station 4 -> Y0060	

● Details of CSV file

The following explains the details of CSV file format.

- The file format is Unicode (including UTF-16, Little Endian, and BOM).
- The delimiter of items is a tab (\t).
- Each item is enclosed in double quotation marks (").
- If the item contains double quotation marks ("), the double quotation marks in the item are expressed as two double quotation marks ("").
- A line feed is set at the end of the line.
  The line feed code is LF.

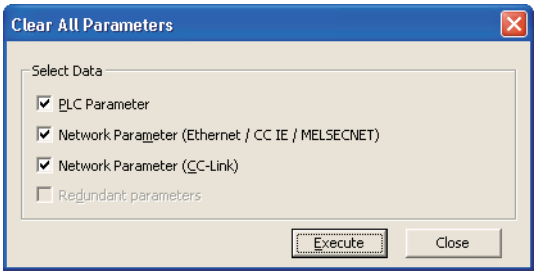
6.7 Setting default parameters

Q CPU L CPU Remote Head FX

This section explains how to set default parameters to the PLC parameter or the network parameter in batch.

Screen display

Select [Tool] ⇒ [Clear All Parameters].
The following is an example of setting screen when QCPU (Q mode) is selected.



Operating procedure

1. **Set the item on the screen.**

Item	Description
Select Data	Select the parameter to which default parameters are set.

2. **Click the Execute button.**

   Default parameters are set to the selected parameter.

7 SETTING DEVICE MEMORY

This chapter explains the settings of the device memory.

7.1 Device Memory

Q CPU L CPU Remote Head FX

This section explains the features of the device memory.

7.1.1 Features of device memory

Device memory is the function that reads/writes data from/to the device memory on a programmable controller CPU.

- **Read**
  The function batch-reads device memory data from a programmable controller CPU to GX Works2. The read data can be used to check the status of the device memory on a programmable controller CPU as well as for offline debugging.
- **Write**
  The function batch-writes device memory data from GX Works2 to a programmable controller CPU. The current values of the device memory on a programmable controller CPU can be batch changed.

7.1.2 List of devices selectable on the Input Devices screen

■ QCPU (Q mode)/LCPU

○: Can be edited △: Display only –: Not supported

Category	Device type		Symbol	Display/edit
Internal user device	Input		X	△
	Output		Y	△
	Internal relay		M	○
	Latch relay		L	○
	Annunciator		F	○
	Edge relay		V	○
	Step relay		S	△
	Link relay		B	○
	Link special relay		SB	○
	Timer	Current value	T	○
		Contact	TS	–
		Coil	TC	–
	Counter	Current value	C	○
		Contact	CS	–
		Coil	CC	–
	Retentive timer	Current value	ST	○
		Contact	STS	–
		Coil	STC	–
	Data register		D	○
	Link register		W	○
	Link special register		SW	○
	Direct input		DX	–
	Direct output		DY	–
Internal system device	Special relay		SM	△
	Special register		SD	○
Link direct device	Link input		J□\X□	△
	Link output		J□\Y□	△
	Link register		J□\W□	○
	Link special register		J□\SW□	○
	Link relay		J□\B□	△
	Link special relay		J□\SB□	△
File register	File register		R*1	–
			ZR*1,*2	○
Index register	Index register		Z	△
Intelligent function module device	Intelligent function module device		U□\G□	○

*1 : Not supported by Q00J/Q00UJ.

*2 : For Universal model QCPU/LCPU, the device cannot be used when '0k' is set for "Device points" of file register (ZR(R)) under "File Register Extended Setting" on the <<Device>> tab of PLC parameter.

■ FXCPU

○: Can be edited △: Display only –: Not supported

Category	Device type	Symbol	Display/edit								
			FX0 FX0S	FX0N	FX1	FX1S	FX1N FX1NC	FXU FX2C	FX2N FX2NC	FX3G FX3GC	FX3U FX3UC
Internal user device	Input	X	△	△	△	△	△	△	△	△	△
	Output	Y	△	△	△	△	△	△	△	△	△
	Internal relay	M	○	○	○	○	○	○	○	○	○
	State	S	△	△	△	△	△	△	△	△	△
	Timer	T	○	○	○	○	○	○	○	○	○
	Counter*1	C	○	○	○	○	○	○	○	○	○
	Data register	D	○	○	○	○	○	○	○	○	○
	File register	D	–	○	–	○	○	○	○	○	○
Internal system device	Special relay	M	○	○	○	○	○	○	○	○	○
	Special data register	D	○	○	○	○	○	○	○	○	○
Extended register		R	–	–	–	–	–	–	–	○	○
Extended file register		ER	–	–	–	–	–	–	–	○	○

*1 : 32-bit counter (C200 and later) is not supported.

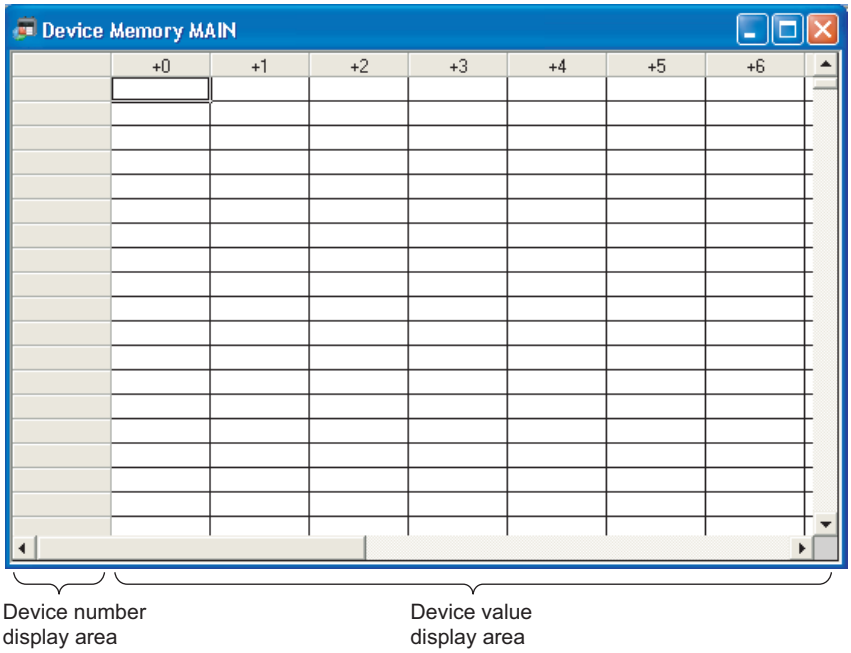
7.2 Setting Device Memory

Q CPU | L CPU | Remote | Head | FX

This section explains how to set a device and device value.

Screen display

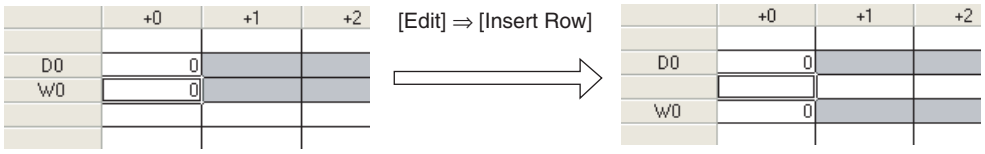
Select Project view ⇒ "Device Memory" ⇒ "(data name)".



Point

● **Inserting rows**

Select [Edit] ⇒ [Insert Row] to insert a blank row at the cursor position.



● **Cutting/copying/pasting character strings in units of rows**

To paste a character string in units of rows, select the desired cell(s) and paste the character string. If a row is selected, pasting is not possible.

● **Cutting/copying/pasting character strings in units of cells**

To paste a character string in units of cells, if the selected cell(s) is in the row where a device is not entered, pasting is not possible.

● **Copying device memory**

Device memory data of the selected range can be copied and pasted to Excel. Data can also be copied and pasted to device memory from Excel.

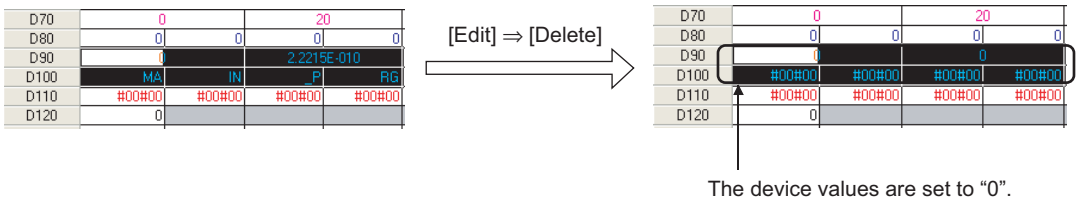
When a value other than 0 is pasted as a bit device, it is replaced to 1.

● **Deleting devices**

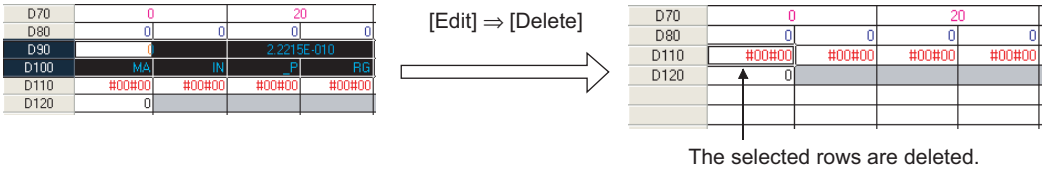
If a deletion is executed after selecting a cell, the device value clears to '0'.

If a deletion is executed after selecting a row, the selected row (device) is deleted.

<Deletion in units of cells>



<Deletion in units of rows>



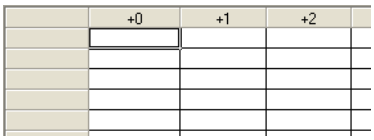
7.2.1 Setting device values in units of points

Set a device and device value in units of points.
Create a new device memory in advance. (☞ Section 4.3.1)

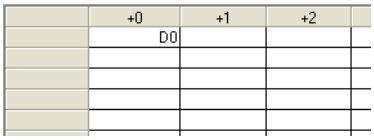
Example) Set the following values.
'Device: D0, Device value: 12'

Operating procedure

1. **Select the cell to which a device value is set.**

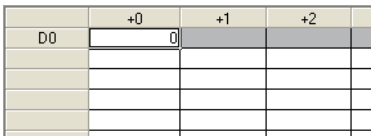


2. **Enter 'D0' for a device.**



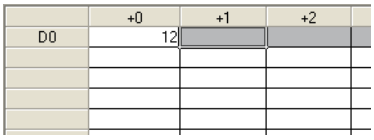
3. **Press the Enter key.**

The entered device is set in the device number display area.
In this example, 'D0' is set in the device number display area and the value is displayed in the device value display area.



4. **Enter '12' for a device value.**

'12' is set as the device value of device 'D0'.



7.2.2 Setting device values by specifying device range

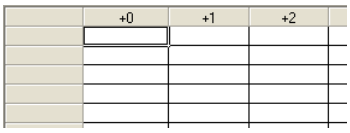
■ Setting device values by specifying a device range on the Input Device screen

Set device values by specifying a device range on the Input Device screen.

Example) Set the following values.
'Device: D, range: 0 to 50, display format: decimal number'

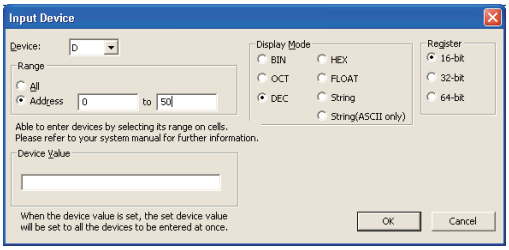
Operating procedure

1. **Select the cell to which a device value is set.**



2. **Select [Edit] ⇒ [Input Device] ( ).**

The Input Device screen is displayed.



3. **Set the items on the screen.**

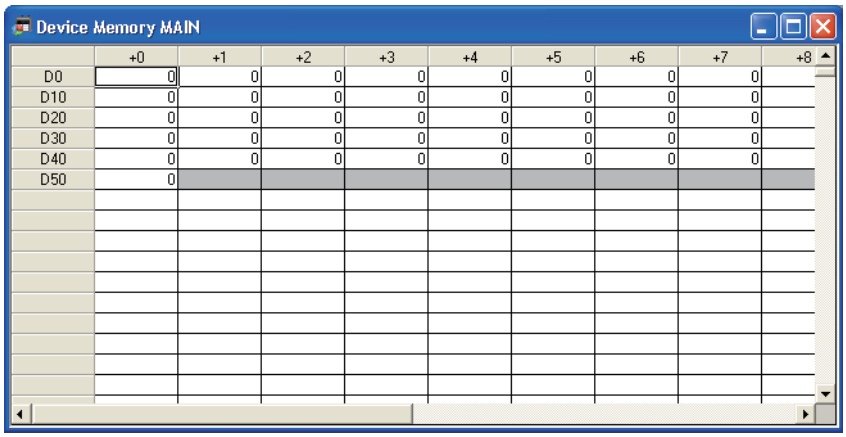
Item		Description
Device		Select the device name. For devices that can be edited, refer to Section 7.1.2.
Module Start*1		Display when U□\G□ or J□\□ is selected in the "Device" field. Enter the start XY address or network number.
Network No.*1		
Range		Select the range of devices to be set.
	All	Select this to target all of the selected devices.
	Address	Select this to target the devices in the specified range.
Display Mode		Select the display format of device values.
	BIN	Select this to display device values in binary numbers.
	OCT	Select this to display device values in octal numbers.
	DEC	Select this to display device values in decimal numbers.
	HEX	Select this to display device values in hexadecimal numbers.
	FLOAT	Select this to display device values in real numbers.
	String	Select this to display device values in character strings.
	String (ASCII only)	Select this to display device values in ASCII strings.

Item		Description
Register		Select the display size of device values.
	16-bit	Select this to display the display size of device values in words.
	32-bit	Select this to display the display size of device values in double words. Specify the device range in multiples of two.
	64-bit	Select this to display the display size of device values in double-precision real numbers. Specify the device range in multiples of four.
Device Value		Enter a value to set device values simultaneously.

*1 : Not supported by FXCPU.

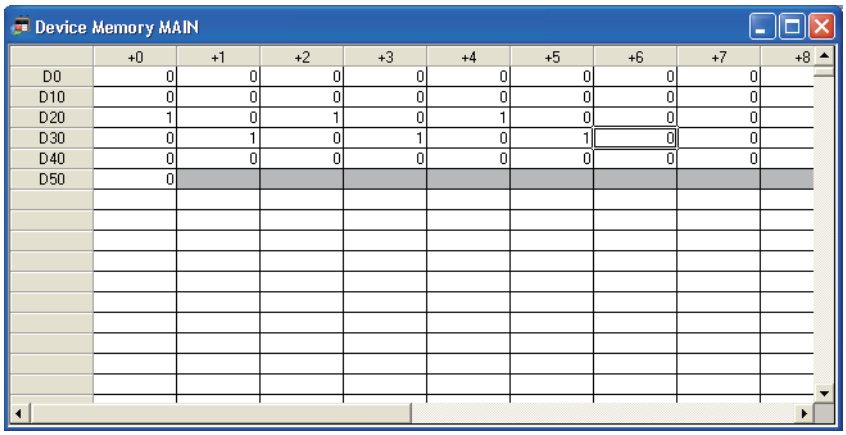
4. Click the OK button.

Devices in the range from D0 to D50 are registered to cells and the values are displayed.



5. Enter a device value to each cell.

The entered values are set.



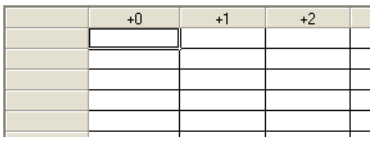
■ Setting device values by specifying a device range on the cell

Set device values by specifying a device range on the cell.

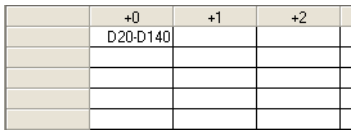
Example) Set the following values.
'Device: D, range: 20 to 40, display format: decimal number'

Operating procedure

1. **Select a cell to which the device value is set.**



2. **Enter the device range.**



3. **Click the Enter button.**

Devices from D20 to D140 are registered to the cells and the values are displayed.

	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10(A)
D20	0	0	0	0	0	0	0	0	0	0	
D30	0	0	0	0	0	0	0	0	0	0	
D40	0	0	0	0	0	0	0	0	0	0	
D50	0	0	0	0	0	0	0	0	0	0	
D60	0	0	0	0	0	0	0	0	0	0	
D70	0	0	0	0	0	0	0	0	0	0	
D80	0	0	0	0	0	0	0	0	0	0	
D90	0	0	0	0	0	0	0	0	0	0	
D100	0	0	0	0	0	0	0	0	0	0	
D110	0	0	0	0	0	0	0	0	0	0	
D120	0	0	0	0	0	0	0	0	0	0	
D130	0	0	0	0	0	0	0	0	0	0	
D140	0										

Point

● **Display format of bit device and word device**
The following table shows the display format of bit device and word device when the device range is specified on the cell.

Device	Value	Display format	Display size
Bit device	0	Binary	–
Word device	0	Decimal	16 bits

● **Device registration when only the start address or the end address is specified**
A device range can be specified by specifying the start address or the end address only.

- **When only the start address is specified (Example: Specify 'D0-' for the device range)**
  Devices from 'D0' to the last valid address are registered to the cells.
- **When only the end address is specified (Example: Specify '-D100' for the device range)**
  Devices from 'D0 to D100' are registered to the cells.

● **Abbreviating device name**
When specifying a device range on the cell, only the end address can be abbreviated.
For example, when a device range is specified with 'D0-100', the devices in the range of 'D0-D100' are registered.

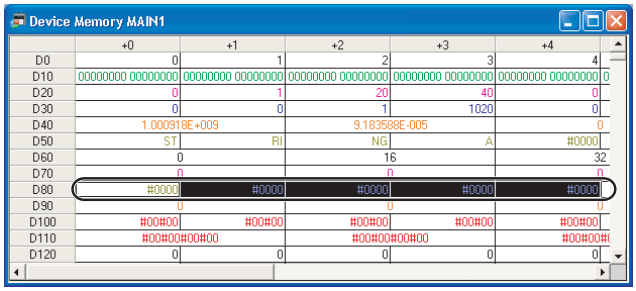
● **Specifying R devices (This function is not supported by FXCPU.)**
When R device is specified, it is changed to ZR device and registered.

7.2.3 Setting character strings

Set a character string to a device.
Set "Display Mode" to 'String' in advance. (☞ Section 7.2.5)

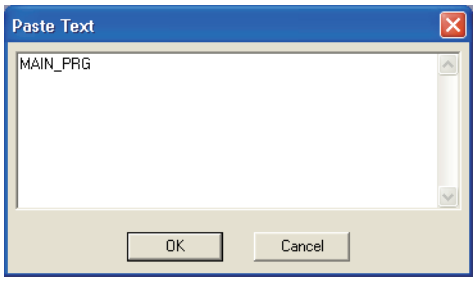
Operating procedure

1. **Select a range of cells to which a character string is set.**



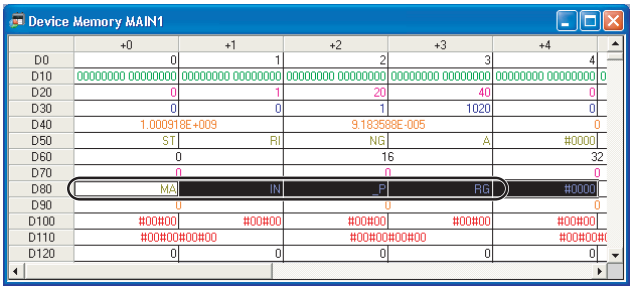
2. **Select [Edit] ⇒ [Paste Text].**

   The Paste Text screen is displayed.



3. **Enter a character string, and click the OK button.**

   The entered character string is set to the selected cells or row.



Point

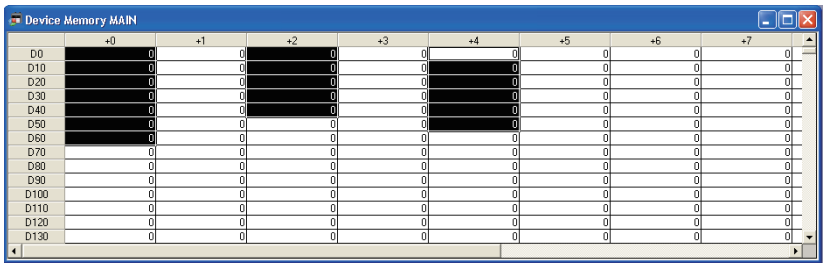
● **Entering character strings**
When "Register" is '16-bit', '32-bit', or '64-bit', the maximum number of characters that can be entered to one cell is 2, 4, or 8 respectively.

7.2.4 Setting same value simultaneously

Set the same value to continuous devices.

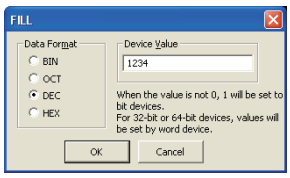
Operating procedure

1. **Select devices to which a value is to be set.**



2. **Select [Edit] ⇒ [Fill] ( ).**

The FILL screen is displayed.

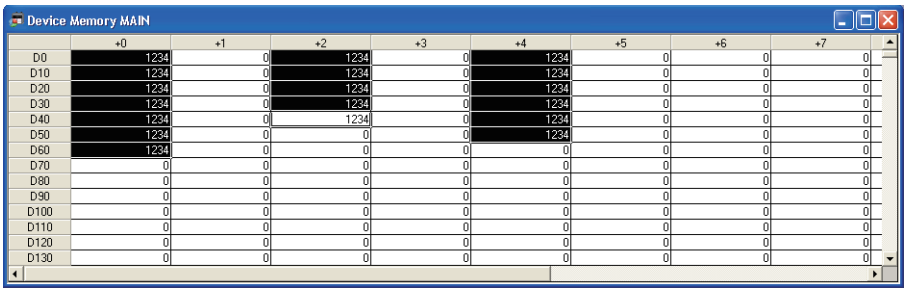


3. **Set the items on the screen.**

Item		Description
Data Format		Select the data format of device values.
	BIN	Select this to set device values in binary numbers.
	OCT	Select this to set device values in octal numbers.
	DEC	Select this to set device values in decimal numbers.
	HEX	Select this to set device values in hexadecimal numbers.
Device Value		Enter a value set to devices simultaneously.

4. **Click the OK button.**

The specified device value is set to devices simultaneously.



Point

● **Setting the same value simultaneously**
Device values can also be set simultaneously by selecting a range, right-clicking it on the device memory editor, and selecting [FILL] from the shortcut menu.

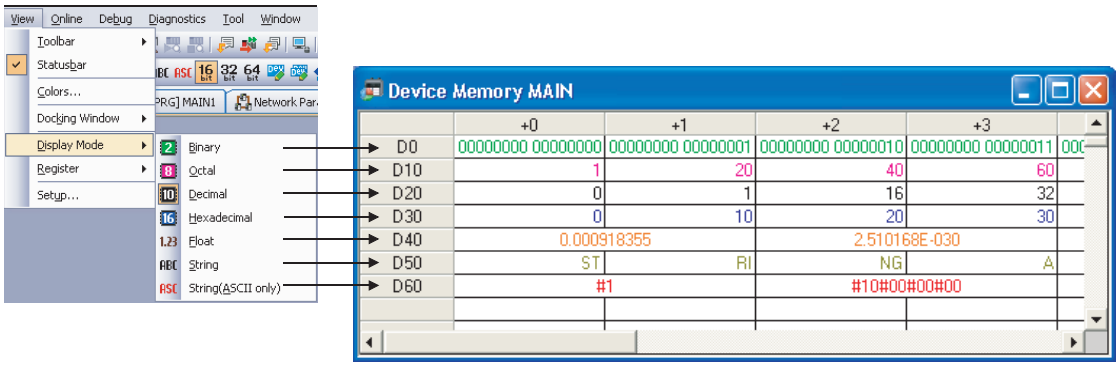
7.2.5 Changing display format

■ Switching display format

Switch the device value display format for each cell on the device memory editor.

Operating procedure

- **Select [View] ⇒ [Display Mode] ⇒ [Binary/Octal/Decimal/Hexadecimal/Float/String/String (ASCII)].**
  Device values are displayed in the selected display format.

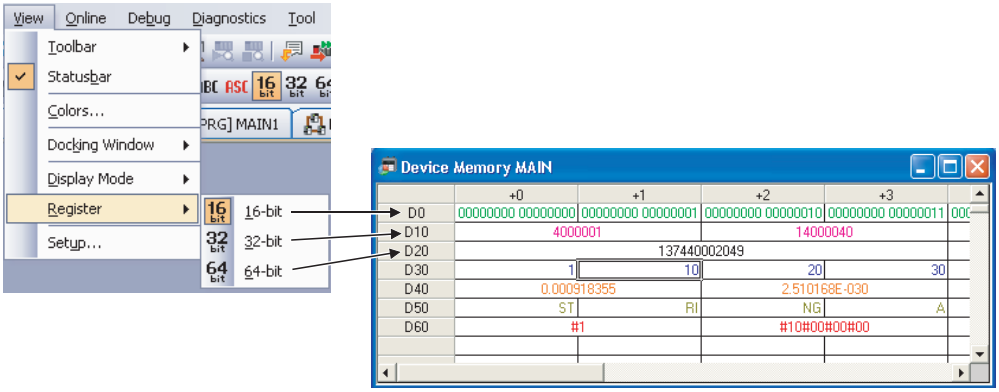


■ Switching display size in 16-bit/32-bit/64-bit

Switch the device value display size in 16-bit/32-bit/64-bit for each cell on the device memory editor.

Operating procedure

- **Select [View] ⇒ [Register] ⇒ [16-bit/32-bit/64-bit].**
  Device values are displayed in the selected display size (16 bits, 32 bits, or 64 bits).

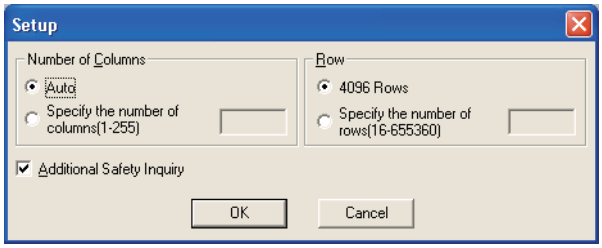


7.2.6 Changing the number of rows/columns on device memory editor

Change the number of rows/columns on the device memory editor.

Screen display

Select [View] ⇒ [Setup].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Number of Columns		Set the number of columns on the editor.
	Auto	Select this to set the number of columns to 16.
	Specify the number of columns (1 - 255)	Select this to set the desired number of columns on the editor. Setting range: 1 to 255
Row		Set the number of rows on the editor.
	4096 Rows	Select this to set the number of rows to 4096.
	Specify the number of rows (16 - 655360)	Select this to set the desired number of rows on the editor. Setting range: 16 to 655360
Additional Safety Inquiry		Select this to display the confirmation message when device deletion is executed.

2. **Click the OK button.**

   The set number of rows/columns are displayed.

Point

- **Number of columns**
  When "Number of Columns" is set to "Auto", the device values are displayed in 10 columns or 16 columns according to the specified devices.
  For FXCPU, the device values of X and Y are displayed in 8 columns.
- **Considerations for changing rows and columns**
  When a value smaller than the current value is set for "Number of Columns" or "Row", a confirmation message is displayed and the data on the device memory editor is discarded.
  When a value larger than the current value is set for "Number of Columns", the sequence of devices registered to the device memory editor do not change by the setting of "Number of Columns".

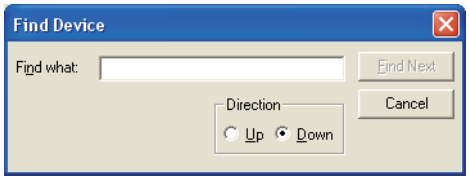
7.3 Searching Devices

Q CPU L CPU Remote Head FX

This section explains how to search for a device set in the device memory.

Screen display

Select [Find/Replace] ⇒ [Find Device Cell].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Find what		Enter the device to be searched for.
Direction	Up	Select this to perform searching in the upward direction from the cursor position.
	Down	Select this to perform searching in the downward direction from the cursor position.

2. **Click the** Find Next **button.**

   The cursor moves to the found device.

7.4 Writing/Reading Device Memory Data

Q CPU | L CPU | Remote | Head | FX

This section explains how to write/read device memory data being edited to/from a programmable controller CPU or Excel file.

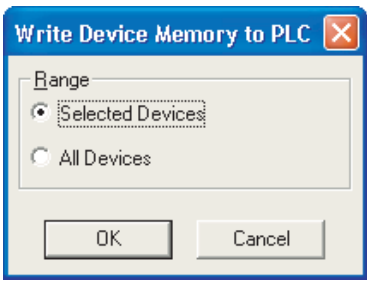
7.4.1 Writing/reading data to/from programmable controller CPUs

Write/read device memory data to/from a programmable controller CPU.
To write/read device memory data in units of files, refer to the online Write to PLC/Read from PLC function. (☞ Section 12.1)

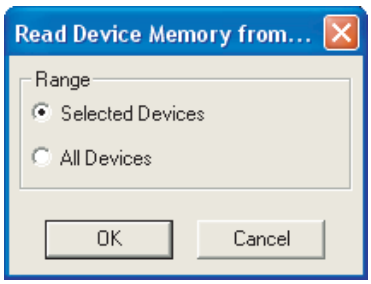
Screen display

Select [Tool] ⇒ [Write Device Memory to PLC]/[Read Device Memory from PLC].

<Writing device memory>



<Reading device memory>



Operating procedure

- **Set the item on the screen.**

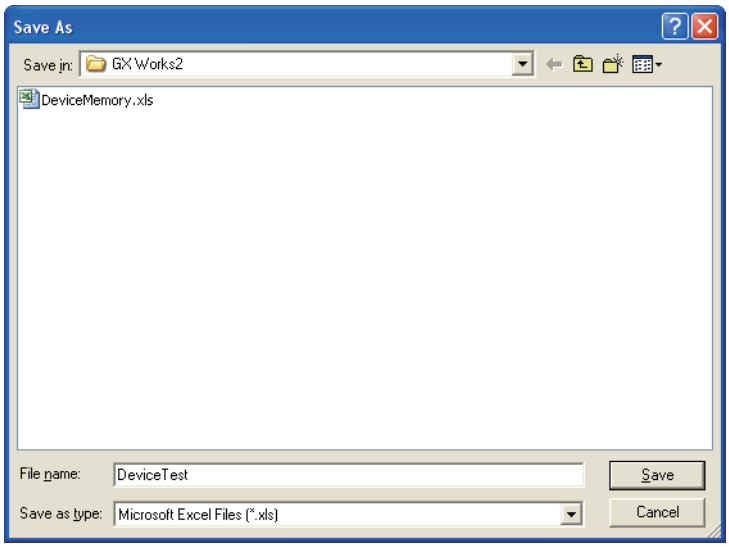
Item		Description
Range		Select the write/read range.
	Selected Devices	Select this to write/read data in the specified range to/from a programmable controller CPU.
	All Devices	Select this to write/read all data in the device memory being edited to/from a programmable controller CPU.

7.4.2 Writing/reading data to/from Excel files

Write/read device memory data to/from an Excel file.

Screen display

Select [Tool] ⇒ [Write to Excel File]/[Read from Excel File].



Operating procedure

1. **Enter a file name or select the file to be opened.**
   The Save As screen or Open screen is displayed.

2. **Click the Save or Open button.**
   Data are saved to the specified destination, or the file is opened from the specified location.

Point

- **Compatible Excel version**
  Microsoft Office Excel 97 or later version is compatible with the data write/read operations.
- **Reading data**
  When data are read from an Excel file, they are read with the saved setting of "Number of Columns".
  The following are regarded as errors and processed as explained.
  - Unsupported devices ⇒ Deleted
  - Invalid value ⇒ Set to '0'.
  - Invalid display format ⇒ Displayed in decimal numbers.

MEMO

8 SETTING DEVICE INITIAL VALUES

This chapter explains how to set, edit, and delete device initial values.

8.1 Device Initial Values

Q CPU L CPU Remote Head FX

This section explains the device initial values.

8.1.1 Feature of device initial values

The device initial values are device values used for the sequence program operation when the programmable controller turns RUN.
When the device initial values are set, the initial setting program is unnecessary.

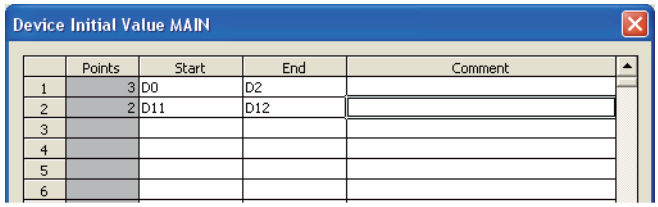
● **When device initial values are not set**

The initial setting program is necessary.

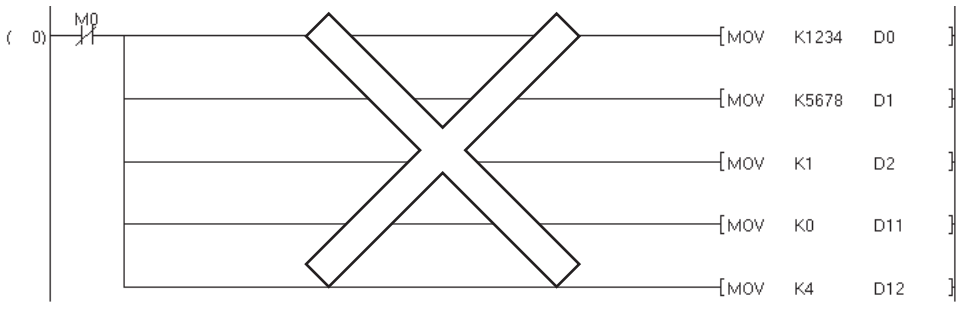
Example)

● **When device initial values are set**

Example)



The initial setting program is unnecessary.



8.1.2 List of applicable devices for device initial values

The following table shows the list of devices which can be used as device initial values.

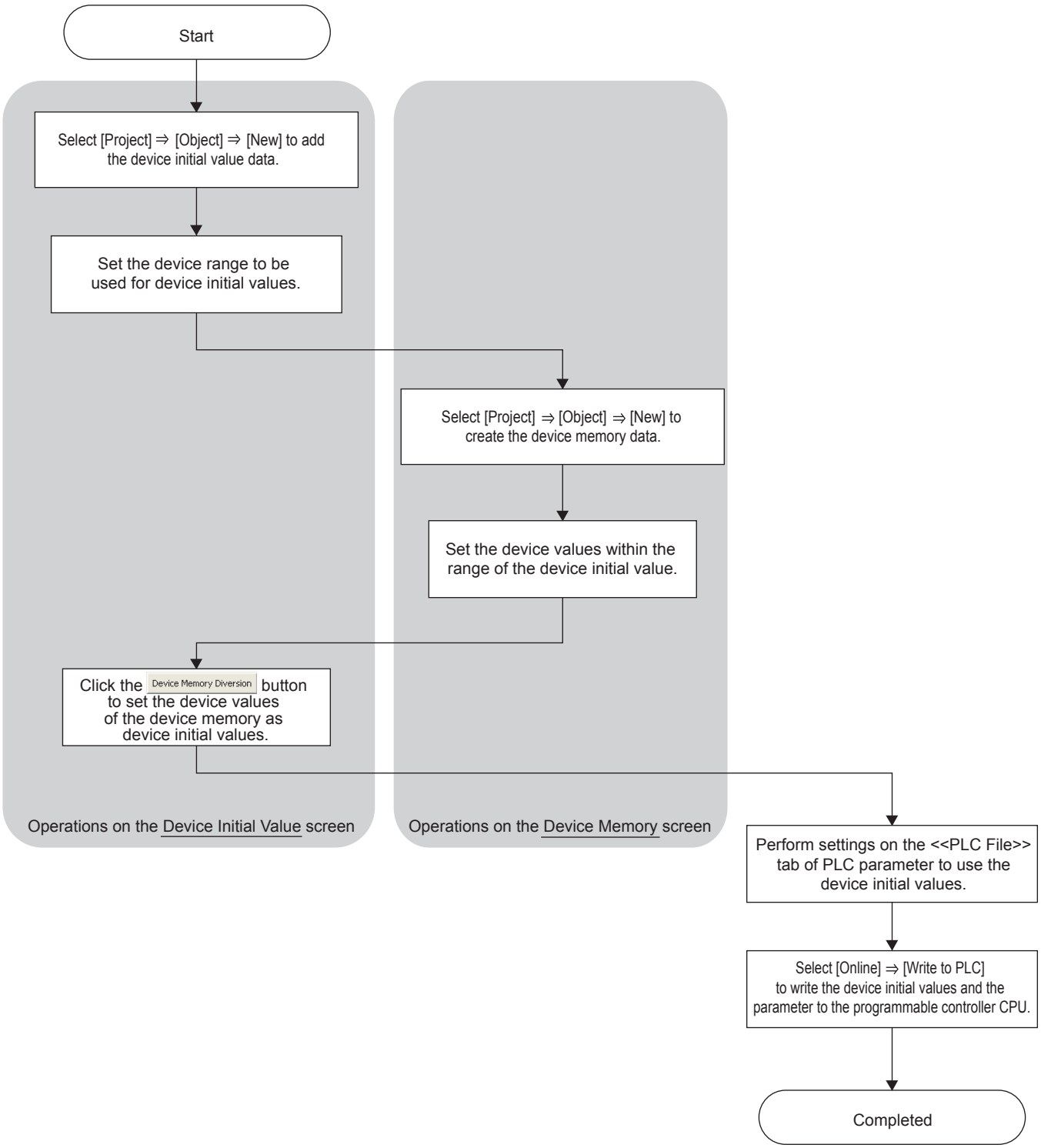
Category	Device name	Device
Internal user device	Timer	T
	Retentive timer	ST
	Counter	C
	Data register	D
	Link register	W
	Link special register	SW
Internal system device	Special register	SD
File register	File register	R*1,*2, ZR*2
Intelligent function module device	Intelligent function module device	U□\G□
Link direct device	Link register	J□\W□
	Link special register	J□\SW□

*1 : When the R device is specified to utilize the device memory data, the ZR device value is utilized for the R device.

*2 : Not applicable to Q00UJ.

8.1.3 Procedure for setting device initial values

The following flow chart shows the procedure for setting the device initial values.



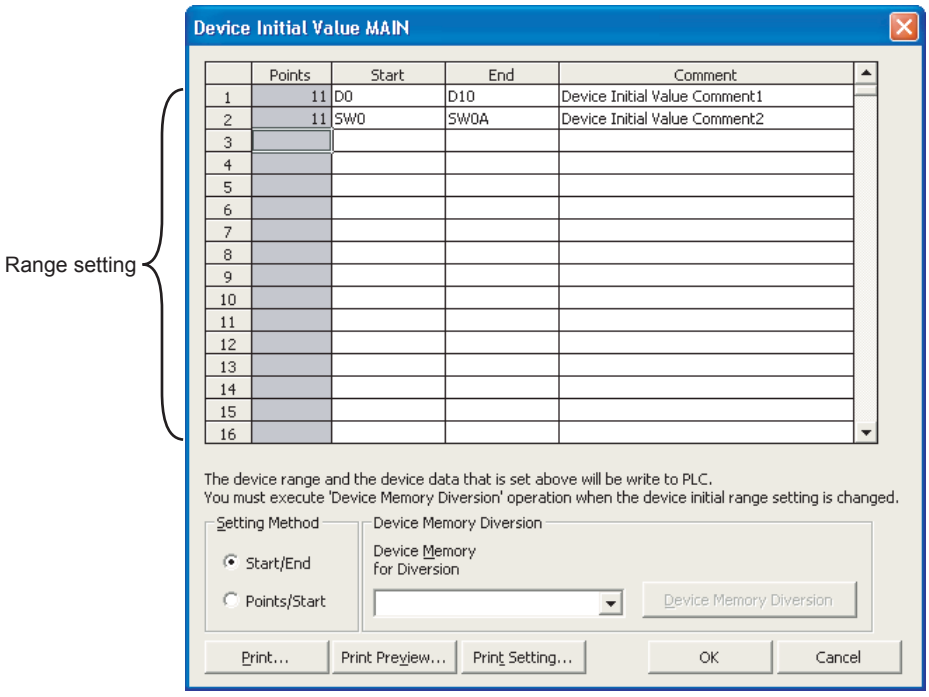
8.2 Setting Device Initial Values

Q CPU L CPU Remote Head FX

This section explains how to set device values set in the device memory as device initial values. Create a new device initial value data in advance. (☞ Section 4.3.1)

Screen display

Select Project view ⇒ "Device Initial Value" ⇒ "(data name)".



Operating procedure

1. **Set the items on the screen.**

Item		Description
Range setting		Set the range for device initial values.
	Points	Set the number of points of each device. Up to 8,000 points of devices can be set within a range.
	Start	Specify the start device of the range to be set.
	End	Specify the end device of the range to be set.
	Comment	Enter a comment in the set device range. (Up to 32 characters)
Setting Method	Start/End	Select this to set the range for device initial values by start or end device.
	Points/Start	Select this to set the range for device initial values by device points or start device.

2. **Select the data name to be utilized from ▼ in "Device Memory Diversion", and click the [Device Memory Diversion] button.**

   The device value in the set range is set as a device initial value.

3. **Click the [OK] button.**

Screen button

- Print...
  Executes printing. (☞ Section 20.7)
- Print Preview...
  Executes print preview. (☞ Section 20.9)
- Print Setting...
  Displays the Print Setting (Device Initial Value) screen. (☞ Section 20.8.2)

Point

- **Using device initial values**
  If the device values with set ranges are used as the initial values when activating the programmable controller CPU, specify the file name to be used for the initial values on the <<PLC File>> tab of PLC parameter.
- **Device range**
  The device range that can be set for device initial values is the range set on the <<Device>> tab of PLC parameter.

9 SETTING DEVICE COMMENTS

This chapter explains the operation methods for setting, editing, and deleting device comments.

9.1 Device Comments

Q CPU L CPU Remote Head FX

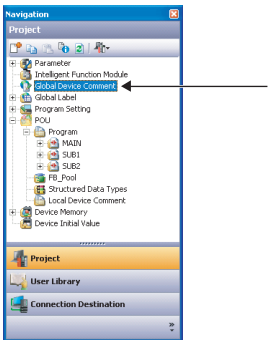
This section explains the general concept of device comments and the setting availability.

9.1.1 Global device comments/local device comments

Device comment is categorized into global device comment and local device comment.

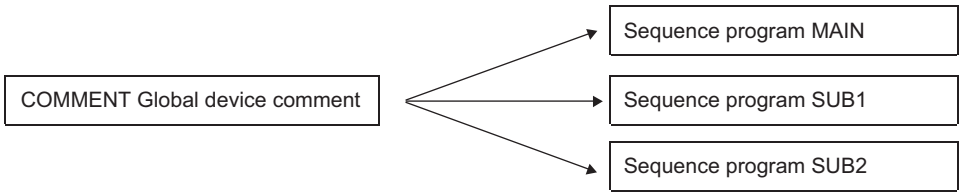
■ Global device comments

A global device comment is a device comment created automatically when a new project is created. Global device comments are set to use common device comment data among multiple programs. Global device comments can be set even when there is only one program.



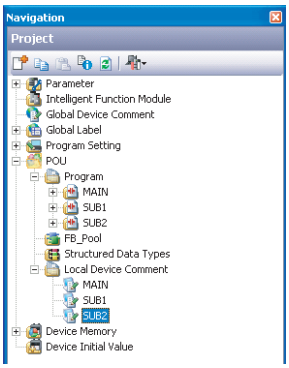
A global device comment name is fixed to COMMENT. Global device comments can be changed to local device comments.

<Image that is created with only global device comments>



■ Local device comments

A local device comment is a device comment created by the user.
No local device comment exists when a new project is created.
Create a local device comment if necessary. (☞ Section 4.3.1)
Local device comments are used in association with each program.
Device comments are set under the same name as sequence programs.
For Structured projects, device comments are set under the same data name as the program file name.



Display example when local device comments are set.

<Image of a project created with only local device comments>

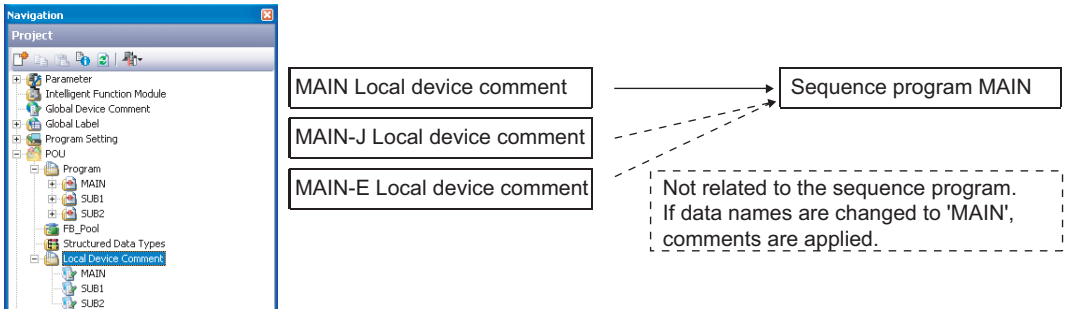
MAIN Local device comment	→	Sequence program MAIN
SUB1 Local device comment	→	Sequence program SUB1
SUB2 Local device comment	→	Sequence program SUB2

Point

● **Writing device comments to a programmable controller CPU**
Up to the following number of device comments can be written to the programmable controller CPU.
Per device: 32k points
Total number of device comments: 64k points
When the number of set device comments exceeds the number of points that can be written to the programmable controller CPU, set the range when writing device comments to the programmable controller CPU. (☞ Section 12.1.3)

● **Data name of global device comments**
A global device comment is displayed as "COMMENT" in the screen for Write to PLC/Read from PLC.

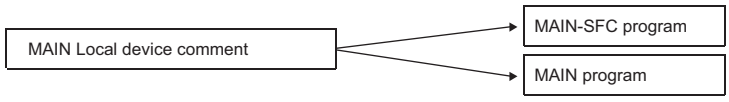
● **Setting local device comments with data names different from the sequence program name**
Multiple local device comments can be created with data names different from the sequence program name. In this case, however, the comments are not related to the sequence program.
To make the comments relate to the sequence program, the comments should have the same data names as the program name.
This is useful for cases, such as when switching comments between Japanese and English in the same program.



● **Global device comments/local device comments**
Global device comments/local device comments correspond respectively to common comments/comments by program in GX Developer.

● **Device comments for Basic model QCPU**
Global device comments are not supported by Basic model QCPU.
A local device comment for Basic model QCPU is fixed to "MAIN".
When an SFC program is created, the SFC program "MAIN-SFC" also refers to a local device comment "MAIN".

<Image of an SFC program for Basic model QCPU>



● **Local device comments for FXCPU**
For FXCPU, local device comments cannot be written to a programmable controller CPU. If local device comments needs to be written, create comments as global device comments, or change local device comments to global device comments. When changing a local device comment to a global device comment, change its data name to "COMMENT". (☞ Section 4.3.3)

● **Difference between device comment and label comment**
A device comment is a comment appended to a device, and it is 'data' to be read from/write to a programmable controller CPU.
A label comment is a comment appended to a defined label. A label comment is not applied to a device comment even when a program is compiled.

■ Displaying device comments on program editors

Device comments can be displayed on program editors.
The following are the settings to display device comments.

● **Displaying device comments on the program editor (ladder editor and Zoom editor only)**
Select [View] ⇒ [Comment].
Device comments are displayed on the ladder editor or the Zoom editor.

● **Displaying device comments on tooltips**
Select "Device Comment" under [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder/SFC"/"Structured Ladder/FBD/ST"*1 ⇒ "Tool hint display items".
Device comments are displayed on tooltips.

*1 : For Simple project (with labels), select "ST" instead of "Ladder/SFC"/"Structured Ladder/FBD/ST".

■ Specifying device comments to be displayed in program

When both global and local device comments are set, specify the comment to be displayed by the following method.

Operation

- **Set the device comment to be referenced by selecting [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "All Editors" ⇒ "Device Comment".**

  Example) When different device comments are set for the same device (M)

Global device comment (COMMENT)

Device Name	Comment
M0	
M1	Initial Start 1
M2	Initial Start 2

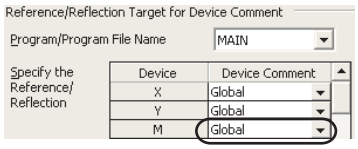
Local device comment (MAIN)

Device Name	Comment
M0	
M1	Stop Device 1
M2	Stop Device 2

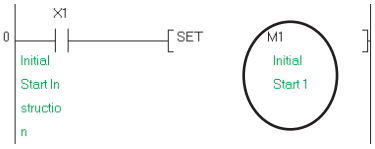
The display differs as shown below according to the option setting.

● When the reference of the device M in the sequence program MAIN is set to the global device comment

<Option>



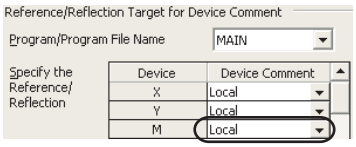
<Sequence program MAIN>



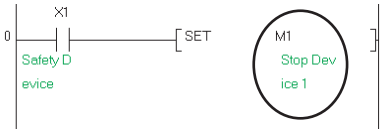
The global device comment, 'Initial Start 1', is displayed as a device comment for M1.

● When the reference of the device M in the sequence program MAIN is set to the global device comment

<Option>



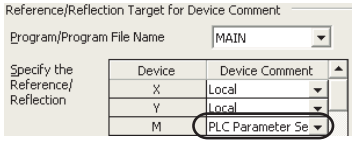
<Sequence program MAIN>



The local device comment, 'Stop Device 1', is displayed as a device comment for M1.

● When the reference of the device M in the sequence program MAIN is set to the PLC parameter setting

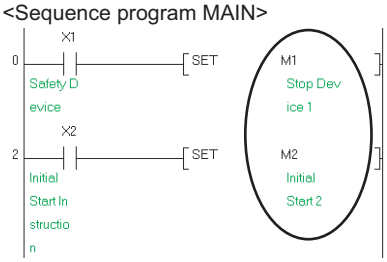
<Option>



<Device>

	Sym.	Dig.	Device Points	Latch (1) Start	Latch (1) End	Latch (2) Start	Latch (2) End	Local Device Start	Local Device End
Input Relay	X	16	8K						
Output Relay	Y	16	8K						
Internal Relay	M	10	8K					0	1
Latch Relay	L	10	8K						

<Sequence program MAIN>



The local device comment, 'Stop Device 1', is displayed for local device M1, and the global device comment, 'Initial Start 2', is displayed for global device M2.

Point

● **Specifying device comments for "Specify the reference/reflection" in batch**

The following operations can be performed to set "Specify the reference/reflection".

By clicking the Global / Local / PLC Parameter Setting button, the "Reference/Reflection Target" settings of all device comments of program selected for "Program/Program File Name" are set to "Global"/"Local"/"PLC Parameter Setting.*1

By clicking the Apply to all programs button, the setting of "Specify the reference/reflection" of the selected program is applied to all programs.

*1 : Only devices with which the range of local devices can be specified on the <<Device>> tab of PLC parameter can be set.

● **Device comment to be referenced is not set**

If a comment does not exist in the device comment set for "Specify the reference/reflection", the other device comment can be displayed by setting the option.*1

Select [Tool] ⇒ [Options] ⇒ "All Editors" ⇒ "Device Comment", and select "Reference/reflect the other, when device comment is not set.".

*1 : Except for when 'PLC Parameter Setting' is set for "Specify the reference/reflection".

9.1.2 List of device comment applicable devices

The following table shows device types and comment setting availability.

○: Applicable / ×: Not applicable

Category	Device name	Symbol	Bit specification*1	QCPU (Q mode)/ LCPU	FXCPU
Internal user device	Input	X	×	○	○
	Output	Y	×	○	○
	Internal relay	M	×	○	○
	Latch relay	L	×	○	–
	Annunciator	F	×	○	–
	Edge relay	V	×	○	–
	Step relay	S	×	×	–
	Link relay	B	×	○	–
	Link special relay	SB	×	○	–
	State	S	×	–	○
	Timer	T	×	○	○
	Retentive timer	ST	×	○	–
	Counter	C	×	○	○
	Data register	D	○	○	○
	Link register	W	○	○	–
	Link special register	SW	○	○	–
	Direct input	DX	×	○	–
	Direct output	DY	×	○	–
Internal system device	Special relay	SM	×	○	–
		M	×	–	○
	Special register	SD	○	○	–
		D	×	–	○
Link direct device	Link input	J□\X□	×	○	–
	Link output	J□\Y□	×	○	–
	Link register	J□\W□	○	○	–
	Link special register	J□\SW□	○	○	–
	Link relay	J□\B□	×	○	–
	Link special relay	J□\SB□	×	○	–
File register	File register	R	○	○*2	○*3
		ZR	○	○*2	–
	(RAM) File register	D	×	–	○
Index register	Index register	Z, ZZ	×	×	–
Intelligent function module device	Intelligent function module device	U□\G	○	○	○*4
Nesting	Nesting	N	×	×	×
Pointer	Pointer	P	×	○	○
	Interrupt pointer	I	×	○	○

Category	Device name	Symbol	Bit specification*1	QCPU (Q mode)/ LCPU	FXCPU
Other	Network number specified device	J	×	○	–
	SFC block device	BL*5	×	○	–
	Step relay (Step relay with a block specification)	BL\S	×	○	–
	SFC transition device	BL\TR	×	○	–
	I/O number specified device	U	×	○	○*4

*1 : Bit-specified word device comment is applicable to Universal model QCPU/LCPU only.
*2 : Not applicable to Q00J/Q00UJ.
*3 : R (extended register) is applicable to FX3G/FX3GC or FX3U/FX3UC only
*4 : Applicable to FX3U/FX3UC only
*5 : For projects with labels, comments of the BL device are not applied to the block titles.

Point

● **Device comment creation supported range in the multiple CPU system configuration for QCPU (Q mode)**
Device comments can be created in the following ranges, corresponding to the buffer memory of the programmable controller CPU (3E00H to 3E30H) in a multiple CPU system.

Supported range	Unsupported range
U0(\G0) to U1FF(\G65535)	U200(\G0) to U3DF(\G65535)
U3E0(\G0) to U3FF(\G65535)	

● **Screen to display bit-specified comments**
Bit-specified word device comments can be displayed only on device comment editors, ladder editors, the Cross Reference window, the Watch window, and the Sampling Trace screen.

9.2 Creating Device Comments

Q CPU | L CPU | Remote | Head | FX

This section explains how to create device comments, which make it easy to understand content of program processing.

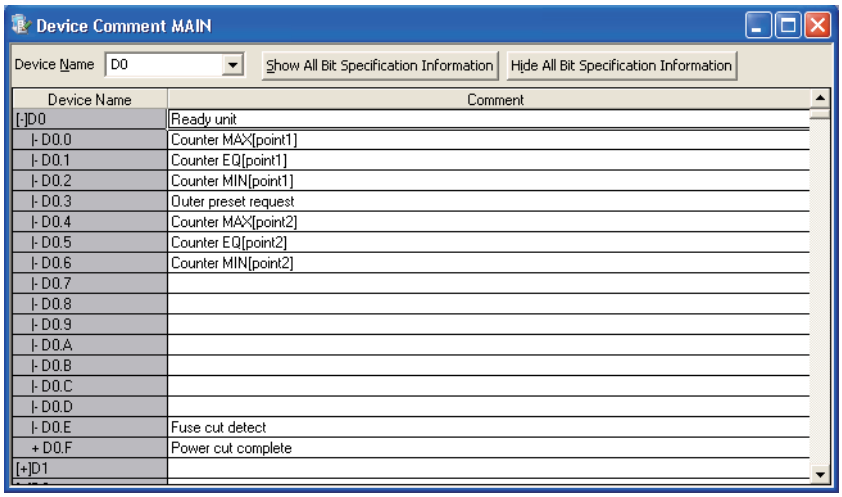
9.2.1 Creating comments on the device comment editor

Create device comments for each device on the same screen.
When creating local device comments, create a new device comment in advance. (☞ Section 4.3.1)

Screen display

● **Creating global device comments**
Select Project view ⇒ "Global Device Comment".

● **Creating local device comments**
Select Project view ⇒ "Local Device Comment" ⇒ "(data name)".



Operating procedure

- **Set the items on the screen.**

Item	Description
Device Name	Specify the device to be edited.
Comment*1	Enter a device comment for each device.

*1 : For Universal model QCPU/LCPU, the entry field for bit-specified word device comment can be expanded/collapsed by clicking a column of "Device Name".

Screen button

- Show All Bit Specification Information **(Universal model QCPU/LCPU only)**
  Displays all entry fields for bit-specified word device comment.
- Hide All Bit Specification Information **(Universal model QCPU/LCPU only)**
  Hides all entry fields for bit-specified word device comment.

Point

- **Limit for the number of characters to be entered**
  Enter each device comment within 32 characters.
  The limit for the number of characters to be entered can be switched between 16 characters and 32 characters.
  (☞ Section 21.2)
- **Cutting/copying/pasting device comments for word devices which support bit-specified word device comments**
  For Universal model QCPU/LCPU, select the following menu when cutting/copying/pasting device comments including bit-specified word device comments.
  - [Edit] ⇒ [Cut The Range including Hidden Bit Specification Information]
  - [Edit] ⇒ [Copy The Range including Hidden Bit Specification Information]
  - [Edit] ⇒ [Paste The Range including Hidden Bit Specification Information]

Restrictions

- **Range selection of entry fields for bit-specified word device comment**
  When a range is selected with entry fields for bit-specified word device comment are collapsed, the last entry field for bit-specified word device comment becomes out of the range selection.
  To select the last entry field for bit-specified word device comment, expand the entry fields and select the range.

9.2.2 Creating comments on the ladder editor

Modify and add device comments.

■ Creating device comments in device comment editing mode

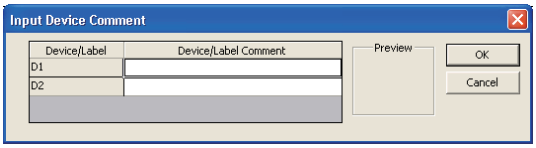
Example: Set 'Result of module A' to D1 and 'Initial setting is completed' to D2.

Operating procedure

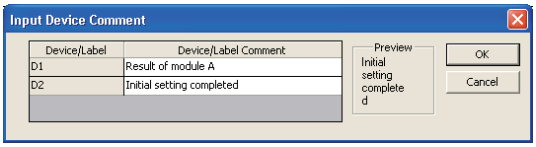
1. **Select [Edit] ⇒ [Documentation] ⇒ [Device Comment] ( ).**
   The mode changes to the device comment editing mode.

2. **Move the cursor to the device comment entry position.**

3. **Press the Enter key.**
   The Input Device Comment screen is displayed.



4. **Enter a device comment.**
   The line wrapping of the device comment for display can be checked when the comment is entered.



5. **Click the OK button.**
   The entered device comment is displayed as shown at the right.

Point

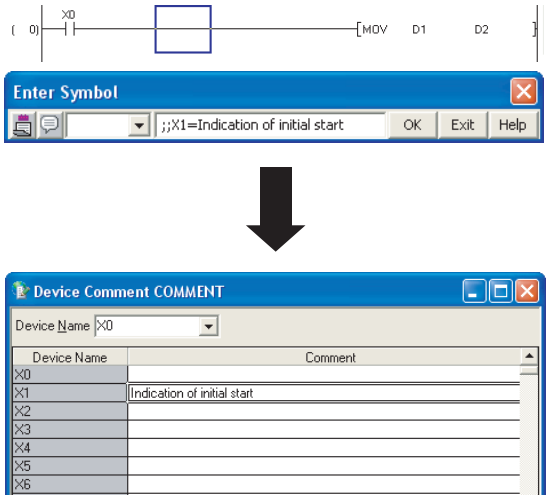
- **Limit for the number of characters to be entered**
  Enter each device comment within 32 characters.
  The limit for the number of characters to be entered can be switched between 16 characters and 32 characters.
  (☞ Section 21.2)
- **Disabling the device comment editing mode**
  Select the same menu option again and clear the check box from the item displayed on the screen.
- **Target of applying device comment change**
  Device comments changed or added on the ladder editor are applied to global device comments.
  To apply changes to local device comments, specify the reflection target for "Reference/Reflection Target for Device Comment" under [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "All Editors" ⇒ "Device Comment".

■ Creating device comments in the ladder editing mode

Device comments can be added/modified on the created ladder program on the ladder editing screen.
Example: Set the comment 'Indication of initial start.' for X1.

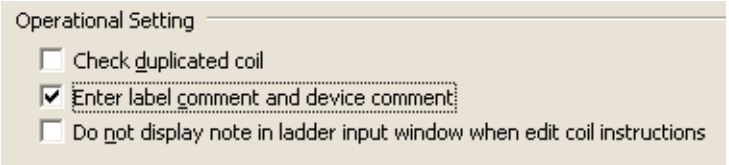
Operating procedure

- **Enter ';;X1=Indication of initial start' on the ladder editor.**
  The entered comment is added as a device comment.



Point

● **Entering comments following element entry**
Using the method explained below, a comment can be entered following an element entry in ladder editing mode.
Click in the Enter Symbol screen, or select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Ladder/SFC" ⇒ "Enter ladder" and select "Enter label comment and device comment".



● **Target of applying device comment change**
Device comments changed or added on the ladder editor are applied to global device comments.
To apply changes to local device comments, specify the reflection target for "Reference/Reflection Target for Device Comment" under [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "All Editors" ⇒ "Device Comment".

● **Considerations when entering device comments in the ladder editing mode**
When entering device comments in the ladder editing mode, do not enter device comments to devices which are out of the range of device points set on the <<Device>> tab of PLC parameter because they cannot be deleted.

9.3 Deleting Device Comments

Q CPU L CPU Remote Head FX

This section explains how to delete device comments.

9.3.1 Deleting comments of all devices

Delete comments of all devices on the device comment editor being displayed.

Operating procedure

- **Select the device comment editor ⇒ [Edit] ⇒ [Clear All (All Devices)].**
  All device comments set on the device comment editor are deleted.

9.3.2 Deleting comments of devices being displayed

Delete comments of devices being displayed on the device comment editor.

Operating procedure

- **Select the device comment editor ⇒ [Edit] ⇒ [Clear All (All Displayed Devices)].**
  All comments of devices being displayed on the device comment editor are deleted.

9.4 Extending Number of Points of Device Comment

Q CPU L CPU Remote Head FX

The number of points of device comment can be extended by changing the mode from the standard mode to the extended mode.
Device comment can be set within the extended number of points in the project.

The following table shows the number of points of device comment that can be set in the standard mode and the extended mode.

Item	Standard mode	Extended mode
Number of points of device comment per device	32k points	192k points
Number of points of device comment per file	1024k points	2048k points

Operating procedure

- **Select "Extended mode" under [Tool] ⇒ [Options] ⇒ "Device Comment Editor".**

Point

● **Writing/reading device comments to/from a programmable controller CPU**
Regardless of the standard mode or the extended mode, up to the following number of device comments can be written to the programmable controller CPU.
Per device: 32k points
Total number of device comments: 64k points
When the number of set device comments exceeds the number of points that can be written to the programmable controller CPU, set the range when writing device comments to the programmable controller CPU. (☞ Section 12.1.3)
Note that when 32k or more points of device comments are set for a single device in the extended mode and device comments are read from a programmable controller CPU, the device comments that exceed 32k points are not deleted.

● **When changing the mode from the extended mode to the standard mode**
Select "Standard mode" under [Tool] ⇒ [Options] ⇒ "Device Comment Editor" to change the mode from the extended mode to the standard mode.
Note that, however, when the number of points which exceeds the number of points that can be set in the standard mode is set, the mode cannot be changed. Delete the exceeded device comments and change the mode.

● **Considerations for saving GX Developer format project**
[Export to GX Developer Format File] under [Project] cannot be performed when the extended mode is set.
Save the GX Developer format project after changing the mode to the standard mode.

9.5 Utilizing Sample Comments

This section explains how to set a sample comment of special relays/special registers and intelligent function modules automatically.
Open the device comment editor in advance.

9.5.1 Utilizing sample comments of special relays/special registers

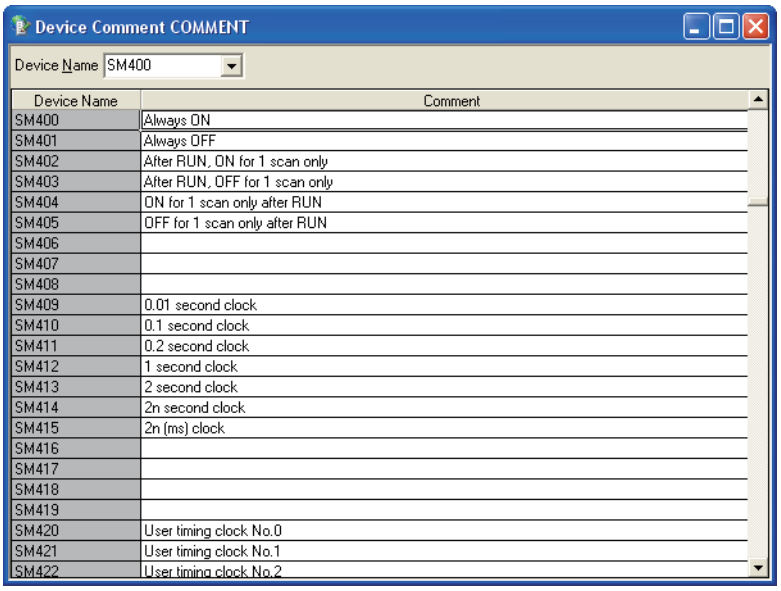
Q CPU | L CPU | Remote (×) | Head (×) | FX

Utilize sample comments of special relays/special registers.

Operating procedure

- **Select [Edit] ⇒ [Import from Sample Comment] ⇒ [Special Relay/Special Register].**

  The sample comments of special relays/special registers are set on the device comment editor being edited.



Point

● **Project language and sample comments to be utilized**
When the project language is changed, sample comments with the language selected for the project language are utilized.

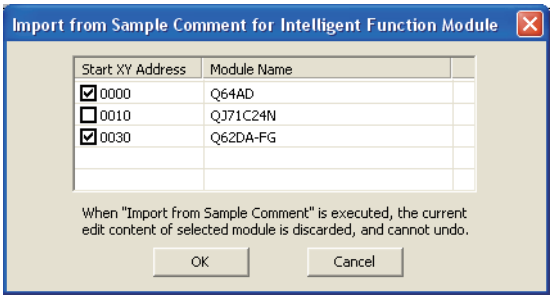
9.5.2 Utilizing sample comments of intelligent function modules

Q CPU | L CPU | Remote (×) | Head (×) | FX (×)

Utilize sample comments of intelligent function module devices and input/output signals.

Operating procedure

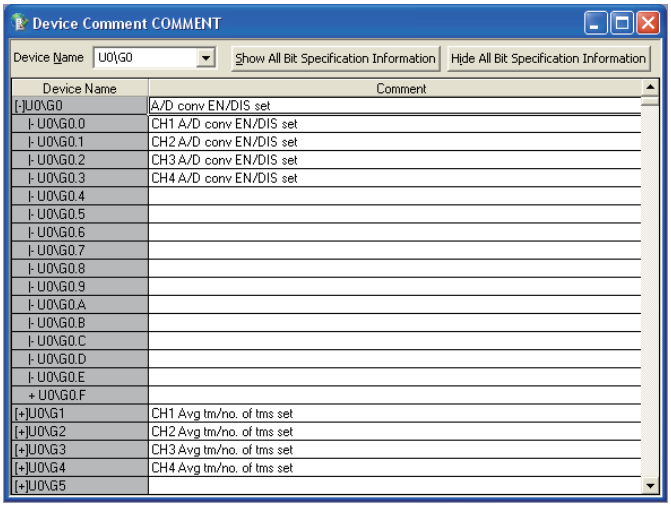
1. **Select [Edit] ⇒ [Import from Sample Comment] ⇒ [Intelligent Function Module].**



2. **Select modules whose sample comments are utilized.**

3. **Click the** OK **button.**

   The sample comments of intelligent function module devices are set on the device comment editor being edited.
   For Universal model QCPU/LCPU, bit-specified word device comments can also be utilized.



Point

● **Utilizing sample comments**
- Sample comments can also be utilized by right-clicking any position on the device comment editor, and selecting [Import from Sample Comment] from the shortcut menu.
- For data protected by security, device comments cannot be utilized.
- When the project language is changed, sample comments of the selected project language are utilized.

● **Number of characters displayed on device comment editor**
The sample comments are displayed with the number of characters set in "Device Comment Editor" under [Tool] ⇒ [Options].

● **Considerations when utilizing sample comments**
When utilizing sample comments of intelligent function module, the data size may exceed the memory capacity of the programmable controller CPU and data may not be written to a programmable controller CPU. In this case, delete unnecessary sample comments.

9.6 Writing/Reading Device Comments to CSV Files

Q CPU | L CPU | Remote | Head | FX

This section explains how to write/read device comment data to a CSV file.

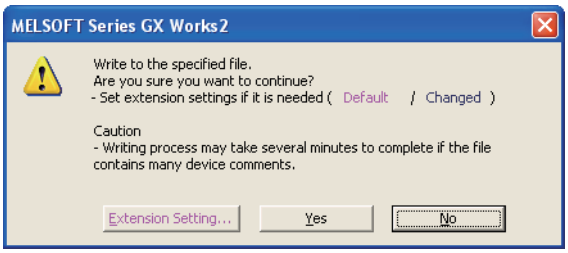
■ Writing device comment data

Write device comment data to a CSV file.

Operating procedure

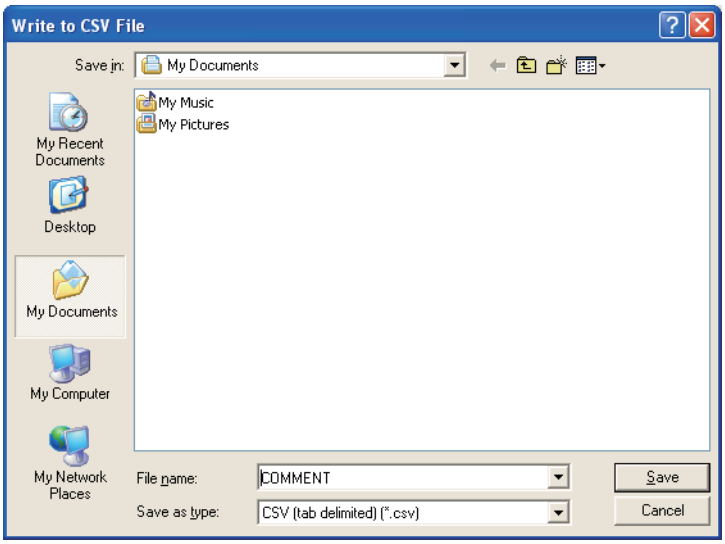
1. **Select [Edit] ⇒ [Write to CSV File].**

   The confirmation message for writing data is displayed.



2. **Click the [Yes] button.**

   The Write to CSV File screen is displayed.



3. **Enter a file name of the data to be saved.**

4. **Click the [Save] button.**

   Device comment data is saved in the CSV file.

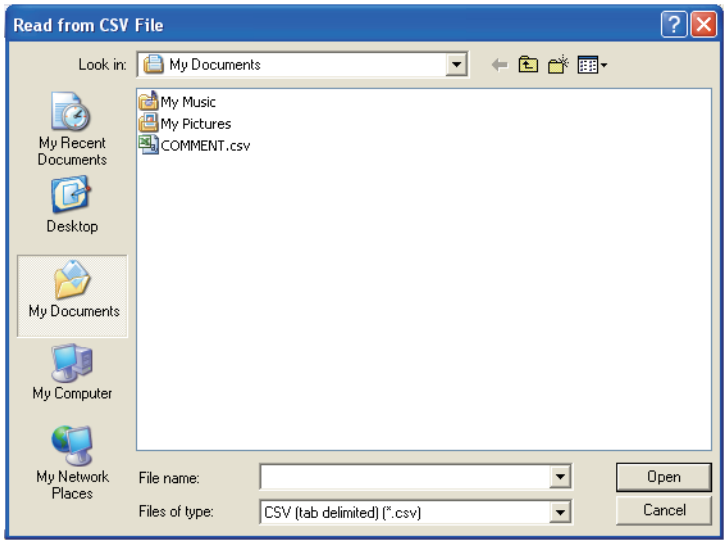
■ Reading device comment data

Read device comment data from a CSV file.

Operating procedure

1. **Select [Edit] ⇒ [Read from CSV File].**

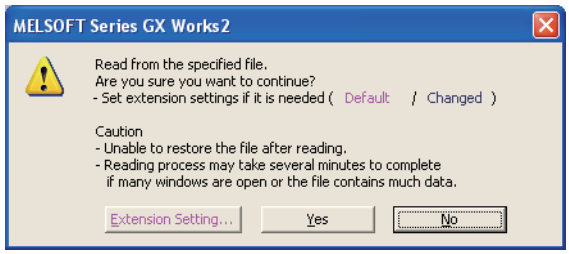
   The Read from CSV File screen is displayed.



2. **Select a file to be read.**

3. **Click the** Open **button.**

   The confirmation message for reading data is displayed.



4. **Click the** Yes **button.**

   Device comment data is read from the CSV file.

Point

● **Device comment data for which an error message is displayed when reading data**

An error message is displayed on the Output window if the following data is included when reading device comment data.

Reading of device comment data is suspended when the number of error messages exceeds 100.

- Device comment data of devices which are not supported by the programmable controller type of the project.
- Bit-specified device comments (For programmable controller type whose project does not support bit-specified comments.)

● **Reading device comment data whose number of characters exceeds the applicable amount**

When a device comment whose number of characters exceeds applicable amount is set on the device comment editor, a warning message is displayed on the Output window and characters exceeded the applicable amount are deleted.

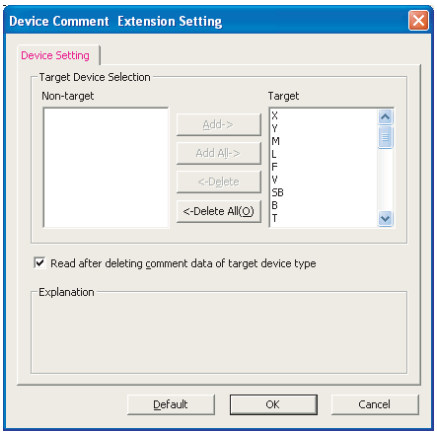
■ Setting extended settings

Set settings such as selecting target devices for writing/reading device comment data.

Screen display

Select the [Extension Setting...] button on the confirmation message for writing/reading data.

< When reading device comment data >



Operating procedure

1. **Set the items on the screen.**

Item		Description
Target Device Selection		Display all devices to which device comments can be set in a program.
	Non-target	Display devices which are not to be written/read.
	Target	Display devices which are to be written/read.
Read after deleting comment data of target device type*1		Select this to read devices after deleting set device comments.

*1 : This item can be selected only when reading data.

2. **Click the [OK] button.**

Return to the confirmation message for writing/reading data.

Screen button

- [Add->]
  Moves devices selected for "Non-target" to "Target".
- [Add All->]
  Moves all devices displayed on "Non-target" to "Target".
- [<-Delete]
  Moves devices selected for "Target" to "Non-target".
- [<-Delete All(O)]
  Moves all devices displayed on "Target" to "Non-target".
- [Default]
  Sets the setting items to the default.

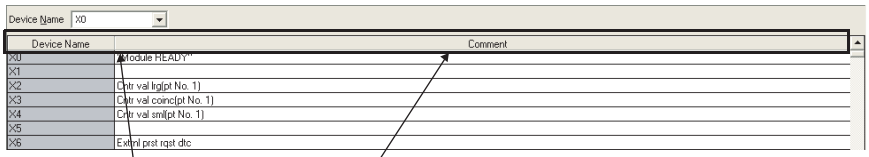
■ CSV file format

A title name of device comment editor and a title name of CSV file are linked.

- Data of the column whose title matches with the title of the device comment editor are read to the device comment editor.
- Data of the column whose title does not match with the title of the device comment editor are not read.
- Data can be read even when the sorted order of CSV file does not match with the sorted order of the device comment editor.

The following is an image of the saved CSV file opened with Excel.

< Device comment editor >



< CSV file >

	A	B	C	D	E
1	SYOKIKA				
2	Device Name	Comment			
3	X0	"Module READY"			
4	X2	Cntr val lrg(pt No. 1)			
5	X3	Cntr val coinc(pt No. 1)			
6	X4	Cntr val sml(pt No. 1)			
7	X6	Extrnl prst rqst dtc			

● Details of CSV file

The following indicates the details of CSV file format.

- The file format is Unicode (including UTF-16, Little Endian, and BOM).
- The delimiter of items is a tab (\t).
- Each item is enclosed in double quotation marks (").
- If the item contains double quotation marks ("), the double quotation marks in the item are expressed as two double quotation marks ("").
- A line feed is set at the end of the line.
  The line feed code is CR+LF.
- A blank space is handled as a regular character.

< Image of device comments in CSV file >

```
"SYOKIKA"
"Device Name"   "Comment"
"X0"    """Module READY"""
"X2"    "Cntr val lrg(pt No. 1)"
"X3"    "Cntr val coinc(pt No. 1)"
"X4"    "Cntr val sml(pt No. 1)"
"X6"    "Extrnl prst rqst dtc"
```

MEMO

10 SEARCH/REPLACE

This chapter explains the operation methods for searching for/replacing the character strings used in programs.

10.1 Cross Reference

Q CPU L CPU Remote Head FX

This section explains how to create and display the cross reference information, which shows a list of locations where devices/labels selected on the program editor/label setting editor are used.
The Cross Reference window is displayed horizontally when it is docked on top or bottom of the main frame, and displayed vertically when it is docked on left or right of the main frame.

■ Target data for creating cross reference information

Cross reference information is created based on devices used in the following editors/parameters.

- Ladder
- SFC
- ST
- Structured Ladder/FBD
- Global label
- Local label
- Structure
- Multiple CPU refresh setting of PLC parameter
- Simple PLC communication setting of PLC parameter
- Refresh parameters of network parameter
- Auto refresh setting of intelligent function module parameter
- Block information of SFC program

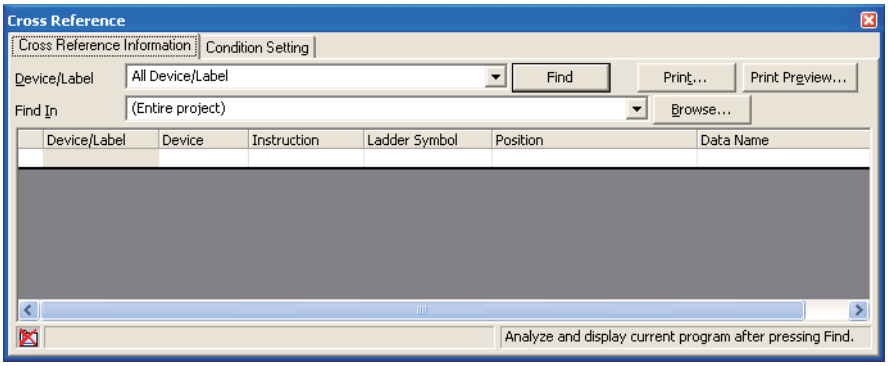
10.1.1 Creating/displaying cross reference information

Create and display cross reference information of the label/device selected on the program editor/label setting editor.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Cross Reference] ( ).

<<Cross Reference Information>>



Operating procedure

1. **Specify the conditions to create cross reference information as necessary.**

   By setting the conditions, the operation such as: searching for a label definition on the label setting editor, displaying hierarchy of structure/array/FB, and displaying a start device and end device of the instruction such as the DMOV instruction which uses two or more points of device, can be performed. (☞ Section 10.1.2)

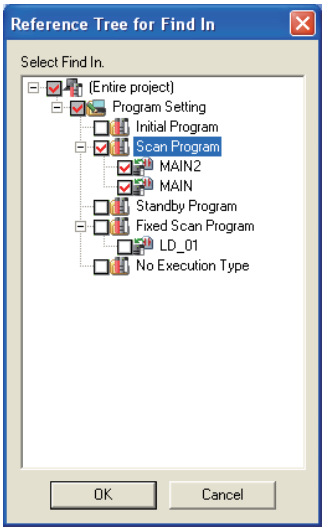
2. **Select a device/label on the program editor/label setting editor.**

3. **To specify the range to be searched, select a search location by clicking the Browse... button of "Find in".**

   Two or more search locations can be selected.

   Click ▼ to select a location from the list of previously searched locations. The location cannot be entered directly.

   This function is not supported by FXCPU.



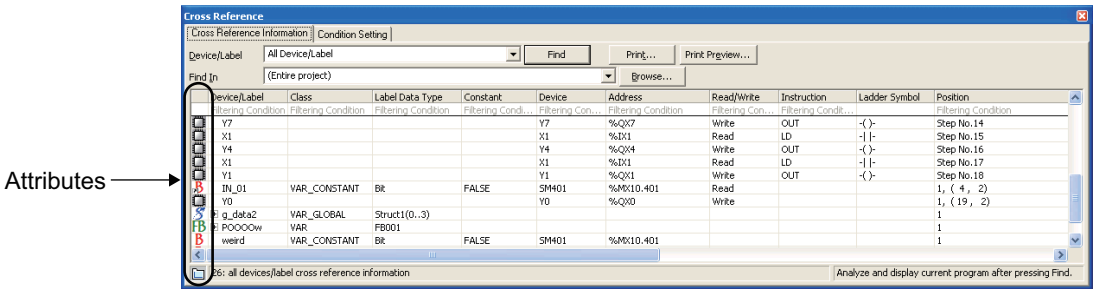
4. **Click the Find button.**

   The cross reference information is created and the result is displayed.

   When the range to be searched is specified and "Include label definition" on the <<Condition Setting>> tab is selected, the cross reference information of global labels, FBs, and structures is also created other than the information of specified search location.

   By pressing the Enter key after selecting a row in the result list, or by double-clicking or right-clicking the selected row and selecting [Jump] from the shortcut menu, the editor in which the device/label is used opens and the corresponding device/label becomes in the selected status.

   The following screen is a result of a Structured project in which "Display all items" and "Display hierarchically" are selected on the <<Condition Setting>> tab.



Display contents

Item	Description
Attributes	Display icons which indicate attributes of devices/labels. (☞ '■ Icons to indicate attribute' in this section)
Device/Label	Display the device/label name.
Class*1,*2	Display the class of the device/label.
Label Data Type*1,*2	Display the data type of the device/label.
Constant*1,*2	Display the constant value set for VAR_GLOBAL_CONSTANT or VAR_CONSTANT.
Device*1	Display the device assigned to the label (automatically assigned device).
Address*2,*3	Display the address of the device/label.
Read/Write	Display whether Read or Write the device/label is.
Instruction*2,*4	Display the name of the instruction in which the device/label is used.
Ladder Symbol	For ladder programs, display elements of instruction in which devices are used.
Position	Display the position which identifies the location of the device/label. (☞ '■ Position information' on the next page)
Project*3	Display the project name or the library name in which the device/label is used.
Program File Name*3	Display the program file name in which the device/label is used.
Task*3	Display the task name of the program registration destination in which the device/label is used.
Data Type	Display the type of data in which the device/label is used.
Data Name	Display the program or the data name registered in the program in which the device/label is used. Display the block name for SFC program.
Comment*2	Display the comments of the device/label.
System Label Name*1,*2	Display the system label name which corresponds to the global label. For devices/labels set for SFC block information, this column will be blank.

*1 : These items are not displayed in Simple project (without labels).
*2 : Only when "Display all items" is selected on the <<Condition Setting>> tab.
*3 : For Structured projects only
*4 : For ladder programs and SFC (Zoom) programs only

Screen button

● Print Window...

Prints the selected row. (☞ Section 20.7)
Prints all lists when a row is not selected.

● Print Window Preview

Displays a print preview of the selected row. (☞ Section 20.9)
Displays a print preview of all lists when a row is not selected.

Point

● Creating cross reference information

- Cross reference information can also be created by right-clicking a device/label on the program editor, and selecting [Cross Reference] from the shortcut menu.

  Cross reference information can also be created based on all devices/labels by clicking the Find button without specifying devices/labels after the Cross Reference window is displayed.
- The maximum number of creation results of the cross reference information is 80,000. However, since the internal data that are not displayed are included to the results, the number of results to be displayed in the cross reference information may not reach 80,000.
  When "Auto-tracking" is selected on the <<Condition Setting>> tab, the maximum number of creation results of the cross reference information is 500.

● When a search location is selected from the list

When a program file name or an execution type is changed, the target program file may not be listed in "Find in". In this case, cross reference information of the program files whose name matches is created.

● Jump function

The jump function cannot be used for the cross reference information of parameters, block information, and block start steps.

● Moving the focus

- F12 (Ctrl + ,) moves the focus between the editor and the Cross Reference window.
- F11 (Ctrl + .)/Shift + F11 (Ctrl + Shift + .) moves the cursor to the previous/next row.

● Displaying comments

In a ladder/SFC project, comments specified in [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "All Editors" ⇒ "Device Comment" ⇒ "Reference/Reflection Target for Device Comment" are displayed as device comments.
(☞ Section 9.1.1)

● Searching cross reference information with label definitions

The time to display the creation results of the cross reference information becomes longer when the number of results exceeds 80,000 substantially.
When labels contain array elements exist, this symptom can be avoided by clearing the check box of "Display hierarchically" on the <<Condition Setting>> tab.

Restrictions

● When "Create cross reference information after completion compile" is selected in the option setting

- When timer device (T) is specified as a search condition, devices of contact (TS), coil (TC), and current value (TN) also become search targets. When any of the timer devices: contact (TS), coil (TC), or current value (TN), is specified, timer device (T) is also searched along with the specified device.
  The same operation as above applies when specifying retentive timer device or counter device.
- When device/label which is not indexed is specified as a search condition, only devices/labels which are not indexed are searched.

■ Icons to indicate attribute

The following table shows icons displayed according to the attribute of device/label.
When the attribute is label, an icon is displayed with a combination of class and data type as shown in the display example.

Attribute		Icon	Description	Display example
Device			Displayed when the attribute is device.	
Label		–	–	–
	Class		Displayed when the label class is VAR_GLOBAL.	
			Displayed when the label class is VAR_INPUT.	
			Displayed when the label class is VAR_OUTPUT.	
			Displayed when the label class is VAR_IN_OUT.	
	Data type		Displayed when the label data type is simple data type.	
			Displayed when the label data type is function block.	
			Displayed when the label data type is structure.	
	Label usage		Displayed when labels are used in a program.	

■ Position information

The following position information is displayed according to the editor.

Type	Description	Example
Ladder editor	Step number	Step No. 5
ST editor	Number of lines	Row No. 2
SFC editor*1	SFC symbol and step number	SFC Step No. 3, Step No. 4
Structured Ladder/FBD editor	Ladder block number and grid position	2. (10. 2)
Label Setting screen, Structure Setting screen	Row number	1
Parameter	Name of parameter item to which devices are set	Auto Refresh
Block information of SFC program	Name of block information to which devices/ labels are set	Block START/END Bit
Inline structured text	STB step (number of lines)	STB 3 (Row No.2)

*1 : For the SFC block number, check the property of block (program) displayed in "Data Name". (For details of properties ☞ Section 4.3.6)

■ Displaying cross reference information

● **Displaying cross reference information in uncompiled state**

For a project with labels, cross reference information can be created based on the compilation result, and it can be displayed even in an uncompiled state.

To display cross reference information in an uncompiled state, perform one of the following operations.

- Select "Fast Find" on the <<Condition Setting>> tab.
  This item can be set for Simple projects (with labels) only.
  For details of "Fast Find", refer to Section 10.1.2.
- Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Basic Setting", select "Create cross reference information after completion compile", and execute the compilation.
  By setting this item, the cross reference information can be displayed quicker while the compilation time gets longer.

● **Display after creation of cross reference information is completed**

The icon on the bottom left of the screen changes according to the status of the displayed cross reference information.

Icon	Status of cross reference information
	Indicate the cross reference information is updated.
	Indicate the project has been changed after the cross reference information is created.
	Indicate the cross reference information cannot be used. For instance, cross reference information has not been created.
	Indicate the cross reference information created in past is displayed. (Only when "Fast Find" is selected.)

- The data protected by security cannot be displayed.
- If the program or the option setting is changed, the cross reference information does not correspond with the program. In order to update the cross reference information, create it again.
- Each column can be sorted in ascending/descending order by clicking on the column header. However, the sort cannot be performed if the structure/array/FB is displayed in the tree. To cancel the display in the tree, clear "Display hierarchically" and "Display the last device of multiple points device" on the <<Condition Setting>> tab.

● **Deleting data after compiling a program**

When data is deleted after the program is compiled, the deleted data may be displayed as a search result.

To display the most recent cross reference information, compile the program and create cross reference information again.

● **Searching for multiple word (such as DMOV instruction) in a ladder program**

When a negative constant (example: K-1) is specified for device/label, an incorrect search result may be displayed.

In this case, perform the search function by specifying all devices/labels, and check the search result.

● **Searching for refresh device of CC-Link parameter**

For refresh devices (RX/RY) set in a local station or standby station of the CC-Link parameter, the target of search is only the first 16 points of devices.

● **When the same name is used for label and device**

The Auto-tracking function of cross reference gives devices a priority to be searched.

To display cross reference information of label whose name is the same as that of device, search for "All Device/Label" in "Device/Label". Then, enter a label name in the "Device/Label" column of filtering condition, and execute the filtering display.

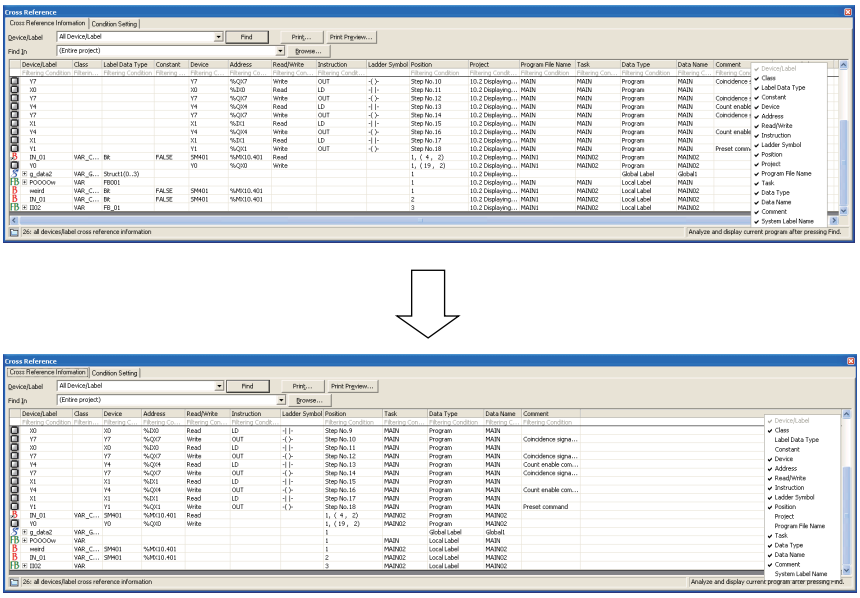
● **Searching for BL devices**

When BLn is specified for the device to be searched, the block start steps for n block start are also searched.

"BLOCK" (with END check) or "BLOCK-S" (without END check) is displayed in the "Instruction" column on the Cross Reference window.

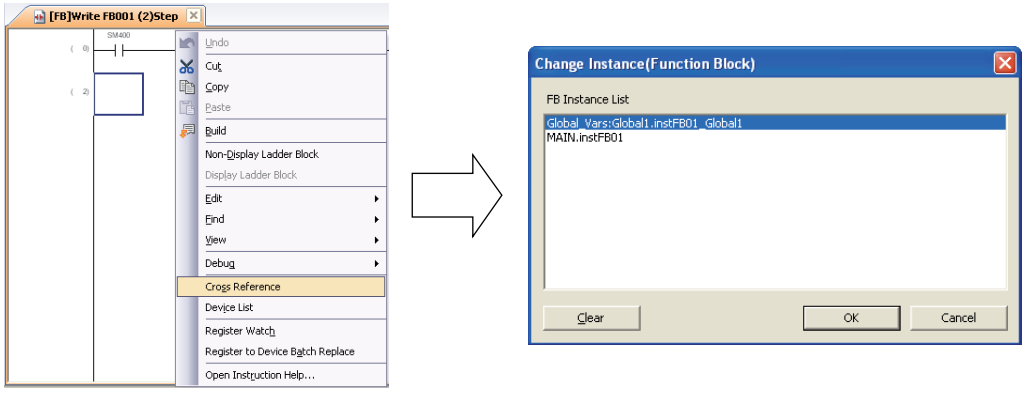
■ Displaying/hiding columns

Columns in the screen can be displayed or hidden by right-clicking a column header of the cross reference information and selecting the items to be displayed or hidden from the shortcut menu.



■ Displaying devices/labels that use FB instance

To create the cross reference information from the devices/labels used in the function block, select the FB instance to create the cross reference information.

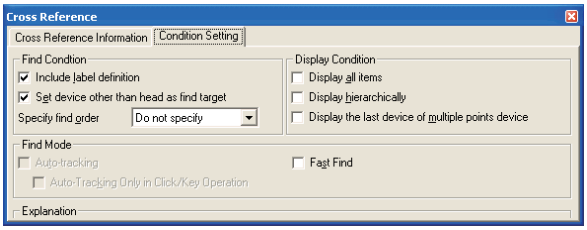


10.1.2 Setting conditions

Conditions are set on the <<Condition Setting>> tab on the Cross Reference window.
Whenever the condition is changed, the cross reference information needs to be recreated.

Screen display

Select the <<Condition Setting>> tab on the Cross Reference window.



Operating procedure

- **Set the items on the screen.**

Item			Description
Find Condition			–
	Include label definition		Select this to search each label setting editor.
	Set device other than head as find target		Select this to search devices following the start device of digit-specified device/ multiple word device.
	Specify find order*1		Specify the search order.
Display Condition			–
	Display all items		Select this to display all items that can be created in the cross reference information.
	Display hierarchically		Select this to display a structure/array/FB hierarchically.
	Display the last device of multiple points device*2		Select this to display the start and last devices when a device which uses two or more points in a instruction is specified.
Find Mode			–
	Auto-tracking*3		Select this to create cross reference information of devices/labels selected on the editor automatically.
		Auto-Tracking Only in Click/Key Operation	Select this to update cross reference information only when the cursor is moved by clicking the mouse or pressing the key. When this item is selected, the Auto-tracking function does not apply to the operations with the mouse wheel and the scroll bar.
	Fast Find*4		Select this to display cross reference information more quickly. Only "Device/Label", "Device", "Instruction", "Ladder Symbol", "Position", and "Data Name" are displayed. ST programs, inline structured text programs, and the second hierarchy of function block in ladder programs are not searched. By selecting this item, the setting of "Create cross reference information after completion compile" under [Tool] ⇒ [Options] ⇒ [Compile] ⇒ "Basic Setting" is disabled.
Explanation			Display the explanation of the condition item.

*1 : For QCPU (Q mode) excluding Basic model QCPU and LCPU only
*2 : For ladder programs and SFC (Zoom) programs only
*3 : For projects with labels, this item can be selected when "Create cross reference information after completion compile" is selected under [Tool] ⇒ [Options] ⇒ [Compile] ⇒ [Basic Setting], or when "Find Mode" is selected on the <<Condition Setting>> tab.
*4 : For Simple projects (with labels) only

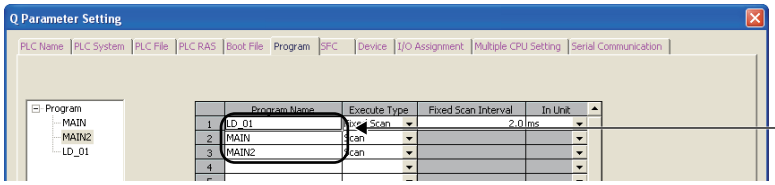
Point

● **"Specify find order" on the <<Condition Setting>> tab**

The search order of the "Specify find order" function and the display order of search result are as follows.

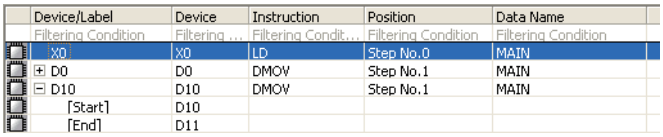
- When "Do not specify" is selected, data are searched in the order of data name.
  The search result is displayed in the order of parameters, programs, and labels.
- When "Program Setting" is selected, data are searched in the order of program files set on the <<Program>> tab of PLC parameter.
  The search result is displayed in the order of local label and program, global labels, and parameters.

Note that when "Fast Find" on the <<Condition Setting>> tab is selected or "Create cross reference information after completion compile" in the option setting is selected, "Do not specify" is set for "Specify find order".



● **"Display the last device of multiple points device" on the <<Condition Setting>> tab**

The last device of the device which uses multiple device points in an instruction or refresh parameter can be displayed.
Select "Display the last device of multiple points device" on the <<Condition Setting>> tab to display the last device.
The start and last devices are displayed in a tree format as shown below.



● **"Auto-tracking" on the <<Condition Setting>> tab**

For ladder program, devices/labels of second and the following arguments of the instruction are also automatically tracked.
To display cross reference information of second and the following arguments of the instruction during the Auto-tracking mode, perform the following operations.

- For a project without labels, select from the "Device/Label" input column.
- To search devices in a project with labels, select from the "Device" column of filtering condition.
- To search labels, select from the "Device/Label" column of filtering condition.

● **"Find Mode" on the <<Condition Setting>> tab**

If "Find Mode" is selected, cross reference information is automatically created when the following operation is performed.

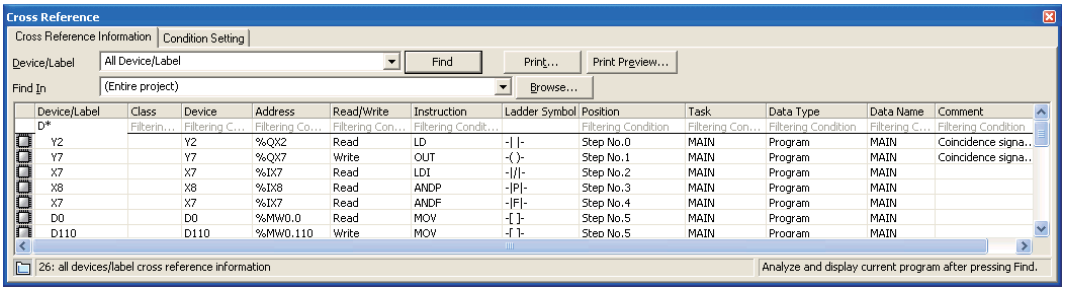
- Changing a ladder or SFC (Zoom) program
- Compiling a program
- Adding/deleting program data
- Reading data from a programmable controller CPU
- Changing a programmable controller type

10.1.3 Filtering display

Filter the created cross reference information.
Elements cannot be filtered.
The following is an example of display by filtering devices/labels with the condition 'D*'.

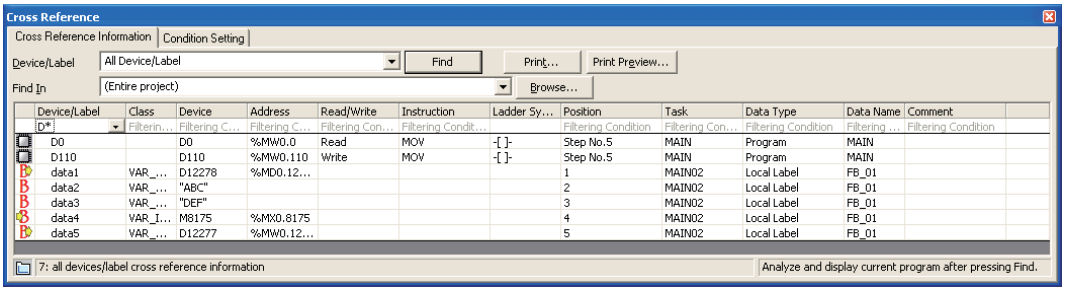
Operating procedure

1. **Enter 'D*' in the filtering condition column under "Device/Label".**



2. **Press the Enter key.**

The data matching with the set filtering condition are displayed on the Cross Reference window.



Point

● **Filtering condition**

Clicking enables to select a keyword from the list of previously entered keywords.
For "Data Name" and "Program File Name", search results can also be selected from the list as well as previously entered keywords.

● **Tree display of filtering condition**

Only data whose components match with the filtering conditions are displayed in the tree format when filtering display is executed for the structure data names or the instance names of the function block.

● **Deleting filtering condition**

Filtering display of the column can be canceled by deleting keywords entered in each filtering condition column.

● **Keywords for filtering condition**

The wild card characters can be used in a filtering condition shown as below.

Example) When the filtering condition is set for the device/label column.

Wild card	Search target	Example	Search Result
*	Specifies any character string.	*30*	ready301, K4X30, K1Y30, K4Y30
?	Specifies any one character.	K4?30	K4X30, K4Y30
[ ]	Specifies any one of those characters.	[XY]8	X8, Y8
[!]	Specifies any one of characters except for the characters in the bracket.	K4X[!3]0	K4X40, K4Y50
[-]	Specifies character strings within the range in the bracket.	D[0-2]	D0, D1, D2
#	Specifies any one-digit number.	Local200#	Local2001, Local2003

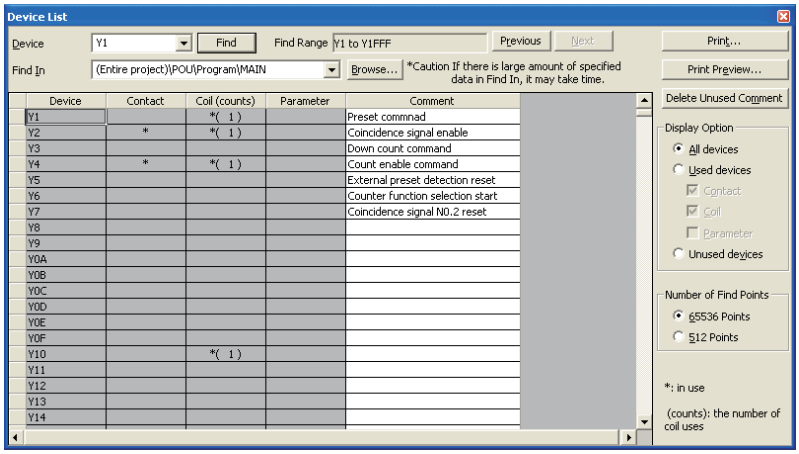
10.2 Displaying Device List

Q CPU L CPU Remote Head FX

This section explains how to display the usage of the specified devices.

Screen display

Select [Find/Replace] ⇒ [Device List].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Device		Enter a device to be searched for. Click ▼ to select a device from the list of previously searched devices.
Find In		Select a location to search for. Click Browse... to select a location to search for. Two or more search locations can be selected. After selecting the search location, click the OK button to save the search location. Click ▼ to select a location from the list of previously searched locations. The location cannot be entered directly.
Display Option	All devices	Display all devices.
	Used devices	Display devices used in the program. Selected items are searched.
	Unused devices	Display devices not used in the program.
Number of Find Points	65536 Points	Select this to set device points to be searched to 65536 points.
	512 Points	Select this to set device points to be searched to 512 points.

2. **Click the Find button.**

Search result is displayed.

Display contents

Item	Description
Find Range	Display the range of the devices searched. The display can be switched by clicking the Previous / Next button.
Device	Display the device name.
Contact	Display '*' when the device is used as a contact.
Coil (counts)	Display '*' and the number of uses when the device is used as a coil.
Parameter*1	Display '*' when the device is used as a parameter or an intelligent function module parameter.
Comment	Display the device comment set for reference/reflection target in the option setting. (☞ Section 9.1.1 "■ Specifying device comments to be displayed in program") Specify a program for "Find In" to enter device comments.

*1 : Not supported by FXCPU.

Screen button

- Print...

  Prints the selected row. (☞ Section 20.7)
  Prints all lists when a row is not selected.

- Print Preview...

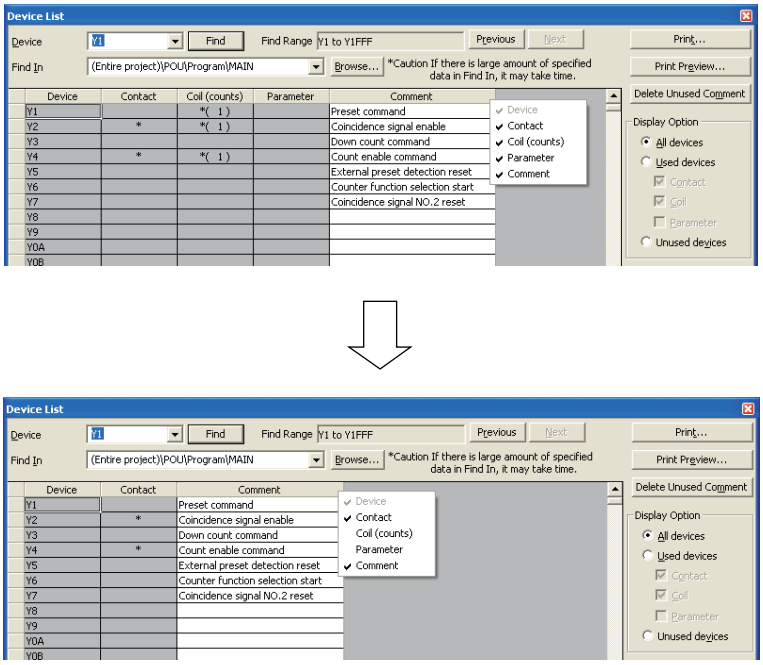
  Displays a print preview of the selected row. (☞ Section 20.9)
  Displays a print preview of all lists when a row is not selected.

- Delete Unused Comment

  Deletes device comments which are not used in a program.
  Device comments can be deleted when a program is specified for "Find In".

■ Displaying/hiding columns

Columns can be displayed or hidden by right-clicking a column header of the search result and selecting the items to be displayed or hidden from the shortcut menu.



■ Considerations of search in device list

The following shows the considerations of search in the device list.

● **Handling of coil instructions**

As output instructions, the following application instructions can also be the target of search.
SET, RST, PLS, PLF, FF, SFT, SFTP, and MC

● **Searching for R devices and ZR devices**

R devices and ZR devices are distinguished in the device list. Specify them separately when searching for R devices or ZR devices.

Point

● **Saved search locations**

When the name of the program specified in the search location is changed, the program is not searched. In order to search the program with the changed name, specify the program in the search location.
Note that, however, when the program name is changed to the original name, the program is searched.

● **Confirming locations of devices**

The Cross Reference window can be opened from a used device displayed in the device list, and the location of the device can be confirmed.
To open the Cross Reference window, select a desired row in the device list and follow any of the following operations.

- Press the Ctrl + E keys or press the Enter key.
- Double-click the row.
- Right-click the row and select [Cross Reference] from the shortcut menu.

For the cross reference function, refer to Section 10.1.

● **Displaying comments**

- When searching for data with a selection of one program, device comments specified for "Reference/Reflection Target for Device Comment" under [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "All Editors" ⇒ "Device Comment" are displayed. (☞ Section 9.1.1)
- When searching for data with a selection of two or more programs, global device comments are displayed.

10.3 Search/Replacement

Q CPU L CPU Remote Head FX

This section explains how to search for and replacing character strings, devices, labels, instructions, etc. in project data.
If the All Find/All Replace function is executed, the details of the execution result are displayed.

Point

● **Purposes of each search/replacement**
The following table shows the purposes of each search/replacement.

Function	Purpose
Find Device/Replace Device	Used for searching for/replacing a device or label in a program.
Find Instruction/Replace Instruction	Used for searching for/replacing an instruction in a program.
Find String/Replace String	Used for searching for/replacing a character string used in a program, label, and device comment.
Change Open/Close Contact	Used for switching the contact type of a specified device in a program from normal to negation, or from negation to normal.
Device Batch Replace	Used for searching for/replacing devices or labels in a program in batch.

● **Displaying the Find/Replace screen**
The Find/Replace screen can also be displayed by selecting [View] ⇒ [Docking Window] ⇒ [Find/Replace].

● **Replace function**
- The programs are in the uncompiled status after the Replace function is executed. Compile all the programs again.
- The Replace function cannot be executed during monitoring. Execute the function after monitoring is finished.
- The Replace function cannot be executed when a program is opened with the read-only mode. Execute the function after setting the data in editable mode by the setting such as resetting the security.

● **Searching/replacing labels**
One point of device can be replaced when searching/replacing labels.

● **Searching/replacing data in inline structured text box**
The search starts from the top of the program in the inline structured text box regardless of the cursor position.

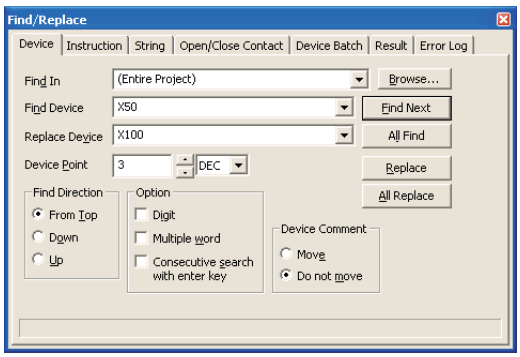
● **Replacement of items corresponding to system labels**
The following items that correspond to system labels cannot be replaced.
- Relation with system label
- System label name
- Attribute

10.3.1 Searching/replacing devices/labels

Search/replace devices/labels in the program.

Screen display

Select [Find/Replace] ⇒ [Find Device]/[Replace Device] ( ).



Operating procedure

1. **Set the items on the screen.**

Item		Description
Find In		Click the Browse... button to select a location to search for. Two or more search locations can be selected. Click ▼ to select a location from the list of previously searched locations. The location cannot be entered directly.
Find Device		Enter a device/label to be searched for or a replacing device/label. Click ▼ to select from the list of devices or labels entered previously.
Replace Device		
Device Point		Enter the number of points to be searched/replaced, counted from the device entered in the "Find Device" field. When a label is entered for "Find Device" or "Replace Device", enter 1. Click ▼ to select either hexadecimal or decimal for the value to be used. Example) When X50 for "Find Device", X100 for "Replace Device", 3 for "Device Point", and "DEC" for entered value are set, the devices are replaced as shown below. X50→X100, X51→X101, X52→X102
Find Direction	From Top	Select this to execute a search in the downward direction from the start of the program.
	Down	Select this to execute a search in the downward direction from the cursor position.
	Up	Select this to execute a search in the upward direction from the cursor position.
Option	Digit*1	Select this to execute a search for the entered device and digit-specified bit devices that include the entered device.
	Multiple word*2	Select this to execute a search for the entered device and the double-word format (double word/real number/indirect specification) word devices that include the entered device.
	Consecutive search with enter key	Select this not to move the focus to the editor after the search/replace function. The searched/replaced position may not be highlighted.
Device Comment*2	Move	Select this to move a device comment of "Find Device" to "Replace Device".
	Do not move	Select this not to move a device comment of "Find Device" to "Replace Device".

*1 : For ladder programs and Structured Ladder/FBD programs only
*2 : For ladder programs only

2. **Click the Find Next button.**

The cursor moves to the searched device.

Screen button

- Find Next
  Searches for the character string entered in "Find String".
- All Find
  Batch searches for the character string entered in "Find String".
  The search result is also displayed. (☞ Section 10.3.6)
- Replace
  Replaces the character string entered in "Find String" with the character string entered in "Replace String".
- All Replace
  Batch replaces the character string entered in "Find String" with the character string entered in "Replace String".
  The replace result is also displayed. (☞ Section 10.3.6)

■ Examples of device search

The following tables show examples of specification for device search operations.

● Example of device search (Option: None)

Device specification	Search result
M0	M0, K4M0, M0Z0, K4M0Z0
K4M0	K4M0, K4M0Z0
D0	D0, D0Z0, D0.1
D0.1	D0.1
J1\B0*1	J1\B0, J1\B0Z0, J1Z0\B0, J1Z0\B0Z0, J1\K4B0, J1\K4B0Z0, J1Z0\K4B0, J1Z0\K4B0Z0

*1 : Not supported by FXCPU.

● Example of device search (Option: Digit)

Device specification	Search result
X0 to X3	K1X0
X0 to X0F	K4X0
X0 to X1F	K8X0
X0Z0	X0Z0, K1X0Z0, K4X0Z0, K8X0Z0

● Example of device search (Option: Multiple word)

Device specification	Search result
D0 to D1	DMOV K1 D0, EMOV E1 D0, MOV K1 @D0
D0 to D9	BMOV D0 D100 K10
D0Z0 to D1Z0	DMOV K1 D0Z0
ZR0ZZ0 to ZR1ZZ0*1	DMOV K1 ZR0ZZ0
J1\W0 to J1\W1*1	DMOV K1 J1\W0
@D0 to @D1*1	DMOV K1 @D0
T0 to T1	DMOV K1 T0
T0Z0 to T1Z0	DMOV K1 T0Z0

*1 : Not supported by FXCPU.

■ Devices/labels that can be replaced or batch replaced

The following table shows the devices/labels that can be replaced or batch replaced.

○: Replaceable ×: Not replaceable

		New device/label							
		Device (X0, D0)	**Bit-specified word device (D0.1*1)**	**Word device indirect specification*2 (@D0)**	**Digit-specified bit device (K1X1)**	**Index setting (X0Z0)**	**Digit-specified bit device + Index setting (K4X0Z0)**	**Index setting + Bit-specified word device (J1Z0\W0.1*2)**	**Label/ String (g_bool1)**
Old device/ label	Device (X0, D0)	○	○	○	○	○	×	×	○
	Bit-specified word device (D0.1*1)	○	○	×	×	×	×	×	○
	Word device indirect specification*2 (@D0)	×	×	×	×	×	×	×	○
	Digit-specified bit device (K1X1)	×	×	×	×	×	×	×	○
	Index setting (X0Z0)	×	×	×	×	×	×	×	○
	Digit-specified bit device + Index setting (K4X0Z0)	×	×	×	×	×	×	×	○
	Index setting + Bit-specified word device (J1Z0\W0.1*2)	×	×	×	×	×	×	×	○
	Label/String (g_bool1)	○	○	○	○	○	○	○	○

*1 : Supported by FX3U and FX3UC only.
*2 : Not supported by FXCPU.

■ Searching/replacing devices/labels in inline structured text program

The following explains the considerations when searching/replacing devices/labels in the inline structured text program.

● **Searching/replacing devices**

Devices in the range specified for the parameter are searched. Devices out of the specified range are not searched.

● **Searching/replacing labels**

Both registered and unregistered labels are searched. All unregistered labels which are used at the label positions in the inline structured text program are searched.
The following table shows the examples of label positions.

Label position	Example	Description
Applicable label position	label1	Labels exist independently.
	MOV (label1, D0, D1);	Labels used at label positions in functions.
Inapplicable label position	label1 (m1, m2)	Labels used at instruction positions.

● **Comments in inline structured text program**

Strings which are recognized as comments are not searched.
The following table shows the examples of comments.

String	Example	Description
String recognized as comment	(* D1 *)	Strings between the comment start symbol and the end symbol.
	(* D1...	Strings following the comment start symbol when the comment does not end with the end symbol.
String not recognized as comment	D1 *)	Strings in front of the comment end symbol when the comment start symbol is not used.

● **Device/label names**

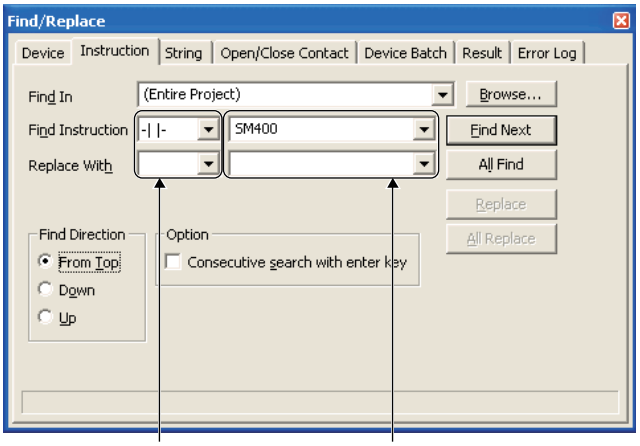
Device/label names are not case-sensitive.

10.3.2 Searching/replacing instructions

Search/replace instructions.

Screen display

Select [Find/Replace] ⇒ [Find Instruction] ( )/[Replace Instruction]/[Find Contact or Coil] ( ).



Operating procedure

1. **Set the items on the screen.**

Item		Description
Find In		Click the Browse... button to select a location to search for. Two or more search locations can be selected. Click to select a location from the list of previously searched locations. The location cannot be entered directly.
Find Instruction	Element selection area	Click to select an element to be searched for from the list.
	Device instruction input area	Enter an instruction, device, or label to be searched for. Click to select from the list of instructions, devices, or labels entered previously.
Replace With	Element selection area	Click to select a replacing element from the list.
	Device instruction input area	Enter a replacing instruction, device, or label. Click to select from the list of instructions, devices, or labels entered previously.
Find Direction	From Top	Select this to execute a search in the downward direction from the start of the program.
	Down	Select this to execute a search in the downward direction from the cursor position.
	Up	Select this to execute a search in the upward direction from the cursor position.
Option	Consecutive search with enter key	Select this not to move the focus to the editor after the search/replace function. The searched/replaced position may not be highlighted.

2. **Click the Find Next button.**

   The cursor moves to the searched instruction.

Screen button

For the screen buttons, refer to Section 10.3.1.

■ Examples of instruction search

The following table shows the examples of instruction search.

Instruction specification	Search result
MOV	MOV, MOVP
MOVP	MOVP
MOV D0 K4Y0	MOV D0 K4Y0, MOVP D0Z1 K4Y0, MOV D0 K4Y0Z1, MOVP D0Z1 K4Y0Z1
MOVP D0 J1\W0*1	MOVP D0 J1\W0, MOVP D0Z1 J1\W0, MOVP D0 J1Z1\W0Z1, MOVP D0Z1 J1Z1\W0Z1

*1 : Not supported by FXCPU.

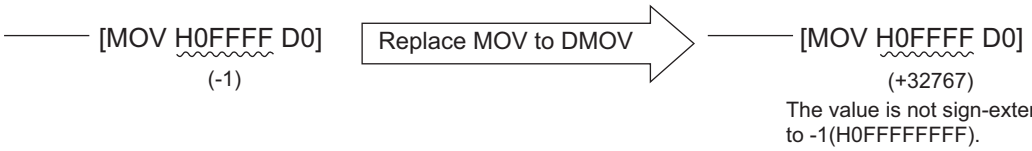
■ Considerations for searching for/replacing instructions

The following explains the considerations for searching for/replacing instructions.

● **Instruction search specifying a coil instruction**
As output instructions, the following application instructions can also be the target of search.
SET, RST, PLS, PLF, FF, SFT, SFTP, and MC

● **Instruction replacement between a 16-bit (word) instruction and a 32-bit (double word) instruction**
When a 16-bit (word) instruction is replaced with a 32-bit (double word) instruction, and if a constant is set for the device, the constant value is not sign-extended to a value in 32 bits.

Example



When a 32-bit instruction is replaced with a 16-bit instruction, and if a constant is set for the device, upper 16 bits are discarded.

Example

Point

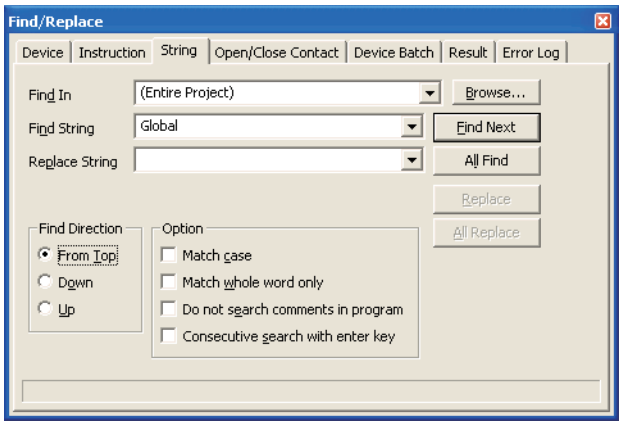
● **Searching for NOP instructions and TRAN instructions**
The NOP instructions used in the ladder programs and the TRAN instructions used in the transition condition of SFC programs cannot be searched.

10.3.3 Searching/replacing character strings

Search/replace character strings.

Screen display

Select [Find/Replace] ⇒ [Find String]/[Replace String].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Find In		Click the Browse... button to select a location to search for. Two or more search locations can be selected. Click ▼ to select a location from the list of previously searched locations. The location cannot be entered directly.
Find String		Enter a character string to be searched for or a replacing character string. Click ▼ to select a character string from the list of character strings entered previously.
Replace String		
Find Direction	From Top	Select this to execute a search in the downward direction from the start of the program.
	Down	Select this to execute a search in the downward direction from the cursor position.
	Up	Select this to execute a search in the upward direction from the cursor position.
Option	Match case	Select this to execute a case-sensitive search.
	Match whole word only	Select this to execute a search by matching whole word only. For details of the whole word, refer to Point in this section.
	Do not search comments in program	Select this to exclude line statements, PI statements, notes, and comments in programs from the search target.
	Consecutive search with enter key	Select this not to move the focus to the editor after the search/replace function. The searched/replaced position may not be highlighted.

2. **Click the Find Next button.**

   The cursor moves to the searched character string.

Screen button

For the screen buttons, refer to Section 10.3.1.

Point

● **Searching for NOP instructions and TRAN instructions**
The NOP instructions used in the ladder programs and the TRAN instructions used in the transition condition of SFC programs cannot be searched.

● **Searching/replacing data by matching whole word only**
The whole word means a string separated by the break characters. The search/replace by matching whole word searches for only the character strings which are completely match with the character string entered in "Find String". Break characters are shown as below.

• Space, tab, line feed

Example) Searching for a device comment 'abc ; def' by the following character strings.

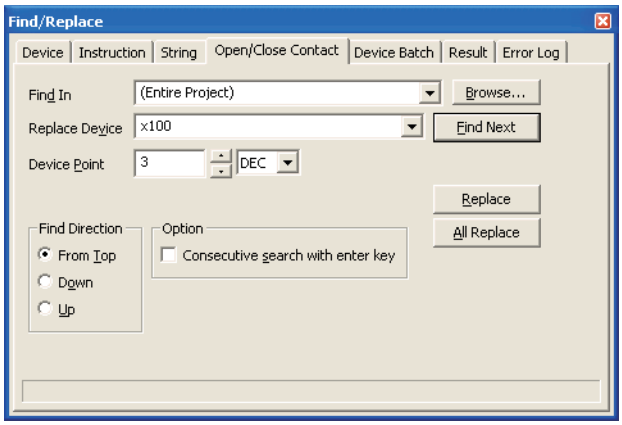
String to be searched for	Search result	
	Not selected	Selected
a	abc ; def	Nothing is found.
abc	abc ; def	abc ; def
bc	abc ; def	Nothing is found.
abc ; def	abc ; def	abc ; def

10.3.4 Changing contacts between open contact and closed contact

Change contact types from open contact to closed contact, and conversely, from closed contact to open contact.

Screen display

Select [Find/Replace] ⇒ [Change Open/Close Contact].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Find In		Click the Browse... button to select a location to search for. Two or more search locations can be selected. Click ▼ to select a location from the list of previously searched locations. The location cannot be entered directly.
Replace Device		Enter a device/label of which the contact type is to be changed between open contact and closed contact. Click ▼ to select from the list of devices/labels entered previously.
Device Point		Enter the number of points to be searched/replaced, counted from the device entered in the "Replace Device" field. When a label is entered for "Replace Device", enter 1. Click ▼ Click to select either decimal or hexadecimal for the value to be entered. Example) When X100 for "Replace Device", 3 for "Device Point" and "DEC" for entered value are set, the contact type is replaced between open contact and closed contact at X100, X101 and X102.
Find Direction	From Top	Select this to execute a search in the downward direction from the start of the program.
	Down	Select this to execute a search in the downward direction from the cursor position.
	Up	Select this to execute a search in the upward direction from the cursor position.
Option	Consecutive search with enter key	Select this not to move the focus to the editor after the search/replace function. The searched/replaced position may not be highlighted.

2. **Click the [Find Next] button.**

   The cursor moves to the searched device.

3. **Click the [Replace] or [All Replace] button to change the contact type.**

   The contact types are changed from open to closed contact and from close to open contact, and the search for the next target devices continues.

   If the [All Replace] button is clicked, all contact types of searched devices are batch changed from open to closed contact and from close to open contact.

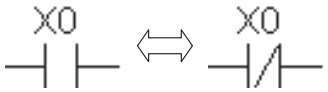
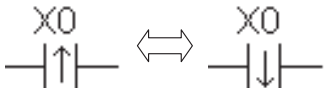
Point

● **Change open/closed contact function**

For the ladder editor, the contact type at the cursor position can also be changed by selecting [Edit] ⇒ [Easy Edit] ⇒ [Switch Open/Close Contact] or pressing the Ctrl + / keys. Convert the program when this function is performed as the program becomes unconverted status.

● **Operation applicability of the change open/closed contact function**

The following table shows the contacts whose contact types can be changed.

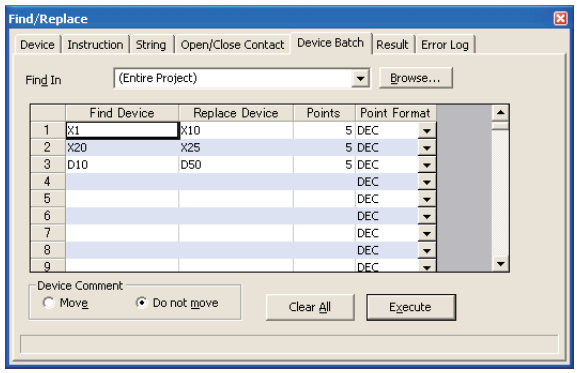
Replace Example					
					

10.3.5 Batch replacing devices

Batch replace devices with the specified device/label.

Screen display

Select [Find/Replace] ⇒ [Device Batch Replace].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Find In		Click the Browse... button to select a location to search for. Two or more search locations can be selected. Click ▼ to select a location from the list of previously searched locations. The location cannot be entered directly.
Find Device		Enter a device/label to be replaced.
Replace Device		Enter a replacing device/label.
Points		Points: Enter the number of points to be replaced, counted from the device specified for "Find Device". When a label is entered for "Find Device" or "Replace Device", enter 1. Point format: Click ▼ to select either decimal or hexadecimal for the value entered for "Points". Example) When X0 for "Find Device", X10 for "Replace Device", 5 for "Points", and "DEC" for "Point Format" are set, the devices are replaced as shown below: X0→X10, X1→X11, X2→X12, X3→X13, X4→X14
Point Format		
Device Comment*1	Move	Select this to move a device comment of "Find Device" to "Replace Device".
	Do not move	Select this not to move a device comment of "Find Device" to "Replace Device".

*1 : For ladder programs only

2. **Click the Execute button.**

The devices/labels entered in "Find Device" are batch replaced with the devices/labels entered in "Replace Device".

Screen button

● Clear All

Resets all setting items to default.

Point

● **Registering devices/labels in batch**
Multiple devices can also be registered at once by selecting a range and dragging and dropping it from the ladder editor.

● **Replacing devices in batch**
Batch replacement between 16-bit counter devices and 32-bit counter devices is not supported by FXCPU.

● **Devices that can be batch replaced**
For devices that can be replaced in batch, refer to Section 10.3.1.

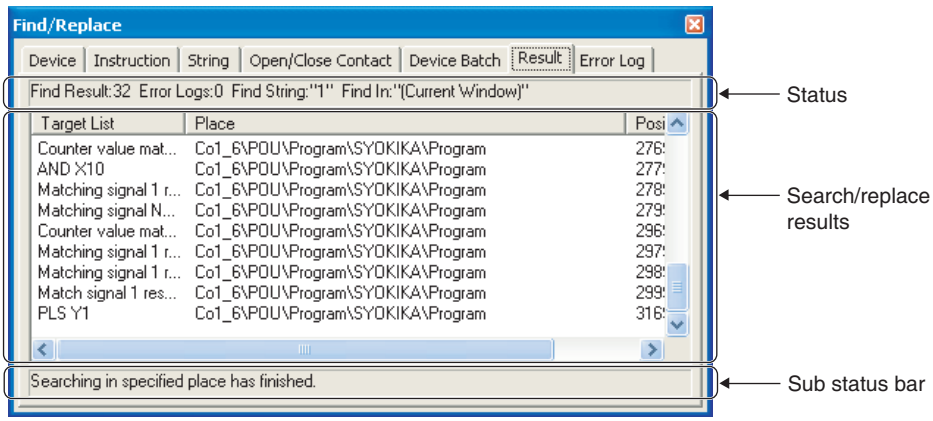
10.3.6 Displaying results and error logs

After the All Find/All Replace function is executed, results and error logs are displayed.

■ Displaying results

Screen display

Click the All Find / All Replace button in the respective Find/Replace windows ⇒ <<Result>>.



Display contents

Item		Description
Search/replace results		Display the character strings, locations, and positions which have been searched for or replaced.
	Target List	Display the character strings which match with the one in "Find/Replace String".
	Place	Display the locations where the search/replace function is executed.
	Position	Display the position information to specify the location where the search/replace function is executed. (☞ '● Position information' on the next page)
Status		Display the details of the search/replace results.
	Find/Replace Result	Display the number of character strings which have been searched for or replaced.
	Error Logs	Display the number of error logs.
	Find String	Display the character strings specified in "Find String".
	Replace String	Display the character strings specified in "Replace String".
	Find In	Display the location specified on the relevant Find/Replace window.
Sub status bar		Display the search/replace results.

● **Position information**

The following position information is displayed according to the editor.

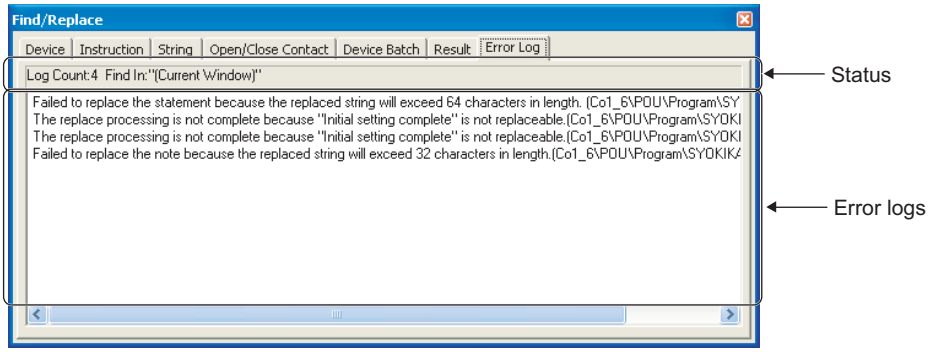
Type	Description	Example
Ladder editor	Step number	2 Step*1
ST editor	Number of lines	(6)
SFC editor	SFC symbol and step number	Transition No. 0
Structured Ladder/FBD editor	Ladder block number and grid position	2. (10. 2)
Device comment editor	Device name, start position	X1, 0 Column
Label Setting screen, Structure Setting screen, Device memory editor	Row, column	8 Row 1 Column

*1 : For project with labels and SFC (Zoom), parentheses are appended to the step number. (Example: (2) Step)

■ Displaying error logs

Screen display

Click the All Find / All Replace button in the respective Find/Replace windows ⇒ <<Error Log>>.



Display contents

Item	Description
Status	Display the number of error logs, and the search location.
Error logs	Display the errors in search/replace results.

Point

● **Jump function**
The jump function is used to jump from any row of search/replace results or logs to the corresponding character strings. To execute a jump, right-click on the selected row and select [Jump] from the shortcut menu, or double-click the selected line.

11 SETTING PROGRAMMABLE CONTROLLER CPU CONNECTION DESTINATION

This chapter explains how to set a connection destination for accessing a programmable controller CPU from GX Works2.

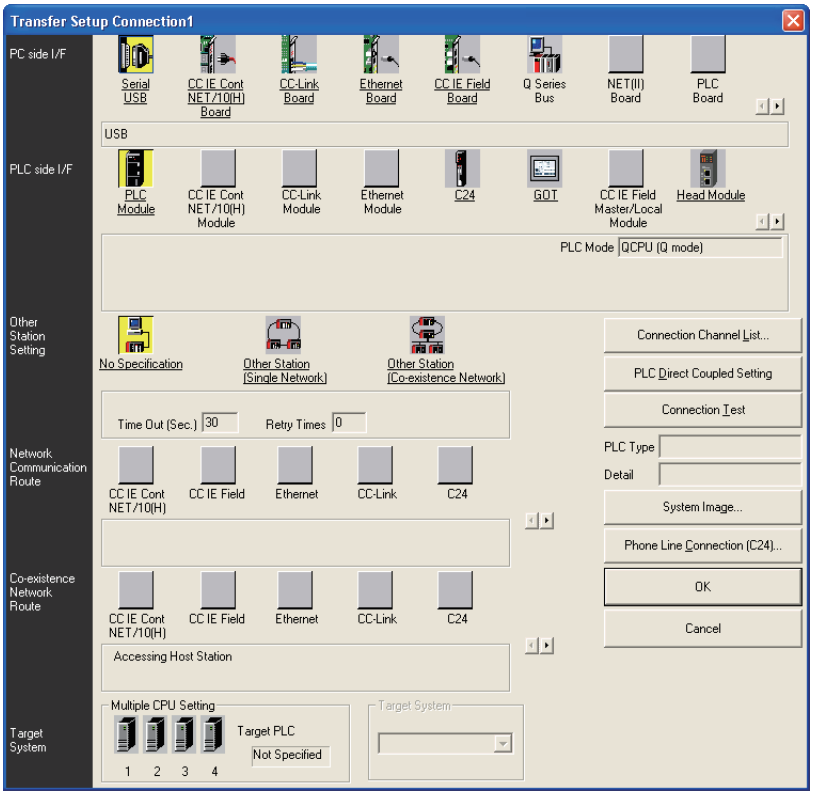
11.1 Setting Connection Destinations

Q CPU L CPU Remote Head FX

This section explains how to set communication routes, including the interfaces both on the personal computer and programmable controller CPU and the routing networks, for accessing a programmable controller CPU.
Multiple connection destinations can be set in GX Works2. To set multiple connection destinations, create data for each connection destination on the New Data screen. (☞ Section 11.1.2)
The programmable controller type of the project should be the same as that of the programmable controller CPU to be accessed.

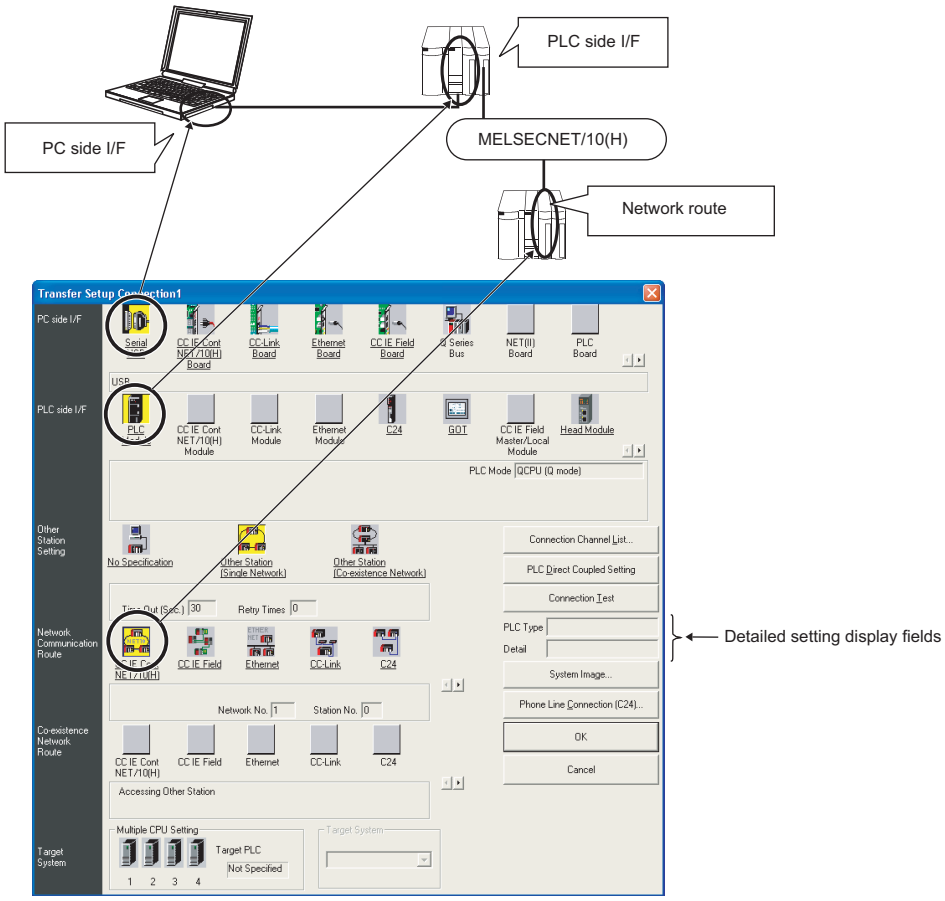
Screen display

Select Navigation window ⇒ Connection Destination view ⇒ "(connection destination data name)".



11.1.1 Transfer setup screen

Interfaces are displayed on the Transfer Setup screen as shown below and detailed settings of each interface can be configured.



Detailed settings can be set for underlined items on the screen. Double-click these items to set the details. The items whose icons are displayed in yellow are items that have been already set.

- **PC side I/F**
  Set the interface of the personal computer.
- **PLC side I/F**
  Set the interface of the programmable controller CPU connected to the personal computer.
- **Other Station Setting**

Item	Description
No Specification	Specify this to access the programmable controller CPU directly connected to a personal computer.
Other Station (Single Network)*1	Specify this to access the programmable controller CPU on another station via only one kind of network (including a multi-tier system) such as CC-Link only, MELSECNET/10(H) only, CC-Link IE only, C24 module only and Ethernet only. Since Ethernet is regarded as equivalent to CC-Link IE and MELSECNET/10(H), specify "Single Network" for a mixed system in which Ethernet, CC-Link IE, and MELSECNET/10(H) are configured.
Other Station (Co-existence Network)*1,*2	Specify this to access the programmable controller CPU on another station via two kinds of network. This means the system that is configured with two different networks, such that from MELSECNET/10(H) to CC-Link master/local module or from Q series C24 module to MELSECNET/10(H).

*1 : When the host station is specified, select "No Specification".
*2 : Not supported by FXCPU.

● **Network Communication Route**
Select the network type, network number, station number, and start I/O number of the network that is routed for accessing the programmable controller CPU on another station. The setting items differ according to the selected network type.

● **Co-existence Network Route*1**
Select the network type, network number, station number, and start I/O number of the network to access. The setting items differ according to the selected network type.

● **Target system*1,*2**
Specify the access target in the multiple CPU system or the redundant system.
*1 : Not supported by FXCPU.
*2 : Not supported by LCPU.

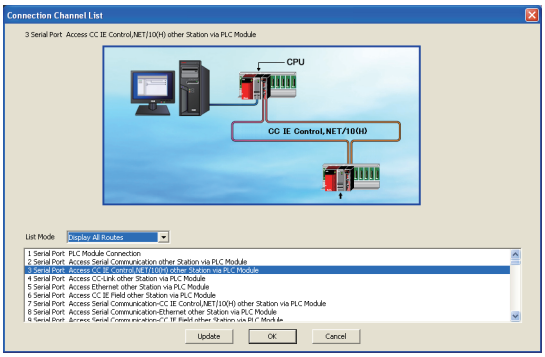
Screen button

● Connection Channel List...
Displays the Connection Channel List screen.
The connection destination can be set while checking network routes on the Connection Channel List screen.
Since the route selected in the Connection Channel List screen is set automatically on the Transfer Setup screen, the setting is easy even for a complex system.
The following is an example of setting screen when QCPU (Q mode) is selected.

Operation

1. Select a route on the Connection Channel List screen.

2. Click the Update / OK button.
The selected route is displayed on the Transfer Setup screen. Set the network number, station number, and other settings depending on the access target.
• "List mode"



List mode	Description
Display All Routes	Display all routes supported by GX Works2.
Display Selected Routes	Specify the interfaces for "PC side I/F" and "PLC side I/F" on the Transfer Setup screen and select "Display Selected Routes" to display only accessible routes for "Other Station Setting" and "Network Communication Route" setting.

● PLC Direct Coupled Setting
Changes the connection destination setting for the setting that connects a personal computer directly to the programmable controller CPU to be accessed.
This function is useful to change the station specification from another station to host station.

- Connection Test

  Tests if the target programmable controller CPU set on the Transfer Setup screen can be accessed normally.
  If accessed normally, the model of the target programmable controller CPU module is displayed on the "PLC Type" field, one of the detailed setting display fields. In addition, for the multiple CPU system, the CPU number of the connection destination is displayed on the "Detail" field.

- System image(S)...

  Shows the set connection channel in an illustration.

- Phone Line Connection (C24)... / TEL (FXCPU)...

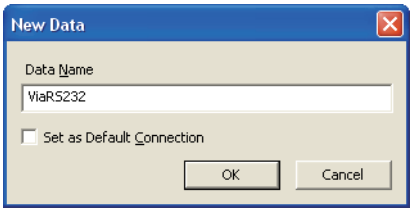
  Displays the Line Connection screen.
  The screen is used to set the communication using a phone line.
  For details of the Line Connection screen setting, refer to Section 11.10.2.

11.1.2 Creating connections

Create a new connection.
Select Navigation window ⇒ Connection Destination view, and perform the following operation.

Screen display

Select [Project] ⇒ [Object] ⇒ [New] ( ).



Operating procedure

1. **Set the items on the screen.**

Item	Description
Data Name	Enter the name of the connection to be created.
Set as Default Connection	Select this to specify the connection destination to be created for regular use.

2. **Click the OK button.**

   The created connection destination is added to "All Connections" on the Connection Destination view.

11.1.3 Specifying connection destination for regular use

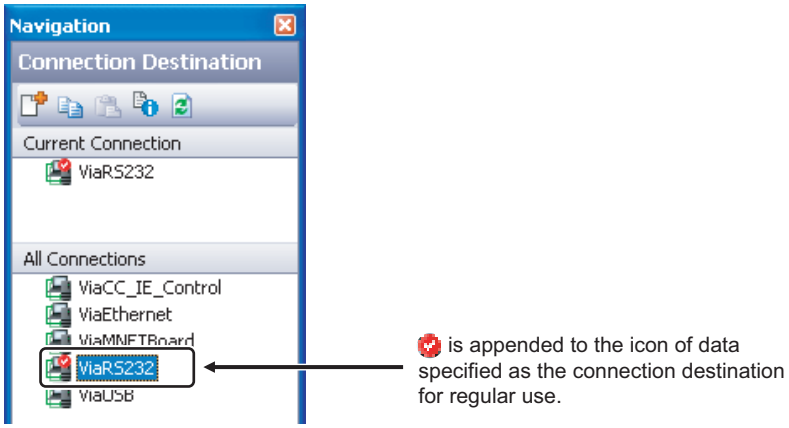
Specify a connection destination for regular use when multiple connection destinations are set.

Operating procedure

1. **Select the connection destination data to be specified as for regular use from "All Connections" on the Connection Destination view.**

2. **Select [Project] ⇒ [Object] ⇒ [Set as Default Connection].**

   The name of the selected connection destination data is set as the connection destination for regular use, and displayed on "Current Connection".



Point

● **Connection destination setting**

The connection destination data can also be specified for regular use by dragging and dropping it from "All Connections" to "Current Connection".

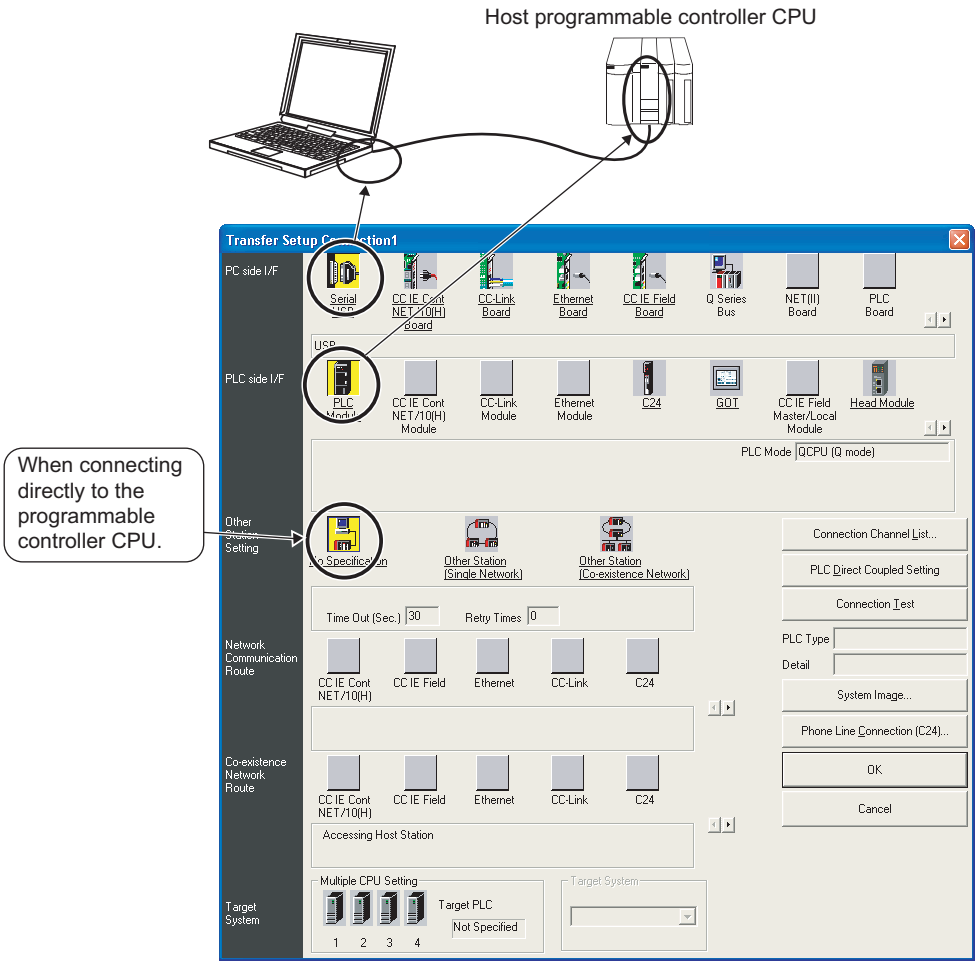
11.2 Accessing Programmable Controller CPU Directly

This section explains the setting method for accessing the programmable controller CPU directly connected to a personal computer.

11.2.1 Connecting with serial/USB cable

Q CPU | L CPU | Remote | Head | FX

The following explains the setting for accessing the host programmable controller CPU from GX Works2 with serial/USB cable.

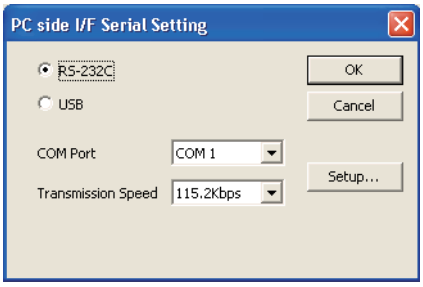


■ Connecting to QCPU (Q mode)/LCPU

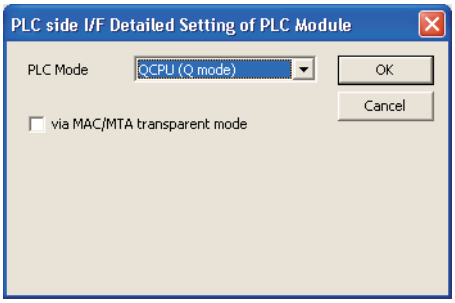
The following explains the setting for accessing the QCPU (Q mode)/LCPU on the host station.

Operation

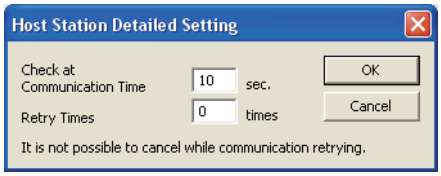
1. **Set "PC side I/F".**
   ☞ Section 11.1.1



2. **Set "PLC side I/F".**
   Select the series of the programmable controller CPU to be connected.



3. **Set "No Specification" for "Other Station Setting".**
   Set "Check at communication time" and "Retry times" as necessary.

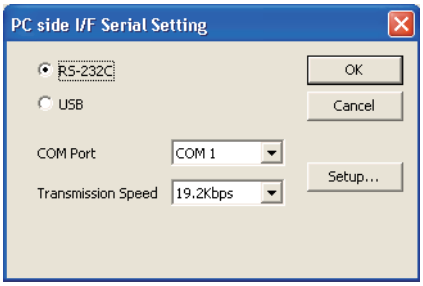


■ Connecting to FXCPU

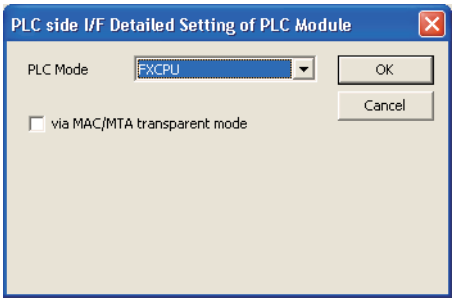
The following explains the setting for accessing the FXCPU on the host station.

Operation

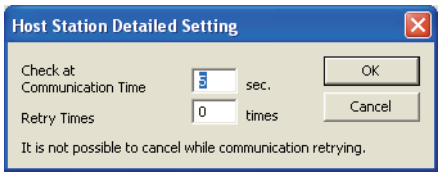
1. **Set "PC side I/F".**
   ☞ Section 11.1.1



2. **Set "PLC side I/F".**
   This setting is not required for the series other than FX3G, FX3GC, FX3U, and FX3UC.



3. Set "No Specification" for "Other Station Setting".
Set "Check at communication time" and "Retry times" as necessary.



Point

● "PC side I/F" of FXCPU

For FXCPU, select the RS-232/USB with considering the description indicated in the table below.

Item	Description
RS-232 C (Including FX-USB-AW and FX3U-USB-BD)	Select this item when connecting using the RS-232 of a personal computer or when connecting to the USB of a personal computer with FX-USB-AW/ FX3U-USB-BD.
USB	Select this item when connecting the GOT1000 series USB to the USB of a personal computer directly using the transparent function or when connecting to the USB of a personal computer directly.

● Communication speed with FXCPU

The following table shows communication speed that FXCPU support.

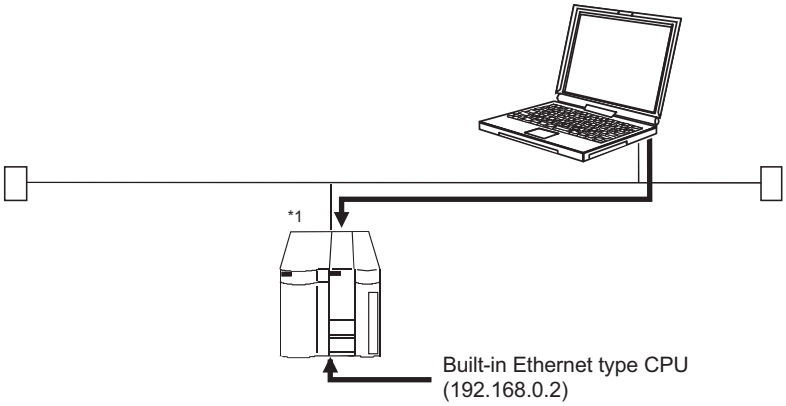
Communication speed	FX0 FX0S	FX0N	FX1	FXU FX2C	FX1S	FX1N FX1NC	FX2N FX2NC	FX3G FX3GC	FX3U FX3UC
9.6kbps	○	○	○	○	○	○	○	○	○
19.2kbps	–	–	–	–	–	○	○	○	○
38.4kbps	–	–	–	–	–	–	–	○	○
57.6kbps	–	–	–	–	–	–	–	○	○
115.2kbps	–	–	–	–	–	–	–	○	○

For connecting to FX3G, FX3GC, FX3U, or FX3UC and communicating at 38.4kbps/57.6kbps/115.2kbps, the following adapter is required.
FX3G, FX3GC: FX-232AWC-H
FX3U, FX3UC: FX-232AWC-H or FX-USB-AW

11.2.2 Accessing by Ethernet

*1: Built-in Ethernet port QCPU only
*2: FX3G, FX3GC, FX3U, and FX3UC only

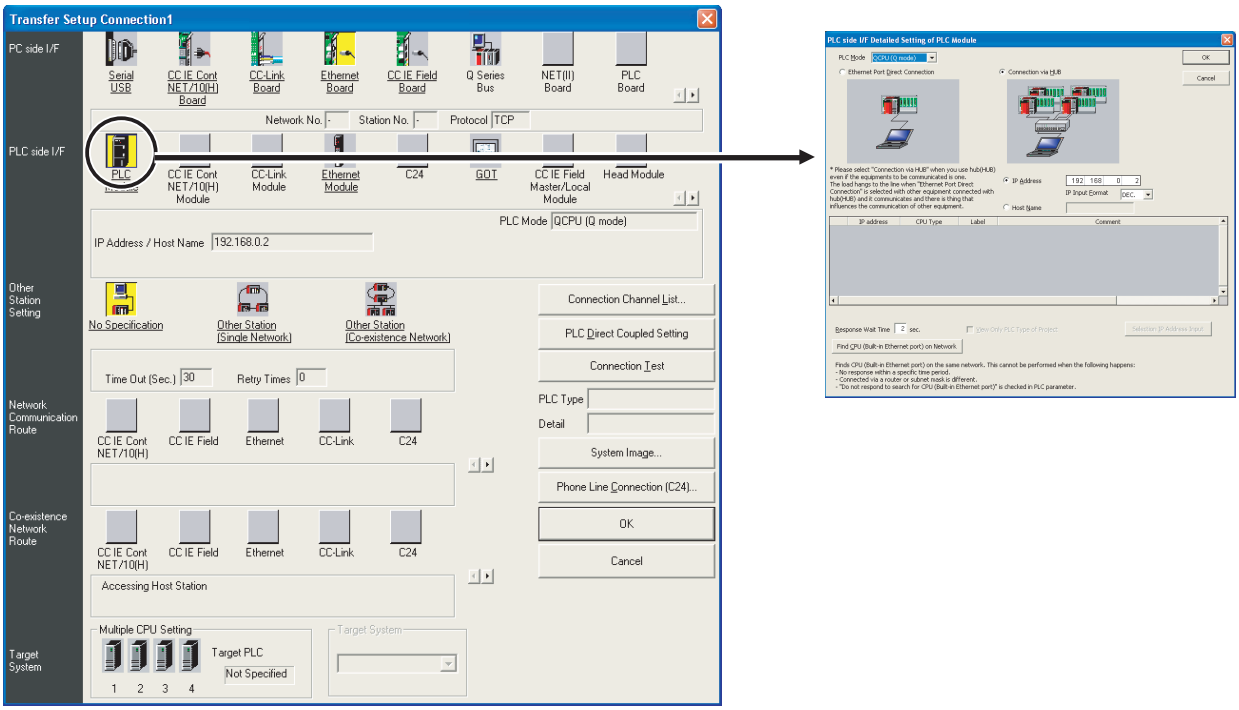
Access the Built-in Ethernet type CPU or the FXCPU with Ethernet adapter from GX Works2 by Ethernet.



*1 : For details of the system consists of FXCPU and an Ethernet adapter, refer to the following manual.
☞ FX3U-ENET-ADP User's Manual

Operation

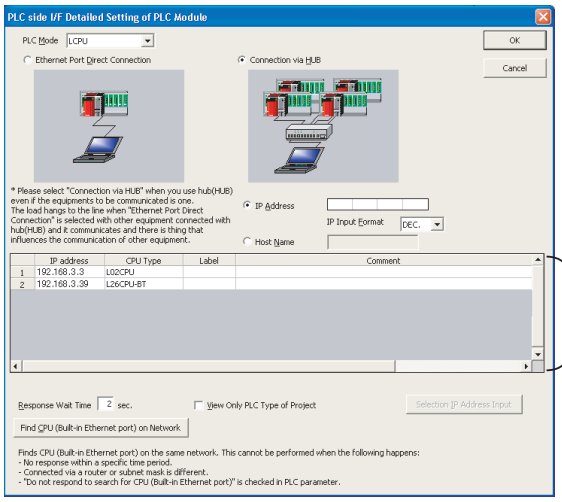
- **Set the connection destination setting.**



Item	Description
PC side I/F	Select a protocol. Since network number and station number are not used, the settings of network number and station number are not required.
PLC side I/F	Select the access method. (☞ ■ Detailed settings of PLC side I/F)

■ Detailed settings of PLC side I/F

The following is a setting example when searching for a Built-in Ethernet type CPU or an FXCPU with Ethernet adapter on the same network connected via hub and utilizing the IP address.
The following is a screen of QCPU (Q mode)/LCPU.



Operation

1. **Select a programmable controller type connected to a personal computer in "PLC Mode". For FXCPU, the programmable controller type is fixed to FXCPU.**
2. **Select "Connection via HUB".**
3. **For QCPU (Q mode)/LCPU, click the** Find CPU (Built-in Ethernet port) on Network **, and for FXCPU, click the** Search for FXCPU on Network **button.**
   The IP addresses, CPU types, labels, and comments of the Built-in Ethernet type CPU or the FXCPUs with Ethernet adapter on the same network are displayed in the 'connection destination CPU information list'.
4. **Select a Built-in Ethernet type CPU or an FXCPU with Ethernet adapter to be connected in the 'connection destination CPU information list', and click the** Selection IP Address Input **button.**
   The selected IP address is displayed in "IP Address".

Point

● **Considerations when using Windows Vista® or Windows® 7**

On Windows Vista® or Windows® 7, the following message may be displayed when the [Find CPU (Built-in Ethernet port) on Network] button is clicked.

Click the [Unblock] button for Windows Vista® and click the [Allow access] button for Windows® 7 to unblock the program (permit the access) and continue the operation. (The screen shown below is from Windows Vista®.)

● **When the same IP addresses are displayed**

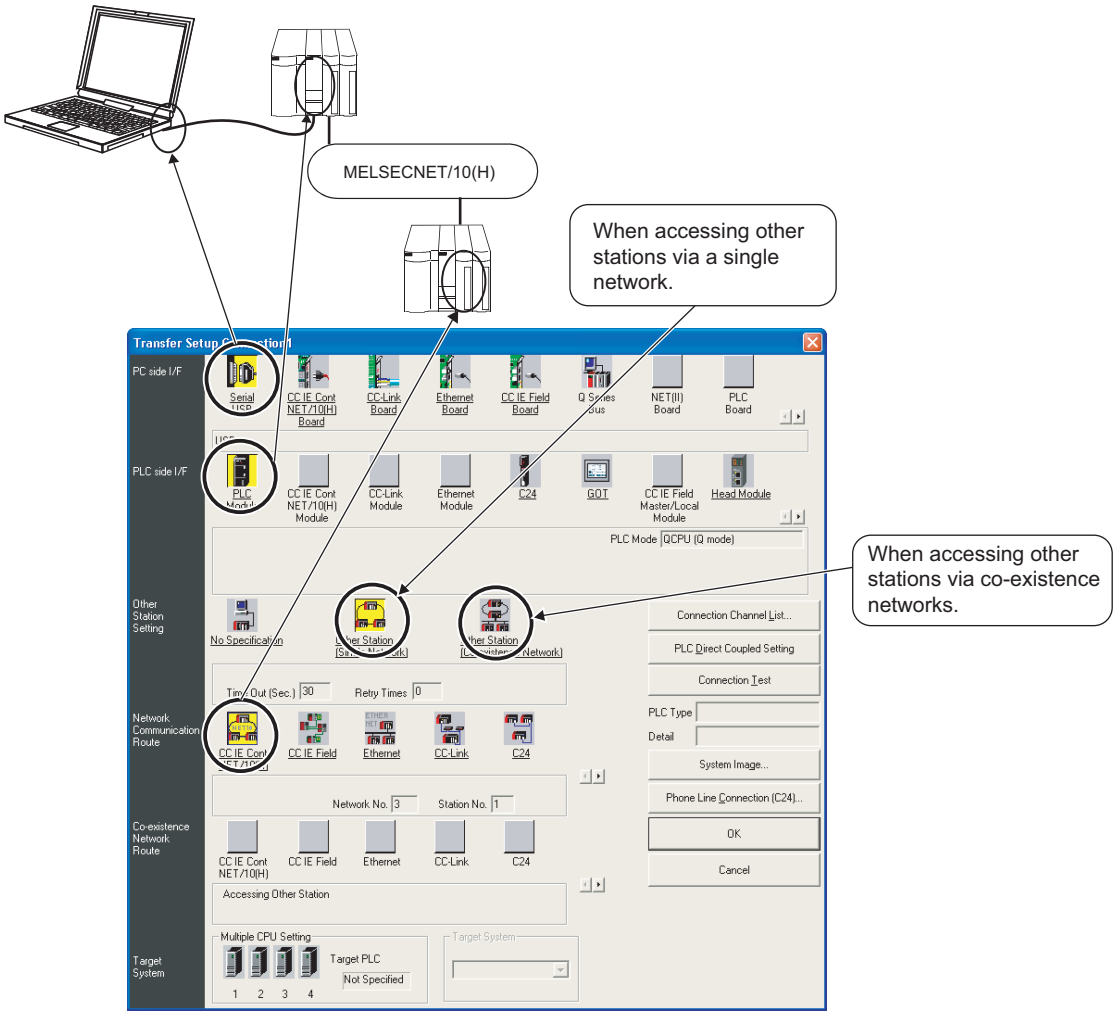
If the same IP address is displayed in the 'connection destination CPU information list' when the [Find CPU (Built-in Ethernet port) on Network] button is clicked, multiple IP addresses may be set in the Windows® Network Connections setting.

In such case, reset the IP addresses not to duplicate on the Internet Protocol (TCP/IP) Properties screen.

11.3 Accessing Programmable Controller CPU Via Networks

Q CPU | L CPU | Remote | Head | FX

This section explains how to access the programmable controller CPU on another station from a personal computer via networks.



Operation

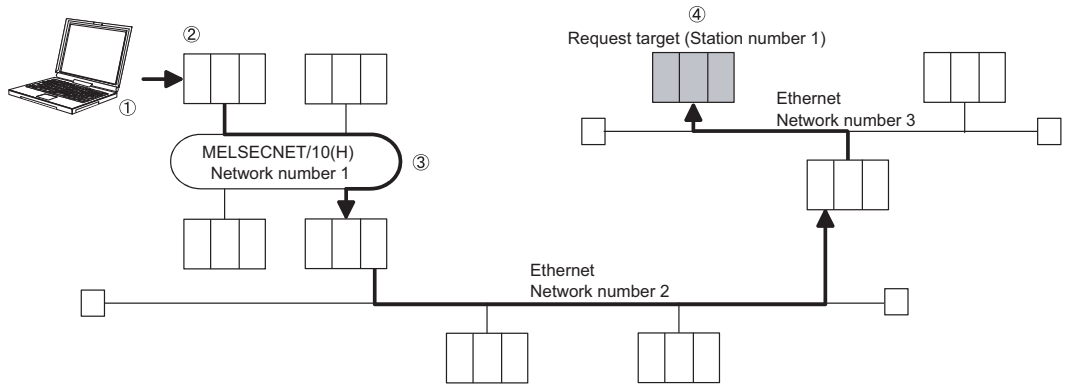
1. **Set "PC side I/F".**
   ☞ Section 11.1.1
2. **Set "PLC side I/F".**
   ☞ Section 11.1.1
3. **Set "Other Station Setting"**
   ☞ Section 11.1.1
4. **Set "Network Communication Route" / "Co-existence Network Route".**
   Select the network type, network number, station number, and start I/O number of the network that is routed for accessing the programmable controller CPU on another station. The setting items differ according to the selected network type.

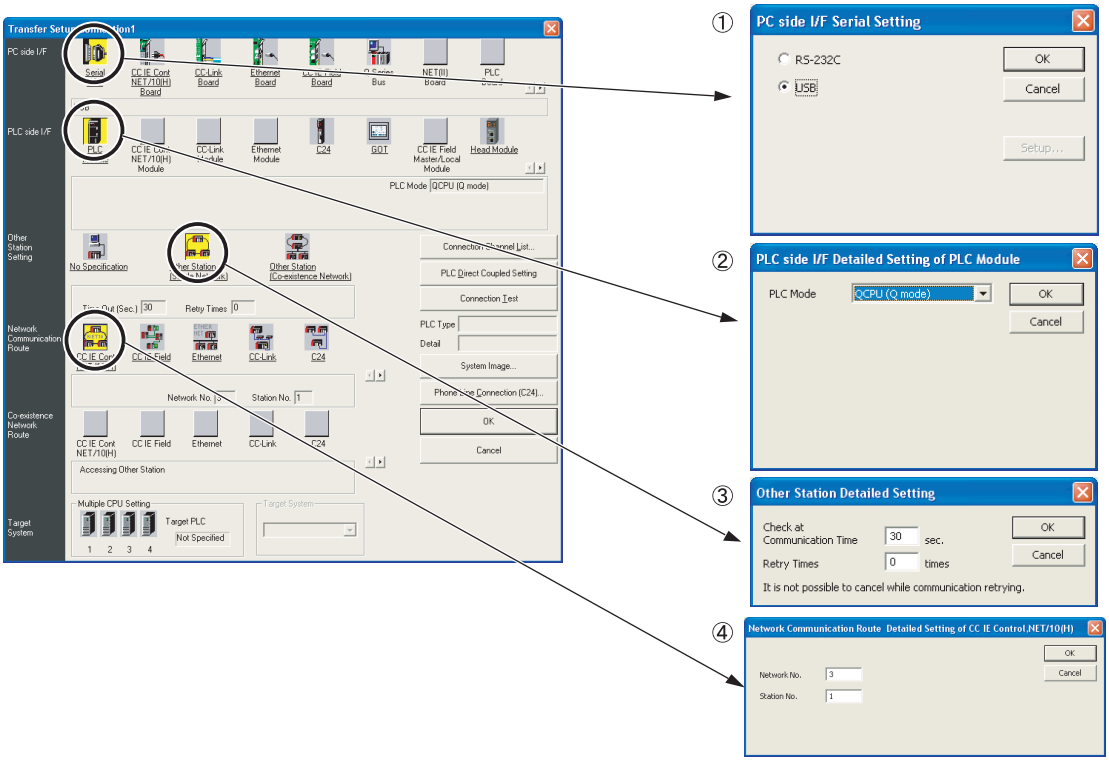
■ Setting example of "Other Station (Single Network)"

The following is the setting example for accessing the programmable controller CPU via single network.

● **Screen settings for the mixed system in which MELSECNET/10(H), CC-Link IE, and Ethernet are configured (single network)**

For the mixed system in which MELSECNET/10(H), CC-Link IE, and Ethernet are configured, specify "Single Network" when accessing the programmable controller CPU on another station. (Since Ethernet is regarded as equivalent to CC-Link IE and MELSECNET/10(H), specify "Single Network".)
The following shows the connection destination detail setting screen example for the mixed system configuration (Q series only).





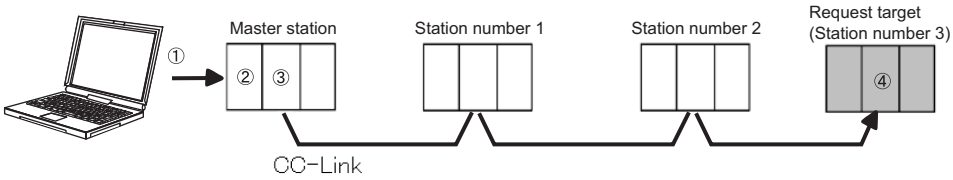
Point

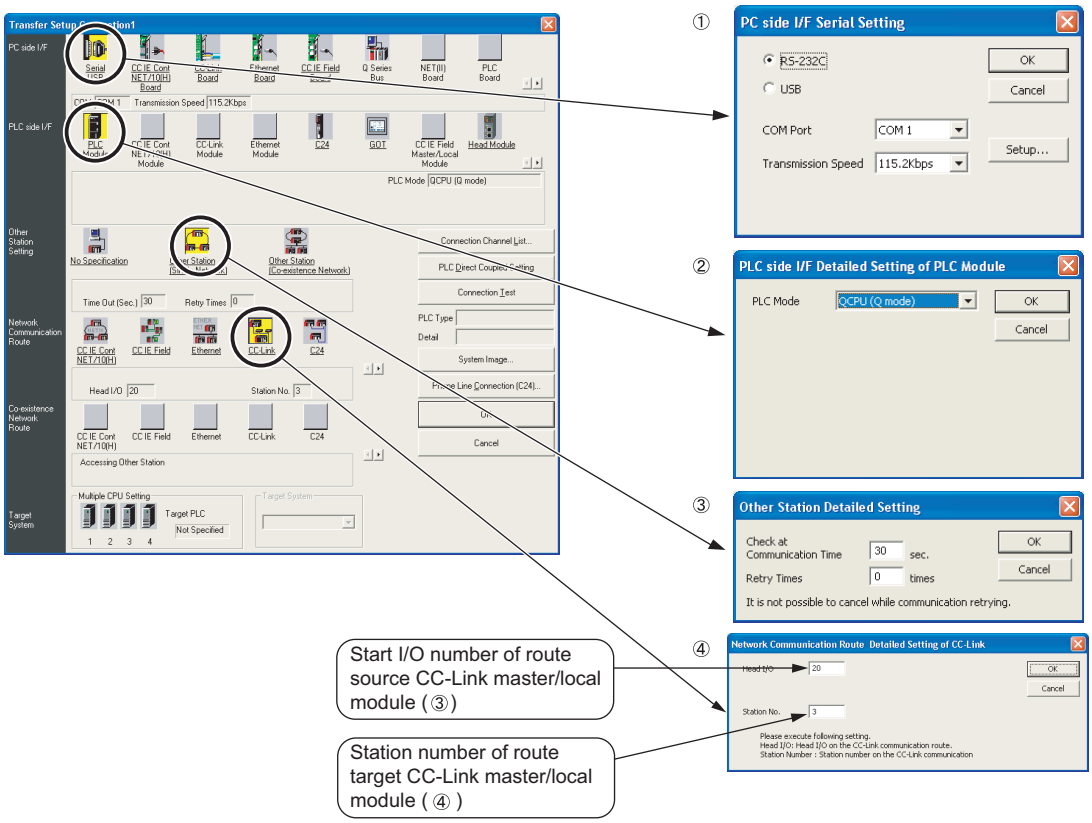
● **Accessing programmable controller CPUs on another station**
Routing parameters need to be set when accessing a programmable controller CPU on another station with a different network number, or when accessing a programmable controller CPU on another station via network system mixed with MELSECNET/10(H), CC-Link IE and Ethernet.
Accessing a programmable controller CPU on another station is possible within the network system specifications by setting routing parameters.
For details of routing parameters, refer to the manual of each network module.

● **Mixed system consisting of MELSECNET/10(H), CC-Link IE, and Ethernet**
Ethernet parameter "Station No. ⇔ IP Information" must be set. For details, refer to the following manual.
☞ Q Corresponding Ethernet Interface Module User's Manual (Application)

● **Screen settings for CC-Link system with QCPU (Q mode)/LCPU (single network)**

The following shows the connection destination detail setting screen example for the CC-Link system configuration.





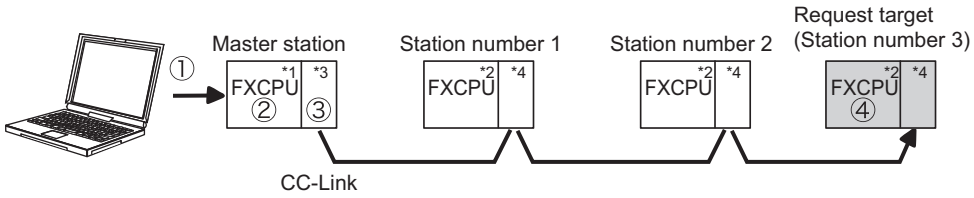
Point

● **Accessible station numbers when accessing the programmable controller CPU on another station via CC-Link**

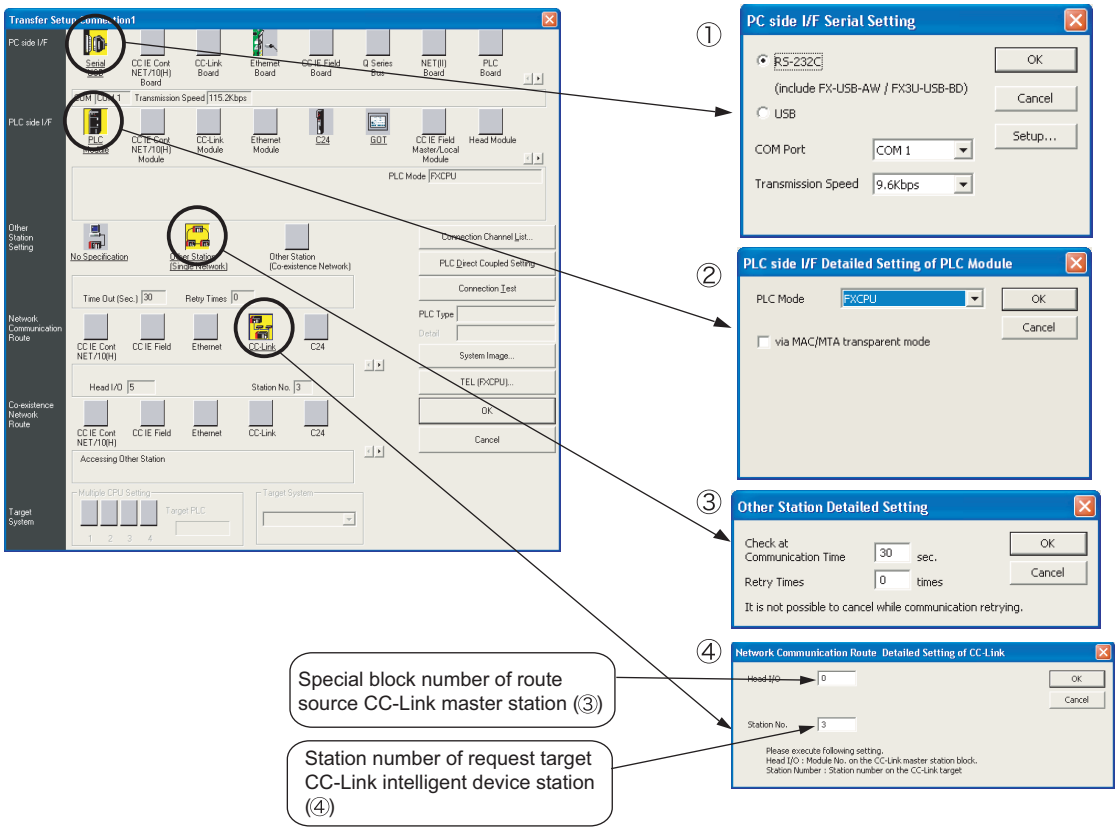
When the programmable controller CPU is connected directly or via a serial communication module, accessible station numbers when accessing the programmable controller CPU on another station via CC-Link are 0 (master) to 63.

● Screen settings for CC-Link system with FXCPU (single network)

- When FXCPU is a master station
  The following shows the example of connection destination detail setting screen for the CC-Link system configuration.
  For details of CC-Link system with FXCPU, refer to the following manuals.
  ☞ CC-Link user's manuals for FXCPU



*1: FX3G/FX3GC version 2.00 or later
FX3U/FX3UC version 3.10 or later
*2: FX3G/FX3GC/FX3U/FX3UC
For FX3UC, supported by version 2.20 or later
*3: CC-Link master station
*4: CC-Link intelligent device station

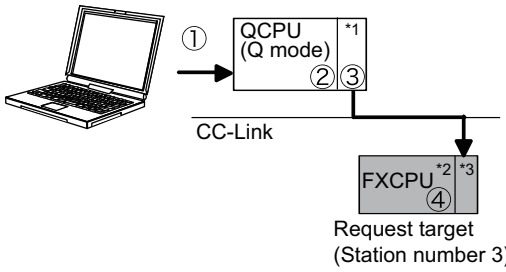


Point

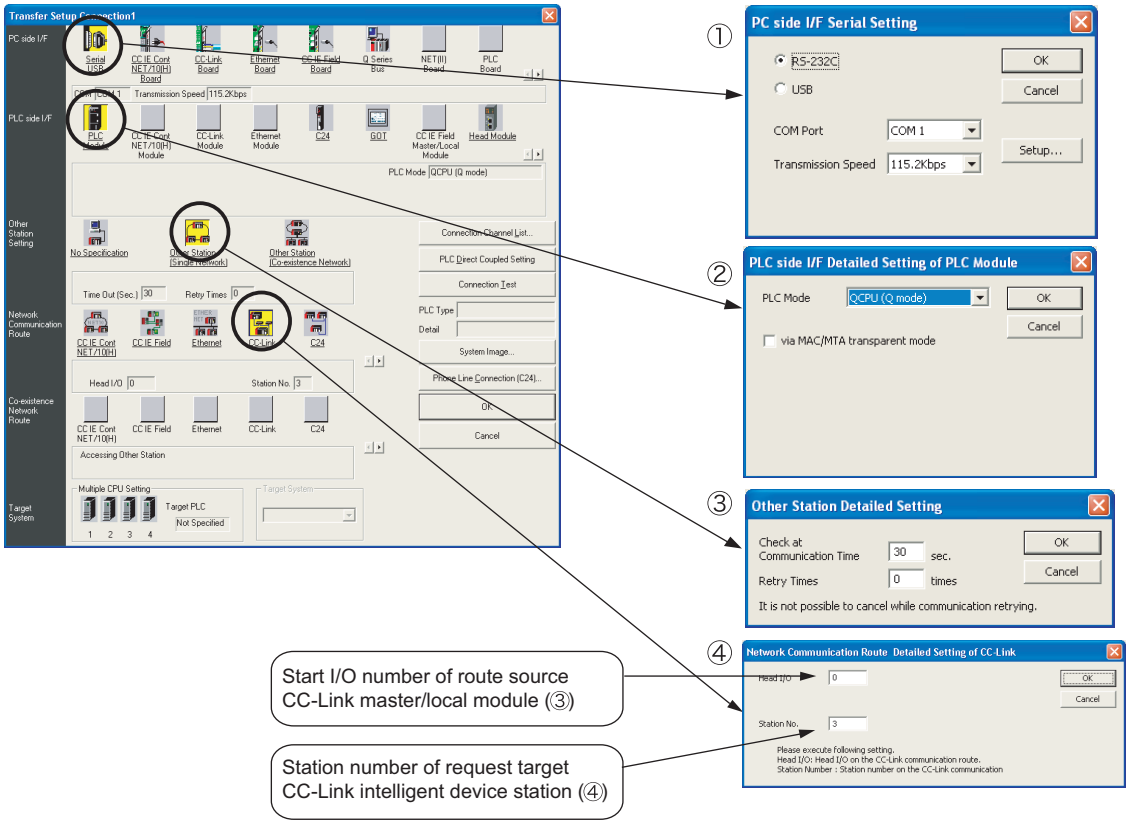
● Considerations when accessing other stations via CC-Link

- When accessing other stations via CC-Link, FXCPUs other than the master station can be accessed only when an FXCPU master station (2 in above figure) is relayed.
- Specify the special block number (0 to 7) of CC-Link master station which is connected to the master station for "Start I/O No." in the Network Communication Route Detailed Setting of CC-Link screen.
- The following are the accessible station numbers according to the FXCPU model of the master station.
  FX3U, FX3UC: 1 to 16
  FX3G, FX3GC: 1 to 12

- When QCPU (Q mode) is a master station
  The following shows the example of connection destination detail setting screen for accessing FXCPU via QCPU (Q mode).
  For details of CC-Link system with FXCPU, refer to the following manuals.
  ☞ CC-Link user's manuals for FXCPU



*1: Master station
*2: FX3G/FX3GC/FX3U/FX3UC
For FX3UC, supported by version 2.20 or later
*3: CC-Link intelligent device station



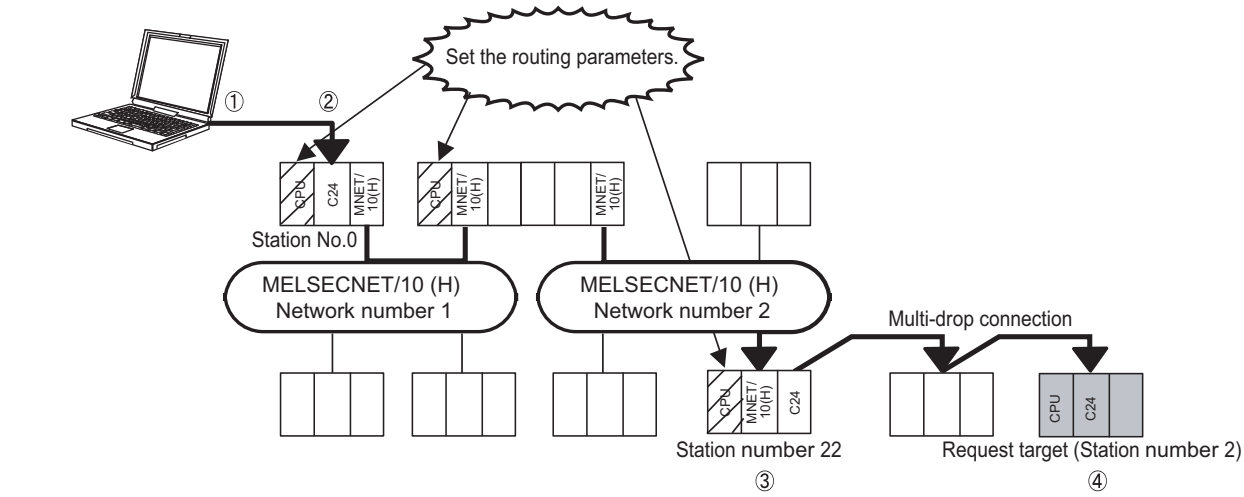
Point

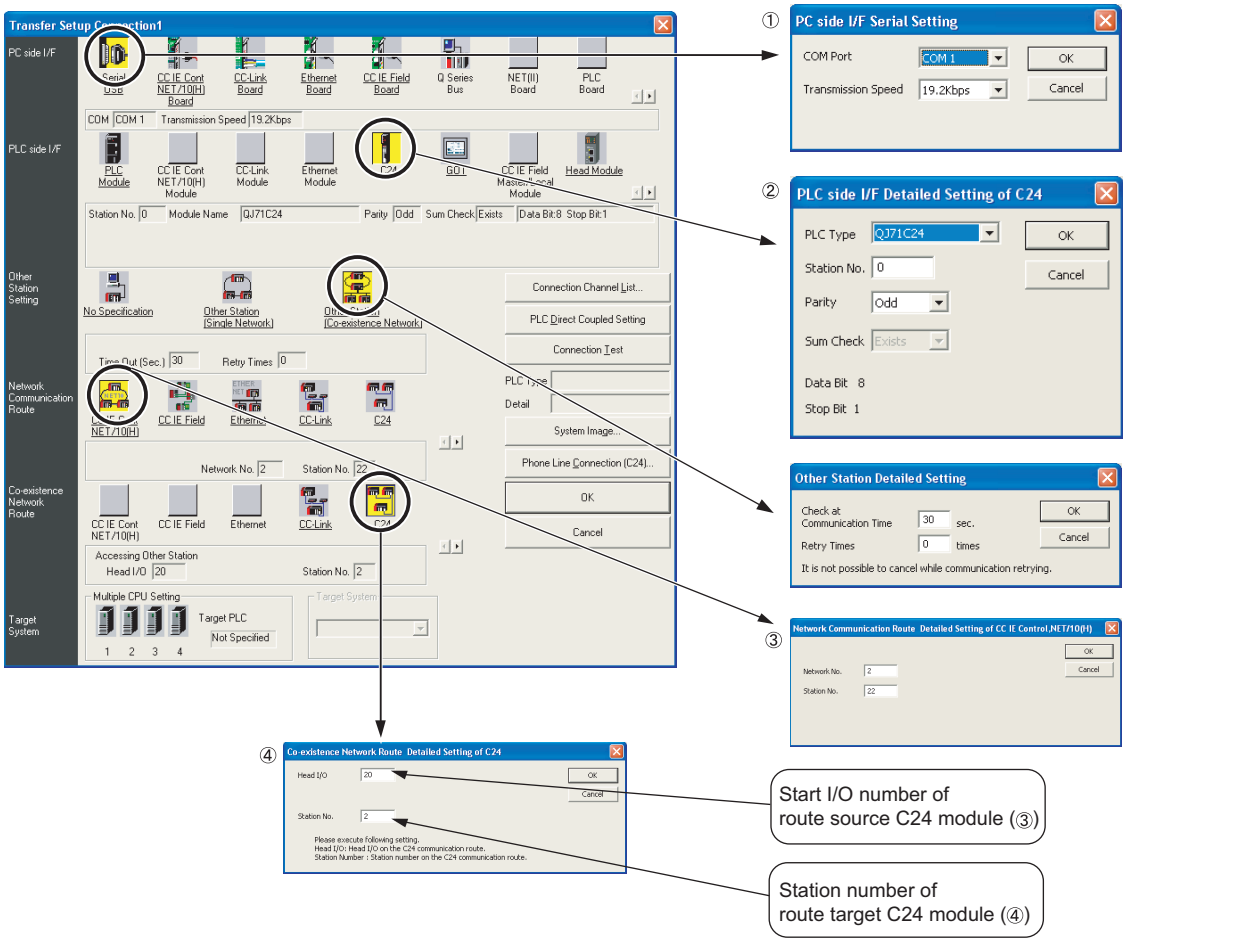
● **Accessible station numbers when accessing other stations via CC-Link**
Accessible station numbers are 1 to 63.

■ Setting example of "Other Station (Co-existence Network)"

The following is the setting example for accessing the programmable controller CPU via co-existence network.
This setting is not supported by LCPU and FXCPU.

● **Screen settings for the mixed system in which MELSECNET/10(H) and Q series C24 modules are configured (co-existence network)**
The following shows the connection destination detail setting screen example for the mixed system configuration (Q series only).





11.4 Accessing Programmable Controller CPU in Multiple CPU System

Q CPU *1 | L CPU | Remote | Head | FX

*1 : Not supported by Q00J/Q00UJ and Redundant CPU.

This section explains the setting method for accessing the programmable controller CPU (host CPU) directly connected to the personal computer or other programmable controller CPUs (other CPUs) in the multiple CPU system. The setting method for accessing the multiple CPU system on another station via a network is also explained.

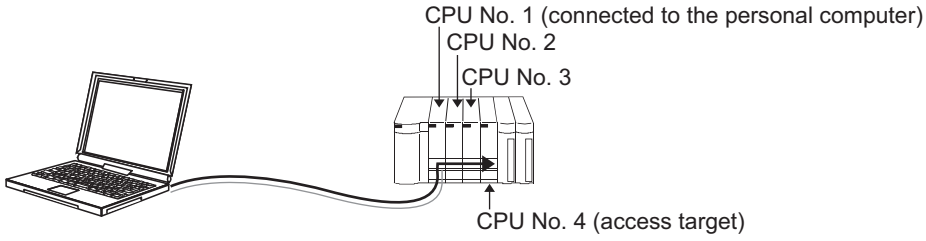
■ Accessing host CPU

The setting for accessing the host CPU is the same as that for accessing the programmable controller CPU on the host station. (☞ Section 11.2)

■ Accessing other CPUs

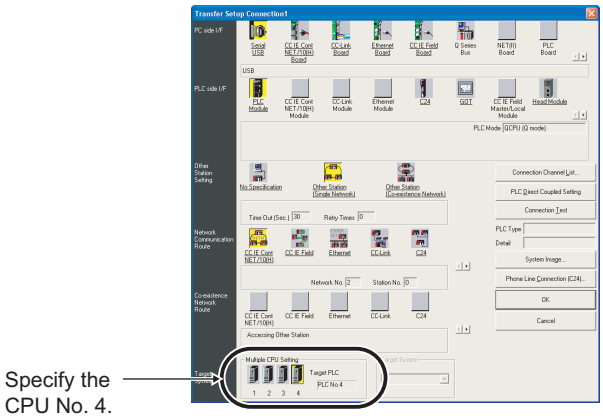
In the multiple CPU system, specify the CPU number of the access target at "Multiple CPU Setting" when accessing a programmable controller CPU that is not directly connected to the personal computer.
For Basic model QCPU and Universal model QCPU (Q00U/Q01U/Q02U), the CPU No. 1 to 3 can be specified.
For High Performance model QCPU, Process CPU, and Universal model QCPU (except for Q00U/Q01U/Q02U), the CPU No. 1 to 4 can be specified.

The following shows a setting example when accessing the CPU No. 4 by connecting the personal computer to the CPU No. 1.



Operation

1. **Set the settings from "PC side I/F" to "Co-existence Network Route"**
   ☞ Section 11.1.1
2. **Set the access target CPU number with "Multiple CPU Setting" for "Target System".**



■ Accessing the programmable controller CPU via network in multiple CPU system

The following explains the setting method for accessing the programmable controller CPU in a multiple CPU system on another station via a network.

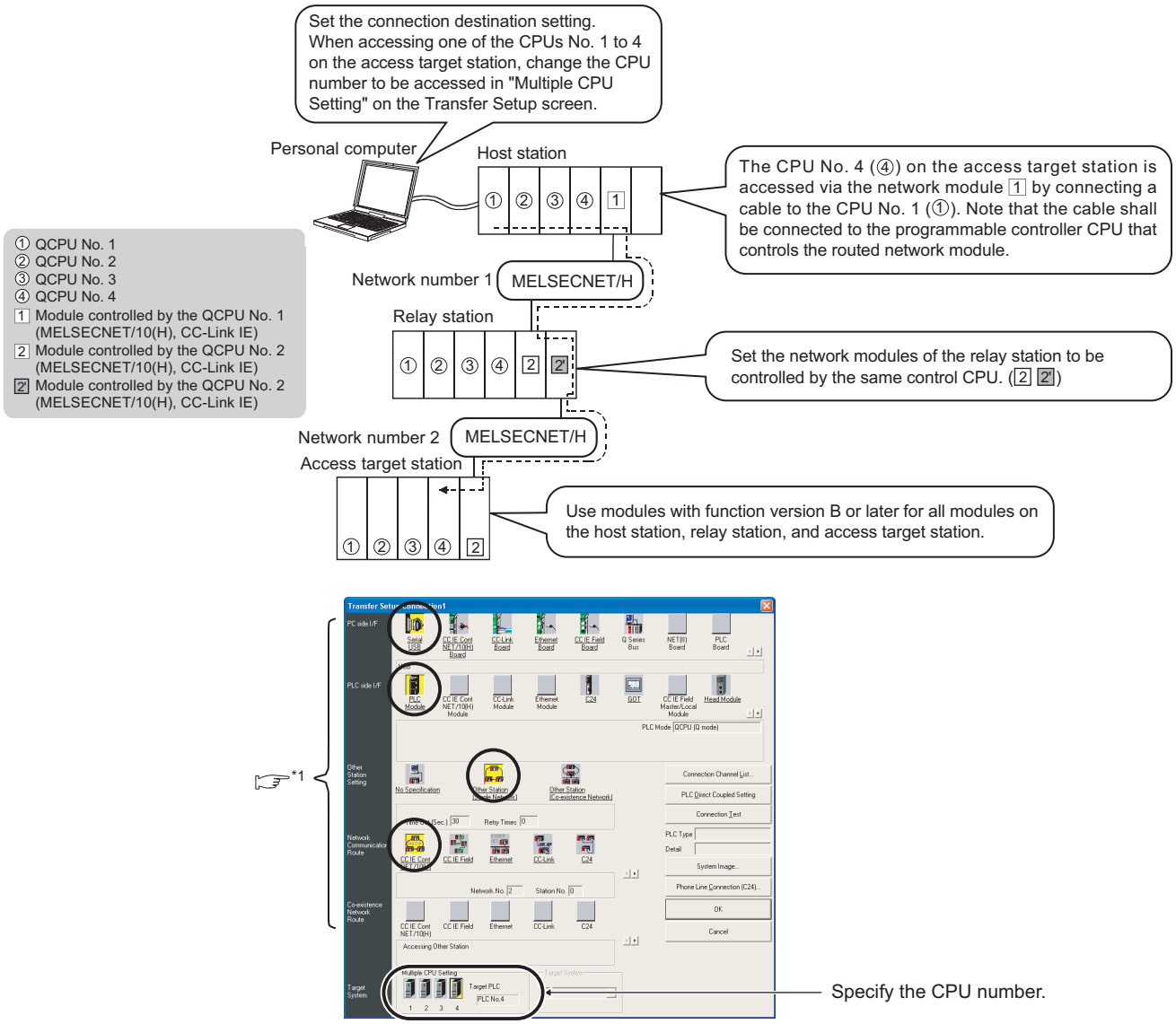
● **Relay station**

Set the parameters so that the network module mounted on the relay station is controlled by the same programmable controller CPU. (In the figure below, CPU No. 2 is the control CPU.)

● **Access target station**

Set the CPU number in "Multiple CPU Setting" on the Transfer Setup screen if the access target station has the multiple CPU system.

The following shows a setting example when accessing the CPU No. 4 in the multiple CPU system on the access target station via a network.



*1 : ☞ Section 11.1.1

Point

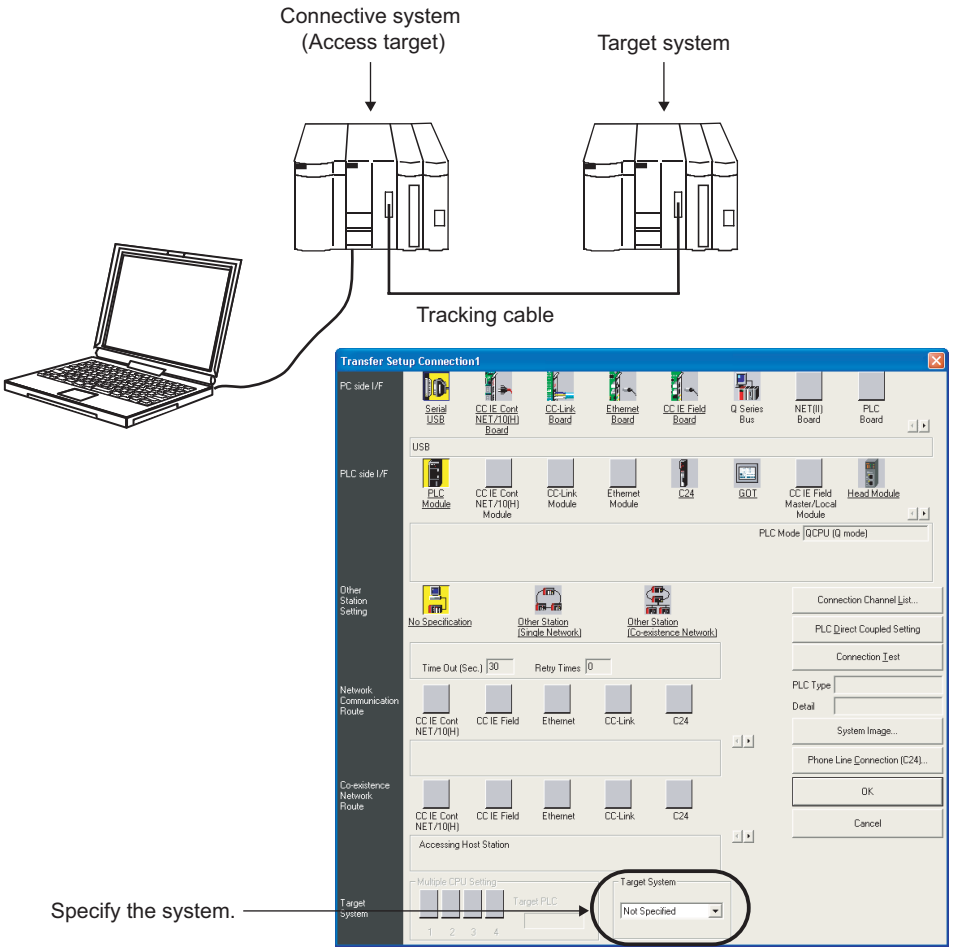
● **Access range by network module function versions**
To access programmable controller CPUs which are not controlling the network module of the access target station, use the network module with function version B or later.

11.5 Accessing Redundant CPUs

Q CPU *1 | L CPU | Remote | Head | FX

*1 : Redundant CPU only

This section explains how to access Redundant CPUs.



Operation

1. **Set the settings from "PC side I/F" to "Co-existence Network Route". (☞ Section 11.1.1)**
2. **Specify the system with "Target System".**

Item	Description
Not Specified	• When connecting a CPU directly A programmable controller CPU directly connected to a personal computer • When routing a module mounted on a main base unit A programmable controller CPU of the station on which a network module whose station number is specified for the network communication route is mounted • When routing a module mounted on an extension base unit A programmable controller CPU whose system is set as a control system
Control System	A programmable controller CPU whose system is a control system
Standby System	A programmable controller CPU whose system is a standby system
System A	A programmable controller CPU with an A side connector of tracking cable
System B	A programmable controller CPU with a B side connector of tracking cable

Point

● **"Target System" setting when performing the monitoring function**
When performing the monitoring function on a Redundant CPU, set "Not Specified", "System A", or "System B" for "Target System".

11.5.1 Considerations for routing intelligent function module on extension base unit

The following table shows the applicability of functions according to the "Target System" setting when accessing a Redundant CPU via an intelligent function module on the extension base unit.

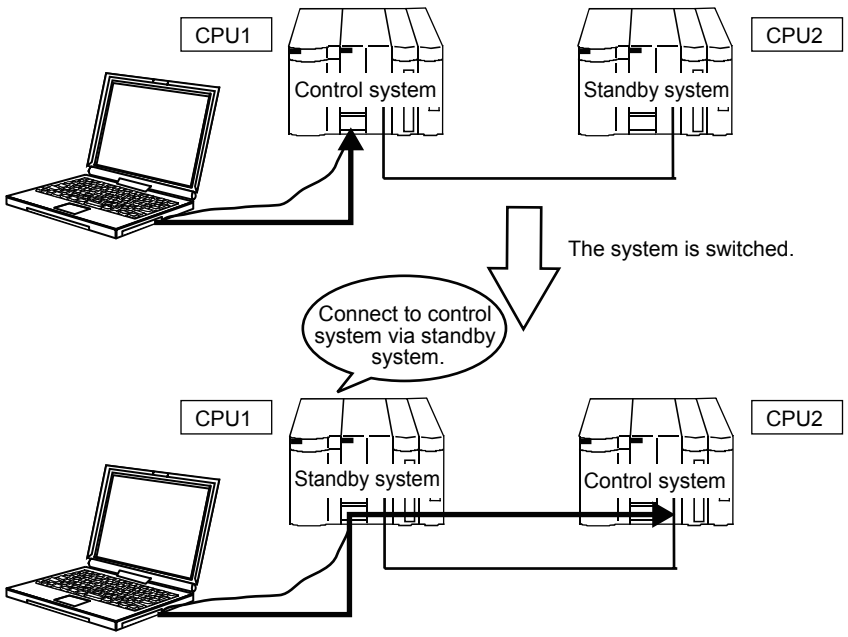
○: Applicable △: Applicable with restrictions ×: Not applicable

Function		Target System		Restrictions
		System A/ System B	Not specified/ Control system/ Standby system	
Change TC setting		×	×	
Online program change		×	×	
Read from PLC		○	×	
Write to PLC		×	×	
Verify with PLC		○	×	
Redundant Operation		○	△	System switching and change operation mode functions are not applicable.
Password	New	○	×	
	Delete	○	×	
	Disable	○	×	
Clear PLC memory		○	△	Clear all file registers function is not applicable.
Arrange PLC memory		×	×	
Delete PLC data		○	×	
Read PLC user data		○	×	
Write PLC user data		×	×	
Delete PLC user data		○	×	
Export to ROM format		×	×	
Monitor mode		○	△	Monitoring SFC programs is not applicable.
Monitor (write mode)		○	△	Monitoring and verifying SFC programs are not applicable.
Start monitoring (all windows)		○	△	Monitoring SFC programs is not applicable.
Stop monitoring (all windows)		○	△	Monitoring SFC programs is not applicable.
Start monitoring		○	△	Monitoring SFC programs is not applicable.
Stop monitoring		○	△	Monitoring SFC programs is not applicable.
Local device monitoring		○	×	
Monitoring program list		○	×	
Interrupt program list		○	×	
Monitoring condition setting		×	×	
SFC all block batch monitoring		○	×	
SFC auto scroll		○	×	
Sampling trace		×	×	
Scan time measurement		○	×	
MELSECNET diagnostics		△	×	Network test, loop test, setting verification test, station order check test, and communication test are not applicable.
Online module change		○	×	
Confirm memory size		○	△	Online mode is not applicable.

11.5.2 Operation when system switching occurs on Redundant CPU

When a system switching occurs while accessing a Redundant CPU, the access is continued as described below.
This function is valid when "Control System" or "Standby System" is set for "Target System" on the Transfer Setup screen.

When "Control System" is set for "Target System".



11.5.3 Operation when communication error occurs during monitoring

If a communication error occurs on the route of communication with Redundant CPU, the communication route is automatically switched to continue the monitoring of the system specified on the Transfer Setup screen.
When the following conditions 1 to 3 are satisfied, the access to the Redundant CPU is continued by route switching.

1) Monitoring functions of route switch target

- Ladder program monitoring (including Entry Ladder Monitor function, and monitoring programs of Zoom editor and inline structured text)*1
- ST program monitoring
- Structured Ladder/FBD monitoring
- Local device monitoring*2
- Device/buffer memory batch monitoring*3
- Watch
- Monitoring condition setting*4
- Monitoring stop condition setting*4
- Remote operation
- Redundant operation
- PLC diagnostics
- Monitoring of intelligent function module

*1 : Not supported by SFC diagram.
*2 : When a communication error occurs and the local device monitoring target program is switched, the monitoring stops.
*3 : When a communication error occurs at a timing of display format change, or when a communication error occurs during scrolling, the monitoring stops.
*4 : When a communication error occurs, conditions cannot be registered/canceled.

2) Operation modes and connection targets in which a route switch can be performed

–	Operation mode/connection target in which a monitoring can be continued
Operation mode	Backup mode, separate mode
Connection target	Control system, standby system, system A, system B

3) Communication routes in which a route switch can be performed

PC side I/F	PLC side I/F	Other Station Setting	Network Communication Route	Co-existence Network Route
Serial/USB	PLC Module	Other Station (Single Network)	CC IE Cont, NET/10(H)	–
			CC IE Field	–
			Ethernet	–
		Other Station (Co-existence Network)	C24	CC IE Cont, NET/10(H)
				Ethernet
			CC-Link	CC IE Cont, NET/10(H)
				Ethernet
	GOT	Other Station (Single Network)	CC IE Cont, NET/10(H)	–
			CC IE Field	–
			Ethernet	–
		Other Station (Co-existence Network)	C24	CC IE Cont, NET/10(H)
				Ethernet
			CC-Link	CC IE Cont, NET/10(H)
				Ethernet
Serial/USB	Communication Head Module	Other Station (Single Network)	CC IE Field	–
		Other Station (Co-existence Network)	C24	CC IE Cont, NET/10(H)
				Ethernet
			CC-Link	CC IE Cont, NET/10(H)
				Ethernet
	C24	Other Station (Single Network)	CC IE Cont, NET/10(H)	–
			CC IE Field	–
			Ethernet	–
		Other Station (Co-existence Network)	C24	CC IE Cont, NET/10(H)
				Ethernet
			CC-Link	CC IE Cont, NET/10(H)
				Ethernet
	NET/10(H) Remote	Other Station (Single Network)	CC IE Cont, NET/10(H)	–
			Ethernet	–
		Other Station (Co-existence Network)	C24	CC IE Cont, NET/10(H)
				Ethernet
			CC-Link	CC IE Cont, NET/10(H)
				Ethernet
	G4 Module	Other Station (Co-existence Network)	CC-Link	CC IE Cont, NET/10(H)
				Ethernet
CC IE Cont NET/10(H) Board	CC IE Cont NET/10(H) Module	Other Station (Single Network)	CC IE Cont, NET/10(H)	–
CC IE Field Board	CC IE Field Master/Local Module	Other Station (Single Network)	CC IE Field	–
	Communication Head Module	Other Station (Single Network)	CC IE Field	–
	CC IE Field Ethernet Adapter	Other Station (Single Network)	CC IE Field	–
CC-Link Board	CC-Link Module	Other Station (Co-existence Network)	CC-Link	CC IE Cont, NET/10(H)
				Ethernet

PC side I/F	PLC side I/F	Other Station Setting	Network Communication Route	Co-existence Network Route
Ethernet Board	CPU module	Other Station (Single Network)	CC IE Cont, NET/10(H)	–
			CC IE Field	–
			Ethernet	–
		Other Station (Co-existence Network)	C24	CC IE Cont, NET/10(H)
				Ethernet
			CC-Link	CC IE Cont, NET/10(H)
				Ethernet
	GOT	Other Station (Single Network)	CC IE Cont, NET/10(H)	–
			CC IE Field	–
			Ethernet	–
		Other Station (Co-existence Network)	C24	CC IE Cont, NET/10(H)
				Ethernet
			CC-Link	CC IE Cont, NET/10(H)
				Ethernet
	Ethernet Module	Other Station (Single Network)	Ethernet	–
	CC IE Field Ethernet Adapter	Other Station (Single Network)	CC IE Field	–

Point

● **Operation of monitoring functions when a route switch occurs**
When the target monitoring functions for route switch and other monitoring functions are mixed in an operation, the target monitoring functions for route switch continues operation and other monitoring functions stop operation.

● **Situations when a route cannot be switched**
A route switch which is triggered by a communication error cannot be performed when any of the following situations occurs at a monitoring start.

- An error occurs on the first communication to the connective system.
- One of the Redundant CPUs is powered OFF or reset.
- A tracking error occurs and a communication cannot be established between the redundant CPUs.

● **Messages indicating a system switch request from network module and a tracking cable communication error detection**
If a message indicating a system switch request from network module or a tracking cable communication error detection is displayed during monitoring, the system may have been switched.
Check the corresponding location by following the instruction described on the message, and remove the error factor of route switch.
In order to display the above message(s) when communicating via Ethernet, select the following item(s) in the redundant setting of the Ethernet parameter.
If the item is not selected, the message will not be displayed even when a route switch is performed.

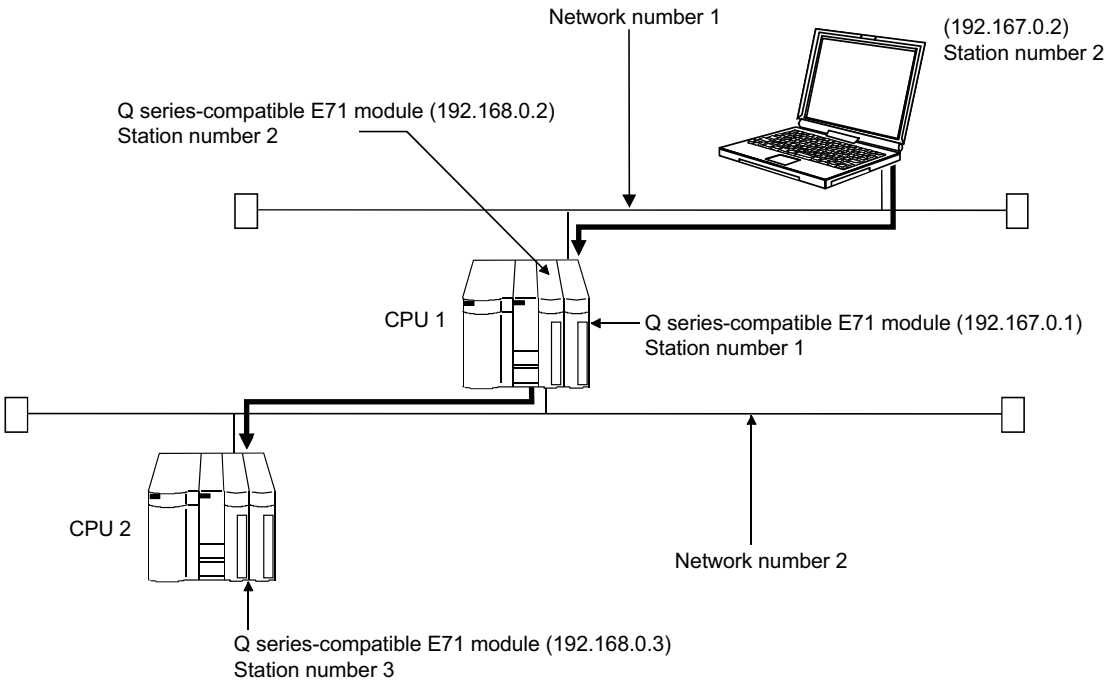
- Issue system switch in Cable disconnection timeout
- Issue system switch in communication error

11.6 Accessing Programmable Controller CPU via Ethernet Board

Q CPU | L CPU | Remote | Head *1 | FX

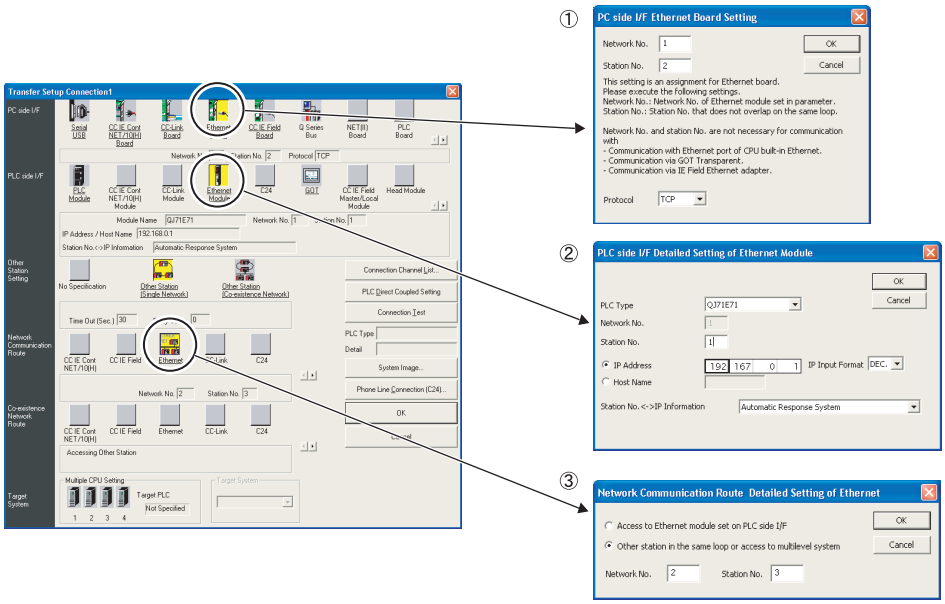
*1 : CC IE Field head module only

This section explains the setting method for accessing the programmable controller CPU via an Ethernet board of a personal computer.
The following shows a setting example when accessing the programmable controller CPU from GX Works2 via Q series-compatible E71 modules.
For the setting to access FXCPU, refer to the manual of the Ethernet module or the manual of the setting software.



Operation

- **Set the connection destination setting.**



Item	Description
PC side I/F	Set the network number, station number*1, and protocol.
PLC side I/F	Set the model, station number, IP address and other items for the module to be connected to the personal computer. For "Station No. ⇔ IP Information", set the method corresponding to the setting for "Station No. ⇔ IP Information" of Ethernet parameter.
Network Communication Route	Set the network number and station number of the access target station.

*1 : Set the station number avoiding the same station number already assigned to the existing system or another Ethernet module.

Point

● **Communication when multiple GX Works2 are connected**
Perform communication using TCP/IP or UDP/IP. (☞ Section 6.3.1)

● **Multiple network systems**
For a multiple network system, routing parameters must be set.
☞ Q Corresponding Ethernet Interface Module User's Manual (Application)

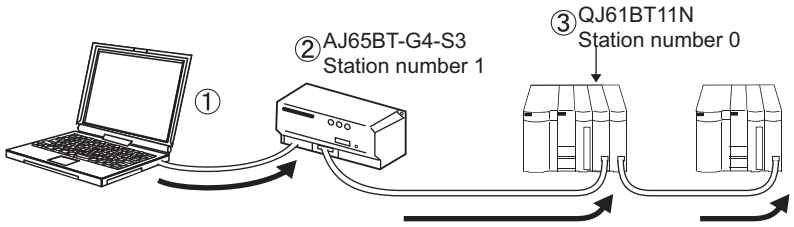
11.7 Accessing Programmable Controller CPU via G4 Module

Q CPU | L CPU | Remote | Head | FX *1

*1 : CC IE Field head module only

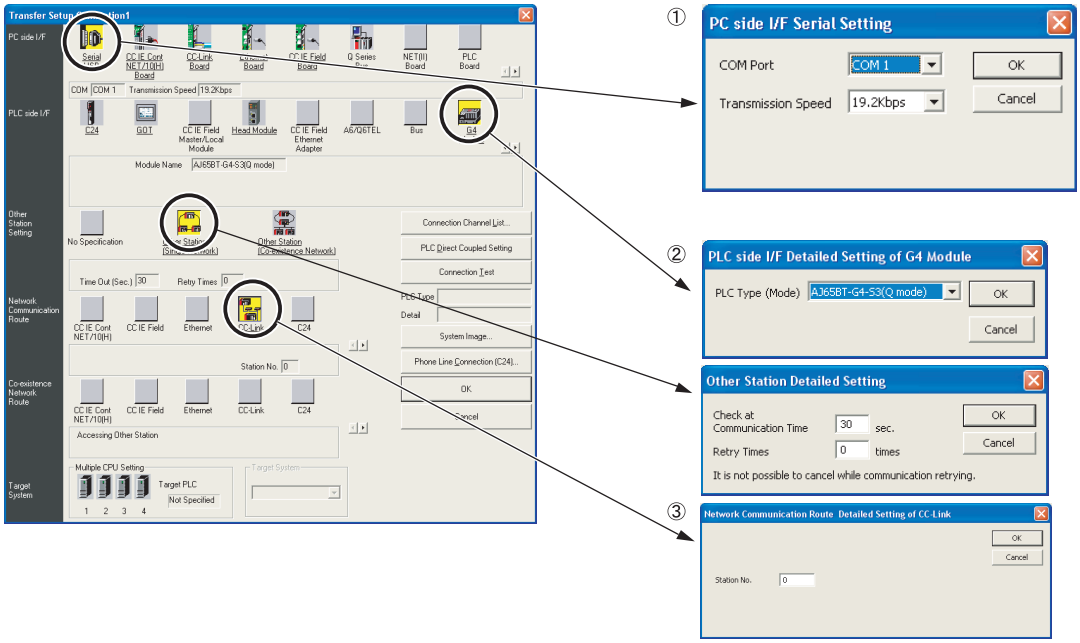
This section explains the setting method for accessing the programmable controller CPU via a G4 module.
For details of AJ65BT-R2N, refer to the following manual.
☞ CC-Link System RS-232 Interface Module User's Manual (MELSOFT Connection Mode)

The following shows a setting example when accessing the programmable controller CPU via AJ65BT-G4-S3 module from GX Works2.
Data link must be correctly established by setting the switch settings and parameters for the AJ65BT-G4-S3 module and the CC-Link master module.



Operation

- **Set the connection destination setting.**



Item	Description
PC side I/F	Set the COM port and transmission speed.
PLC side I/F	Set the model of the G4 module to be connected.
Other Station Setting	Set "Other Station (Single Network)".
Network Communication Route	Set the station number of the access target station.

11.8 Setting for Access via Serial Communication Module

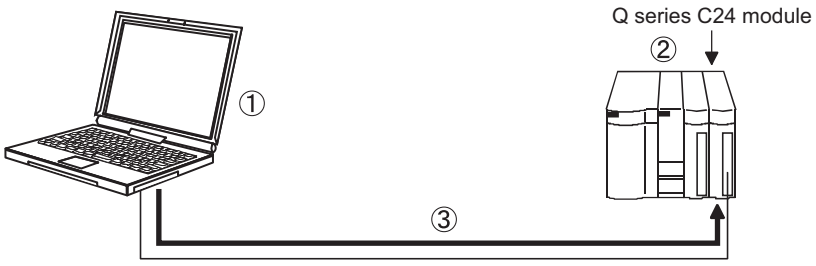
Q CPU | L CPU | Remote | Head | *1 FX

*1 : CC IE Field head module only

This section explains the setting method for accessing the programmable controller CPU on host station or on another station via a C24 module.

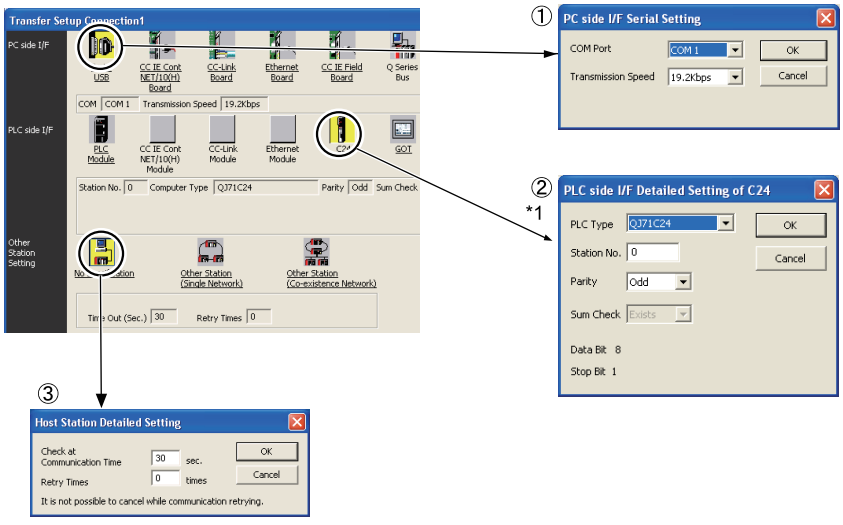
11.8.1 Connection on a 1:1 basis

The following shows a setting example when accessing a programmable controller CPU by connecting a personal computer and a Q series C24 module.



Operation

- **Set the connection destination setting.**
  The following shows a setting example on a screen when accessing a programmable controller CPU from GX Works2 via a C24 module.
  The image below is an example for Q series C24 module.



Item	Description
PC side I/F	Set the COM port and transmission speed.
PLC side I/F*1	Set the model and station number of the C24 module to be connected.
Other Station Setting	Set "No Specification".

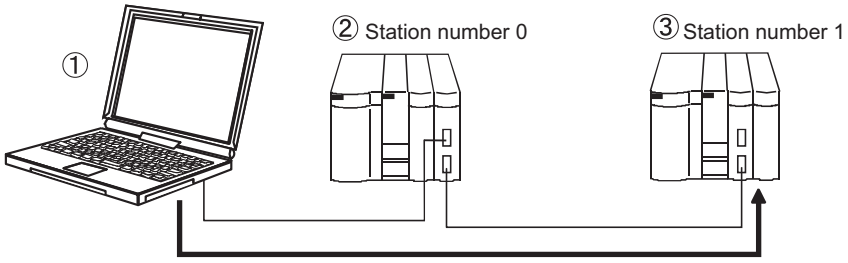
*1 : If a number other than '0' is set in the station number setting of the C24 module, set the same number for its station number.
The station number setting can be set in "Switch 5" (station number setting) in the switch setting of the PLC parameter.

11.8.2 Connection on a 1:n basis

Access the programmable controller CPU in another station from GX Works2 in a system composed of multiple programmable controller CPU stations.

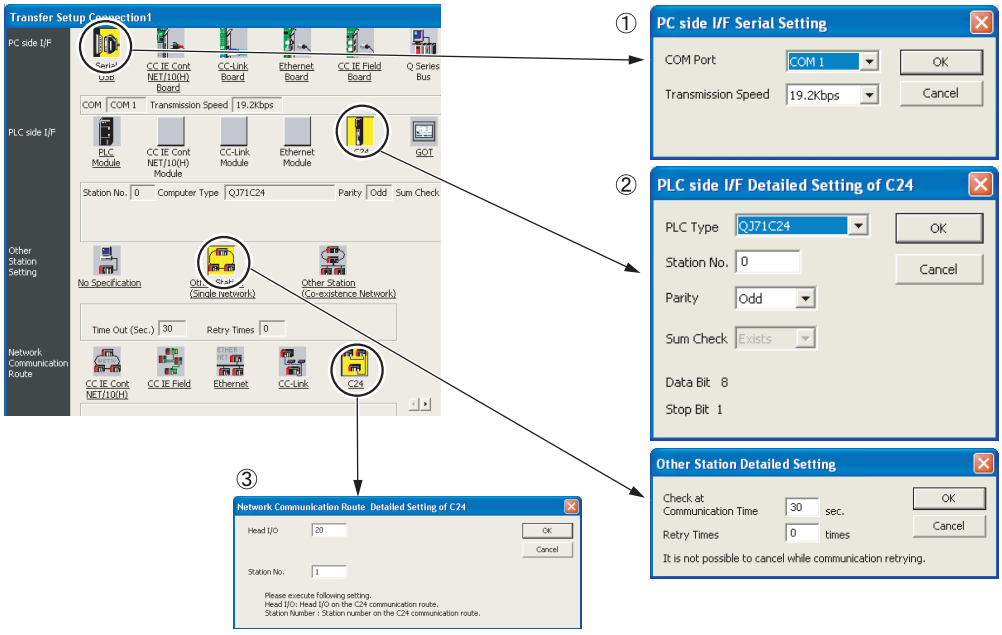
■ Access via a serial communication module

The following shows a setting example when accessing the programmable controller CPU in another station via Q series C24 modules.



Operation

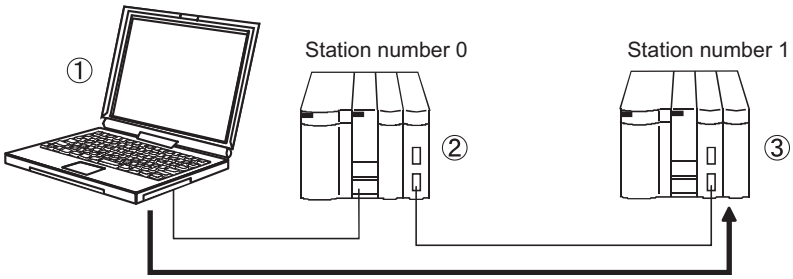
- **Set the connection destination setting.**
  The following shows a setting example of a screen for accessing C24 modules from GX Works2.
  The image below is an example for Q series C24 module.



Item	Description
PC side I/F	Set the COM port and transmission speed.
PLC side I/F	Set the model and station number of the C24 module to be connected.
Other Station Setting	Set "Other Station (Single Network)".
Network Communication Route	Specify the start I/O number of the C24 module connected to GX Works2 and the station number of access target.

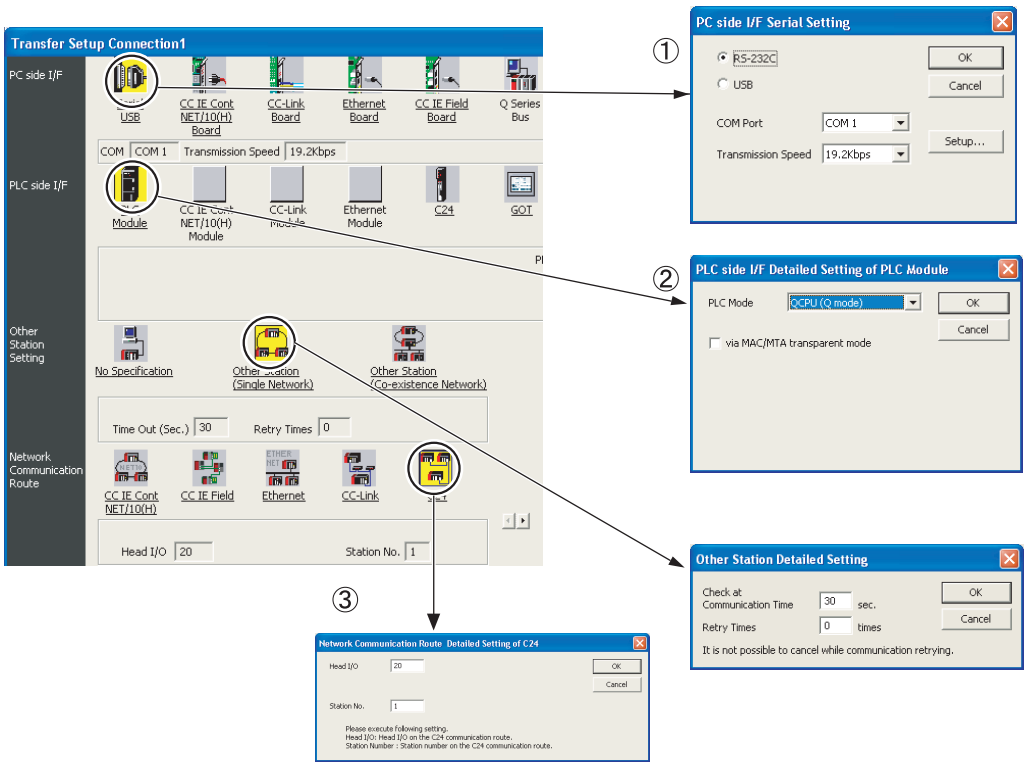
■ Direct connection of a programmable controller CPU

The following shows a setting example when accessing the programmable controller CPU in another station via Q series C24 modules by directly connecting the personal computer to the programmable controller CPU.



Operation

- **Set the connection destination setting.**
  The following shows a setting example of a screen for accessing a programmable controller CPU from GX Works2 via C24 modules.
  The image below is an example for Q series C24 module.



Item	Description
PC side I/F	Set the interface of the personal computer. (☞ Section 11.1.1)
PLC side I/F	Select the series of the programmable controller CPU to be connected.
Other Station Setting	Set "Other Station (Single Network)".
Network Communication Route	Specify the start I/O number of the C24 module connected to GX Works2 and the station number of access target.

11.9 Setting for Access via GOT (GOT Transparent Function)

This section explains how to access the programmable controller CPU from GX Works2 via GOT using the GOT transparent function.

Point

● **Considerations on executing online operations from GX Works2**
Do not execute online operations from GT Designer2 to GOT (such as downloading project data) when online operations are being executed from GX Works2 to the programmable controller CPU using the GOT transparent function.

● **When GOT does not monitor normally**
The GOT transparent function cannot be used in the following cases.
- When GOT does not monitor normally due to programmable controller CPU errors or communication errors between the programmable controller CPU and GOT
- During the period of time between turning ON or resetting the programmable controller CPU or GOT and the start of GOT monitoring

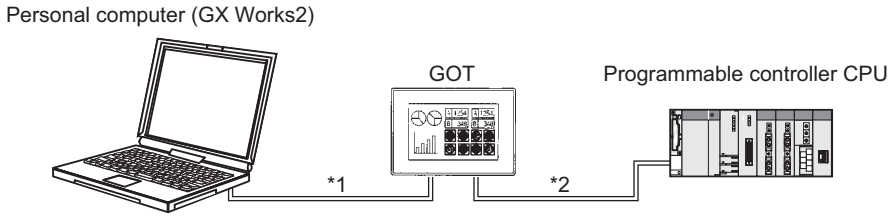
Check the following items if GOT does not monitor normally.

Item	Description
Does the programmable controller CPU operates normally?	Refer to the user's manual of the programmable controller CPU used.
Is the programmable controller CPU connected to GOT normally?	Refer to the user's manual of the GOT to be used. • GOT1000 Series Connection Manual • GOT-A900 Series User's Manual (Connection System Manual) • GOT-F900 SERIES GRAPHIC OPERATION TERMINAL HARDWARE Manual [Connection]

11.9.1 Accessing programmable controller CPU via GOT

Q CPU L CPU ~~Remote~~ ~~Head~~ FX

Access the programmable controller CPU via GOT.



*1 : The following table shows the connection between the personal computer and GOT.

○: Connectable

Connection	GOT		
	GOT1000 series	GOT-A900 series	GOT-F900 series
RS-232 connection	○	○	○
USB connection	○	–	–
Ethernet connection	○	–	–

*2 : For cables connecting GOT with the programmable controller CPU, GOT settings, and considerations, refer to the manual of the GOT connected.

- GOT1000 Series Connection Manual
- GOT-A900 Series User's Manual (Connection System Manual)
- GOT-F900 SERIES GRAPHIC OPERATION TERMINAL HARDWARE Manual [Connection]

■ Connecting personal computer and GOT with RS-232 or USB

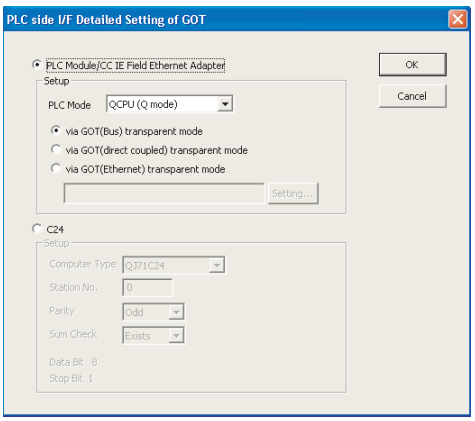
The following shows the settings for connecting a personal computer and a GOT with RS-232 or USB.

Operation

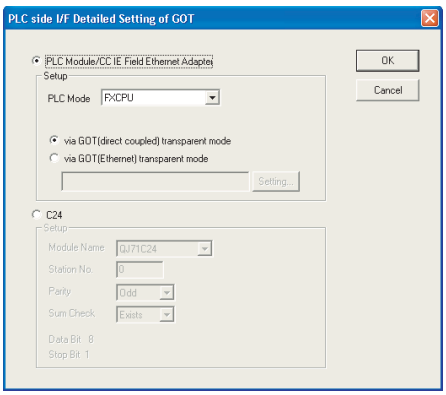
1. Set "PC side I/F".
☞ Section 11.1.1

2. For QCPU (Q mode), LCPU, FX3G, FX3GC, FX3U, or FX3UC, double-click "GOT" on "PLC side I/F".
The PLC side I/F Detailed Setting of GOT screen is displayed.

< QCPU (Q mode)/LCPU >



< FXCPU >



For CPUs other than FX3G, FX3GC, FX3U, or FX3UC, click "GOT" on "PLC side I/F". The screen will not be displayed in this situation.

3. For QCPU (Q mode), LCPU, FX3G, FX3GC, FX3U, or FX3UC, set the following setting on the PLC side I/F Detailed Setting of GOT screen.

Item		Description
Detail setting for GOT and PLC connection		Select "PLC Module/CC IE Field Ethernet Adapter"
	Setup	Select "QCPU (Q mode)", "LCPU", or "FXCPU" for "PLC Mode".

Setting method	Description
Bus connection	Select "via GOT (Bus) transparent mode". (For QCPU (Q mode) only)
Direct connection	Select "via GOT (direct connection) transparent mode".
Ethernet connection	Select "via GOT (Ethernet) transparent mode", and set the GOT (Ethernet) transparent setting from the Setting... button.
GOT-F900	Select "via GOT-F900 transparent mode". Note that if the detailed setting for PC side I/F is USB, this item cannot be selected. (FXCPU only)

4. Set "Other Station Setting" depending on a route to the connection destination.
☞ Section 11.1.1

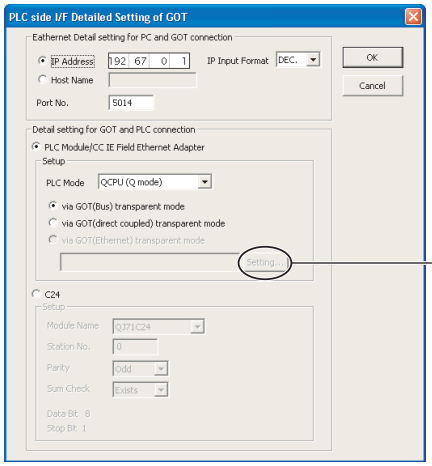
■ Connecting personal computer and GOT with Ethernet

The following shows the settings for connecting a personal computer and a GOT with Ethernet.

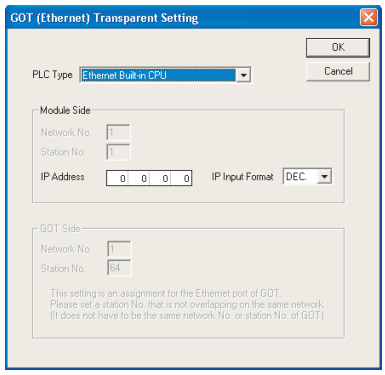
Operation

1. **Set "PC side I/F".**
   ☞ Section 11.1.1
2. **Double-click "GOT" on "PLC side I/F".**
   The PLC side I/F Detailed Setting of GOT screen is displayed.
3. **Set the following setting on the PLC side I/F Detailed Setting of GOT screen.**

< Detailed setting screen when using the Ethernet connection between personal computer and GOT>



<GOT (Ethernet) Transparent Setting screen>



Item		Description
Ethernet Detail setting for PC and GOT connection		Set settings such as an IP address and a host name when using the Ethernet connection between a personal computer and a GOT.
Detail setting for GOT and PLC connection		Select "PLC Module/CC IE Field Ethernet Adapter"
	Setup	Set the following setting according to the setting method between a GOT and a programmable controller CPU. For details, refer to "☞ ■ Connecting personal computer and GOT with RS-232 or USB".

4. **Set "Other Station Setting" depending on a route to the connection destination.**
   For FXCPU, only "No Specification" can be set.
   ☞ Section 11.1.1

Point

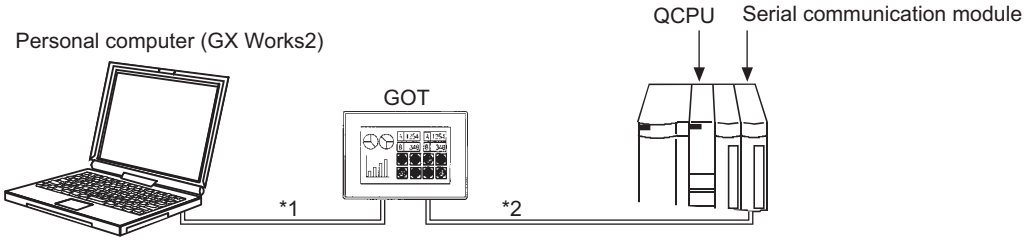
● **Connecting modules via Ethernet adapter module (For QCPU (Q mode)/LCPU)**
Modules can be connected via Ethernet adapter module using an Ethernet adapter module with the GOT (Ethernet) transparent function.

- Select "via GOT (Ethernet) transparent mode" in the detailed setting and select "NZ2GF-ETB" in the field next to the Setting... button.

11.9.2 Accessing programmable controller CPU via serial communication module

Q CPU | L CPU | Remote (×) | Head (×) | FX (×)

The following explains the GX Works2 setting method for accessing the programmable controller CPU via a GOT and a serial communication module.



*1 : The following table shows the connection between the personal computer and GOT.

○: Applicable

Connection	GOT		
	GOT1000 series	GOT-A900 series	GOT-F900 series
RS-232 connection	○	–	–
USB connection	○	–	–
Ethernet connection	○	–	–

*2 : For details of cables connecting GOT with the serial communication module, GOT settings, and considerations, refer to the manual of the GOT to be connected.
· GOT1000 series Connection Manual

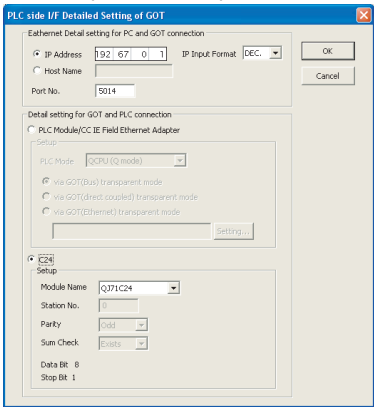
■ Connecting to QCPU (Q mode)/LCPU

The following shows the settings for accessing QCPU (Q mode)/LCPU.

Operation

1. **Set "PC side I/F".**
   ☞ Section 11.1.1
2. **Double-click "GOT" on "PLC side I/F".**
   The PLC side I/F Detailed Setting of GOT screen is displayed.
3. **Set the following setting on the PLC side I/F Detailed Setting of GOT screen.**

<Detailed setting screen when using the Ethernet connection between personal computer and GOT>



Item		Description
Ethernet Detail setting for PC and GOT connection		Set settings such as an IP address and a host name when using the Ethernet connection between a personal computer and a GOT.
Detail setting for GOT and PLC connection		Select "C24".
	Setup	Select "QJ71C24", "QJ71CMO", or "LJ71C24" for "Module Name".

4. **Set "Other Station Setting" depending on a route to the connection destination.**
   ☞ Section 11.1.1

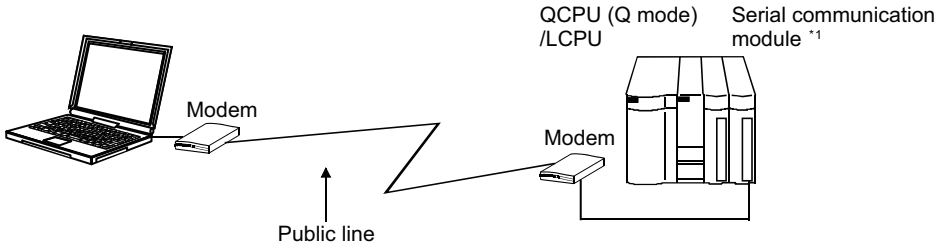
11.10 Accessing Programmable Controller CPU via Phone Line

Q CPU | L CPU | Remote | Head *1 | FX

*1 : CC IE Field head module only

This section explains how to set functions to access a programmable controller CPU via phone line, and how to connect/disconnect the line.
Modems described in the system configuration below include an external type, built-in PC modem, PC card modem (PIMCIA), and TA (terminal adapter).

■ When accessing a serial communication module from a personal computer



*1 : Only modules with RS-232C interface can be used.

Select [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [Line Connection] to access the serial communication module from the personal computer.
For details of setting items on the Line Connection screen, refer to the following section.
☞ Section 11.10.2 "■ Connecting a line automatically"

The setting of the modem function of serial communication module can be set with the parameter setting of intelligent function module.
For details of the modem function, refer to the following manual.
☞ MELSEC-Q/L Serial Communication Module User's Manual (Application)

1) Switch settings of serial communication module

Item		Description
Transmission setting	Operation setting	Independent
	Data bit	8
	Parity bit	None
	Even/odd parity	Odd
	Stop bit	1
	Sum check code	Exist
	Online change	Enable
	Setting modifications	Disable/Enable
Communication rate (transmission speed) setting		According to modem specification
Communication protocol (mode setting)		5

2) Initial settings for buffer memories

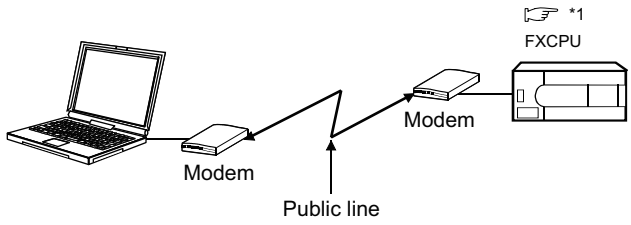
The initial settings are required for the following buffer memories.

Buffer memory address	Name	Setting
2EH (46)	Modem connection channel specification	0: None 1: CH1 2: CH2
34H (52)*1	Data number for initialization specification	0H: Specified initialization data send in user registration frame area for transmission From 7D0H: Data number for initialization
36H (54)	MELSOFT connection specification	0: Not connected 1: Connected

*1 : The following initialization data are registered as a factory setting for serial communication module.
Q/L series C24: 7D0H (2000) to 7DDH (2013)
If a modem to be used is registered to the initialization data, specify the registration number.
When using an unregistered modem, a user can register initialization data to the following registration numbers.
· 9C4H (2500) to 9E1H (2529)
· 8001H (-32767) to 801FH (-32737)

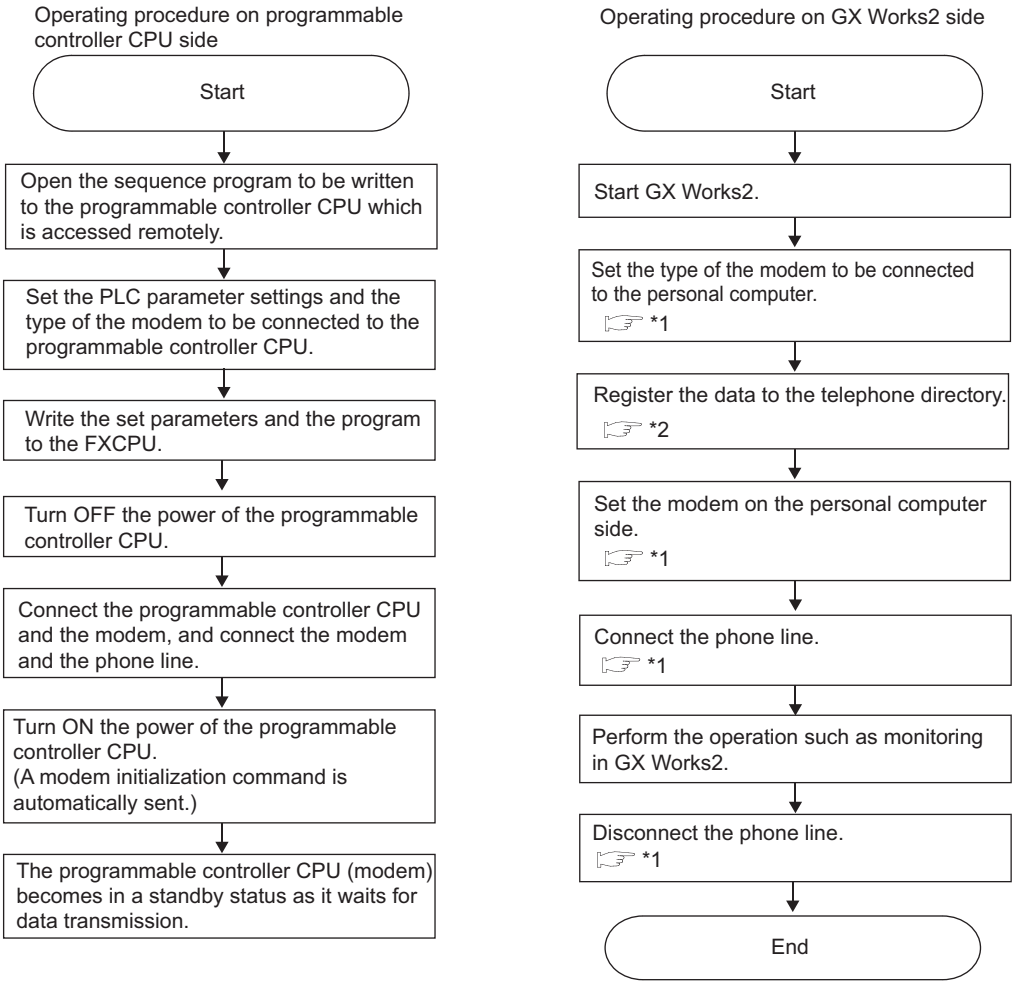
■ When accessing an FXCPU from a personal computer

Access an FX1S, FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3GC, FX3U, or FX3UC through a modem with a phone line, and remotely-operate the functions such as monitoring, testing, and writing/reading programs.



*1 : For the combinations of an FXCPU and a function expansion board (special adapter), refer to the Section 2.1.10.

1) Operation flow



*1 : ☞ Section 11.10.2

*2 : ☞ Section 11.10.1

Point

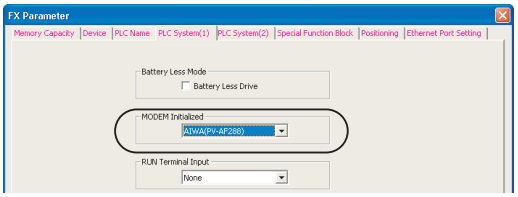
● **Power supply procedure**

Power should be supplied to the modem first, then to the programmable controller CPU.
If the programmable controller CPU is turned ON before the modem, the initialization command which is sent to the modem at the power ON of programmable controller CPU is invalidated, and a communication error occurs when operating the system remotely.
Furthermore, if only the modem is turned OFF after the power supply, the initialization command is cleared and the same communication error occurs.

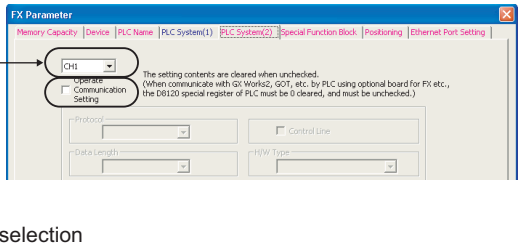
2) Setting PLC parameters

Set the PLC parameters which are required to access an FXCPU through the phone line.

< <<PLC System (1) >> tab >



< <<PLC System (2) >> tab >



Channel selection

Operating procedure

- **Set the items on the screen.**

Item			Description
<<PLC System (1)>>			-
	MODEM Initialized		Set the initialization command of the modem on the programmable controller side, which is used for the remote access of the programmable controller CPU.
		User Register Mode	Select this when using a modem other than "AIWA (PV-AF288)" or "OMRON (ME3314B)". The following are the communication specifications for this mode. • Start bit: 1 bit • Data length: 7 bits • Parity: EVEN • Stop bit: 1 bit
		AIWA (PV-AF288)	Select this when using "AIWA (PV-AF288)".
		OMRON (ME3314B)*1	Select this when using "OMRON (ME3314B)".
		PP Modem Mode (CH1)	Select this when using a modem other than "AIWA (PV-AF288)" or "OMRON (ME3314B)", or when using a modem which cannot set the communication specification for the user registration mode. For details, refer to Point in this section. This item is supported by FX3G, FX3GC, FX3U, and FX3UC only. The following are the communication specifications for this mode. • Start bit: 1 bit • Data length: 8 bits • Parity: None • Stop bit: 1 bit
		PP Modem Mode (CH2)	
<<PLC System (2)>>			-
	Channel selection		Specify the channel of programmable controller side to communicate with a personal computer. This item is supported by FX3G, FX3GC, FX3U, and FX3UC only.
	Operate Communication Setting		Clear this item when setting the programmable controller CPU which is operated remotely.

*1 : When selecting OMRON (ME3314B) for FX2N, use the module with the version 2.01 or later (manufacturing number 78**** or later).

Point

● **Setting PP modem mode (CH1) and PP modem mode (CH2)**

- <FX3U/FX3UC (FX3UC-32MT-LT, FX3UC-32MT-LT-2) series>
  When using the first adapter of FX3U-232ADP which is connected to FX3U-232-BD or FX3U-CNV-BD, specify "PP Modem Mode (CH1)".
  When using FX3U-232ADP which is connected to a board other than FX3U-CNV-BD, specify "PP Modem Mode (CH2)".
- <FX3UC (D, DS, DSS)/FX3GC series>
  When using the first adapter of FX3U-232ADP which is connected to FX3UC (D, DS, DSS) or FX3GC series, specify "PP Modem Mode (CH1)".
  When using the second adapter of FX3U-232ADP, specify "PP Modem Mode (CH2)".
- <FX3G series (14-/24-point type)>
  When using FX3G-232-BD, or when using the first adapter of FX3U-232ADP which is connected to FX3G-CNV-ADP, specify "PP Modem Mode (CH1)".
- <FX3G series (40-/60-point type)>
  When using FX3G-232-BD, or when using the first adapter of FX3U-232ADP which is connected to FX3G-CNV-ADP, specify "PP Modem Mode (CH1)".
  When using FX3G-232-BD and FX3U-232ADP which is connected to FX3G-CNV-ADP, specify "PP Modem Mode (CH1)" for FX3U-232ADP, and specify "PP Modem Mode (CH2)" for FX3G-232-BD.

● **Considerations for creating sequence programs**

To perform a remote access, the special data register D8120 (communication format) of the programmable controller CPU needs to be "0".
D8120 can be cleared to 0 by clearing "Operate Communication Setting" on the <<PLC System (2)>> tab.
Note that if a value other than "0" is specified for D8120 in the sequence program, the remote access cannot be performed.
Create a sequence program without specifying a specific value for D8120.

3) Setting AT commands

When "User Register Mode", "PP Modem Mode (CH1)", or "PP Modem Mode (CH2)" is selected for "MODEM Initialized" on the <<PLC System (1)>> tab, set AT commands according to the following operations.

- Register AT commands to programmable controller CPU
  Send the following data register data to the modem as a modem initialization command following the "AT&F" (initialization to the factory setting) command when the programmable controller CPU is turned ON.
  - D1000 to D1059 (For FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3GC, FX3U, or FX3UC)
  - D200 to D255 (For FX1S)

  Write a user-registered modem initialization command to above data register in advance using the Modify Value function or a sequence program.

Example) When the initialization command is "ATE0S0=2Q1&D0&M4\Q0\J0&W"

Register No.	ASCII	Hexadecimal
D1000	A	41
D1001	T	54
D1002	E	45
D1003	0	30
D1004	S	53
D1005	0	30
D1006	=	3D
D1007	2	32
D1008	Q	51
D1009	1	31
D1010	&	26
D1011	D	44
D1012	0	30

Register No.	ASCII	Hexadecimal
D1013	&	26
D1014	M	4D
D1015	4	34
D1016	\	5C
D1017	Q	51
D1018	0	30
D1019	\	5C
D1020	J	4A
D1021	0	30
D1022	&	26
D1023	W	57
D1024	CR	0D
D1025	LF	0A

A user-registered initialization command ends the transmission at the point when "0" is read.
As a precaution, create a sequence program in which the input area of initialization command for modem and the data register area used by the general sequence program do not overlap.

• Setting content of registered modem
The following table shows the setting items of AT command for the modem registered to the programmable controller CPU in advance.
The setting items differ according to the modem to be used. For details of the actual setting items, refer to the manual of the modem.

Setting item	AIWA (PV-AF288) ATE0S0=2Q1&D0&M5\Q0\JO&W	OMRON (ME3314B) ATE0S0=2Q1&D0&H0&R1S15=8&W
Command echo setting	E0 (None)	E0 (None)
Number of automatic incoming calls	S0=2 (Twice)	S0=2 (Twice)
Result code display	Q1 (None)	Q1 (None)
DTR control	&D0 (Always ON)	&D0 (Always ON)
Communication mode	&M5 (V.42bis)	S15=8 (V.42bis)
Terminal flow control	\Q0 (None)	&R1 (None)
Transmission data flow control	–	&H0 (None)
Terminal speed fixed mode	\JO (Fixed)	–
Write to non-volatile memory	&W	&W

■ Modem specifications

Select a modem which satisfies the following specifications.
Communication data can be transferred from a built-in modem personal computer or a PC card modem (PCMCIA) used by connecting it to a personal computer.

1) When using a subscriber/in-plant phone line

- AT commands are supported. (Initialization command)
- DR terminal can be turned ON (High) independently.
  (Example: A modem, whose CD terminal turns ON as the DR terminal turns ON, cannot be used.)
- Communication standard
  - ITU-T V.90/V.34/V.32bis/V.32/V.22bis/V.22/V.21/V.FC
  - Bell 212A/103

2) Manual line connection (when connecting a line through an operator)

- Addition to the above specification 1), "ANS mode" and "ORG mode" can be switched.
  (The above mode switches are available on the specific AIWA modem.)

The communication may not be established with the above specification depending on a line condition.

Point

● **Performing communication using a PC internal modem or PC card (PCMCIA)**
The COM port setting is required on the Transfer Setup screen to perform communication using a PC internal modem or PC card (PCMCIA). For the COM port number for the PC internal modem or PC card (PCMCIA), refer to the manual of the PC internal modem or PC card (PCMCIA).

● **Performing communication via a modem**
When performing communication from GX Works2 via a modem, the standard AT commands cannot be used for some specific modems. If a line cannot be connected by selecting standard AT commands, a user needs to specify the AT commands.
For details of specifying AT commands, refer to the following section.
☞ Section 11.10.2 "■ Connecting a line automatically"

■ Connection cables

Use an RS-232 cable included in a modem package, or a specified cable to connect a personal computer and a modem.
Since the connectors may differ depending on a personal computer, check the specification of the connector when purchasing a modem.

■ Restrictions on phone line

1) **Do not use a line with the call-waiting feature enabled.**
Data may be corrupted or the line is disconnected by the incoming call when the line is enabled with the call-waiting feature.

2) **Do not use an extension phone.**
The phone line may be disconnected when the receiver is picked up during the phone line connection.

3) **An analog two-wire circuit can be used for the phone line.**
For a digital line, the line can be connected by using a TA (terminal adapter).

Point

● **Phone line with a four-wire circuit**
A phone line with a four-wire circuit may not be used depending on the modular connector type.
For a phone line with a four-wire circuit, perform a connection test in advance.

4) **Modems for wireless communication using a cellular phone**
Select a model according to the cellular phone to be used.
For details, contact the company of the cellular phone to be used.

5) **Coexistence with other applications when performing modem communication**
When performing modem communication, applications such as GX Works2 and MX Component cannot perform modem communication simultaneously.
When performing modem communication in GX Works2, set the other applications not to perform modem communication.
If modem communication is performed simultaneously with GX Works2 and other applications, a phenomenon such as a communication error and a line disconnection occurs.

11.10.1 Setting TEL data

A personal computer can be connected with a programmable controller CPU using a phone line.
Use a serial communication module for QCPU (Q mode)/LCPU, and use a function expansion board (special adapter) for FXCPU, to perform communication using a phone line.

Point

● **Managing telephone directory and AT commands**
The registered telephone directory and AT commands are managed under each user of Windows® operating system.
The telephone directory and AT commands registered by another user cannot be used even when the same personal computer is used.
To use the telephone directory and AT commands registered by another user, use the import/export function.

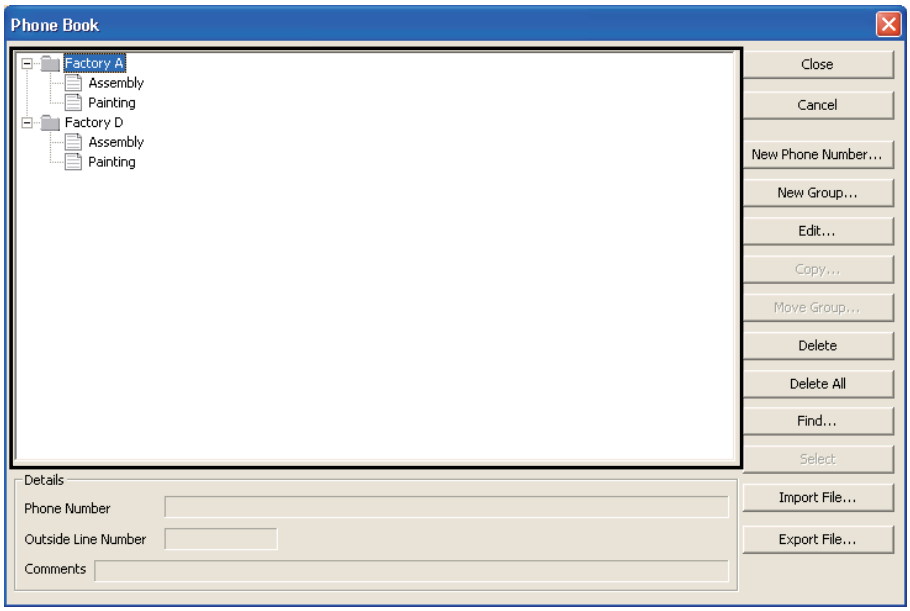
■ Creating a telephone directory

Register phone numbers.

Screen display

Select [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [Phone Book].

List of registered phone numbers →



Display contents

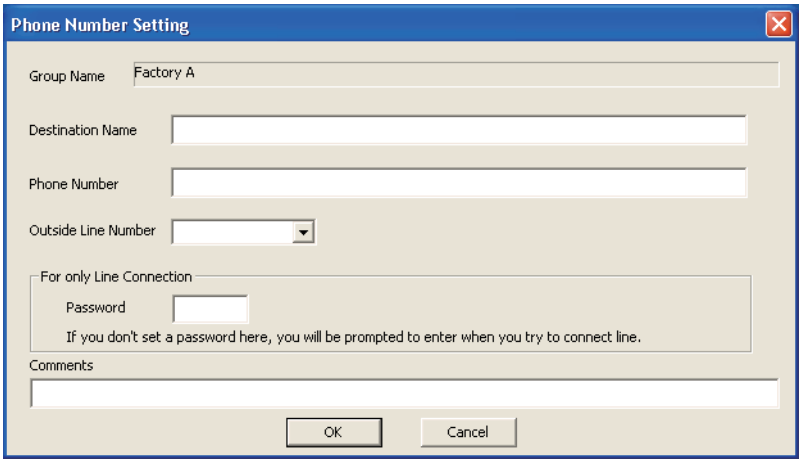
Item	Description
List of registered phone numbers	Display group names and user names of phone numbers.
Details	Display the registered information of the data selected on the list of registered phone numbers.

Operating procedure

1. **Select a group for which the phone number to be registered on the list of registered phone numbers.**

2. **Click the** New Phone Number... **button.**

   The Phone Number Setting screen is displayed.



3. **Set the items on the screen.**

Item	Description
Group Name	Display the group name to which the information is registered.
Destination Name	Enter the name of the phone number to be set. The maximum number of characters that can be set is 50.
Phone Number	Enter the phone number. The maximum number of characters that can be set is 50.
Outside Line Number	Set the outside line number. The maximum number of characters that can be set is 10.
For only Line Connection	When a password is set for Q/L series-compatible C24, this setting enables to process the password authorization automatically to connect the line.
Comments	Enter notes on the registered information. The maximum number of characters that can be set is 60.

4. **Click the** OK **button.**

   The phone number is registered.

Screen button

- New Group...

  Creates a new group.

  The Group Setting screen is displayed by clicking the New Group... button. Enter a group name.
  The maximum number of characters that can be set is 50.

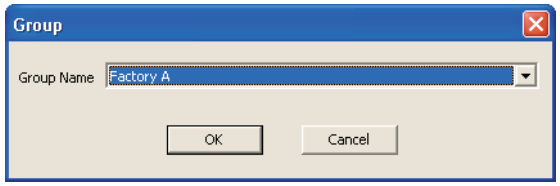
- Edit...

  Opens the screen to edit the registered data.
  Select a registered data to be edited on the list of registered phone numbers.

  The Phone Number Setting screen is displayed by clicking the Edit... button. Edit the data.

- Copy...

  Copies a registered phone number to another group.
  Select the registered data to be copied on the list of registered phone numbers.
  The Group screen is displayed by clicking the Copy... button.
  Select the group to which data is copied, and click the OK button.



- Move Group...

  Moves a registered phone number to another group.
  Select the registered data to be moved on the list of registered phone numbers.
  The Group screen is displayed by clicking the Move Group... button.
  Select the group to which data is moved, and click the OK button.

- Delete

  Deletes a registered group and phone number.
  Data cannot be batch deleted in group unit.

- Delete All

  Deletes all registered groups and phone numbers.

- Find...

  Searches for a registered phone number. The search condition is a partial match.
  Target data is searched from all registered data.
  When entering search conditions to both "Destination Name" and "Phone Number", the data which satisfies the both search conditions is searched.

- Select

  Performs a selection processing of phone number setting when referring from the Line Connection screen.

- Import File...

  Imports phone number data from the specified file and adds it to the directory.
  Execute the file import after deleting all groups and phone numbers to replace the data with the imported phone number data.

- Export File...

  Writes the data set on the Phone Book screen to the specified file.

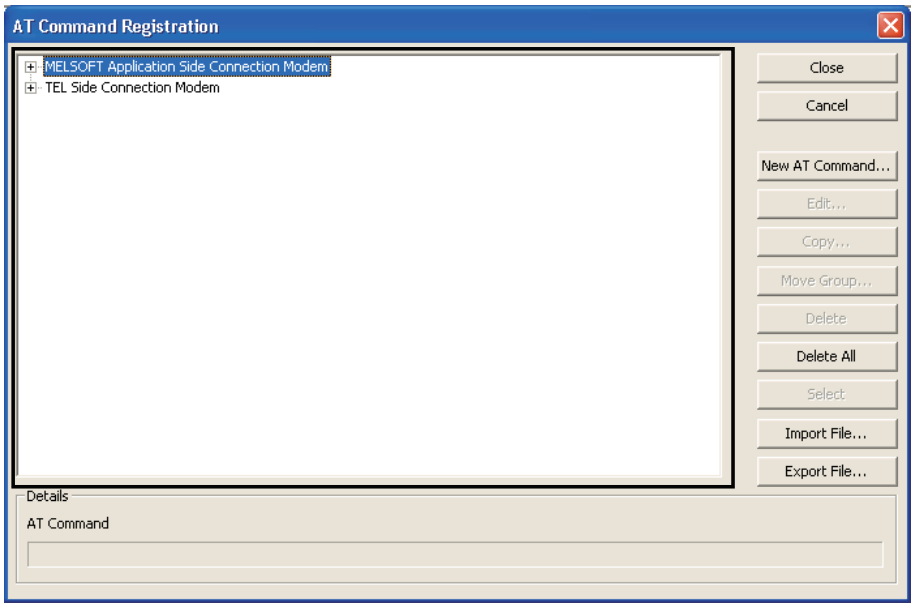
■ Registering AT commands

Register AT commands.

Screen display

Select [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [AT Command Registration].

List of registered AT commands →



Display contents

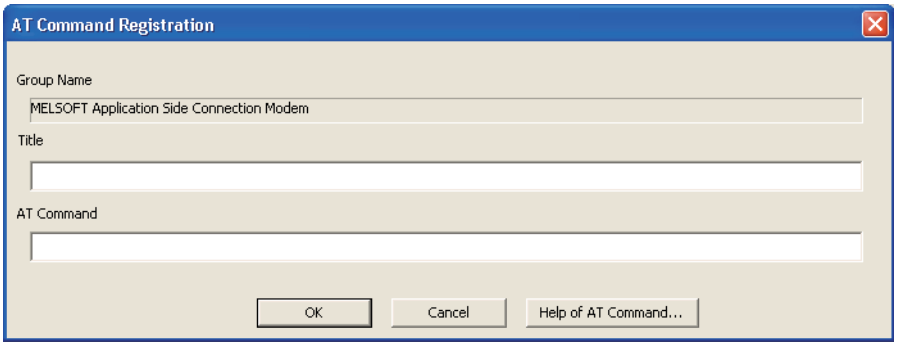
Item	Description
List of registered AT commands	Display titles of AT commands.
Details	Display the registered information of the data selected on the list of registered AT commands.

Operating procedure

1. **Select "MELSOFT Application Side Connection Modem" or "TEL Side Connection Modem" on the list of registered AT commands.**

2. **Click the** New AT Command... **button.**

   The AT Command Registration screen is displayed.



3. **Set the items on the screen.**

Item	Description
Group Name	Display the group name of data to which AT command is registered.
Title	Enter a title for the AT command to be registered.
AT Command	Set the command for modem initialization. The maximum number of characters that can be entered is 70 in ASCII code.

4. **Click the** OK **button.**

   The AT command is registered.

Screen button

- Edit...

  Opens the screen to edit the registered data.
  Select the registered data to be edited on the list of registered AT commands.

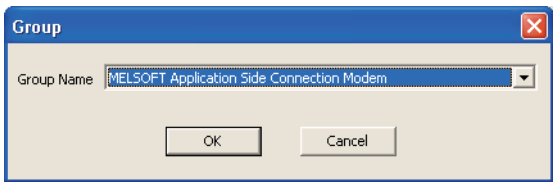
  The AT Command Registration screen is displayed by clicking the Edit... button.
  Edit the data.

- Copy...

  Copies a registered AT command to another group.
  Select the registered data to be copied on the list of registered AT commands.

  The Group screen is displayed by clicking the Copy... button.

  Select the group (to which data is copied), and click the OK button.



- Move Group...

  Moves a registered AT command to another group.
  Select the registered data to be moved on the list of registered AT commands.

  The Group screen is displayed by clicking the Move Group... button.

  Select the group (to which data is moved), and click the OK button.

- Delete

  Deletes a registered AT command.

- Delete All

  Deletes all registered AT commands.

- Select

  Performs a selection processing of AT command when referring from the Line Connection screen.

- Import File...

  Imports AT command from the specified file and adds it to the directory.
  Execute the file import after deleting all AT commands to replace the commands with the imported commands.

- Export File...

  Writes data set on the AT Command Registration screen to the specified file.

11.10.2 Connecting/disconnecting line

Connect/disconnect a line.

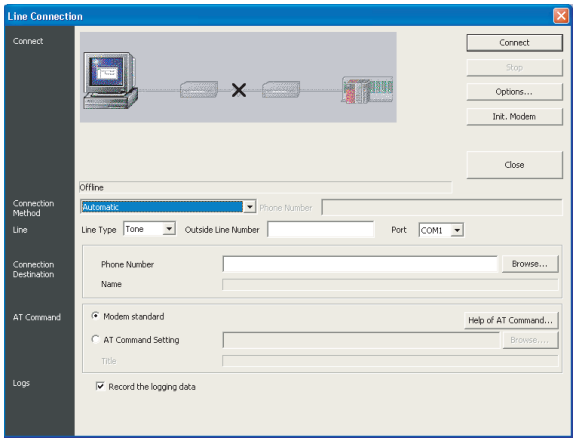
■ Connecting a line automatically

Connect a personal computer to a programmable controller CPU (with the following method: automatic/callback/manual) for remote access.

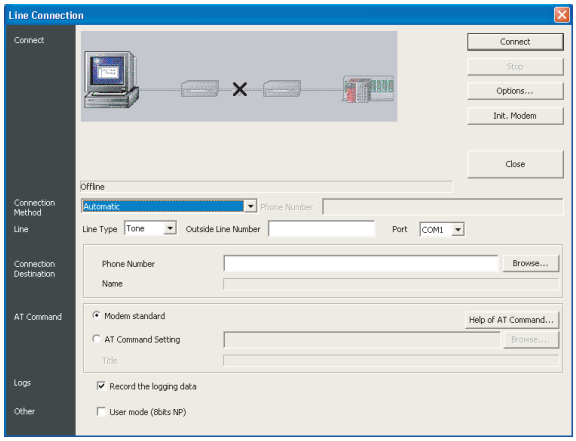
Screen display

Select [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [Line Connection].

< QCPU (Q mode)/LCPU >



< FXCPU >



Display contents

Item	Description
Connect	Display a line connection status. The device which is being accessed is displayed flashing. Devices will be displayed after the connection is established successfully. When an error occurs during the connection attempt, the failed location is displayed with ⊗, and devices are displayed in gray. Check the failed location with a displayed message regarding the cause of the failure.

Operating procedure

1. Set the items on the screen.

Item		Description
Connection Method		Select a method: Automatic, Callback, or Manual (connecting a line through an operator). The phone number is set when specifying a phone number of the callback target. For a connection using the callback function, refer to "■ Connecting a line using the callback function". For a manual connection, refer to "■ Connecting a line through an operator (manual connection)".
Line		–
	Line Type	Select a line type: Tone, Pulse, or ISDN.
	Outside Line Number	Set the number as necessary when calling through the outside line.
	Port	Select the COM port number which is connected to the modem.
Connection Destination		Set the phone number of the target. The previously-registered phone numbers in the telephone directory can be specified by clicking the Browse... button.
AT Command		–
	Modem standard	Use the AT command set on the modem.
	AT Command Setting	When a difficulty of line connection arises using the standard AT command, create an AT command with reference to the manual of the modem and the content displayed by clicking the Help of AT Command... button.
Record the logging data		Line connected time, line disconnected time, connection duration, destination, target phone number, callback, error status, or normal connection can be checked in log files. The log file at the line connection is saved in the following log file. <Save location> • For Windows® 2000 and Windows® XP User folder\Application Data\MITSUBISHI\MELSOFT\TEL\Log • For Windows Vista® and Windows® 7 User folder\AppData\Roaming\MITSUBISHI\MELSOFT\TEL\Log <Log file name> year, month, day.dat (Example: 110615.dat)
User mode (8bits NP)		This item is supported by FX3G, FX3GC, FX3U, and FX3UC only. Select this when "PP Modem Mode (CH1)" or "PP Modem Mode (CH2)" is selected in the PLC parameter. Do not select this item when the setting other than "PP Modem Mode (CH1)" or "PP Modem Mode (CH2)" is selected.

2. Click the Connect button.

When the line was not connected, perform the modem initialization.

For the considerations for connecting a line using the callback function, refer to the following manual.
☞ MELSEC-Q/L Serial Communication Module User's Manual (Application)

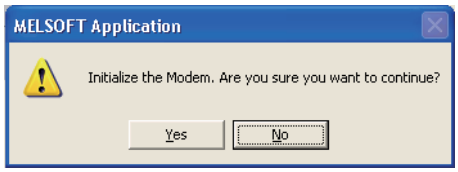
Screen button

- Stop
  Stops the line connection.
- Options...
  Displays the Options screen. (☞ Section 11.10.3)

● Init. Modem

Performs a modem initialization when the modem did not respond at the line connection.

The following confirmation message is displayed by clicking the Init. Modem button.



A modem initialization starts by clicking the Yes button. "AT&F" is set as a default command for the modem initialization.

The command for the modem initialization can be changed by "Modem Initialization AT Command" under [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [Options].

Change the initialization command according to the modem used.

When a failure occurs to the modem initialization, the Options screen is displayed.

Only the settings of items which may become a problem at the line connection can be changed.

For details of the Options screen, refer to Section 11.10.3.

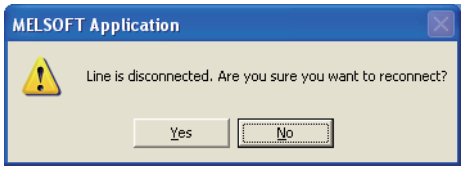
Point

● **Phone line connection**

The phone line connection can also be performed on the Transfer Setup screen.

● **When the line is disconnected by disturbance**

If the line is disconnected by disturbance during the line connection, a confirmation message will be displayed to select whether to reconnect or disconnect the line.



● **Connection duration**

The connection duration is displayed on the status bar when the line is connected.

● **When the connection destination is changed during the phone line connection**

Even when the connection destination is changed to another COM port or a communication board (such as MELSECNET/10) on the Transfer Setup screen during the phone line connection, the communication can be performed using the communication routes while the phone line is being connected.

● **When two or more error messages are displayed**

Two or more communication error messages are displayed when the modem is turned OFF during the phone line connection. In this case, set a longer time check period for "Other Station Setting" on the Transfer Setup screen.

● **Using a serial communication module to communicate through a phone line**

The following table shows the items to be set on a programmable controller CPU and GX Works2 when performing communication using a serial communication module (for Q/L series) through a phone line.

Setting target	Setting item	Reference
Programmable controller CPU	• Switch setting Set the following items in the sequence program. • Write the initialization command (ATS0=1). • Set the initialization request.	Section 11.10
GX Works2	• AT command registration • Phone number registration	Section 11.10.1

■ Connecting a line using the callback function

The callback function is a function which enables access from GX Works2 to QCPU (Q mode)/LCPU with the line re-connection (callback) operation performed on the Q/L series C24 module side, after the line connection operation is performed in GX Works2.
The callback function is not supported by FXCPU.

For 1 to 3, and 9, telephone usage is charged on a personal computer side.
For 4 to 8, telephone usage is charged on a Q/L series C24 module side.
For details, refer to the following manual.
☞ MELSEC-Q/L Serial Communication Module User's Manual (Application)

1) Automatic
Select "Automatic" when the callback function is not set on a Q/L series C24 module.

2) Automatic (Callback Fixation)
Connect a line without using the callback function when the callback function is set on a Q/L series C24 module.
A connection operation can be performed on a personal computer whose phone number is registered to the buffer memory (2101H).

3) Automatic (Callback Number Specification)
Connect a line without using the callback function when the callback function is set on a Q/L series C24 module.
A connection operation can be performed on a specific personal computer.

4) Callback Connect (Fixation)
A callback operation is performed on a personal computer whose phone number is registered to the buffer memory (2101H) of a Q/L series C24 module.

5) Callback Connect (Number Specification)
A callback operation is performed on a specified personal computer.

6) Callback Request (Fixation)
Send a callback request from a specified personal computer, and perform a callback operation on a personal computer whose phone number is registered to the buffer memory (2101H) of a Q/L series C24 module. (A callback operation is not performed on the personal computer which is connected first.)

7) Callback Request (Number Specification)
Send a callback request from a specified personal computer, and perform a call back operation on a specified personal computer. (A callback operation is not performed on GX Works2 which is connected first.)

8) Callback Reception Waiting
When connecting a line with Callback Request (Fixation or Number Specification), select "Callback Reception Waiting" for the personal computer on which a callback is to be performed.

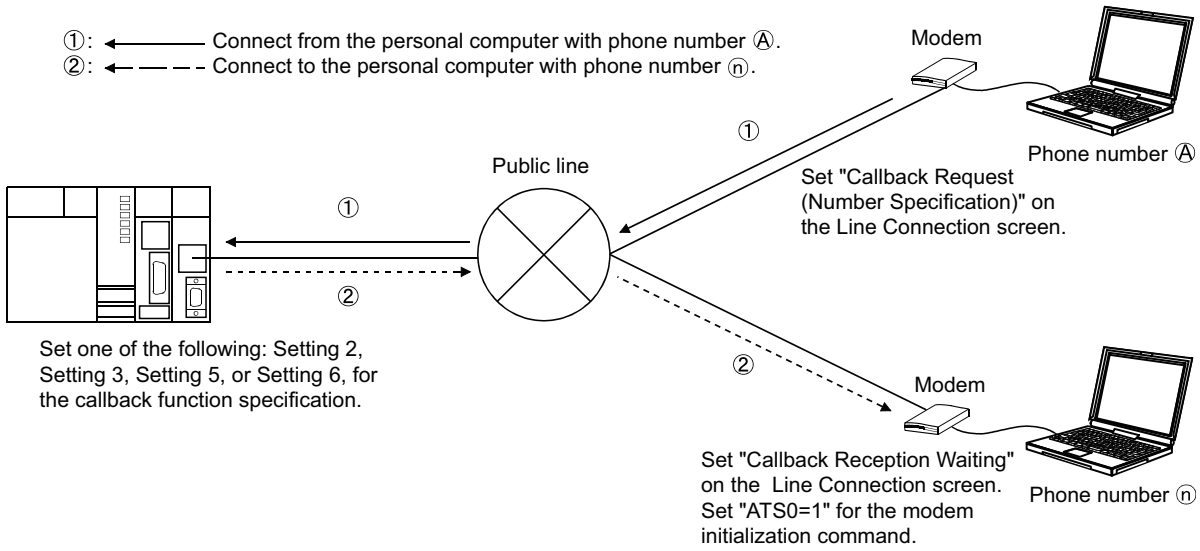
9) Manual
This setting is not for the callback function.
Select this item when connecting a line through an operator.

A line connection with the GX Works2 connection method described in the following table can be performed when "Callback function specification" is set for the modem function of the intelligent function module parameter of a Q/L series C24 module.
The following table shows the setting items of "Callback function specification" of the modem function and corresponding setting items of GX Works2 connection method.

○: Connectable

Q/L series C24 side callback function specification	Connection method on GX Works2 side								
	1)	2)	3)	4)	5)	6)	7)	8)	9)
Auto	○								○
Setting 1: Auto/Callback Connection (at Fixation)		○		○		○		○	
Setting 2: Auto/Callback Connection (at Number Specified)		○	○	○	○	○	○	○	
Setting 3: Callback Connection (at Number Specified Max 10)			○		○		○	○	
Setting 4: Callback Connection (at Fixation)				○		○		○	
Setting 5: Callback Connection (at Number Specified)				○	○	○	○	○	
Setting 6: Callback Connection (at Number Specified Max 10)					○		○	○	

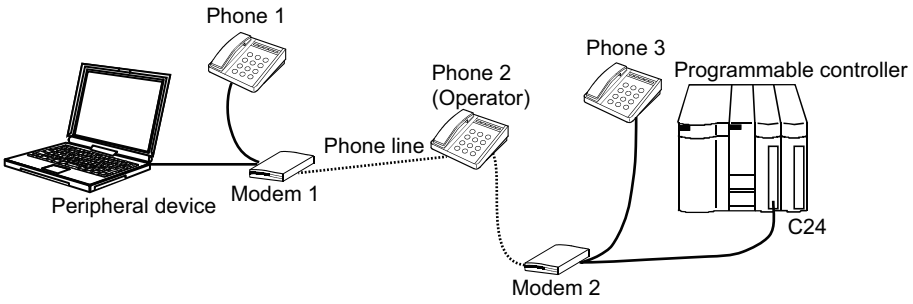
The following is an example of line connection with "Callback Request (Number Specification)".



■ Connecting a line through an operator (manual connection)

Connect to the in-plant phone line through an operator.
A manual line connection cannot be performed on modems without the ANS/ORG/TEL switch.

● **System configuration**



Operation

1. **Select [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [Line Connection].**
   (Select "Manual" for the line connection method on the Line Connection screen. For details of operating procedure, refer to "■ Connecting a line automatically".)
2. **Set the mode on Modem 1 on Phone 1 side to the ORG mode, and Modem 2 on Phone 3 side to the ANS mode.**
3. **Call Phone 2 (operator) from Phone 1.**
4. **Phone 1 and Phone 3 are connected through Phone 2 (operator).**
5. **While Phone 1 and Phone 3 are connected, connect C24.**
6. **Turn ON the DATA switch on Modem 2 on Phone 3 side.**
7. **After the modem tone on Modem 1 on Phone 1 side is confirmed, turn the DATA switch ON.**
8. **When the modem tone on Modem 1 on Phone 1 side is faded, click the** Connect **button in GX Works2.**
   When the line is connected normally, the message "Line connected" is displayed.

● **Considerations**

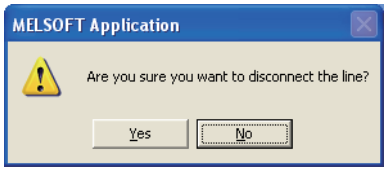
- If the connection cannot be established in step 6 and step 7, repeat the operations and adjust the timing.
- The ANS - ORG switch is required on the modem to connect a line manually.

■ Disconnecting a line

Disconnect a phone line being connected.

Operating procedure

- **Select [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [Line Disconnection].**

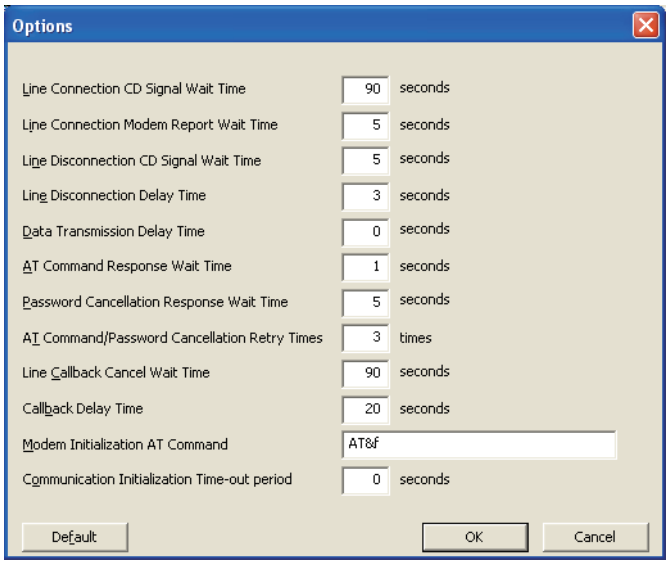


11.10.3 Setting options

Set options for a line connection.

Screen display

Select [Tool] ⇒ [Set TEL Data/Connect via Modem] ⇒ [Options].



Operating procedure

- **Set the items on the screen.**

Item	Description
Line Connection CD Signal Wait Time	Extend the set period when the CD signal does not turn ON within the set period depending on the area (example: overseas) to be connected.
Line Connection Modem Report Wait Time	Extend the set period when the response speed of the modem is slow.
Line Disconnection CD Signal Wait Time	Extend the set period when the CD signal does not turn OFF within the set period depending on the area (example: overseas) to be connected.
Line Disconnection Delay Time	Extend the set period when the response speed of the modem is slow.
Data Transmission Delay Time	
AT Command Response Wait Time	
Password Cancellation Response Wait Time	Extend the set period when the quality of line connection is poor.
AT Command/Password Cancellation Retry Times	Increase the number of settings.
Line Callback Cancel Wait Time	Extend the set period when the line of the target (Q/L series C24) is not disconnected within the set period depending on the area (example: overseas) to be connected.
Callback Delay Time	Extend the set period when a specific period is required for the device which relays a connection (example: modem) between the line disconnection and the reconnection.
Modem Initialization AT Command	Set a command at the modem initialization. The maximum number of characters that can be entered is 70 in ASCII code.
Communication Initialization Time-out period	Set the timeout period at the communication initialization.

11.11 Considerations of Communication with Programmable Controller CPU

Q CPU L CPU Remote Head FX

This section explains the considerations of communication with the programmable controller CPU. Refer to POINT and Restrictions described in each section as well as the descriptions in this section.

■ Considerations of communication via multiple network systems

When accessing QCPU (Q mode)/LCPU via multiple network systems, connected station*1 and relay stations*2 must all be QCPU (Q mode)/LCPU.

*1 : Station directly connected from GX Works2
*2 : Stations to be routed on network system

■ Considerations of communication with the programmable controller CPU using a USB cable

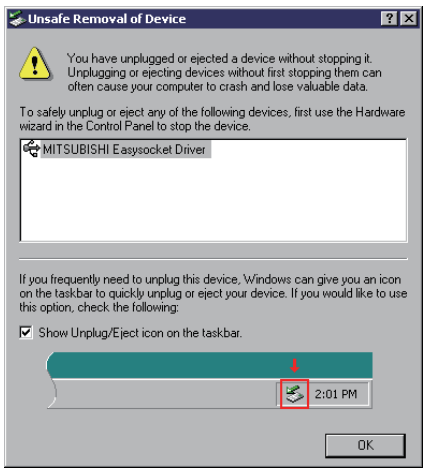
1) Connecting and disconnecting a USB cable, resetting the programmable controller CPU, and turning the power ON/OFF

A communication error may occur and operation may not be recovered if connecting and disconnecting a USB cable, resetting the programmable controller CPU, or turning the power ON/OFF is performed frequently during communication with the programmable controller CPU.
Be sure to set GX Works2 to offline*1 as much as possible during these operations.
When operation is not recovered from an error, remove the USB cable. Then, connect it again after five or more seconds. (Even after this operation, an error may occur at initial communication. However, communication will be successful after that.)

*1 : The offline indicates the status other than indicated below.
- Write to PLC, Read from PLC, Monitor, and PLC diagnostics

The following screen appears on the personal computer using Windows® 2000 Professional Operating System.

If the screen appears, click the OK button and remove a USB cable from the personal computer.



2) Combination of personal computers and USB cables

A communication error may occur depending on the combination of personal computers and USB cables.
If an error occurs, take appropriate actions according to the message displayed on the screen.

■ Other considerations

1) High-speed communication using an RS-232 cable

Communication may fail depending on the performance of the personal computer when high-speed communication is attempted by changing the transmission speed at the serial port of the personal computer (personal computer side interface). Communication speed may also slow down due to communication retries. Decrease the transmission speed if high-speed communication is not performed normally.

2) Resume function, suspend setting, power saving function, and standby mode of the personal computer

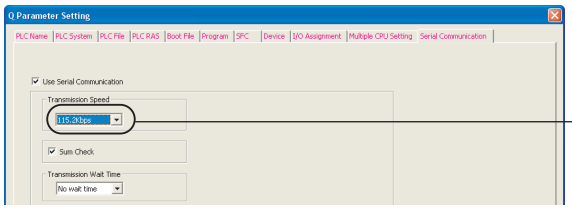
A communication error may occur during communication with the programmable controller CPU when the resume function, suspend function, power saving function, or standby mode is set to the personal computer. Disable these settings for communication with the programmable controller CPU.

3) Switching the connection to GX Works2 during communication through the serial communication function

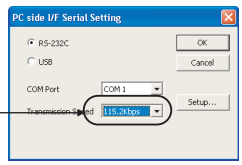
When using Q00, Q01, Q00UJ, Q00U, Q01U, Q02U, or QnUD(H)CPU, the connection can be switched to GX Works2 during communication to a personal computer, indicator, etc. through the serial communication function.

If unable to connect to GX Works2, adjust the transmission speed to that specified on the <<Serial Communication>> tab of PLC parameter.

<PLC parameter setting screen>



<PC side I/F Serial Setting screen>



Select the same transmission speed.

MEMO

12 WRITING/READING DATA

This chapter explains operations to write or read data to/from the programmable controller CPU or a memory card.

12.1 Writing or Reading Data to/from Programmable Controller CPU

This function writes project data to the programmable controller CPU or a memory card, or reads data from the programmable controller CPU or a memory card to the project.
Data for intelligent function module also can be written/read. (☞ Section 12.1.4)
For reading data from a programmable controller CPU without a project being opened, refer to '■ Creating new projects with data read from programmable controller CPU or intelligent function module (New project creation with data read from programmable controller CPU)'.

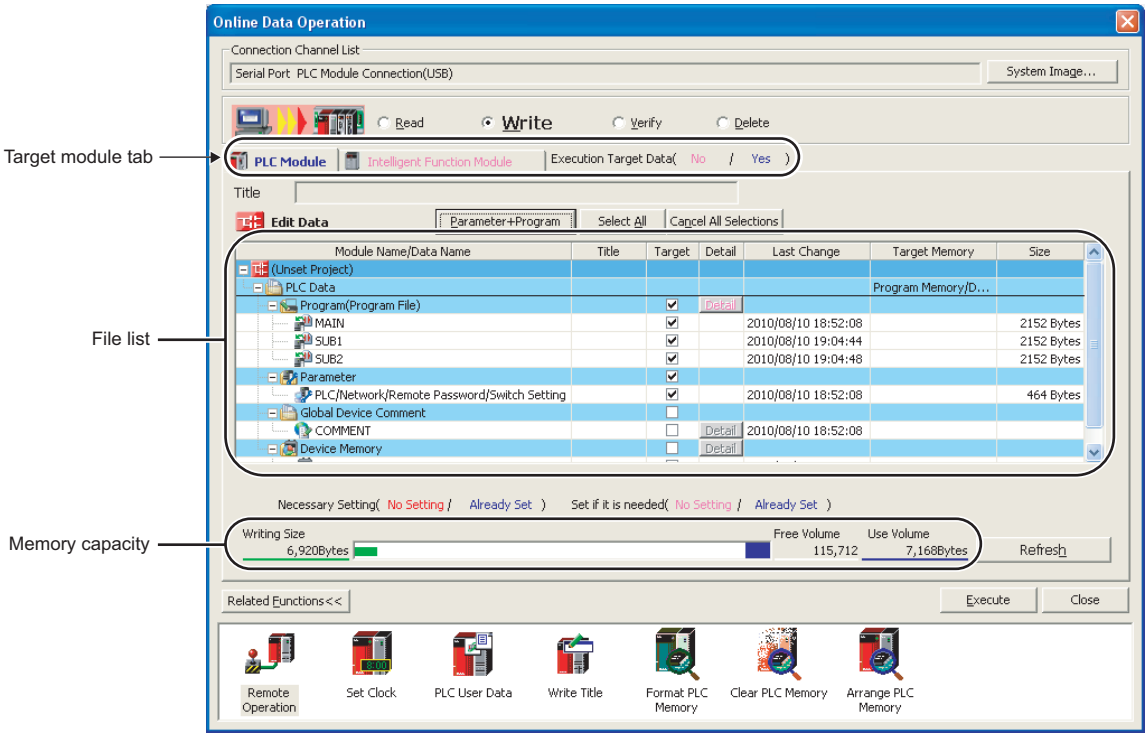
For FXCPU projects with labels, created project data can be read from FX3U/FX3UC version 3.00 or later only.

To boot QCPU (Q mode) using a standard ROM or Flash card, it is recommended to firstly write necessary data to the program memory using the Write to PLC function and then write the data to the standard ROM or Flash card using the Export to ROM Format function. (☞ Section 12.4)

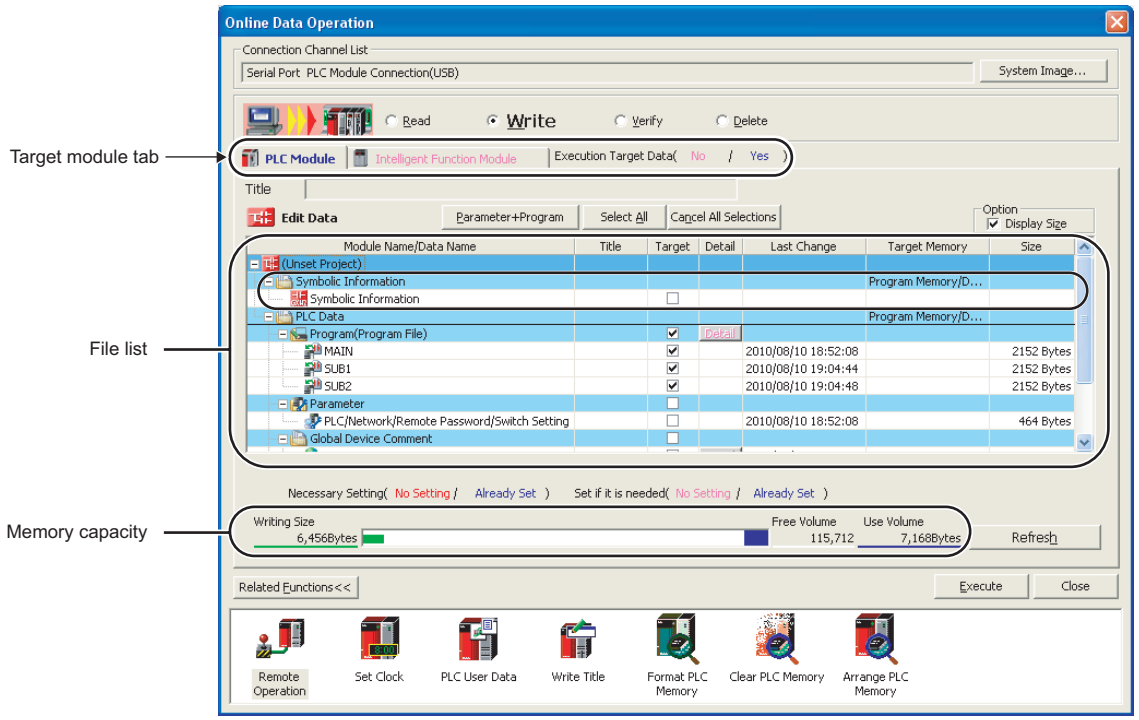
Screen display

Select [Online] ⇒ [Write to PLC] ( )/[Read from PLC] ( ).

The following explains the settings for writing data to a programmable controller CPU. Settings for reading data from a programmable controller CPU can be made in the same manner.
<Write to PLC screen for the projects without labels.>



<Write to PLC screen for the projects with labels>
For QCPU (Q mode)/LCPU/FXCPU (FX3U/FX3UC version 3.00 or later), the symbolic information is displayed in the file list.



Operating procedure

1. Set the items on the screen.

Item		Description
Connection Channel List		Display the information of the connection destination setting.
Target module tab		Switch the setting target module. Characters on the tab are displayed in blue when data to be written/read exist.
	PLC Module	Set the settings to write data to the programmable controller CPU.
	Intelligent Function Module*1	Set the settings to write intelligent function module data to the buffer memory or flash ROM of the intelligent function module. ☞ Section 12.1.4
Title*1		Display the title of the target memory by clicking the Refresh button.
Option*2		–
	Display Size	Select this to display the "Size" column in the file list and the memory capacity.
File list		–
	Target	Select the data to be written/read.
	Target Memory*1	Select the memory from the list ( ) by clicking the cell under "Target Memory". For details of the memory card application, refer to the following manuals. ☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection) ☞ MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
Memory capacity*3		–
	Writing Size	Display the total size of written data selected in "Target".
	Free Volume	Display the free space volume of the target memory.
	Use Volume	Display the used space volume of the target memory.

*1 : Not supported by FXCPU.
*2 : Displayed only when a project with labels is written to the programmable controller CPU.
*3 : For FXCPU, the program size and the symbolic information size are displayed when the project is written to the programmable controller CPU. Symbolic information size is displayed on the screen for projects with labels of FX3U/FX3UC version 3.00 or later only.

When a program (program file), device comment, device memory, or file register is selected, the range can be set by clicking the Detail / Detail button.
When reading data from the programmable controller CPU, and the device memory is selected, the detailed settings are required.
For details, refer to the following sections.
☞ Section 12.1.1 "Setting write/read range of program (program file)"
☞ Section 12.1.2 "Setting write/read range of device data"
☞ Section 12.1.3 "Setting range of device comment to be written/read"

2. Click the Execute button.

When the Write to PLC function is executed, the specified data are written to the target memory.
When the Read from PLC function is executed, the specified data are read from the target memory.

Screen button

- System Image...
  Displays the illustration of the connection channel.
- Parameter + Program
  Selects the parameters and all the programs displayed in the list.
- Select All
  Selects all data displayed in the list.
- Cancel All Selections
  Cancels the selection status of all data selected in the list.
- Related Functions>> / Related Functions<<
  Switches display/hide of the Related functions button.
  For details of the related functions, refer to the following sections.
  - Remote Operation ☞ Section 17.1 "Remote Operation of Programmable Controller CPU"
  - Set Clock ☞ Section 17.6 "Setting Clock on Programmable Controller CPU"
  - PLC User Data ☞ Section 12.5 "Writing/Reading/Deleting PLC User Data"
  - Write Title: Sets a title to the target memory.
  - Format PLC Memory ☞ Section 17.3 "Formatting Programmable Controller CPU Memory"
  - Clear PLC Memory ☞ Section 17.4 "Clearing Programmable Controller Memory"
  - Arrange PLC Memory ☞ Section 17.5 "Arranging Programmable Controller Memory"
- Acquire Symbolic Information Project Name **(Read from PLC and Delete PLC Data only)**
  Displays the project name of the symbolic information in the Title/Project Name column.
  It is not displayed for projects without labels or by FXCPU.
- Refresh
  Updates the file list on the Online Data Operation screen.
  For QCPU (Q mode)/LCPU, the writing size, free volume, and used volume are also updated.
  When multiple personal computers are connected to the programmable controller CPU, update the target memory before reading data from the programmable controller CPU.

■ Unlocking a remote password

The confirmation message for unlocking the remote password is displayed when the programmable controller CPU for which the remote password is set is accessed via C24 modules or Q series-compatible E71 modules. Unlock the password by following the message.
(Setting a remote password ☞ Section 6.4)

When the number of permissible incorrect remote password entries or the cumulative number of permissible incorrect password entries has been set and the number of incorrect entries exceeds the set number, the programmable controller CPU will be in the status as shown in the following table. For corrective action, refer to MELSEC-Q/L Serial Communication Module User's Manual (Application).

Item	Status
When the number of permissible entries is exceeded	The line is disconnected automatically.
When the cumulative number of permissible entries is exceeded	Turn ON the ERR. LED on the module.

Point

● **Target memory**
The following table shows the relations between the target memory on the Online Data Operation screen and the drive of the programmable controller CPU.

PLC type	Drive No.	Target memory on the Online Data Operation screen	PLC parameter
QCPU (Q mode)/LCPU	0	Program memory/Device memory	Program memory (Drive 0)
QCPU (Q mode) (except for High-speed Universal model QCPU)	1	Memory card (SRAM)	Memory card (RAM) (Drive 1)
	2	Memory card (Flash): Q2MEM-2MBF	Memory card (ROM) (Drive 2)
		Memory card (Flash): Q2MEM-4MBF	
		Memory card (ATA)	
High-speed Universal model QCPU/LCPU		Memory card (SD)	Memory card (SD) (Drive 2)
QCPU (Q mode)/LCPU	3	Standard RAM	Standard RAM (Drive 3)
	4	Standard ROM	Standard ROM (Drive 4)

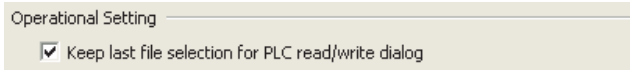
● **Memory capacity**
When a project is written to the programmable controller CPU, the target memory capacity may be displayed smaller than the actual file size.

● **Writing multiple programs to programmable controller CPU**
When more than one program is written to the programmable controller CPU, programs categorized as “No Execution Type” will never be executed on the programmable controller CPU.
For saving the memory capacity of the programmable controller CPU, it is recommended to remove them from the target data of the Write to PLC function.

● **Reading device memory data from programmable controller CPU**
Device memory data are read in the condition in which "Number of Columns" is set to "Auto" on the device memory editor.

● **Saving the selection status of the files for the Write to PLC/Read from PLC function**
The selection status of the files for the Write to PLC/Read from PLC function can be saved.
To save the file selection status, select [Tool] ⇒ [Options] ⇒ "PLC Read/Write" and set "Operational Setting".
However, the file selection status is canceled by any of the following operations.

- Changing the connection destination setting
- Changing the target memory
- Changing the PLC type
- Ending the project



<Option setting>

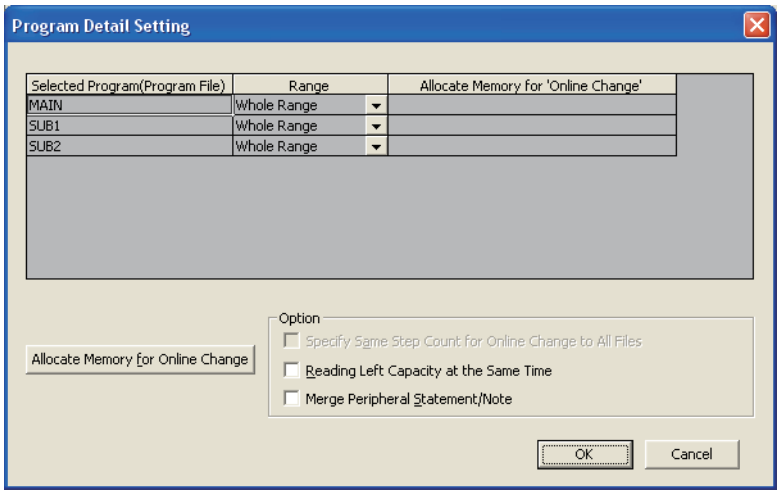
12.1.1 Setting write/read range of program (program file)

Q CPU L CPU Remote Head FX

Set the range of a program (program file) to be written/read when the program (program file) is selected on the Online Data Operation screen.

Screen display

Select the program (program file) and click the Detail button.



Operating procedure

- **Set the items on the screen.**

Item		Description
Selected Program (Program File)		Display the program name selected in the 'File list'.
Range		Display write/read range of each program.
Allocate Memory for 'Online Change' (Write to PLC only)		Enter the number of steps secured for Online program change.
Option		–
	Specify Same Step Count for Online Change to All Files (Write to PLC only)	Select this to specify the equal number of secured steps for Online program change to all files.
	Reading Left Capacity at the Same Time (Read from PLC only)	Select this to read the remaining secured steps for Online program change of the files written on the programmable controller CPU.
	Merge Peripheral Statement/Note (Read from PLC only)	Select this to use an Peripheral statement/note. If a program is read without selecting this item, the Peripheral statement/note is lost. ☞ GX Works2 Version 1 Operating Manual (Simple Project)

Screen button

● Allocate Memory for Online Change **(Read from PLC only)**
Displays the remaining steps for Online program change.

12.1.2 Setting write/read range of device data

Q CPU | L CPU | Remote | Head | FX

Set the type and range of device memory and the range of file register to be written/read when any or both of them are selected on the Online Data Operation screen.

■ Setting type and range of device memory to be written/read

Set the type and range of device memory to be written to/read from a programmable controller CPU. The following tables show devices that can be written/read.

● QCPU (Q mode)/LCPU

○: Applicable ×: Not applicable

Device	Writing	Reading
M, L, B, F, SB, V, S*1, T*2, ST*2, C*2, D, W, SW, FX, FY, FD, Z	○	○
X, Y, SM, SD, intelligent function module device, link direct device	×	○

*1 : Not supported by Basic model QCPU.
*2 : Three types of data (contact, coil, and current value) can be written/read.

● FXCPU

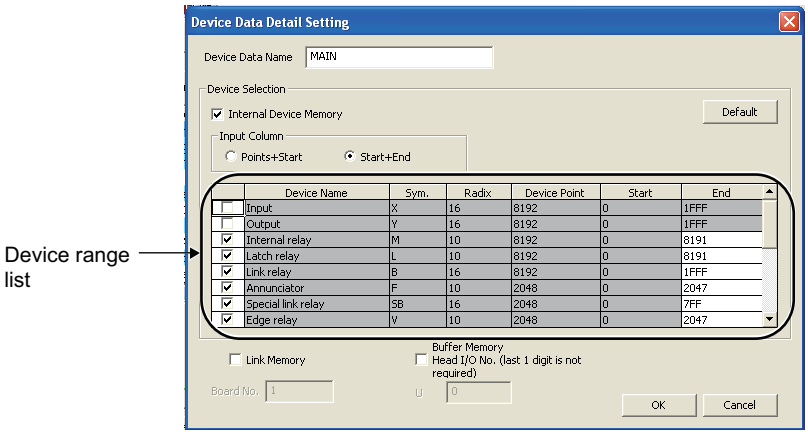
○: Applicable ×: Not applicable

Device	Writing	Reading
M, S, T, C, D, R*1, ER*1	○	○
X, Y, D (Special register), M (Special relay)	×	○

*1 : Supported by FX3G, FX3GC, FX3U, and FX3UC only.

Screen display

Select the device data and click the Detail / Detail button.
<QCPU (Q mode)/LCPU>



Device range list

Operating procedure

- **Set the items on the screen.**

Item			Description
Device Data Name (Read from PLC only)			Enter the data name for data created when the device memory data are read.
Device Selection			–
	Internal Device Memory		Select this to write/read device data. For FXCPU, this setting is fixed as selected status.
	Input Column		Set the method for specifying the device range to be written/read.
		Points + Start	Select this to specify the range with the number of device points and the start device number.
		Start + End	Select this to specify the range with the start and end device numbers.
	Device range list		Set the device to be written/read and the device range. The default device range is a range set on the <<Device>> tab of PLC parameter. Devices to which 0 point is set cannot be set without selecting the check box.
Link Memory*1 (Read from PLC only)			Select this to read the link memory of the data link module or the network module to the link direct device.*2, *3 Setting range: Slots 1 to 4
Buffer Memory Head I/O No.*1 (last 1 digit is not required) (Read from PLC only)			Select this to read the intelligent function module buffer memory to the intelligent function module device.*3 Setting range: 0 to 1FF

*1 : Not supported by FXCPU.
*2 : For the method to number the module to be set, refer to Point in Section 17.1.
*3 : For specifying devices, refer to MELSEC-Q/L Programming Manual (Common Instructions).

Screen button

● Default

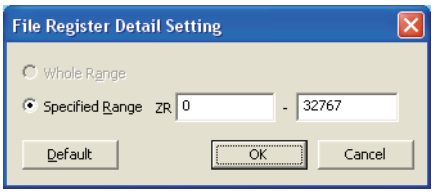
Changes the device range to the default.

■ Setting range of file register to be written/read

Set the range of file register to be written to/read from a programmable controller CPU.
For Q00JCPU/FXCPU, the range of file register to be written/read cannot be set.

Screen display

Select a file register and click the Detail / Detail button.
<QCPU (Q mode)/LCPU>



Operating procedure

- **Set the item on the screen.**

Item	Description
Specified Range	Specify the range of file register to be written/read. If multiple file registers are selected, each file register value is written/read in the same range.

Screen button

For the buttons on the screen, refer to ■ Setting type and range of device memory to be written/read.

Point

● Specifying file registers

- For QCPU (Q mode)/LCPU, "Whole Range" cannot be selected.
- For Universal model QCPU/LCPU, specify the range of file register assigned on the <<Device>> tab of PLC parameter when using extended data registers or extended link registers.

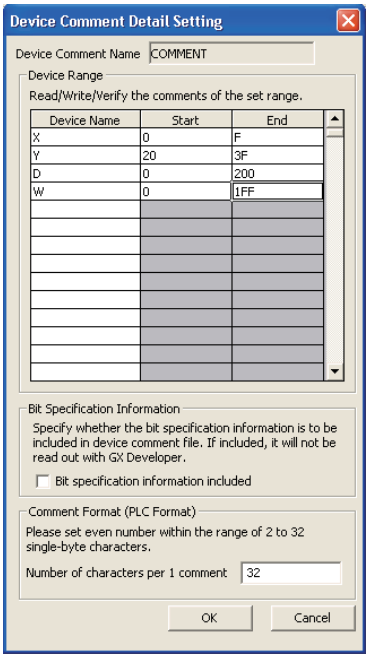
12.1.3 Setting range of device comment to be written/read

Q CPU L CPU Remote Head FX

Set the device and range of global device comment/local device comment to be written or read when the global device comment/local device comment is selected on the Online Data Operation screen.
Set this setting to limit the writing range of device comments in cases such as when the programmable controller CPU has small free capacity. When the range of device comments is not set, all device comments are written/read.
For FXCPU, this function only supports global device comments being written to the programmable controller CPU.

Screen display

Select a global device comment/local device comment and click the Detail button.



Operating procedure

- **Set the items on the screen.**

Item		Description
Device Comment Name		Display the selected device comment name.
Device Range		–
	Device Name	Set the device name whose write/read range is to be specified.
	Start	Set the start device number.
	End	Set the end device number.
Bit Specification Information		–
	Bit specification information included*1	Select this to specify whether bit-specified word device comments are included as write target.
Comment Format (PLC Format)		–
	Number of characters per 1 comment*2	Set the number of characters for a comment to be written to a programmable controller CPU.

*1 : For Universal model QCPU/LCPU only
*2 : Not supported by FXCPU.

Point

● **When the setting of "Number of characters per 1 comment" is changed**
When the number of characters set for "Number of characters per 1 comment" is less than the number of characters of device comment set for the project, the device comment with less number of characters is written to a programmable controller CPU. Therefore, mismatched data may be detected when verifying project data.

Restrictions

● **Specifying bit-specified word device comments as write target**
Device comments cannot be read in GX Developer.
When a device comment contains a bit-specified comment of LCPU is read in GX Works2 Version 1.62Q or earlier, the bit-specified comment is deleted.
When a device comment contains a bit-specified comment of Universal model QCPU is read in GX Works2 Version 1.31H or earlier, the bit-specified comment is deleted.

12.1.4 Writing/reading intelligent function module data

Q CPU L CPU Remote Head FX

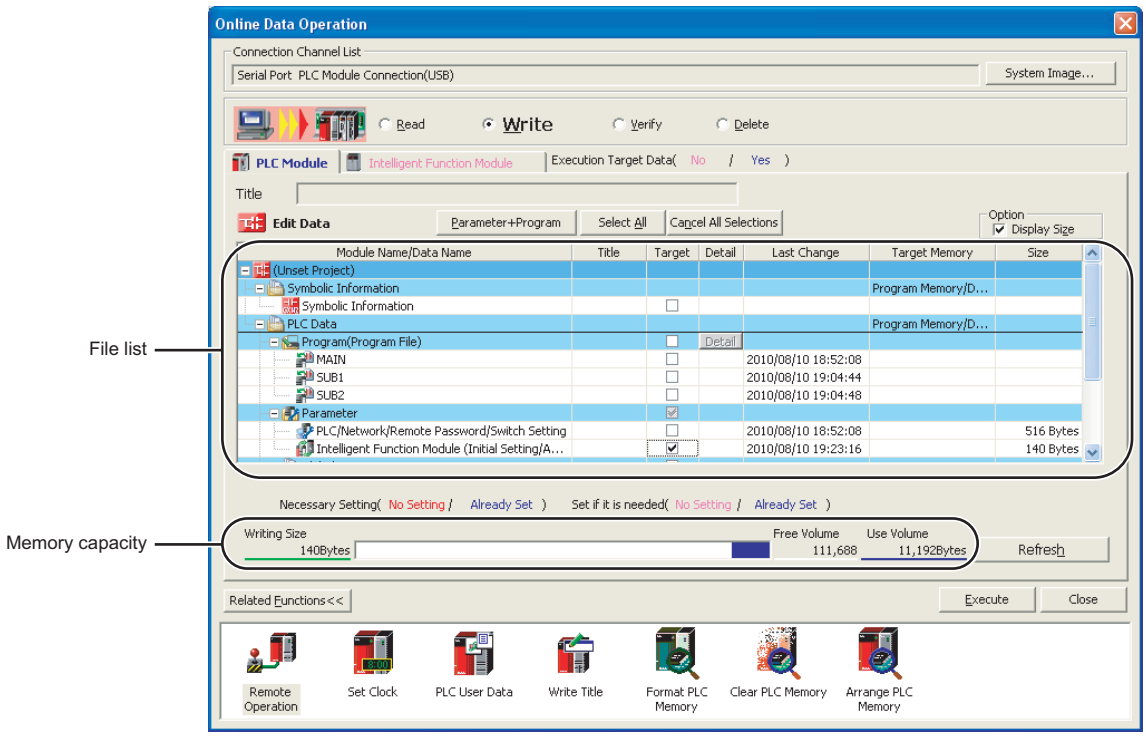
Write the intelligent function module data to a programmable controller CPU or intelligent function module buffer memory/flash ROM.
Intelligent function module data includes intelligent function module parameters to be written to a programmable controller CPU as a parameter file, and data whose values are written directly to intelligent function module buffer memory/flash ROM.
For details of data to be written as intelligent function module parameters and data to be written to intelligent function module buffer memory/flash ROM, refer to the following manuals.
☞ GX Works2 Version 1 Operating Manual (Intelligent Function Module)
☞ User's Manual to be used

■ Writing/reading intelligent function module parameters to/from programmable controller CPU

Write intelligent function module parameters to a programmable controller CPU, and read the data from the programmable controller CPU to a project.

Screen display

Select [Online] ⇒ [Write to PLC] ( )/[Read from PLC] ( ) ⇒ <<PLC Module>>.
The settings for writing/reading data to/from a programmable controller CPU are explained together as they are similar operations.
<Write to PLC screen>



Operating procedure

1. **Select "Intelligent Function Module (Initial Setting/Auto Refresh)" from the file list. For the items on the screen, refer to Section 12.1.**

2. **Click the [Execute] button.**

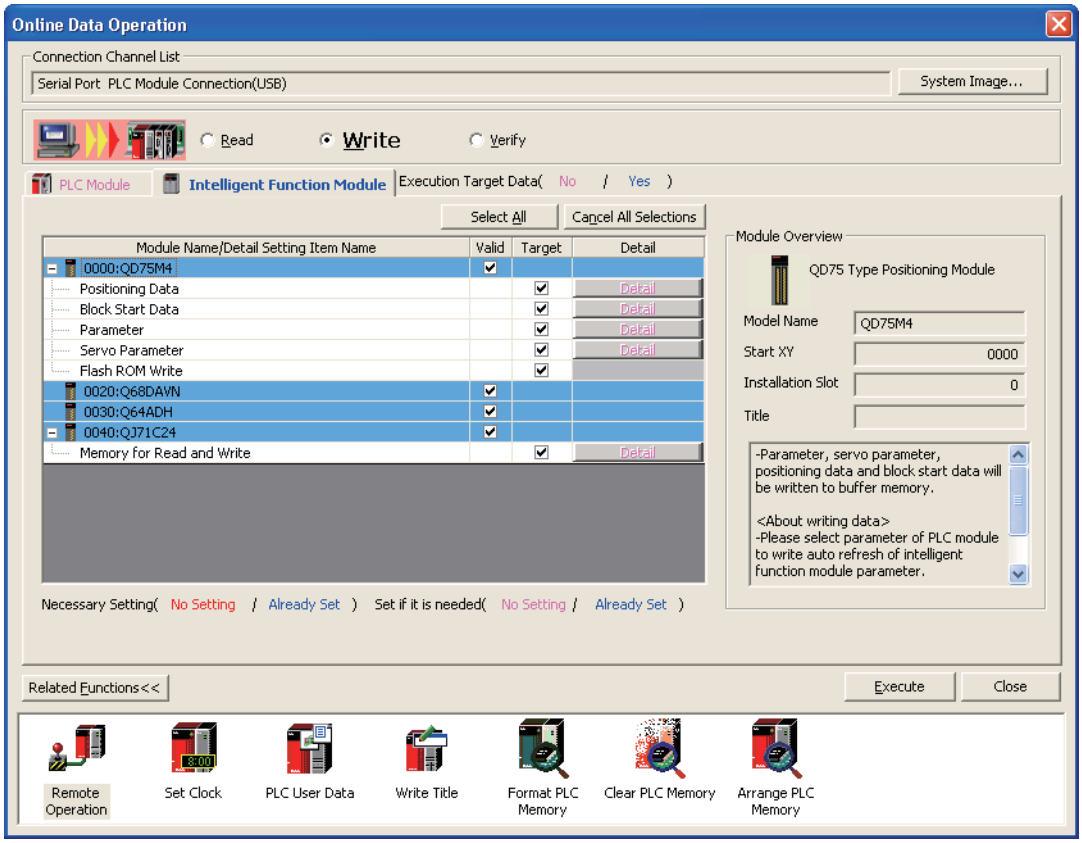
In the Write to PLC operation, the intelligent function module parameters are written to the target memory.
In the Read from PLC operation, the intelligent function module parameters on the programmable controller CPU are read from the target memory.

■ Writing/reading data to/from intelligent function module buffer memory/ flash ROM

Write the set intelligent function module data to the buffer memory/flash ROM of the intelligent function module via a programmable controller CPU, and read the intelligent function module data to a project. Use the operation for changing the data temporarily during debugging.
If a module does not have initial settings for intelligent function module parameters, this function can directly write data such as initial values to the intelligent function module buffer memory/flash ROM.

Screen display

Select [Online] ⇒ [Write to PLC] ( )/[Read from PLC] ( ) ⇒ <<Intelligent Function Module>>.
The following explains the settings for writing data to a programmable controller CPU. Settings for reading data from a programmable controller CPU can be made in the same manner.
<Write to PLC screen>



The items in [Detail] may differ depending on the module.

Operating procedure

1. **Select "Valid" for write/read target module and "Target" for each item.**

   Set details such as a write/read range and write target by clicking the Detail button of each item.

2. **Click the Execute button.**

   In the Write to PLC operation, the set data are written to the intelligent function module buffer memory/flash ROM, and in the Read from PLC operation, the data are read from the intelligent function module buffer memory/flash ROM.

Screen button

For the buttons on the screen, refer to Section 12.1.

Point

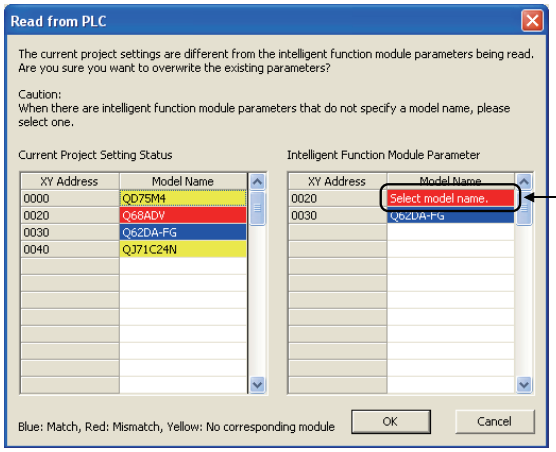
● Writing data to programmable controller CPU

When writing the intelligent function module parameters, match the configuration of the intelligent function module on the project with the configuration in the intelligent function module parameters stored on the programmable controller CPU.

Data cannot be written to the programmable controller CPU unless the start XY address and the module name for the write target match.

● Reading data from programmable controller CPU

- When the intelligent function module parameter does not exist on the programmable controller CPU, read the data from the programmable controller CPU after adding the intelligent function module according to the actual module configuration to the Navigation window.
  For the method for adding the intelligent function module, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Intelligent Function Module)
- If the configuration of the intelligent function module on the project does not match with the mounted status, the intelligent function module on the project is overwritten with the actual module configuration. The following screen is displayed when the mounted status is different or a specific intelligent function module*1 is used. Double-click the cell indicated with "Select model name" under "Model Name" of intelligent function module parameter, select a module, and read data from the programmable controller CPU.



*1 : The specific intelligent modules are listed below.
Analog module: Q62DAN, Q64DAN, Q68DAVN, Q68DAIN, Q62DA, Q64DA, Q68DAV, Q68DAI
Temperature control module: Q64TCTT, Q64TCTTBW, Q64TCRT, Q64TCRTBW, Q64TCTTN, Q64TCTTBWN, Q64TCRTN, Q64TCRTBWN
QD75 positioning module: QD75P1/P2/P4, QD75P1N/P2N/P4N, QD75D1/D2/D4, QD75D1N/D2N/D4N
Serial communication/modem interface module: QJ71C24N, QJ71C24N-R2, QJ71C24N-R4, QJ71C24, QJ71C24-R2
For QD75 positioning modules and serial communication/modem interface modules, the screen to select a module is displayed when the auto refresh is set.

● Writing data when the QD75 ready signal (X0) is ON (positioning data only)

Data cannot be written when the QD75 ready signal (X0) of the target intelligent function module is ON.

When the QD75 ready signal (X0) is OFF, the availability of operation differs according to the option setting*1.

○: Applicable ×: Not applicable

-		"Confirm PC operation status when writing a data"	
		Selected	Cleared
Programmable controller CPU operating status	STOP	○	○
	Other than STOP	×	○

*1 : Select [Tool] ⇒ [Options] ⇒ "Intelligent Function Module" ⇒ "QD75/LD75 Type Positioning".

● Displaying the confirmation message when writing data to a flash ROM (positioning data only)

The confirmation message can be displayed when data are written to a flash ROM by the following setting.

Select [Tool] ⇒ [Options] ⇒ "Intelligent Function Module" ⇒ "QD75/LD75 Type Positioning" and select "Display a confirmation message when writing to flash ROM".

12.1.5 Symbolic information

Q CPU L CPU Remote Head FX *1

*1 : FX3U/FX3UC (version 3.00 or later) only

Symbolic information is data that store the program configuration such as structures and labels.
To restore these data included in the symbolic information when reading a program from the programmable controller CPU, write/read the symbolic information to/from the programmable controller CPU.
Data such as structures and labels included in the symbolic information cannot be restored if only sequence programs are read. (In case of a Structured project, the programming language is treated as Ladder Diagram.)
The following table shows the program data included in the symbolic information.

Project type	Data included in symbolic information	
Simple project	Structures	
	Global labels	
	Local labels	
	Programs	
	Function blocks	
Structured project	User libraries	
	Structures	
	Global labels	
	Program Setting	
		Tasks
	POU	
		Local labels
		Programs
		Function blocks
		Functions

Point

● **Write target of symbolic information**
Symbolic information can also be written to drives other than the program memory (drive 0).
For details of writable drives, refer to the following manual.
☞ User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used

● **Compile status when the symbolic information is read**
- When the symbolic information and parameters are read simultaneously, and the data in the symbolic information match with parameters and programs (program files) on the programmable controller CPU, the read data are in compiled status.
- When only the symbolic information is read, the read data are in uncompiled status.
- When the symbolic information of GX Developer or GX IEC Developer is read, the read data are in uncompiled status. Compile the program again after executing the Read from PLC function.

● **Considerations for reading symbolic information**
For the considerations for reading label programs (symbolic information) of the existing application using GX Works2, or reading label programs (symbolic information) of GX Works2 using the existing application, refer to the following section. (☞ Appendix 6.2 "Data compatibility")

● **FXCPU**
When a memory cassette to which the symbolic information has been written is used on an FXCPU other than FX3U/FX3UC version 3.00 or later, the memory cassette can be used, however, the symbolic information cannot be read from the memory cassette.
When the symbolic information is written to a memory cassette on an FXCPU other than FX3U/FX3UC version 3.00 or later, the symbolic information may be corrupted.

● **Automatic project save after writing to programmable controller CPU**
By setting the option, the project can be saved automatically after writing to the programmable controller CPU.
Select [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Automatic Save" and select "Save project after writing to PLC".

■ High speed mode and Compatible mode

'High speed mode' and 'Compatible mode' are added as modes to write symbolic information to a programmable controller CPU in GX Works2 Version 1.48A.
Use 'High speed mode' when using GX Works2 for the first time.
For FXCPU, only 'High speed mode' is supported.

'High speed mode' or 'Compatible mode' can be selected by "Setting for Writing Symbolic Information to PLC" under [Tool] ⇒ [Options] ⇒ "Symbolic Information". 'High speed mode' is set as a default setting.

● High speed mode

- Higher speed of writing/reading symbolic information compare to 'Compatible mode'.
- Smaller symbolic information data size increases a free space on a programmable controller CPU.
- The number of files for the symbolic information is counted as two files. Check the number of files that can be stored on a programmable controller CPU.

<Considerations>

- Symbolic information written to a programmable controller CPU with 'High speed mode' cannot be read in GX Works2 Version 1.43V or earlier.

● Compatible mode

- Symbolic information which does not support 'High speed mode', and it is the same as the one in GX Works2 Version 1.43V or earlier.
- Larger symbolic information data size decreases a free space on a programmable controller CPU.

Point

● 'High speed mode' and 'Compatible mode'
'High speed mode' and 'Compatible mode' can be changed any time.
Symbolic information on a programmable controller CPU is always the one written most recently. Thus, the management of symbolic information is not complicated.

● Symbolic information on programmable controller CPU
Symbolic information written to a programmable controller CPU with 'High speed mode' cannot be displayed on the screen for Read from PLC in GX Works2 Version 1.43V or earlier.

● Write to PLC function when symbolic information is set on the <<Boot File>> tab of PLC parameter.
When symbolic information is set on the <<Boot File>> tab of PLC parameter, performing the Write to PLC function with changing the mode between 'High speed mode' and 'Compatible mode' may cause an improper boot operation.
When the mode is changed, write symbolic information to a programmable controller CPU after performing the following operation.

- Check if symbolic information is set on the <<Boot File>> tab of PLC parameter, click the End button and update the boot file setting.
- Select symbolic information and parameters on the screen for Write to PLC and write symbolic information to a programmable controller CPU. Confirm the target memory of symbolic information is the same as that of the transfer destination set on the <<Boot File>> tab of PLC parameter.

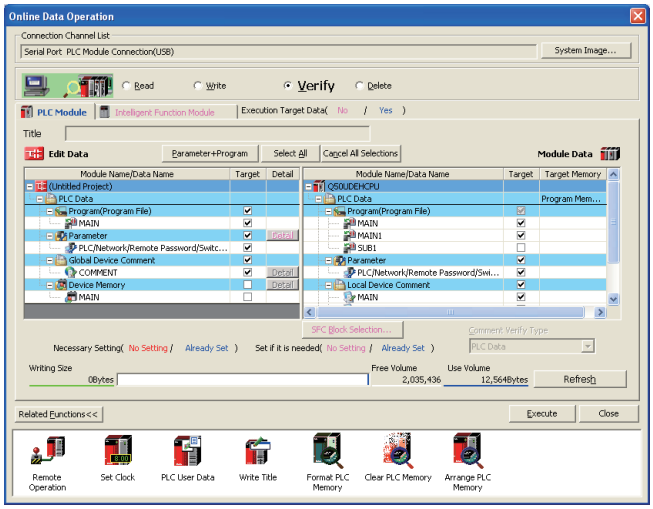
12.1.6 Specifying target to write device comments to programmable controller CPU

Q CPU | L CPU | Remote | Head | FX

Specify a target memory to write device comments to a programmable controller CPU.
In order to store device comments to the storage destination which is different from the target memory of the current programmable controller data, select "Set save destination of device comment to the target memory of PLC data" under [Tool] ⇒ [Options] ⇒ "Save Destination of Device Comment", and set a target for "Save Destination of Device Comment" in advance.

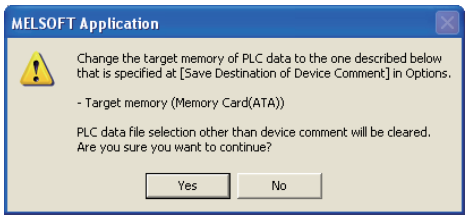
Screen display

Select device comments (global device comments, local device comments) on the Online Data Operation screen.



Operating procedure

1. **The following message is displayed.**



2. **Click the Yes button.**

The target set for "Target Memory" is changed to the target specified for "Save Destination of Device Comment" in the option setting.

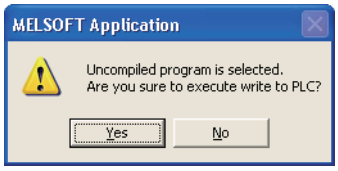
12.1.7 Considerations for writing/reading data to/from programmable controller CPU

Q CPU L CPU Remote Head FX

The following explains the considerations for writing/reading data to/from the programmable controller CPU.

1) **Writing or reading programs with a Peripheral statement/note to or from the programmable controller CPU**
The information of the lines with Peripheral statement/note is written to the programmable controller CPU, but the content of the statement/note are not written to the programmable controller CPU.
If a program with the same name as that of the program set with a Peripheral statement/note is read from the programmable controller CPU, the former overwrites the latter (the one in GX Works2), so the Peripheral statements/notes of the latter is discarded. To keep the Peripheral statement/note in GX Works2 when reading data from the programmable controller CPU, merge the Peripheral statement/note.
(Merging statements/notes ☞ GX Works2 Version 1 Operating Manual (Simple Project))

2) **An uncompiled program exists when writing data to the programmable controller CPU**
If the following message is displayed when writing data to the programmable controller CPU, click the No button and stop writing data. Then, execute [Compile] ⇒ [Build] again on the uncompiled program.



3) **Writing programs to programmable controller CPU after compiling all programs**
Compiling all programs changes the device assignment to labels. Therefore, device values set before the program change remain on the device-assigned labels.
By setting the following option, device values in the range set with the "Device/Label Automatic-Assign Setting" function can be automatically cleared to 0 after writing programs to the programmable controller CPU.
- [Tool] ⇒ [Options] ⇒ "When writing to PLC after a Rebuild All operation, clear the device ranges set in the Device/Label Auto-Assign setting to 0."

Perform the following operations for a precautionary measure when the above option setting is not set.
- For QCPU (Q mode)/LCPU
  After writing data to the programmable controller CPU, reset the programmable controller CPU, clear all device memories including latches, clear all file registers, and switch the programmable controller CPU to RUN.
- For FXCPU
  After writing data to the programmable controller CPU, clear device memory using the PLC memory clear function, and switch the programmable controller CPU to RUN.

(☞ Section 17.4)

4) Editing programs after writing symbolic information to the programmable controller CPU

Edit programs in the same project type as the symbolic information if editing them after writing symbolic information to the programmable controller CPU.
In addition, be sure to write the latest symbolic information to the programmable controller CPU if writing only execution programs to it using such as Online program change.
If execution programs are read out and edited in GX Works2 projects without labels or GX Developer and rewritten to the programmable controller CPU, the programs being edited may be inconsistent with the execution programs on the programmable controller CPU when symbolic information is read out using GX Works2.
If inconsistency occurs by the operation mentioned above, check the mismatch parts using the Verify with PLC function and correct them.

5) Performing the Write to PLC function when symbolic information is not written to the programmable controller CPU

Program data are not displayed on the screen for Read from PLC in a project with labels.
When reading programs in a project with labels, select symbolic information.
When symbolic information is not written to the programmable controller CPU, create a new project without labels, and read the programs.
When reading programs in a project without labels, the read programs are displayed as a ladder program. However, as there are cases where programs cannot be displayed correctly as a ladder program, be sure to check the program after the symbolic information has been read from the programmable controller CPU.
The background color of the ladder block in which the program cannot be displayed correctly in a program is displayed in yellow.
The program can be edited by deleting the ladder block or adding new ladder block before or after it, even when the background color is displayed in yellow.
Be sure to write/read the symbolic information to/from the programmable controller CPU in order to restore the program to its original state.

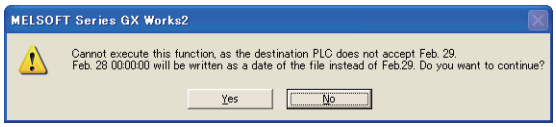
6) Writing data after the device range in PLC parameter is changed

When the device range of PLC parameter has been changed, write the parameter to the programmable controller CPU.
Programs cannot be written to the programmable controller CPU unless the parameter is written to the programmable controller CPU.

7) When the date on the personal computer is February 29

When the date on the personal computer is February 29, the following message is displayed if the Write to PLC, Online program change, or Change TC setting function is performed on a Basic model QCPU function version A.

The file will be written with the date 'February 28' by clicking Yes button.



8) Basic model QCPU function version A

Basic model QCPU function version A does not support SFC programs, device initial values, and remote passwords.
For the Write to PLC function, these files cannot be written even though their names are displayed.
For the Read from PLC function, files of SFC programs and device initial values are not displayed in the file list. Files of remote passwords cannot be read out even though their file names are displayed.

9) Writing data to a Redundant CPU in the backup mode

When a Redundant CPU is operating in the backup mode, the write to PLC function is performed on both systems (control system and standby system).
However, in any of the following states, the write to PLC function is performed on the connective system only.

- The target system power is OFF.
- The target system is reset.
- The tracking cable failed.

10) Writing data to a Redundant CPU in the separate mode/debug mode

When a Redundant CPU is operating in the separate mode or debug mode, the write to PLC function is only performed on the Redundant CPU which is specified for "Target System" on the Transfer Setup screen.

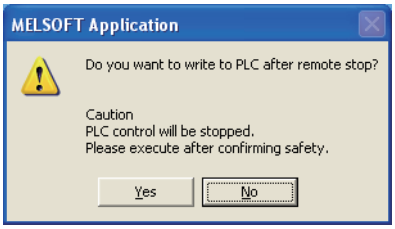
11) FXCPU

- For projects with labels, data can be read from a programmable controller CPU, and symbolic information can be read from/write to a programmable controller CPU in a project of FX3U/FX3UC version 3.00 or later only. Since these functions cannot be performed on the other FXCPU projects with labels, store the projects in a safe place.
- When a project in which a block password with the validated setting for "Read-protect the execution program" exists is written, the execution program cannot be read. Write the symbolic information to recover the program.
- When a program with an Peripheral statement/note is written to the programmable controller CPU, the Peripheral statement/note cannot be written to it. (The information of the lines with Peripheral statement/note also cannot be written to the programmable controller CPU.)

12) Writing data to FXCPU in batch

Set the programmable controller CPU to STOP status.

When it is in RUN status, the message shown below is displayed. Select the Yes button.



13) When the program memory of FXCPU is the EPROM cassette

Write programs with the ROM writer. For the EEPROM or flash memory cassette, turn the PROTECT switch OFF first and write programs.

14) Writing/reading ER device with FX3U/FX3UC

Writing/reading data cannot be executed with FX3U/FX3UC unless the memory cassette is installed to the programmable controller main unit.

15) Writing data to FX1S version earlier than 2.00

Data of project with labels cannot be written.
Use data of project without labels.

16) Reading the symbolic information, which has been written to the programmable controller CPU using the Japanese version of GX Works2, using the English version of GX Works2

The symbolic information, which has been created and written to the programmable controller CPU using the Japanese version of GX Works2, cannot be read from the programmable controller CPU using the English version of GX Works2.

In this case, save again the project created with the Japanese version of GX Works2 using the English version of GX Works2, and write the symbolic information to the programmable controller CPU.

By following the operation described above, the symbolic information can be read from the programmable controller CPU using the English version of GX Works2.

17) Reading projects created in English version of GX Works2 from programmable controller CPU

When reading projects created in the English version of GX Works2 Version 1.31H or earlier from the programmable controller CPU, select "Japanese" for the language selection.

18) Reading data from SD memory card

The following are the considerations when reading data from the SD memory card.

- Program files/intelligent function module parameters created on the programmable controller CPU whose series is different from the connected programmable controller CPU cannot be read.
- Parameters/symbolic information on the programmable controller CPU whose type is different from the connected programmable controller CPU cannot be read.

  Example) When the program file created on the LCPU is stored on the SD memory card
  The program file created on the LCPU cannot be read from the SD memory card on the High-speed Universal model QCPU.

12.2 Verifying Data on Programmable Controller CPU against Data on Personal Computer

Q CPU | L CPU | Remote | Head | FX

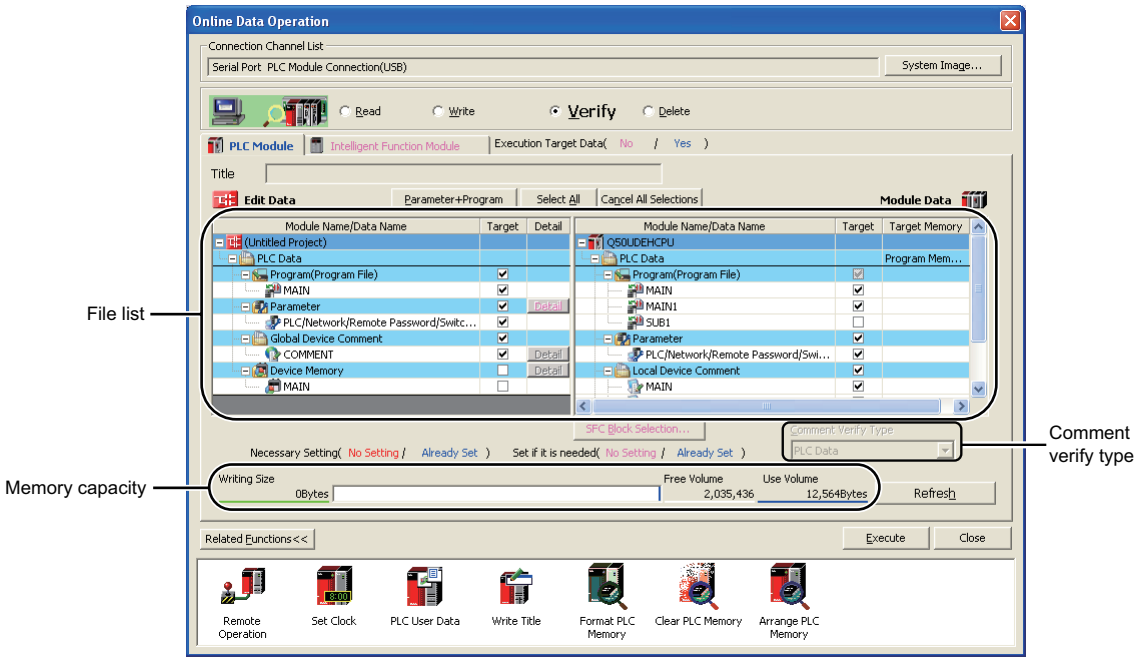
This section explains how to verify the open project against the data on the programmable controller CPU.
The verification function is used to compare the content of two projects or to locate program changes.
To verify data between two projects, use the Verify function. (☞ Section 4.2.7)
The following data can be selected as verification targets for the Verify with PLC function.

- Programs
- Parameters
- Intelligent function module parameters (initial setting/auto refresh)*1
- Device comments
- Device memory data
- File registers
- QD75/LD75 positioning module*1

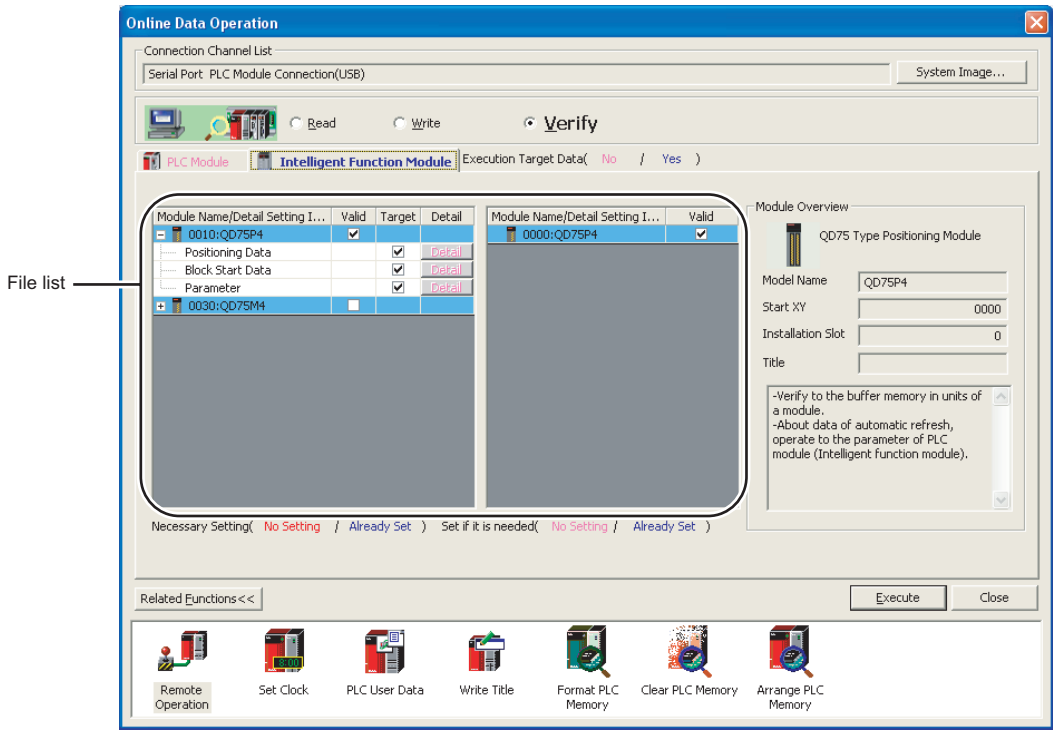
*1 : Not supported by FXCPU.

Screen display

Select [Online] ⇒ [Verify with PLC].
<CPU module>



<Intelligent function module>



Operating procedure

1. Select data to verify from the file list.

Item			Description
Connection Channel List			Display the information of the connection destination setting.
Target module tab			Switch the setting target module. Characters on the tab are displayed in blue when data to be verified exist.
	PLC Module		Set the settings to verify data with data on the programmable controller CPU.
	Intelligent Function Module*1		Set the settings to verify data with data on the intelligent function module. ☞ Section 12.1.4
Title*1			Display the title of the target memory by clicking the Refresh button.
File list			–
		Target	Select the data to be verified.
		Target Memory*1	Select the memory from the list ( ) by clicking the cell under "Target Memory". For details of the memory card application, refer to the following manuals. ☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection) ☞ MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
Comment Verify Type			Set a basis either; data being edited or module data, when verifying device comments. (☞ "■ Comment verify type")
Memory capacity*1			–
		Writing Size	Display the total size of written data selected in "Target".
		Free Volume	Display the free space volume of the target memory.
		Use Volume	Display the used space volume of the target memory.

*1 : Not supported by FXCPU.

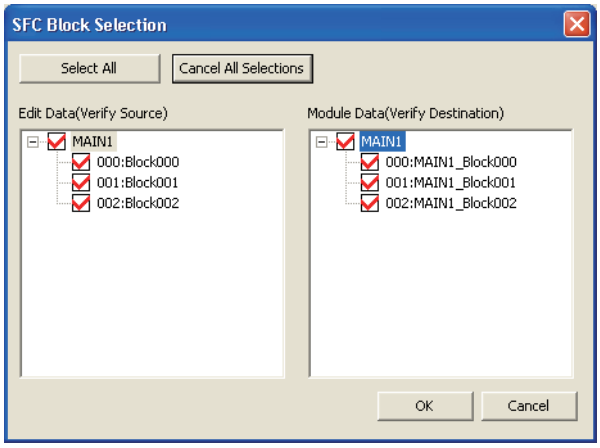
2. Click the Execute button.

The verification results are displayed on the Verify Result screen.
☞ Section 4.2.7 "■ Checking verification result details"

Screen button

For the buttons on the screen, refer to Section 12.1.

● SFC Block Selection... **(Not supported by FXCPU)**
Opens the screen to select the SFC block to be verified.



Point

● **Verification result when CC-Link configuration window is created**
When the same profile is not registered to the verify destination and the verify source, the verification result may be a mismatch.
(☞ Section 6.3.4)

● **Project security status**
Projects to which the security is set can be verified when both verify source data and verify destination data are not read-protected.

● **Verifying intelligent function module parameters (initial setting/auto refresh)**
Among modules without initial setting such as QD75/LD75 positioning modules, serial communication/modem interface modules, and AS-i master modules, only modules in which the auto refresh is set are the verification targets.

● **Verifying QD75/LD75 positioning modules**
One module each for verify source and verify destination can be selected.
The following data can be selected as verification targets.

- Parameter
- Servo parameter (For QD75M/MH only)
- Positioning data (Except for positioning comments and M code comments)
- Block start data

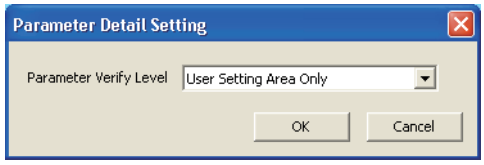
● **Verifying device memory data for FXCPU**
Special registers (M) and special data registers (D) cannot be selected as verification targets.

■ Parameter verification

Verification levels can be selected for verifying parameters.
This function is not supported by FXCPU.

Screen display

Select the parameter and click the Detail button.



The following table shows the setting items for parameter verification.

Item	Description
User Setting Area Only	Verify only the parameter area set by the user.
All Areas	Verify all area including the parameter area set by the system.

● Mismatched point in system area

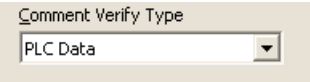
If a mismatched point is detected in the system area by the "All Areas" verification, either of the following messages is displayed.
Take corrective action according to the message.

Message	Corrective action
The header information of the parameter block is inconsistent.	A mismatch exists in area other than the user setting area.*1 Rewrite the parameters having been written to the programmable controller CPU.
This parameter block can't analyze.	Versions of GX Works2, GX Developer, or GX IEC Developer used to create the project differ between the programmable controller CPU and GX Works2. The operation of the programmable controller CPU is not affected. To match the "All Areas" verification, install the latest version of GX Works2, read the parameters from the programmable controller CPU, and write them again to the programmable controller CPU.

*1 : Data in areas other than the user setting area may be erroneous due to such as noise.

■ Comment verify type

A basis of the range, either 'data being edited' or 'module data', can be set in the Verify with PLC function of device comment.
The comment verify type can be set when global device comments or local device comments of both 'data being edited' and 'module data' are selected.



The following table shows the items of the comment verify type and their descriptions.

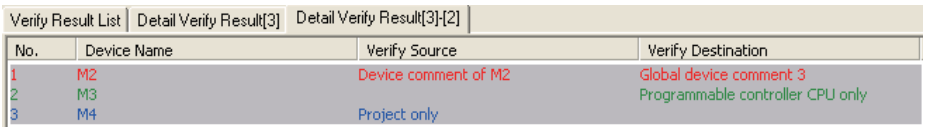
Item		Description
Comment Verify Type		–
	GX Works2 Data	Verify data with the range of device comments in the project as a basis. When this item is selected, detail setting of the selected device comments can be set by clicking the Detail button. (☞ Section 12.1.3)
	PLC Data	Verify data with the range of device comments written to the programmable controller CPU as a basis.

● Verification result differences of comment verification method

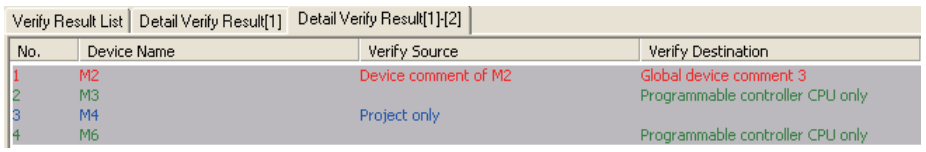
The following shows an example of the Verify with PLC function performed on the following device comments.

Device	Device comments in project	Device comments on programmable controller CPU
M0	Global device comment 1	Global device comment 1
M1	Global device comment 2	Global device comment 2
M2	Device comment of M2	Global device comment 3
M3		Programmable controller CPU only
M4	Project only	
M5		
M6		Programmable controller CPU only

< When "GX Works2 Data" is selected for verification >



< When "PLC Data" is selected for verification >



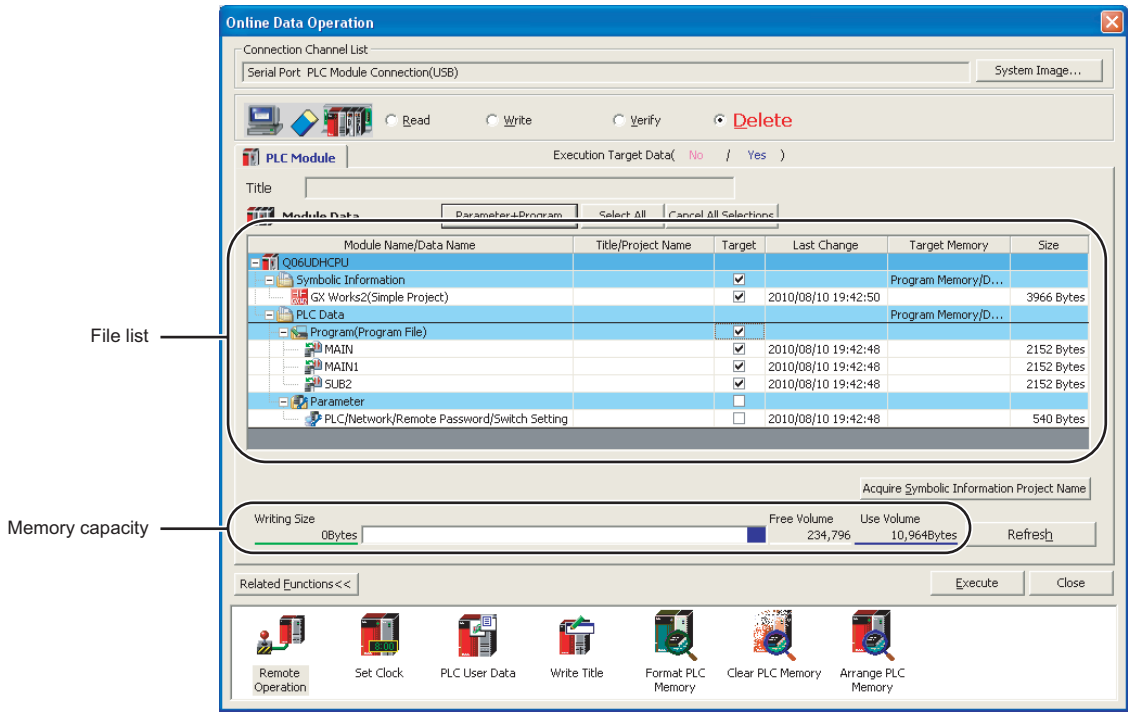
12.3 Deleting Programmable Controller CPU Data

Q CPU | L CPU | Remote | Head | FX

This section explains how to delete data on the programmable controller CPU such as programs and parameters.

Screen display

Select [Online] ⇒ [Delete PLC Data].



Operating procedure

1. **Select the data to delete from the file list.**
   For the items on the screen, refer to Section 12.1.

2. **Click the** Execute **button.**
   The specified data are deleted.

Screen button

For the buttons on the screen, refer to Section 12.1.

Point

- **Deleting symbolic information**
  If the symbolic information is deleted, information such as labels cannot be restored.
- **Deleting programs (program files) only**
  The content of the symbolic information are not updated, even if a program (program file) is deleted. When the symbolic information is read, the deleted program is restored.

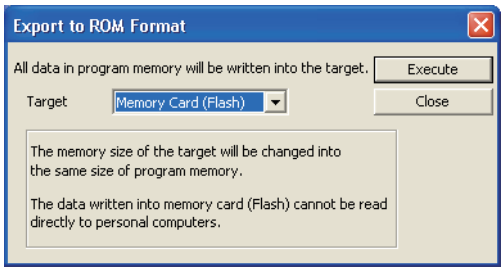
12.4 Copying Program Memory Data to ROM

Q CPU | L CPU | Remote | Head | FX

This section explains how to copy the program memory data on the programmable controller CPU to a standard ROM on the programmable controller CPU or a Flash card in batch.
This function is used to boot up using a standard ROM or a Flash card, or save program memory data in a standard ROM or a Flash card without a battery backup.
Since the program memory of Universal model QCPU and LCPU is a flash ROM, program memory data can be saved without a battery backup for those CPUs.

Screen display

Select [Online] ⇒ [Export to ROM Format].

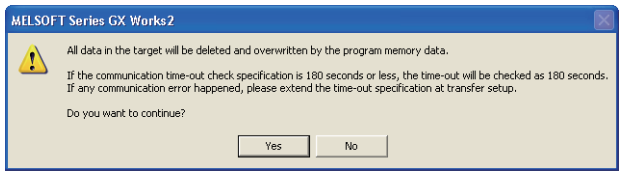


Operating procedure

1. **Set the items on the screen.**

Item	Description
Target	Select the memory in which the program memory data are to be written.

2. **Click the Execute button.**
   The message is displayed.



3. **Click the Yes button.**
   The program memory data are exported in ROM format and the data are written to the memory set in "Target".

Point

- **Considerations for writing**
  All the write target data are deleted.
- **Reading data written in ROM format**
  Use the Read from PLC function to read the data written in ROM format.
- **Exporting device memory in ROM format**
  The device memory cannot be written using the Export to ROM format function.

12.5 Writing/Reading/Deleting PLC User Data

Q CPU *1 | L CPU | Remote | Head | FX

*1 : Not supported by Basic model QCPU, Q00UJ, Q00U, and Q01U.

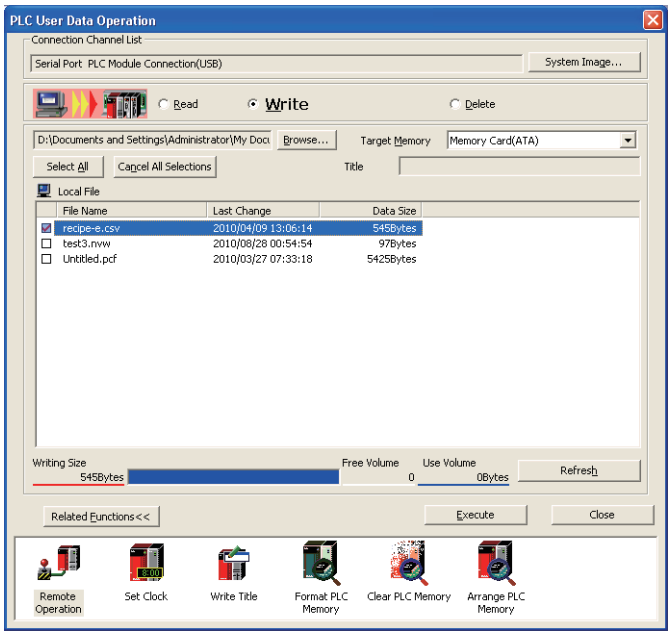
This section explains how to write/read/delete PLC user data (CSV format file/binary format file) to/from an ATA card/SD memory card/standard ROM.
PLC user data written to an ATA card/SD memory card/standard ROM can be used in sequence programs.
For the method for handling the PLC user data in sequence programs, refer to the following manual.
☞ MELSEC-Q/L Programming Manual (Common Instructions)

Point

- **Formatting ATA cards**
  Format the ATA card to be used on the programmable controller CPU by selecting [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory] in GX Works2.
  If a card is formatted using the function such as Windows® format functions, it may not be used on the programmable controller CPU.
- **Project file attributes**
  The file attributes (read only, hidden file) set by the application such as Windows® Explorer are ignored.
- **Memory capacity**
  When PLC user data are written to the programmable controller CPU, the target memory capacity may be displayed smaller than it really is.
- **Folders in memory card**
  When reading/deleting PLC user data, data such as logging data contained in folders are not displayed in "PLC Side File".
- **Writing data to an SD memory card**
  When PLC user data is written to an SD memory card, the characters of the file names become upper-case characters.

Screen display

Select [Online] ⇒ [PLC User Data] ⇒ [Write]/[Read]/[Delete].
The following explains the settings for writing PLC user data. The settings for reading/deleting PLC user data can be made in the same manner.
<Writing PLC User Data>



Operating procedure

1. **Use the Browse... button to set the storage source for the PLC user data to be written.**

   When reading PLC user data, set the save destination for the PLC user data to be read.

2. **Set the items on the screen.**

Item	Description
Connection Channel List	Display the information of the connection destination setting.
Target Memory	Select the memory to which the PLC user data are to be written. For details of the memory card application, refer to the following manuals. ☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection) ☞ MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
Title	Display the title of the target memory by clicking the Refresh button.
Local File (Write only)	Select the PLC user data to be written. The maximum file size is 32MB per file.
PLC Side File (Read/Delete only)	Select the PLC user data to be read. Select the PLC user data to be deleted.

3. **Click the Execute button.**

   When writing PLC User Data, the selected PLC user data are written.
   When reading PLC User Data, the selected PLC user data are read.
   When deleting PLC User Data, the selected PLC user data are deleted.

Screen button

For the explanation of the buttons on the screen, refer to Section 12.1.

12.6 Transferring Data to Program Memory in Batch

Q CPU *1 | L CPU | Remote | Head | FX

*1 : Universal model QCPU only

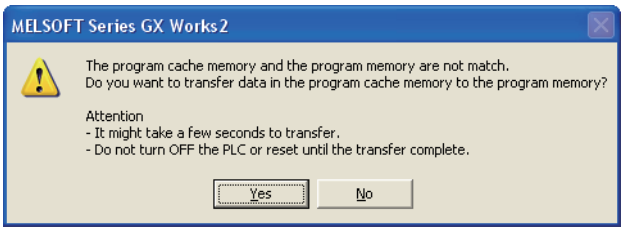
This section explains how to transfer the content of program cache memory to program memory in batch using Universal model QCPU/LCPU.
Use this function to transfer data at desired timing, for example, when option setting is made so that a program is not transferred to the program memory at Online program change.

Operating procedure

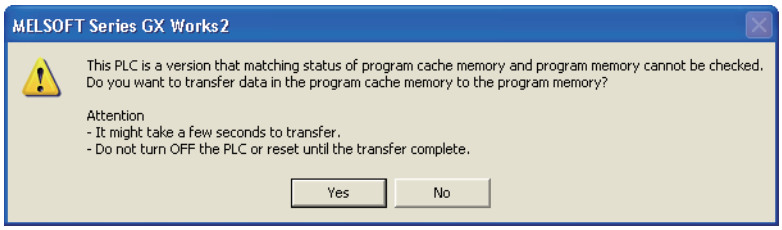
1. **Select [Online] ⇒ [Program Memory Batch Download].**

   Either of the following screens is displayed according to the programmable controller CPU and its version.

   <Universal model QCPU with a serial number whose first five digits are '10012' or higher, LCPU>



   <Universal model QCPU with a serial number whose first five digits are '10011' or lower>



2. **Click the Yes button.**

   The content in the program cache memory is transferred to program memory in batch.

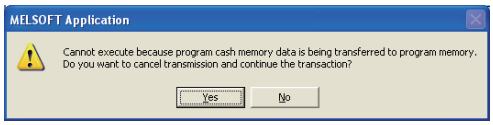
Point

● **Considerations of program memory batch transfer**

The following functions cannot be executed during program memory batch transfer.
Execute these functions only after completing program memory batch transfer.

- Online program change (ladder program, Structured Ladder/FBD program, ST program, function block)*1
- Change TC Setting (when "Write changed program to PLC" is selected)*1
- Write to PLC function (when program memory is the target memory)*1
- Program memory batch transfer (this function)
- Set as default connection
- Change PLC Type function
- Check Parameter

*1 : For Universal model QCPU with a serial number whose first five digits are '12012' or higher, the following message is displayed and the process of the program memory batch transfer can be canceled. To cancel the transfer, click the Yes button.



● **When the program cache memory and the program memory match**

The batch transfer of the program memory data is not executed.

12.7 Latch Data Backup

Q CPU *1 | L CPU | Remote | Head | FX

*1 : Universal model QCPU only

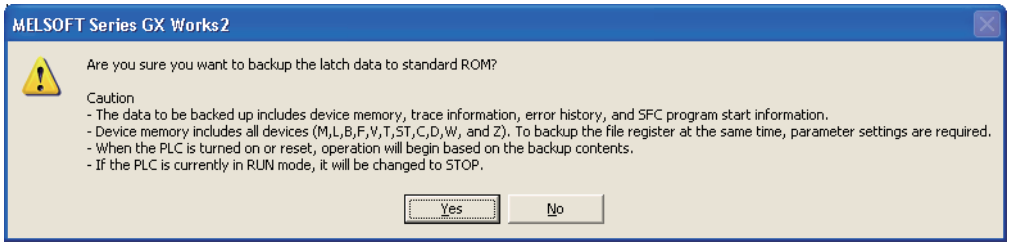
This section explains how to back up data such as device memory, file register, and error history to the standard ROM using Universal model QCPU/LCPU.
The backup content stored using this function is automatically restored to the program memory or other area when the programmable controller CPU is turned from OFF to ON or when it is reset.
This function allows the system to create backups of the data such as device data and error history data for those times when the system needs to be shut down for a prolonged time without use of battery.
For details of backup target data, refer to the User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used.

12.7.1 Backing up latch data

Back up device memory/file register/error history data.

Operating procedure

1. **Select [Online] ⇒ [Latch Data Backup] ⇒ [Backup].**



2. **Click the [Yes] button.**
   Device memory/file register/error history data are backed up.

Point

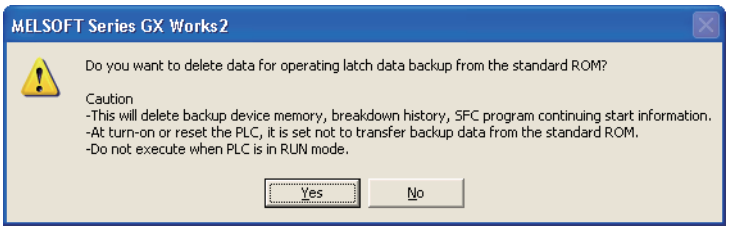
● **Devices**
The latch data backup function is available for the following devices.
M, L, B, F, V, T, ST, C, D, W, Z, ZR, R
To back up ZR and R, select "Transfer to Standard ROM at Latch data backup operation" on the <<PLC File>> tab of PLC parameter.

12.7.2 Deleting backup data

Delete the backup data on programmable controller CPU.

Operating procedure

1. **Select [Online] ⇒ [Latch Data Backup] ⇒ [Delete Backup Data].**



2. **Click the Yes button.**
   Backup data are deleted.

Point

● **Considerations for deleting backup data**
Backup data cannot be deleted when the programmable controller CPU is in RUN status.
To delete the backup data, set the programmable controller CPU to STOP status.

12.8 Backing up/Restoring Data

Q CPU *1 | L CPU *2 | Remote | Head | FX

*1: Universal model QCPU (except for Q00UJ, Q00U, Q01U) only
*2: Not supported by L02S.

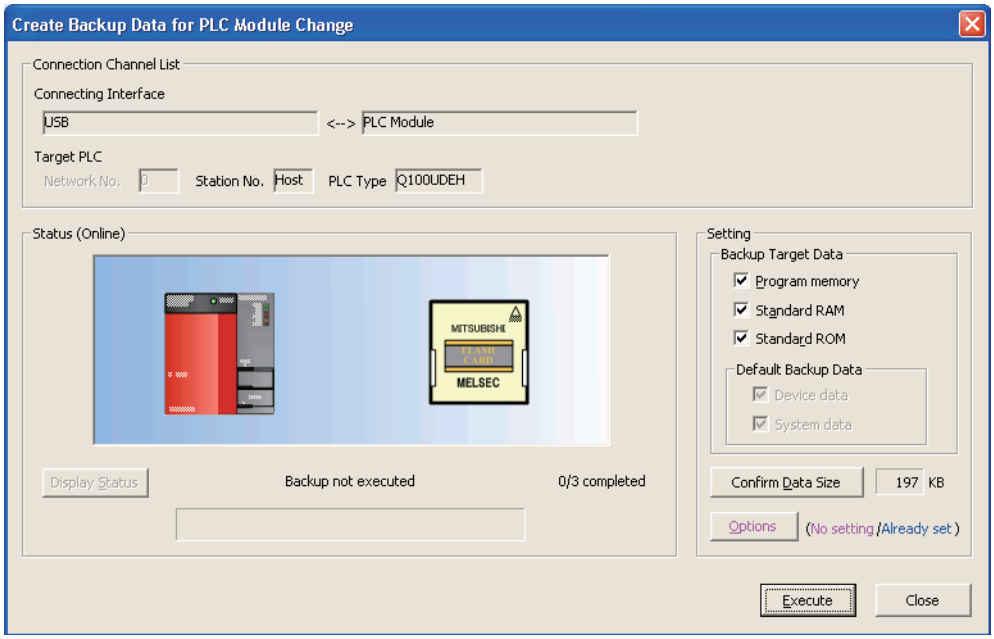
This section explains how to back up data on the programmable controller CPU to a memory card, and restoring it to another programmable controller CPU using Universal model QCPU/LCPU.

12.8.1 Backing up data to memory card

Back up data on the programmable controller CPU to a memory card.

Screen display

Select [Online] ⇒ [PLC Module Change] ⇒ [Create Backup Data].
The following is an example of setting screen when QCPU (Q mode) is selected.



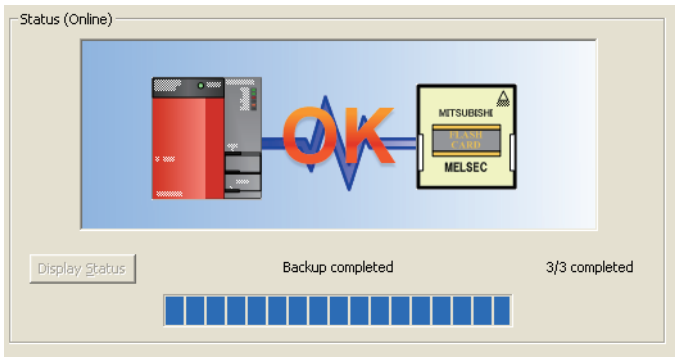
Operating procedure

1. **Set the items on the screen.**

Item	Description
Connection Channel List	Display information of the connection channel being set.
Status	Display the execution status of backup.
Setting	Select data to be backed up from "Backup Target Data". "Default Backup Data" settings are fixed as selected status. They cannot be changed.

2. **Click the Execute button.**

Data backup starts.
When data backup is completed normally, the image as shown below is displayed in "Status".



3. **Remove the memory card.**

Turn the programmable controller CPU from OFF to ON, or reset it.

Screen button

- Display Status

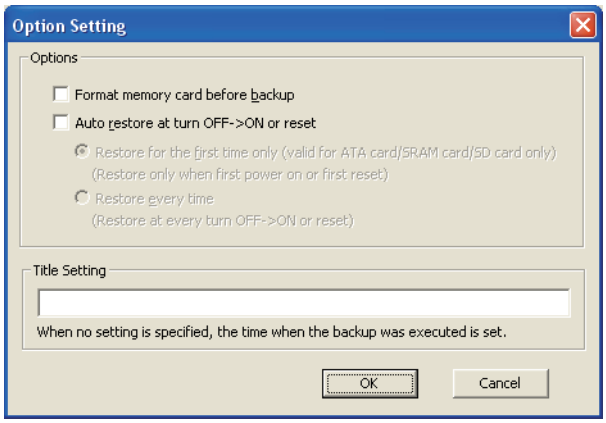
Refreshes and displays the execution status of backup when the power is turned OFF or reset.

- Confirm Data Size

Displays a total size of data selected in "Backup Target Data".

- Options

Opens the screen to set options for creating backup data.



Point

- **Deleting backup data**

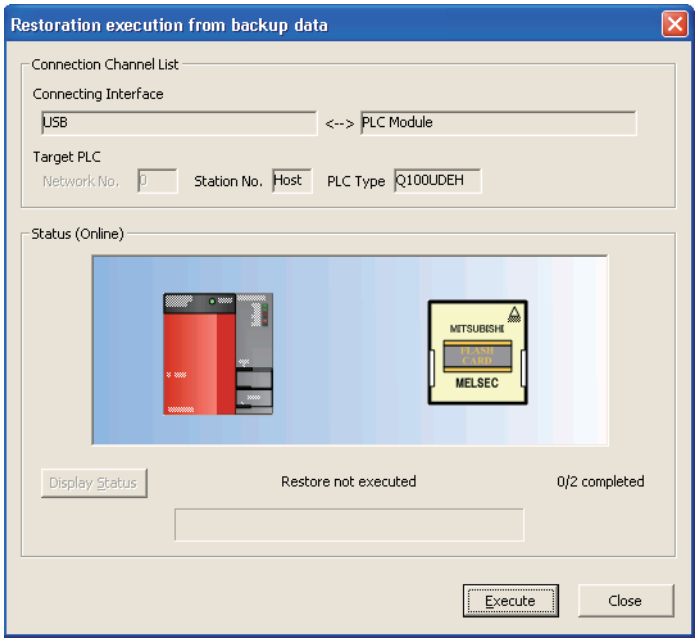
Backup data can be deleted by selecting [Online] ⇒ [Delete PLC Data]. However, backup data in a Flash card cannot be deleted.

12.8.2 Restoring backup data

Restore the registration from backup data for the programmable controller CPU replacement.

Screen display

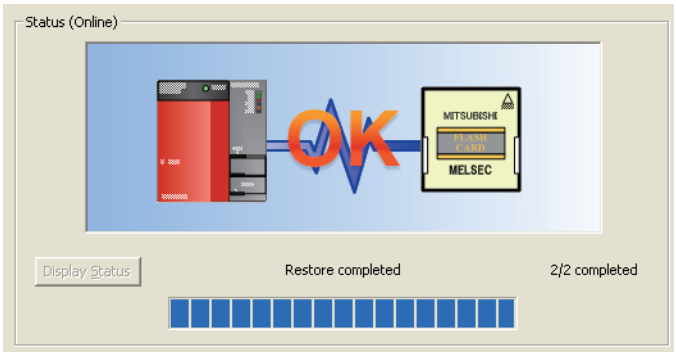
Select [Online] ⇒ [PLC Module Change] ⇒ [Restore].
The following is an example of setting screen when QCPU (Q mode) is selected.



Operating procedure

- **Click the Execute button.**

  Data restoration starts.
  When data restoration is completed normally, the image as shown below is displayed in "Status".



12.9 Online Program Change

This section explains the operations for changing programs or data while the programmable controller CPU is in RUN (Online program change).
The Online program change operations include Online program change performed during conversion/compilation and performed from the Write to PLC screen in units of files.
Be sure to fully understand the descriptions below and in Section 12.9.4 to Section 12.9.6 for operating with care.

⚠ WARNING

- **When data change, program change, or status control is performed from a personal computer to a running programmable controller, create an interlock circuit outside the programmable controller to ensure that the whole system always operates safely.**
  Furthermore, for the online operations performed from a personal computer to a programmable controller CPU, the corrective actions against a communication error due to such as a cable connection fault should be predetermined as a system.

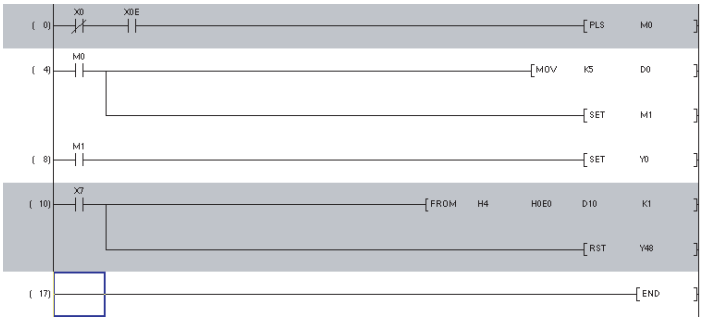
⚠ CAUTION

- **The online operations performed from a personal computer to a running programmable controller CPU (Program change when a programmable controller CPU is RUN, operating status change such as RUN-STOP switching, and remote control operation) have to be executed after the manual has been carefully read and the safety has been ensured.**
  When changing a program while a programmable controller CPU is RUN, it may cause a program corruption in some operating conditions. Fully understand the precautions described in this section.

12.9.1 Performing Online program change during conversion/compile

Q CPU | L CPU | Remote | Head | FX

Perform Online program change during conversion/compilation after program change.
Before changing a program, check that the program matches the one on the programmable controller CPU using the Verify with PLC function. Online program change cannot be performed if the programs do not match.



Writes data to programmable controller CPU in units of changed ladder blocks.

■ Projects without labels

Operating procedure

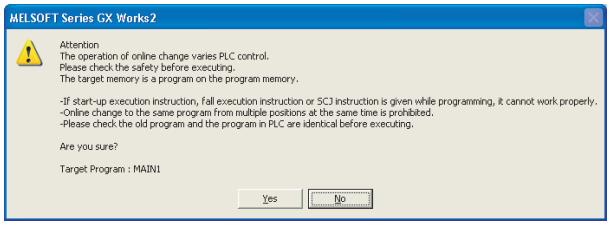
1. **Verify a program against a program on the programmable controller CPU to ensure that they match.**

2. **Change or modify the program.**

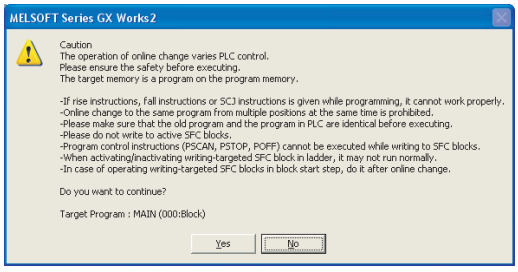
3. **Select [Compile] ⇒ [Online Program Change] to perform Online program change.**

   The message is displayed.
   Fully understand the message before performing Online program change.

   <When not writing/deleting SFC blocks>

   <When writing/deleting SFC blocks>

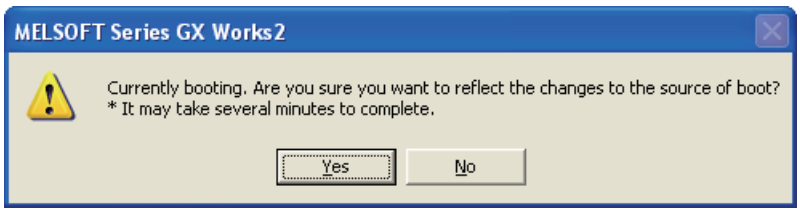
4. **Click the** Yes **button.**

Point

● **When target memory to write data is booting up**

When updating the changes to the boot source while "Under booting, reflect changes to boot source during online program change" is selected under [Tool] ⇒ [Options] ⇒ "Online Change", and the target memory is booting up, click the Yes button on the message shown below.*1

*1 : For Universal model QCPU (except for Q00UJ/Q00U/Q01UCPU) and LCPU only



■ Projects with labels

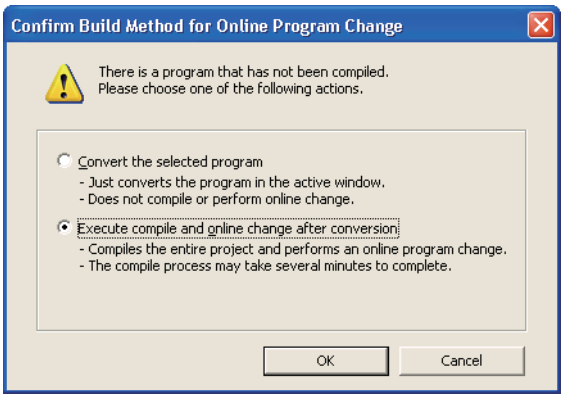
Operating procedure

1. **Verify a program against a program on the programmable controller CPU to ensure that they match.**

2. **Change or modify the program.**

3. **Select [Compile] ⇒ [Online Program Change].**

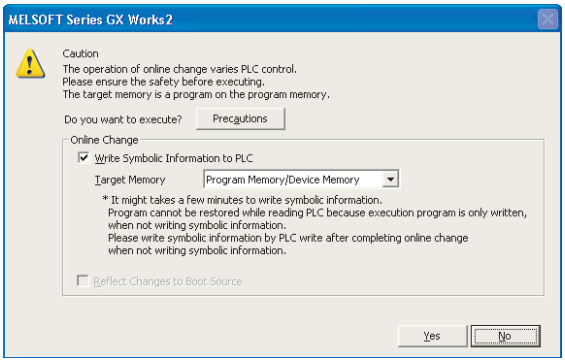
   The Confirm Build Method for Online Program Change screen is displayed.



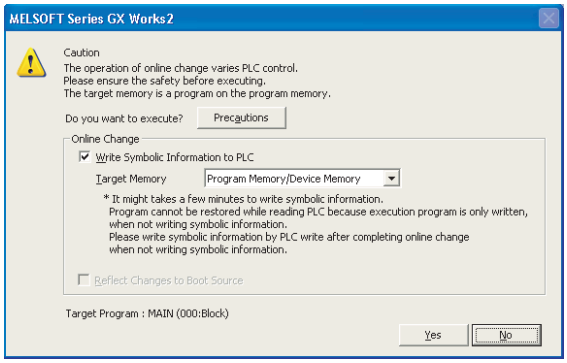
4. **Select "Execute compile and online change after conversion" and click the [OK] button.**

   The program is converted and compiled simultaneously, and Online program change is performed. The following message is displayed.

<When not writing/deleting SFC blocks>



<When writing/deleting SFC blocks>

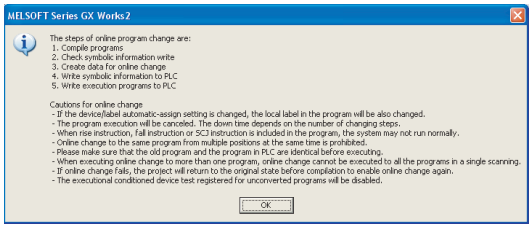


5. Click the Precautions button.

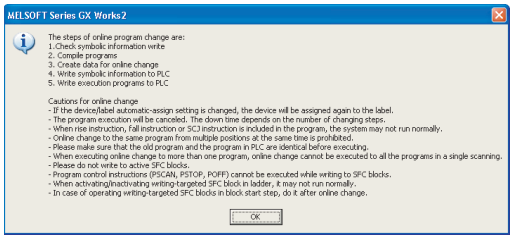
The following message is displayed.

Be sure to read and fully understand the message, and click the OK button.

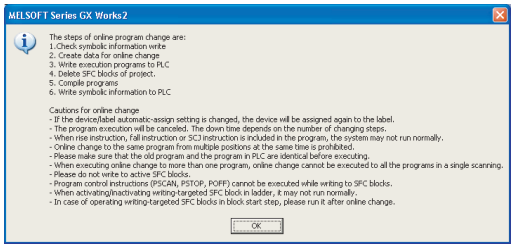
<When not writing/deleting SFC blocks>



<When writing SFC blocks>



<When deleting SFC blocks>



6. Set the items on the screen.

Item		Description
Online Change		
	Write Symbolic Information to PLC*1	Select this to write the symbolic information to the programmable controller CPU. Select "Target Memory".
	Reflect Changes to Boot Source*2,*3	Select this to apply the change to the boot source while the target memory is booting.

*1 : For FXCPU, this item is supported by FX3U/FX3UC version 3.00 or later only.

*2 : Not supported by FXCPU.

*3 : This item can be selected when "Under booting, reflect changes to boot source during online program change" is selected under [Tool] ⇒ [Options] ⇒ "Online Change", and the target memory is booting up. (For Universal model QCPU (except for Q00UJ/Q00U/Q01UCPU) and LCPU only)

7. Click the Yes button.

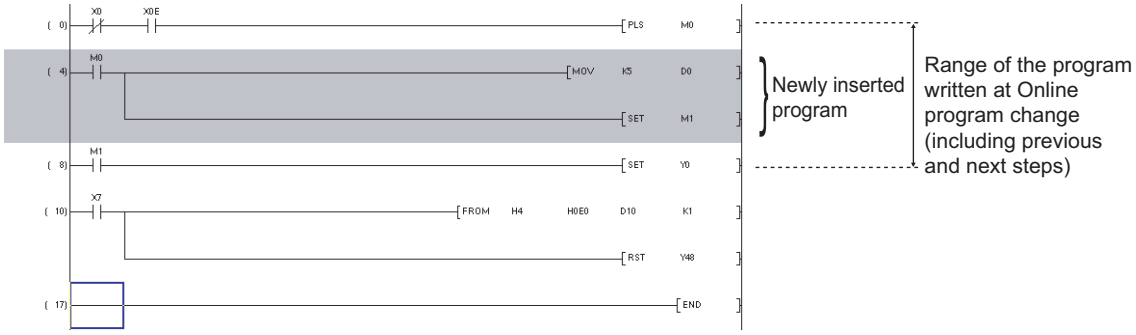
Online program change is completed.

■ Writing range for Online program change

Perform Online program change with the following writing range which depends on the editing mode.
When a new ladder block is inserted, the inserted program is written together with two steps (one before and the other after the program) to the programmable controller CPU.
Therefore, the Online program change may not be completed at a time depending on the number of program steps added and the two steps before and after the program. In this case, reduce the number of steps written at a time and perform Online program change in several times.
The following table shows the number of steps that can be written at once.

CPU type	Number of steps that can be written at once
QCPU, LCPU	512
FX3G, FX3GC, FX3U, FX3UC	256
FX0N, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, FX2NC	127

Example)



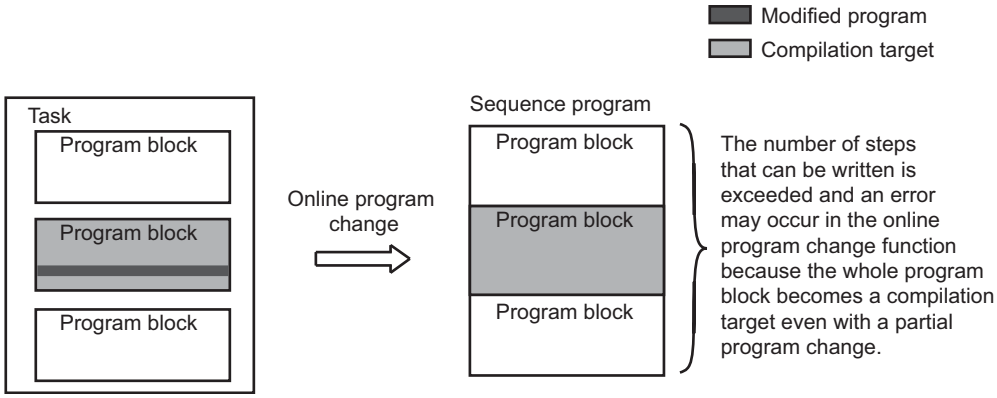
● **Editing separate ladder blocks**

For QCPU (Q mode), when the programmable controller CPU has "Online change area of multiple blocks" in its memory, multiple blocks can be written in units of blocks.
For High Performance model QCPU, "Online change area of multiple blocks" can be created using the memory format function. (☞ Section 17.3)

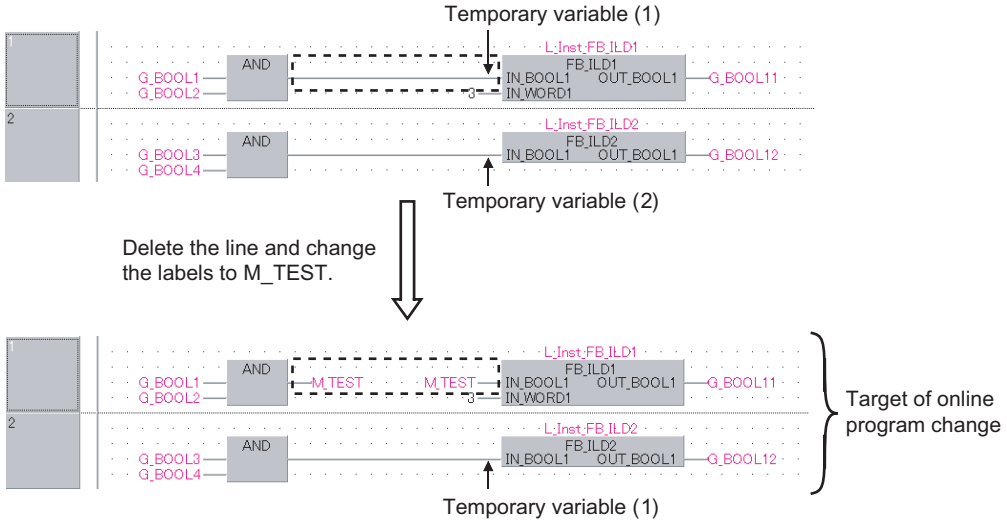
● Editing Structured Ladder/FBD or ST programs

Structured Ladder/FBD or ST programs are compiled in program block unit.
Even with a partial program change, the whole program block becomes a write target of Online program change. For this reason, the number of steps that can be written is exceeded and an error may occur in Online program change.

When an error occurs, update the program with the Write to PLC function.
For QCPU (Q mode)/LCPU, Online program change can be performed in file unit.
(☞ Section 12.9.2)



Example) Online program change target after compiling a program with a line change
As shown in the following figures, delete the line in the ladder block 1 and change the labels to M_TEST, and compile the program.
Since the temporary variable (1) used for the line in the ladder block 1 is released and reused as a temporary variable of the line in the ladder block 2, a change is also applied to the ladder block 2 to which any changes has not been applied by a user, and the ladder block 2 becomes the Online program change target.



Point

● **When performing Online program change to a programmable controller CPU for the first time, or an error occurs during Online program change**
Make sure that the program before writing matches the program on the programmable controller CPU with the Verify with PLC function.

● **When the program part to be written does not match**
If the program part to be written does not match with the program on the programmable controller CPU, Online program change cannot be performed.
Perform Online program change in units of files. (☞ Section 12.9.2)

● **When Online program change of multiple blocks cannot be performed**
The message is displayed in the following cases when Online program change is performed. Select whether to perform Online program change in units of files.
- There are no "Online change area of multiple blocks".
- The number of blocks exceeds the limit of Online program change of multiple blocks.
- The programmable controller CPU does not support the Online program change of multiple blocks.

● **When performing Online program change to a programmable controller CPU in which the symbolic information has been written**
Symbolic information, which contain the program configuration data such as structures and labels, are the data necessary only for restoring the data such as structures and labels after reading a program from the programmable controller CPU. (☞ Section 12.1.1) Therefore, the write of symbolic information does not affect the operation of the programmable controller CPU, however, when performing Online program change to a programmable controller CPU in which the symbolic information has been written, be sure to write the execution program together with the symbolic information.
Note that since programs (program files) are written in batch along with source information, writing only source information is not applicable.
However, it may take a few or more minutes to write symbolic information, therefore, the following action is recommended.
When performing Online program change repeatedly, do not write symbolic information every Online program change but perform Online program change in units of files, and perform the Write to PLC operation to write symbolic information after all processes of Online program change are completed. (☞ Section 12.9.2)

● **Online program change after compiling all programs**
All programs need to be compiled when the following operations are performed. Therefore the [Online Program Change] function cannot be performed.
Write programs to programmable controller CPU after compiling all programs. (☞ Section 12.1, Section 12.9.2)
- Changing the following PLC parameters (QCPU (Q mode)/LCPU only)
  - "Common Pointer No." and "Timer Limit Setting" on the <<PLC System>> tab
  - "File Register" and "File for Local Device" on the <<PLC File>> tab
  - Settings on the <<Device>> tab
- Changing the following option settings
  - "Default Length of String Data Type" in "Label Setting Editor"
  - Settings in "Compile"
- Changing automatically assigned devices
- Updating instructions and application functions when opening Structured project.
- Changing PLC type
- Changing project type
- Executing the Write to PLC function when a new project is not created, or a project is not opened

● **Automatic project save after Online program change**
By setting the option, the project can be saved automatically after Online program change. Select [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Automatic Save" and select "Save project after online change".

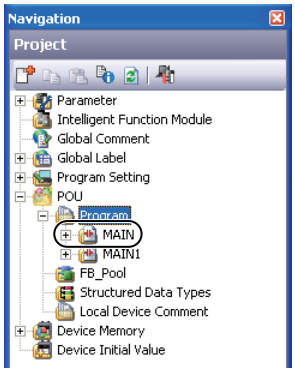
● **Editing separate ladder blocks with FXCPU**
For FXCPU, ladder blocks between the edited ladder blocks are also written to the programmable controller CPU.

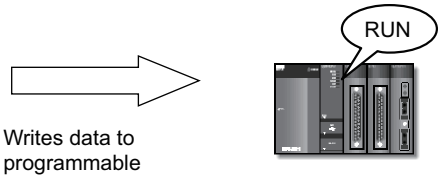
● **Performing Online program change with FXCPU**
- Symbolic information can be written to a programmable controller CPU with the Online program change function for projects of FX3U/FX3UC version 3.00 or later only.
- The Online program change function does not support SFC programs.
- When selecting [Compile] ⇒ [Online Program Change], Online program change may not be able to be performed if a restriction of the programmable controller CPU is applied to the compilation result. (☞ Section 12.9.6)

12.9.2 Performing Online program change in units of files

*1 : Not supported by Basic model QCPU.

Write programs or data in units of files while the programmable controller CPU is in RUN.



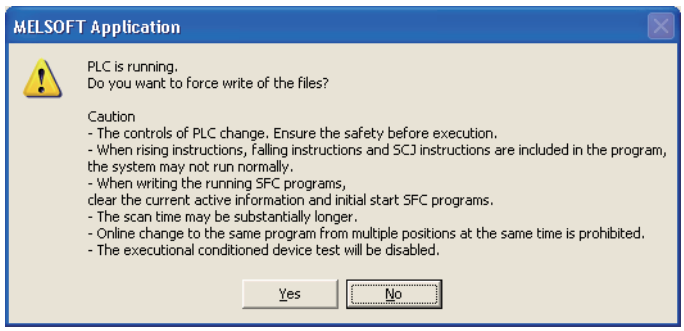


Writes data to programmable controller CPU in units of files.

Operating procedure

- **Select [Online] ⇒ [Write to PLC] for Online program change.**

  The message is displayed.
  Fully understand the message before performing Online program change.
  (Writing to programmable controller CPU ☞ Section 12.1)



Point

● **Data that can be written in units of files with Online program change**
Data such as sequence programs and device comments can be written with Online program change.
The data that can be written with Online program change differs depending on the write target memory.
For details, refer to the following manual.

- User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used

● **Online program change after compiling all programs**
The Online program change cannot be performed after compiling all programs. When the Online program change function is executed after compiling all programs, the programmable controller CPU is remotely stopped and programs are written to the programmable controller CPU.
Compiling all programs changes the device assignment to labels. Therefore, device values set before the program change remain on the device-assigned labels.
By setting the following option, device values in the range set with the "Device/Label Automatic-Assign Setting" function can be automatically cleared to 0 after writing programs to the programmable controller CPU.

- [Tool] ⇒ [Options] ⇒ "When writing to PLC after a Rebuild All operation, clear the device ranges set in the Device/Label Auto-Assign setting to 0."

For not configuring the above setting, as a precautionary measure, after writing programs to the programmable controller CPU, reset the programmable controller CPU, clear all device memories including latches, clear all file registers, then switch the programmable controller CPU to RUN. (☞ Section 17.4)
For the considerations for compiling all programs, refer to the following manuals.

- GX Works2 Version 1 Operating Manual (Simple Project)/(Structured Project)

● **Memory shortage of the programmable controller CPU**
Increase the free space of the programmable controller CPU with the Memory arrangement function.
(☞ Section 17.5)
If the capacity is still insufficient after the operation, switch the programmable controller CPU to STOP and delete unnecessary programs in it. Then, write the programs using the Write to PLC function.
(Delete PLC Data ☞ Section 12.3, Write to PLC ☞ Section 12.1)

● **When performing Online program change to a programmable controller CPU in which the symbolic information has been written**
Symbolic information, which contains the program configuration data such as structures and labels, is data necessary for restoring the data such as structures and labels after reading a program from the programmable controller CPU. (☞ Section 12.1.1)
Therefore, the symbolic information does not affect the operation of the programmable controller CPU, however, write the symbolic information when performing Online program change to a programmable controller CPU to which the symbolic information has been written.
However, note that since it may take a few minutes to write symbolic information, it is recommended not to write symbolic information every Online program change but to write symbolic information after all Online program changes are completed.

● **When performing Online program change to Universal model QCPU**
For Universal model QCPU, the following Online program change cannot be performed.

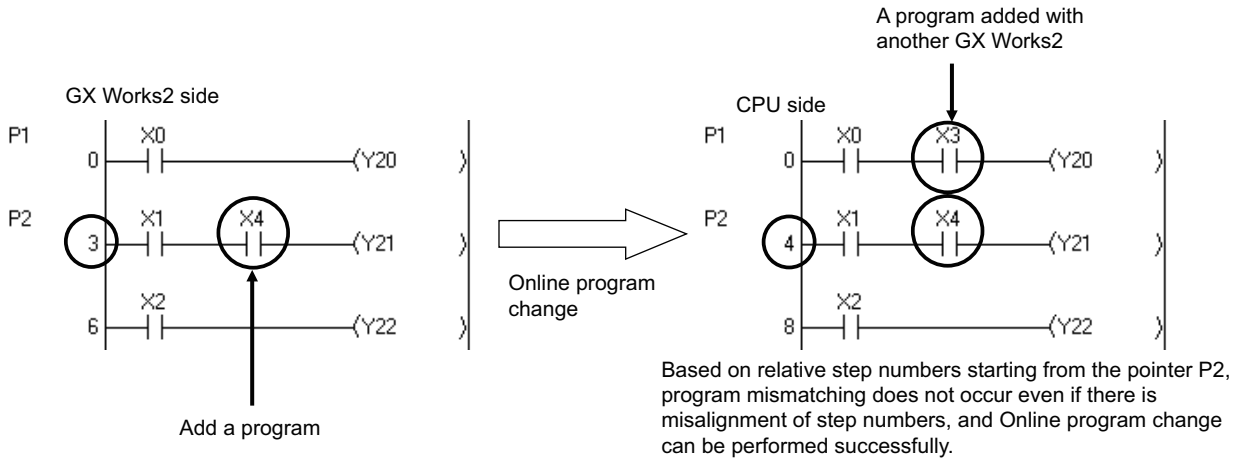
- Online program change performed on a program which does not exist on a programmable controller CPU.
- Online program change performed on a program which is not registered on the <<Program>> tab of PLC parameter.
- Online program change on an SFC program in unit of file.

12.9.3 Online program change starting from pointer

*1 : Not supported by Basic model QCPU function version A.

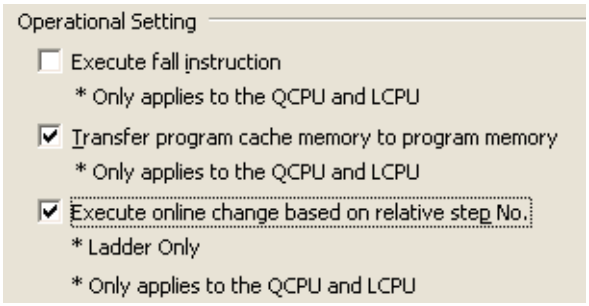
Write data to one file with two or more GX Works2s while the programmable controller CPU is in RUN, using relative step numbers starting from a pointer.
A pointer for Online program change needs to be set in advance.

Example)



Screen display

Select [Tool] ⇒ [Options] ⇒ "Online Change".



Operating procedure

- **Select "Execute online change based on relative step No.".**

  When Online program change is performed, data are written with relative step numbers starting from the pointer.

Point

● **Ladder blocks including a pointer**

When performing Online program change based on relative step numbers starting from the pointer, do not add any line statements to a ladder block including the pointer.
If Online program change of a program with line statements is performed, program mismatching may occur. In this case, perform Read from PLC, and executes normal Online program change.

12.9.4 Considerations for Online program change of rise, fall, or SCJ instruction

Q CPU | L CPU | Remote | Head | FX

The following explains the considerations for Online program change of programs containing the rise, fall, or SCJ instruction.

■ QCPU (Q Mode)/LCPU

● Fall instruction

The fall instruction may be executed even if the executing condition (ON→OFF) in the online-changed ladder programs is not satisfied.
For the types and functions of the fall instructions, refer to the Programming Manual for each CPU.
<Fall instruction examples> PLF, LDF, ANDF, ORF, MEF, FCALLP, and EFCALLP

ON/OFF status of a contact (conduction state at Online program change)	Fall instruction
OFF→OFF	Executed*1
OFF→ON	Not executed
ON→OFF	Executed*1
ON→ON	Not executed

*1 : For details of disabling the fall instruction execution, refer to the following section.
(☞ ■ Disabling the fall instruction in Online program change for QCPU (Q mode)/LCPU)

● Rise instruction

The rise instruction is not executed even if the executing condition (OFF→ON) in the online-changed ladder programs is satisfied.
The rise instruction is executed when the executing condition turns OFF→ON again.
For the types and functions of the rise instructions, refer to the programming manual of each CPU.
<Rise instruction examples> PLS, LDP, ANDP, ORP, and MEP

ON/OFF status of a contact (conduction state at Online program change)	Rise instruction
OFF→OFF	Not executed
OFF→ON	Not executed
ON→OFF	Not executed
ON→ON	Not executed

● SCJ instruction

When the executing condition for the SCJ instruction is ON after writing, the instruction jumps to the specified pointer without waiting for one scan.

■ Disabling the fall instruction in Online program change for QCPU (Q mode)/ LCPU

The following explains methods for avoiding the fall instruction execution when the executing condition (ON→OFF) of the fall instruction for the online-changed program is not satisfied.

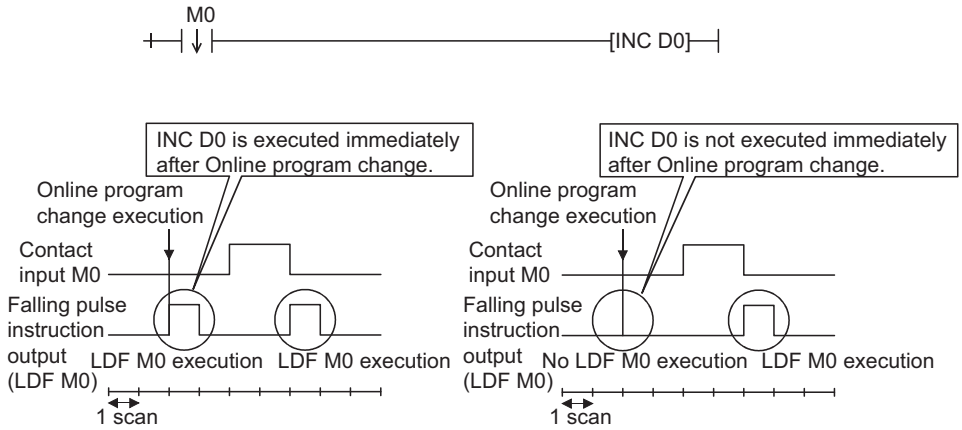
● **Using the option setting (not supported by Basic model QCPU)**

The fall instruction execution can be disabled by selecting [Tool] ⇒ [Options] ⇒ "Online Change" and setting "Execute fall instruction". However, the fall instruction is not executed even if the executing condition (ON→ OFF) is satisfied in the online-changed ladder programs. The fall instruction is executed when the execution condition turns ON→ OFF again.

For information on the QCPU versions that support this function, refer to the User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used.

Example) The following example shows the difference in the executing status depending on the option setting.

<Program example>



"Execute fall instruction" is selected in the [Options].

"Execute fall instruction" is not selected in the [Options].

Point

● **Universal model QCPU/LCPU**

In option setting for Universal model QCPU/LCPU, the item is not selected at default.

● **Replacing the instruction with the EGF instruction**

The fall instruction execution can be disabled with the EGF instruction, which converts the operation result into a pulse.

For details, refer to the following manual.

☞ MELSEC-Q/L Programming Manual (Common Instructions)

■ FXCPU

● Fall instruction

When Online program change of ladder programs which include fall instructions (LDF/ANDF/ORF) is completed, the fall instructions are not executed regardless of the ON/OFF status of their target devices.

Fall instructions (PLF) are also not executed regardless of the ON/OFF status of their operating condition devices.

To execute a fall instruction, turn the status of its target device/operating condition device ON → OFF again.

Performing Online program change of a ladder block including fall instructions (LDF/ANDF/ORF)	
Target devices are ON	**Target devices are OFF**
Contacts of the LDF/ANDF/ORF instructions in the ladder block remain OFF.	

Performing Online program change of a ladder block including the PLF instruction	
Operating condition is ON	**Operating condition is OFF**
Target devices of the PLF instruction in the ladder block do not operate.*1	

*1 : Operate if the operating condition changes ON → OFF before/after Online program change.

● Rise instruction

When Online program change of ladder programs which include rise instructions is completed, the rise instructions are executed if their target devices/operating condition devices are ON.

- Target rise instructions: LDP, ANDP, ORP, and Pulse operation type application instructions (such as MOVP)

Performing Online program change of a ladder block including rise instructions (LDP/ANDP/ORP)	
Target devices are ON	**Target devices are OFF**
Contacts of the LDP/ANDP/ORP instructions in the ladder block turn ON for one scan.	Contacts of the LDP/ANDP/ORP instructions in the ladder block remain OFF.

Performing Online program change of a ladder block including pulse operation type application instructions (such as MOVP)	
Operating condition is ON	**Operating condition is OFF**
The relevant pulse operation type application instruction in the ladder block operates for one scan.	The relevant pulse operation type application instruction in the ladder block does not operate.

Performing Online program change of a ladder block including the PLS instruction	
Operating condition is ON	**Operating condition is OFF**
Target devices of the PLS instruction in the ladder block do not operate.*1	

*1 : Operate if the operating condition changes OFF → ON before/after Online program change.

● **Operation result falling pulse instruction**

When Online program change of ladder programs which include operation result falling pulse instructions (MEF) is completed, the operation result falling pulse instructions are not executed regardless of the satisfied/not satisfied status of their executing condition.

To execute an operation result falling pulse instruction, turn the operation result up to it once ON, and then OFF.

Performing Online program change of a ladder block including the MEF instruction	
Executing condition is satisfied	**Executing condition is not satisfied**
The operation result of the MEF instruction is OFF.	

● **Operation result rising pulse instruction**

When Online program change of ladder programs which include operation result rising pulse instructions (MEP) is completed, the operation result of the operation result rising pulse instruction is ON if the operation result up to it is ON.

Performing Online program change of a ladder block including the MEP instruction	
Operation result up to the MEP instruction is ON	**Operation result up to the MEP instruction is OFF**
The operation result of the MEP instruction is ON.	The operation result of the MEP instruction is OFF.

12.9.5 Considerations of Online program change of SFC programs

Q CPU | L CPU (×) | Remote (×) | Head (×) | FX (×)

The following explains the considerations of Online program change of SFC programs.
For LCPU/FXCPU, the Online program change function does not support SFC programs.

● **Online program change for operation outputs/transition conditions**

Online program change cannot be performed after changing programs of multiple operation outputs/transition conditions.

After correcting the program, perform Online program change for each unit of operation output or transition condition.

● **Online program change of SFC diagrams (For CPU modules which do not support Online program change of SFC blocks)**

When a SFC diagram is edited, perform Online program change in unit of file by selecting [Online] ⇒ [Write to PLC] (☞ Section 12.9.2).

● **Online program change of SFC diagrams (For CPU modules which support Online program change of SFC blocks)**

When a SFC diagram is edited, Online program change can be performed in unit of SFC block by selecting [Compile] ⇒ [Online Program Change].

Restrictions

● **Online program change of SFC blocks**

For details of CPU modules which support Online program change of SFC blocks, and restrictions regarding Online program change of SFC blocks, refer to the following manual.

☞ MELSEC-Q/L/QnA Programming Manual (SFC)

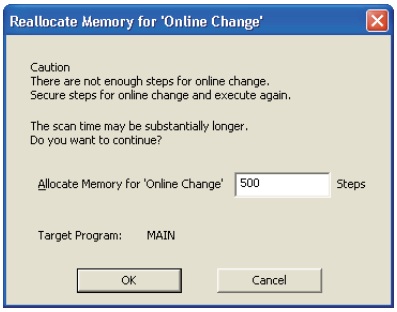
12.9.6 Considerations of each programmable controller series

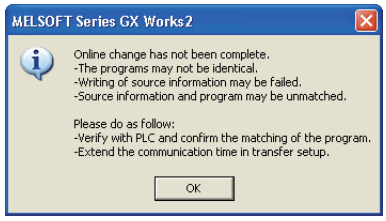
Q CPU L CPU Remote Head FX

The following explains the considerations of Online program change for each programmable controller series.

■ QCPU (Q mode)/LCPU

Item		Description
Online program change to another station		Online program change to another station can be performed within the accessible range set in the connection destination setting. Take extra caution when performing Online program change to another station.
During boot operation		
	Online program change on Redundant CPU	• When the online program change function is performed during a boot operation in the backup mode, the function is performed on the program memory and transfer source drive of both systems (connective system and target system). • When the online program change function is performed during a boot operation in the separate/debug mode, the function is performed on the program memory and transfer source drive of connective system. • When a memory card (ROM) or standard ROM is used, all files on the transfer source drive are deleted and changed to files on the program memory. Set the setting on the <<Boot File>> tab of PLC parameter to transfer all files on the transfer source drive to the program memory.
Deleting a corresponding device from a program		When an instruction is deleted during the OUT instruction execution, or when the device number has been changed and the corresponding device cannot be found in the program, the output status is retained. Perform Online program change after ensuring that sequence programs containing unnecessary coil outputs are OFF.
Online program change while a low-speed execution type program is executed		While a low-speed execution type program is executed, Online program change starts after the program execution. The program execution is suspended during Online program change. However, if "PRG TIME OVER(5010)" keeps occurring while a low-speed execution type program is executed, Online program change cannot be performed. In this case, set the programmable controller CPU to STOP, and increase the constant scan time and low-speed program execution time in PLC parameter, then execute Online program change again.

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Allocating memory for Online program change</td><td>
• When the number of secured steps exceeds the currently set number during Online program change, the following message is displayed. In this case, set a new number of secured steps.
• If '0' is set for the number of secured steps on the following message screen, the area for the exceeding amount from the secured steps is reserved and a sequence program is written.
• The number of secured steps newly set on the following message screen is not displayed on the Program Detail Setting screen of the Write to PLC function.


• The message above is not displayed with Basic model QCPU function version A.
• When re-securing the secured steps for Online program change in the backup mode of Redundant CPU, the steps are secured on the basis of the smaller remaining program memory capacity of either control system or standby system.
Example) When the remaining capacity (step) of the control system is 100 steps and that of the standby system is 50 steps
The maximum number of re-secured steps for Online program change is 50.
</td></tr>
<tr><td>Error during Online program change</td><td>
The following message may be displayed during Online program change. Take corrective action by following the message.


If the above error message is displayed, the program in GX Works2 changes back to the uncompiled status. However, the program on the programmable controller CPU may have been changed.
In this case, compile the GX Works2 program and verify it against the program on the programmable controller CPU to confirm that these programs match. If the programs do not match, write the program to the programmable controller CPU using the Write to PLC function to match them.
</td></tr>
<tr><td>Online program change of a program for which a password is set</td><td>When Online program change is performed to a sequence program for which a password is set, the Disable Password screen is displayed. Unlock the password to perform Online program change.
Online program change is not possible if a password cannot be unlocked.</td></tr>
<tr><td colspan="2">When system is configured with Redundant CPU</td></tr>
<tr><td>Backup mode</td><td>
• Online program change is performed on both systems (connective system and target system).
However, if the target system fails (communication cannot be established with the target system), Online program change is not performed on both systems.
• Online program change cannot be performed in units of files to the program file which does not exist on the programmable controller CPU.
Perform Online program change in units of files after changing the operation mode of the programmable controller CPU to the separate mode or write data to the programmable controller CPU after switching the programmable controller CPU to STOP.
</td></tr>
<tr><td>Separate mode/debug mode</td><td>Online program change is only performed on the programmable controller CPU specified for "Target System" on the Transfer Setup screen.</td></tr>
</table>

Item	Description

Online program change to Universal model QCPU	• Universal model QCPU has option setting of "Transfer program cache memory to program memory" that allows selection whether to transfer the data of program cache memory to program memory after Online program change. (For option setting, ☞ Section 21.2)
	• For Universal model QCPU, when a password is registered/changed while the programmable controller CPU is running, the program memory batch transfer is executed. (☞ Section 12.6)
	• While program memory is being transferred in Universal model QCPU after Online program change, the following functions cannot be executed.
	  • Online program change (ladder program, SFC program, Structured Ladder/FBD program, ST program, function block)*1
	  • Change TC Setting (when "Write changed program to PLC" is selected)*1
	  • Write to PLC (when the target memory is program memory)*1
	  • Program memory batch transfer
	  • Set as default connection
	  • Change PLC Type
	  • Check Parameter

*1 : For Universal model QCPU with a serial number whose first five digits are '12012' or higher, the process of the program memory batch transfer can be canceled. (☞ Section 12.6)

■ FXCPU

Item		Description	
Programmable controller CPUs that support Online program change			
	Model name	FX2C/FXU series (Version No. V2.1 or later)	
		FX0N series (Version No.V1.10 or later) and FX1S/FX1N/FX2N/FX3G/FX3GC/FX3U/FX1NC/FX2NC/FX3UC series	
	Memory type	FX3U/FX3UC series	Built-in RAM or optional FLASH cassette (PROTECT switch OFF)
		FX3G series	Built-in EEPROM or optional EEPROM memory cassette (PROTECT switch OFF)
		FX3GC series	Built-in EEPROM
		FX2N series	Built-in RAM, optional RAM cassette or optional EEPROM cassette (PROTECT switch OFF)
		FX2NC series	Built-in RAM or optional memory board (PROTECT switch OFF)
		FX1NC series	Built-in EEPROM
		FX1S/FX1N series	Built-in EEPROM or optional memory cassette (PROTECT switch OFF)
		FXU/FX2C series	Built-in RAM or optional RAM cassette
		FX0N series	Built-in EEPROM
When using FX0N, FX1S, FX1N, FXU, FX2N, FX1NC, FX2C or FX2NC		• A modified ladder program must not contain added/deleted/changed P and I labels. • A target range for Online program change must not contain I labels	
		• If a ladder program before or after modification contains the C235 to C255 high-speed counter output instruction (OUT instruction) and the application instructions (MNET, ANRD, ANWR, RMST, RMWR, BLK, and MCDE), the ladder program cannot be changed.	
		• A new 1ms retentive timer must not be inserted.	
		• If the number of program steps decrease due to deletion of contacts, coils, application instructions, etc., the number of NOPs equivalent to the number of steps removed are added.	
		• For the application instruction (EXTR) for FX2N and FX2NC, do not perform Online program change during communication (while the instruction is being activated). Communication may stop if Online program change is performed during communication. If the communication stops, switch the programmable controller CPU from STOP to RUN.	
When using FX1S, FX1N, FX1NC, FX2N or FX2NC		Do not perform Online program change on a function block which contains pulse output instructions (PLSY, PLSR, PWM) or positioning instructions (ZRN, PLSV, DRVI, DRVA) after performing any of the following operations. • Changing a program of a ladder block which contains instructions described above. • Changing a program of a ladder block in front or back of a ladder block which contains instructions described above. • Deleting a ladder block in front/back of a ladder block, or adding a ladder block to front/back of a ladder block, which contains instructions described above.	

Item	Description
When using FX3G, FX3U, FX3GC or FX3UC	• A modified ladder program must not contain added/deleted/changed P and I labels. • A target range for Online program change must not contain I labels.
	• If a ladder program before or after modification contains the C235 to C255 high-speed counter output instruction (OUT instruction) and the application instructions (SORT2, TBL, RBFM, WBFM), the ladder program cannot be changed.
	• A new 1ms retentive timer must not be inserted.
	• If the number of program steps decrease due to deletion of contacts, coils, application instructions, etc., the number of NOPs equivalent to the number of steps removed are added.
	• Do not perform Online program change for positioning instructions (DSZR, DVIT, ZRN, PLSV, DRVI, DRVA) while the pulse output instruction is being executed. The pulse output stops if the ladder program is online-changed during the pulse output instruction execution. PLSV instruction [without acceleration or deceleration] stops immediately. DSZR, DVIT, ZRN, PLSV [with acceleration and deceleration] DRVI and DRVA instructions stop after decreasing the speed. When these instructions are stopped as a result of Online program change, deactivate the instructions (OFF) and activate them again (ON).
	• For the IVMC, IVCK, IVDR, IVRD, IVWR, and IVBWR inverter communication instructions, do not perform Online program change during communication (while the instruction is being activated). Communication may stop if Online program change is performed during inverter communication. If communication stops, switch the programmable controller CPU from STOP to RUN.
When using FXU (V3.07 or later) or FX2C*1	• A substitute instruction for a new instruction cannot be inserted or replaced in the program.
	• Even a substitute instruction is already written in a program, the function is disabled due to Online program change.
	• The operations of the CMP, ZCP, MOV, ADD, SUB, MUL, DIV, INC, and DEC instructions can be processed at a high speed when word devices specified by digit or index modification are not set to the data. However, the high-speed processing function is disabled when Online program change or insertion is performed.
	• The OFF execution time of the application instructions for FXU (V3.07 or later) and FX2C can be processed at a high speed. However, the high-speed processing function is disabled when Online program change or insertion is performed. The processing time is approximately 60% of that for FXU (V2.30 or earlier).
When using FXU (V2.1 to V2.30)	• The application instructions and element numbers added to FXU (V3.07 or later) are written to the programmable controller CPU program memory. The programmable controller CPU assumes that these instructions are non-processing instructions and continues its operation. However, when the programmable controller CPU operating status is changed from STOP to RUN, a program is checked and, as the result, the 'PROG-E LED' indicator flashes. If this happens, correct application instructions and element numbers not supported and batch-transfer the correct program.
	• If an element number specified as an operand of application instructions is not supported by FXU (V2.1 to V2.30), the instruction is written to the programmable controller CPU program memory as it is. In this case, an element number range over operation error occurs. The programmable controller CPU assumes that these instructions are non-processing instructions and continues its operation. However, when the programmable controller CPU operating status is changed from STOP to RUN, a program is checked and, as the result, the "PROG-E LED" indicator flashes. If this happens, batch-transfer the program with the correct operand set to application instructions.
When using FX0N (V1.10 or later)	• If a written element number is not supported by FX0N, the message "The changed program contains an instruction or device not supported for Online program change. Online program change operation is disabled for this program" is displayed, and the program change is stopped.
	• The pulse executing type application instruction is not available for FX0N. If this instruction is written, the message "Write failure" is displayed, and the program change is stopped.

Item	Description
When using FX0N, FX1S, FX1N, FXU, FX2N, FX3U, FX1NC, FX2C, FX2NC or FX3UC (earlier than V2.00)	• Ladder program change is possible for one ladder block at a time and the number of program steps after editing (adding/deleting) must be within 127 (including an NOP immediately after the ladder block and excluding the end circuit). To change programs with more than 127 steps, use the Batch-transfer function.
When using FX3G, FX3U, FX3GC or FX3UC (V2.00 or later)	• Ladder program change of multiple ladder blocks at a time is possible and the changes can be written with Online program change. However, the number of the program steps from the start ladder block to the end circuit after editing must be within 256 steps (including unchanged ladder programs). To change programs with more than 256 steps, use the Batch-transfer function.
When using FX3U/FX3UC (V3.00 or later)	• Online program change can be performed only when the protection status (validated or invalidated) of the block password setting for "Read-protect the execution program" is the same as the programmable controller CPU of the online change target.

*1 : Each deteriorated function can be recovered by switching the programmable controller CPU from STOP to RUN after Online program change.

12.10 Calculating Memory Size

Q CPU | L CPU | Remote | Head | FX

This section explains how to calculate a memory size required when data in a user-created project is written to the programmable controller CPU.

12.10.1 Offline calculation and Online calculation

There are two ways to calculate the memory size: the offline calculation and the online calculation.
(☞ Section 12.10.3)
For FXCPU, only the offline calculation is supported.
(☞ Section 12.10.4)

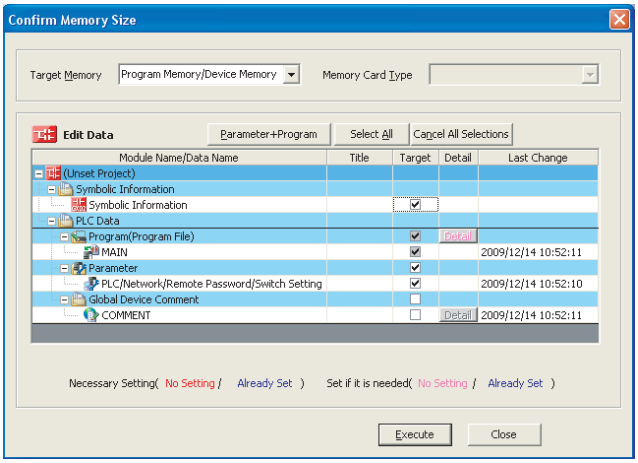
- **Offline calculation**
  Displays the size of available memory if data are written to the programmable controller CPU after its memory is initialized by such as the PLC memory format function.
  In the system file memory size entry field, enter the system file size acquired by the online calculation.
- **Online calculation**
  Displays the size of available memory if selected files are actually written to the programmable controller CPU.
  Regarding data written on the programmable controller CPU, the exact size of available memory can be confirmed.
  This function is available when GX Works2 is capable of communicating with the programmable controller CPU.

12.10.2 Setting target data for memory size calculation (QCPU (Q mode)/LCPU)

Set the target data for memory size calculation.

Screen display

Select [Tool] ⇒ [Confirm Memory Size].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Target Memory/IC Card Type*1		Set the memory of which the size is to be calculated, and memory card type. For details of the memory card application, refer to the following manuals. ☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection) ☞ MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
File list		–
	Target	Select data of which the size is to be calculated.

*1 : For High-speed Universal model QCPU, when the standard RAM is selected for "Target Memory", "Extended SRAM cassette type" is displayed.

2. **Click the** Execute **button.**

The result of memory size calculation is displayed. (☞ Section 12.10.3)

Screen button

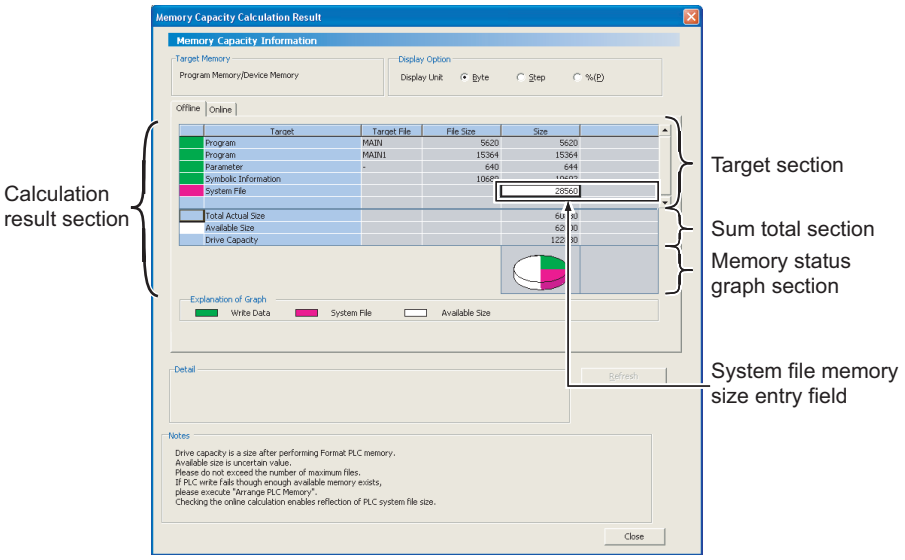
For the buttons on the screen, refer to Section 12.1.

12.10.3 Confirming result of memory size calculation (QCPU (Q mode)/LCPU)

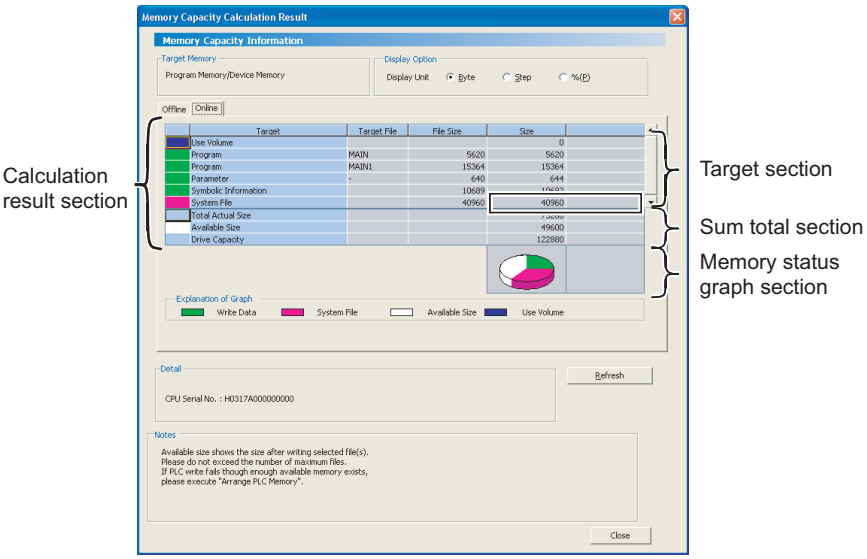
Display the result of memory size calculation. Additionally, the offline calculation and online calculation can be switched each other.

Screen display

Select [Tool] ⇒ [Confirm Memory Size] ⇒ Execute **.**
<Offline calculation>



<Online calculation>



Display contents

Item			Description
Target Memory			Display the target memory and IC card type selected on the Confirm Memory Size screen.
Display Option			Select the unit (Byte/Step/%) used for displaying the file size and memory size.
<<Offline>>/<<Online>>			Switch the result display between the offline calculation and online calculation. The result of the offline calculation is displayed just after the execution of the memory size calculation. For High Performance model QCPU, the <<Online>> tab is not displayed when "Target Memory" is 'Memory Card (Flash)'/'Standard ROM'. For Universal model CPU, the <<Online>> tab is not displayed when "Target Memory" is 'Memory Card (Flash)'.
Calculation result section			–
	Target section		Display the size of the data selected on the Confirm Memory Size screen in units of files.
		System file memory size entry field (Offline calculation only)	Enter the memory size of system files. The default value is "0" at the offline calculation. Enter the memory size when using system files. When the exact memory size is required, it can be confirmed by the online calculation. The memory size of system files may differ depending on target memory.
	Sum total section		Display the calculation result according to conditions of the target memory, IC card type, and files specified in the Confirm Memory Size screen.
	Memory status graph section		Display the calculation result in a circle graph. It is displayed in red when there is no available memory.
Detail			Display the detailed information of the result of the memory size calculation.

Screen button

For the buttons on the screen, refer to Section 12.1.

Point

● **File size of symbolic information**
The symbolic information in a project (with labels) is compressed every compilation. Since date information is added every time, the memory size may vary even though the symbolic information itself is not changed.

● **File size units for programmable controller CPUs**
Memory of a programmable controller CPU is occupied by file size units. Therefore, the required memory size may be larger than the actual file size.
For details of file size units, refer to the following manuals.
☞ User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used

● **Memory size required for parameters and system files**
Parameters/system files consist of multiple files.
The memory size required to store parameters/system files is the total of memory areas occupied by each files.

Display example of "System File" (for Q12HCPU with a serial number whose first file digits are "04122")

<Sampling trace>
File size : 2422 bytes
Memory size : 3072 bytes
<Error history data>
File size : 5472 bytes
Memory size : 6144 bytes
↓
<Display of "System File">
File size : 7894 bytes
Memory size : 9216 bytes

The following table shows files included in parameters and system files.

File		Parameter
Parameters	Parameter file	PLC parameter, network parameter, and redundant parameter
	Boot file	Created when the boot file setting is configured.
	Remote password	Created when the remote password setting is configured.
System files	Sampling trace file	For details of each file, refer to the following manuals. ☞ User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used
	Error history file	
	Local device	
	User setting system area	An area specified when the programmable controller CPU memory is formatted. (For formatting programmable controller CPU memory, ☞ Section 17.3)
	PLC user data	User-optional data
	Graphic data for PX Developer	User-created graphic data

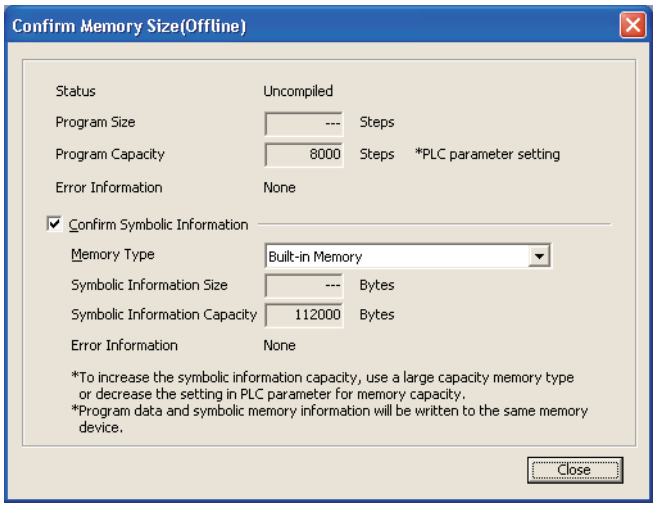
● **Memory capacity**
The memory capacity may be displayed smaller than it really is.

12.10.4 Confirming result of memory size calculation (FXCPU)

Display sizes and capacities of program and symbolic information calculated offline.
Displayed values are values when the program and parameters are written to the programmable controller CPU.

Screen display

Select [Tool] ⇒ [Confirm Memory Size].



Display contents

Item		Description
Status		Display compilation status. "---" is displayed for Simple projects (without labels).
Program Size		Display the number of current program steps. "---" is displayed when the program is uncompiled.
Program Capacity		Display the value set for "Program Capacity" on the <<Memory Capacity>> tab of PLC parameter of the project.
Error Information		Display error information regarding the program size and capacity.
Confirm Symbolic Information*1		Select this to calculate the symbolic information size and capacity.
	Memory Type	Select a memory type used on the programmable controller CPU. The symbolic information capacity increases/decreases according to the memory type.
	Symbolic Information Size	Display the current symbolic information size in byte unit. "---" is displayed when the program is uncompiled.
	Symbolic Information Capacity	Display the symbolic information capacity in byte unit. The symbolic information capacity increases/decreases according to the memory type used on the programmable controller CPU or the memory capacity set in the PLC parameter.
	Error Information	Display error information regarding the symbolic information size and capacity.

*1 : This item is displayed only for FX3U and FX3UC projects with labels.

Point

● **File size of symbolic information**
For projects with labels, the symbolic information is compressed each time the memory capacity is calculated or data is written to the programmable controller CPU. Since date information is included when the symbolic information is compressed, its memory capacity may change even though the symbolic information has not been changed.

12.10.5 Considerations of calculating memory size

The following explains the considerations of calculating memory size.

1) Memory size calculation using the offline calculation
A memory size of system files may differ depending on the target memory.
Confirm a memory size of system files using the online calculation and enter the value in the system file memory size entry field.
Without using the value calculated by the online calculation, an accurate result may not be ensured.

2) Memory size calculation using the online calculation
When lower-case characters are used for data names in a project, the memory size may not be calculated correctly.
To calculate the memory size correctly, change the characters of data names to upper-case characters to match the data names on the programmable controller CPU.

3) Limit of the number of files
The number of files that can be stored on the programmable controller CPU is limited, however, the memory size calculation ignores the limit.
Set target data so that the number of files including those stored on the programmable controller CPU is less or equal to the limit.
For the number of files which can be stored on a programmable controller CPU, refer to the following manuals.
☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection)
☞ MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

4) Specifying a range of file registers
At the online calculation, when a range smaller than that of file registers written on the programmable controller CPU is specified for the target data of the memory size calculation, the difference from the written file registers is displayed as "Use Volume".

5) Calculating a memory size of a Flash card/standard ROM
For High Performance model QCPU, a memory size of a Flash card/standard ROM can be confirmed only using the offline calculation.
For Universal model QCPU, a memory size of a Flash card can be confirmed only using the offline calculation. A memory size of a standard ROM can also be confirmed using the online calculation.
To confirm a memory size required when writing data using the export to ROM function, select 'Program Memory' for "Target Memory".

6) When data cannot be written to the programmable controller CPU
When data cannot be written to the programmable controller CPU despite enough available memory, perform Arrange PLC Memory to secure consecutive free memory areas. (Arrange PLC Memory ☞ Section 17.5)

7) Calculating a memory size of an ATA card
For Q2MEM-8/16/32MBA, confirm an accurate drive capacity using the online calculation.
Depending on the versions of the Q2MEM-8/16/32MBA and CPU module, the offline calculation may be based on a drive capacity smaller than it really is.

8) Calculating a memory size of an SD memory card
The calculation of the memory size of an SD memory card is different between the online calculation and the offline calculation.
For the offline calculation, the memory size is calculated based on the size of the SD memory card selected for "Memory Type".
For the online calculation, the memory size is calculated based on the size of the SD memory card inserted on the programmable controller CPU.

12.11 Writing/Reading Data to/from Memory Cards

This section explains the functions for writing/reading data to/from a memory card installed on a personal computer.
If a memory card cannot be installed to a programmable controller CPU, the data can be written to/read from the memory card on a personal computer by using this function.

For the system configuration and other information to use a memory card on a personal computer, refer to Section 2.4.

For writing/reading data when the memory card is installed to a programmable controller CPU, refer to ☞ Section 12.1.

Point

- **Formatting memory cards**
  Format the memory card to be used on the programmable controller CPU by selecting [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory] in GX Works2.
  If a memory card is formatted using the function such as Windows® format function it may not be used on the programmable controller CPU.
- **PLC user data**
  The PLC user data in the memory card installed on a personal computer cannot write/read to/from GX Works2 directly. Write/read the data using the application such as Windows® Explorer.
  For writing/reading the PLC user data in the memory card installed to a programmable controller CPU, refer to Section 12.5.
- **Reading intelligent function module data**
  To read intelligent function module data, create the intelligent function module data in the project in advance.
  If the intelligent function module data that match the data in the memory card or the image data do not exist, the data are read as data of an unsupported module.

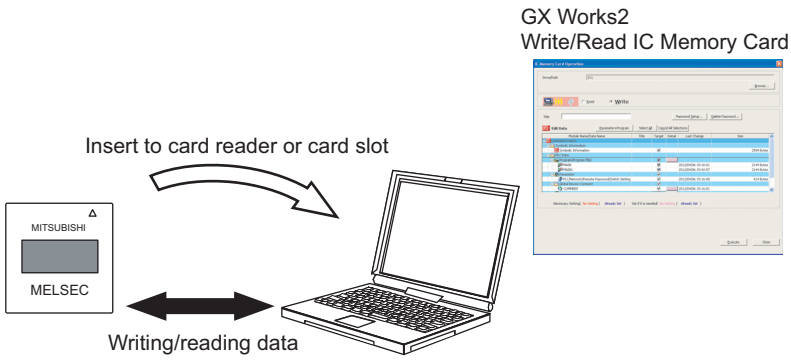
12.11.1 Writing/reading data to/from ATA/SRAM/SD memory cards

Q CPU *1 | L CPU *2 | Remote | Head | FX

*1: Universal model QCPU (except for Q00UJ, Q00U, Q01U) only

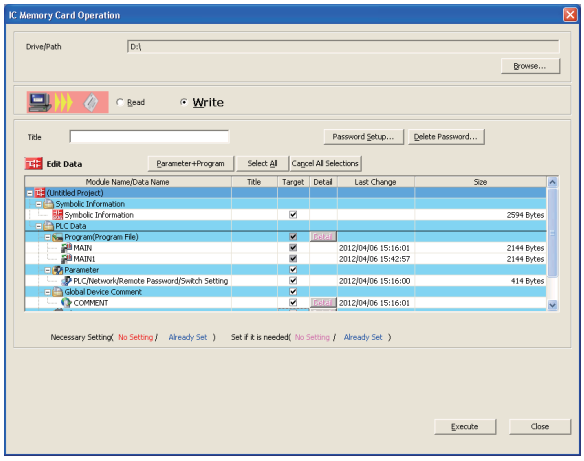
*2: Not supported by L02S.

Write/read data in a memory card (ATA card, SRAM card or SD memory card) installed on a personal computer to/from GX Works2.



Screen display

Select [Tool] ⇒ [IC Memory Card] ⇒ [Write IC Memory Card]/[Read IC Memory Card].
<Screen for writing IC memory card>



Operating procedure

1. **Set the items on the screen.**

Item	Description
Drive/Path	Click the Browse... button and select a drive on the Browse for Folder screen. If a folder is selected, it cannot be used on a programmable controller CPU.
Title	Enter title of the target memory when writing data to the IC memory card. Display the title of the target memory when reading data from the IC memory card.
Edit Data (Write IC Memory Card only)	Select data to be written from the data list. Display the data list of the open project. (☞ Section 12.1)
IC Memory Data (Read IC Memory Card only)	Select data to be read from the data list. Display the data list of the project in the memory card. (☞ Section 12.1)

2. Click the Execute button.

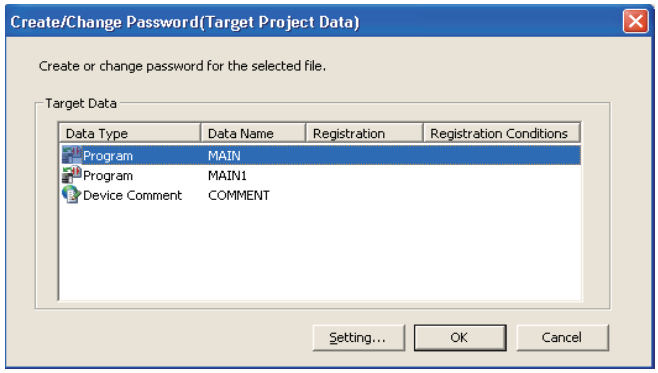
For the Write IC Memory Card function, the specified data are written to the memory card.
For the Read IC Memory Card function, the specified data are read from the memory card.

Screen button

● Password Setup...

Opens the screen to set a password to a specified data when writing data to an IC memory card.
The set password is validated after data are written to the IC memory card.
For details of setting a password, refer to the following sections.
For QCPU (Q mode) (except for High-speed Universal model QCPU) ☞ Section 13.2.1
For High-speed Universal model QCPU and LCPU ☞ Section 13.3.1

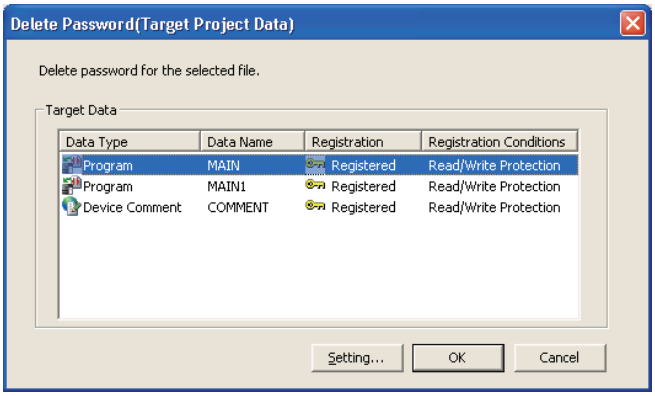
< Create/Change Password (Target Project Data) screen (For QCPU (Q mode)) >



● Delete Password...

Opens the screen to cancel a set password when writing data to an IC memory card.
The set password is canceled after data are written to the IC memory card.
For details of canceling a password, refer to the following sections.
For QCPU (Q mode) (except for High-speed Universal model QCPU) ☞ Section 13.2.2
For High-speed Universal model QCPU and LCPU ☞ Section 13.3.2

< Delete Password (Target Project Data) screen (For QCPU (Q mode)) >



Point

● **Canceling a password**

The password cancellation on the Delete Password screen can only be performed while the project is opened after the password is set.
To cancel the password after the project is reopened, overwrite the data by writing data to the IC memory card without setting a password.

■ Considerations when reading program files with the Read IC Memory Card function

Perform the following operations when reading program files with the Read IC Memory Card function.

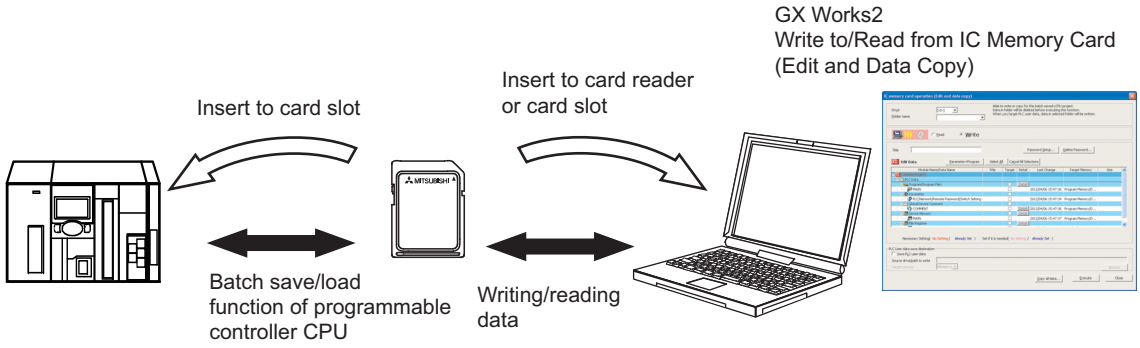
- **When parameters are written to the IC memory card along with the program files**
  Read parameters along with the program files.
- **When parameters are not written to the IC memory card along with the program files**
  Before reading the program files, open the project at the time of writing data to the IC memory card. Import the parameters used to write data to the IC memory card from the programmable controller CPU.

12.11.2 Writing/reading data to/from SD memory cards (batch save/batch load function)

Q CPU | L CPU *1 | Remote | Head | FX

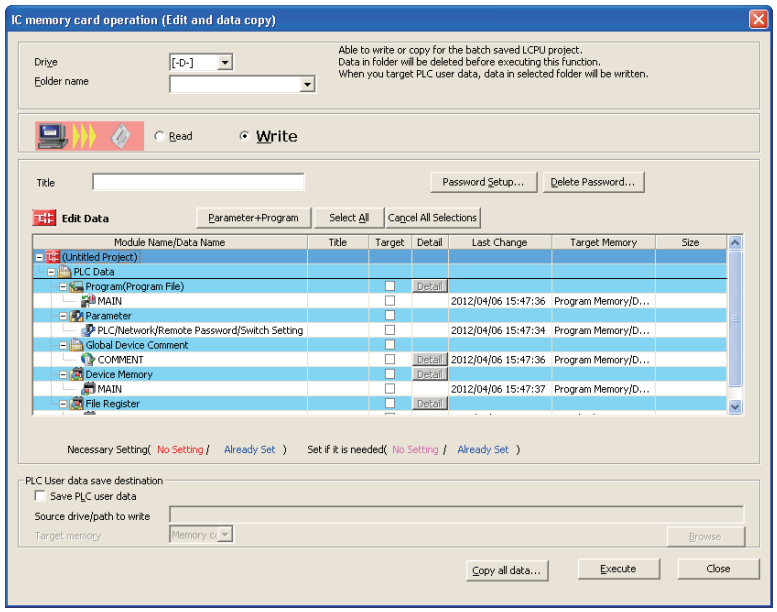
*1 : Not supported by L02S.

Read project data saved on an SD memory card with the batch save function of programmable controller CPU, or copy all data to a personal computer.
Write project data to an SD memory card in the format which can be used for the batch load function of programmable controller CPU.
For the batch save/batch load function, refer to the following manual.
☞ MELSEC-L CPU Module User's Manual (Function Explanation, Program Fundamentals)



Screen display

Select [Tool] ⇒ [IC Memory Card] ⇒ [Write to IC Memory Card (Edit and Data Copy)]/[Read from IC Memory Card (Edit and Data Copy)].
<For writing IC memory card (edit and data copy)>



Operating procedure

1. Set the items on the screen.

Item	Description
Drive	Select a drive to write/read data.
Folder name	A folder in the "SaveLoad" folder on the specified drive is displayed. Select a folder to write/read data.
Title	For the write to IC memory card (edit and data copy) function, enter a title of the folder selected for "Folder name". For the read from IC memory card (edit and data copy) function, the title of the folder selected for "Folder name" is displayed.
Edit Data (for Write to IC Memory Card (Edit and Data copy))	Display the data list of the open project. Select data to be written from the data list.
IC Memory Data (for Read from IC Memory Card (Edit and Data Copy))	Display the data list of the project in the memory card. Select data to be read from the data list.
PLC user data save destination	–
Save PLC user data	For the write to IC memory card (edit and data copy) function, select this to write PLC user data. For the read from IC memory card (edit and data copy) function, select this to copy PLC user data to a personal computer.]
Source drive/path to write (for Write to IC Memory Card (Edit and Data Copy))	Click the Browse... button and select a drive/path on which PLC user data to be written on the IC memory card are saved.
Source drive/path to read (for Read from IC Memory Card (Edit and Data Copy))	Click the Browse... button and select a drive/path to save user data.
Target memory (for Write to IC Memory Card (Edit and Data Copy))	Specify a save destination for PLC user data selected for "Source drive/path to write".

2. Click the Execute button.

For the write to IC memory card (edit and data copy) function, the specified data are written to the memory card.

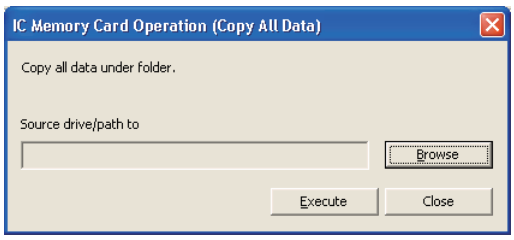
For the read from IC memory card (edit and data copy) function, the specified data are read from the memory card.

Screen button

For the buttons on the screen, refer to Section 12.1 and Section 12.11.1.

● Copy all data...

Copies all data saved with the batch save function of programmable controller CPU on the IC memory card to the copy destination specified for "Source drive/path to".



Point

● **Considerations for writing data to SD memory card**

Data are written after all files in the target folder are deleted.

12.12 Reading Data of Local Devices

Q CPU *1 | L CPU ✗ | Remote ✗ | Head ✗ | FX ✗

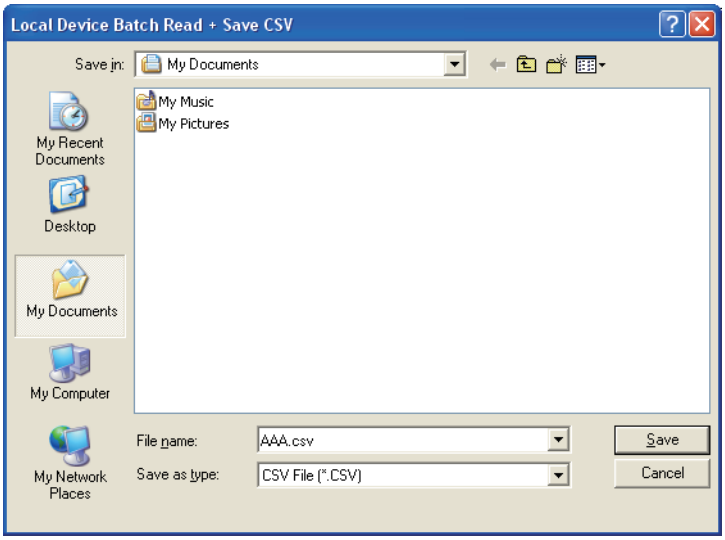
*1 : Universal model QCPU (except for Q00UJ) with a serial number whose first five digits are "12012" or higher only

This section explains how to read local device data from the programmable controller CPU and save the data on a personal computer in CSV format.

Operating procedure

1. **Select [Online] ⇒ [Local Device Batch Read + Save CSV].**

   The Local Device Batch Read + Save CSV screen is displayed.



2. **Enter a name of the file to be saved.**

3. **Click the** Save **button.**

   The data of local devices are saved on the personal computer.

■ Formatting CSV files

Saved CSV files are displayed as shown below when they are opened by Excel.

Example) The following tables show the settings of this example.

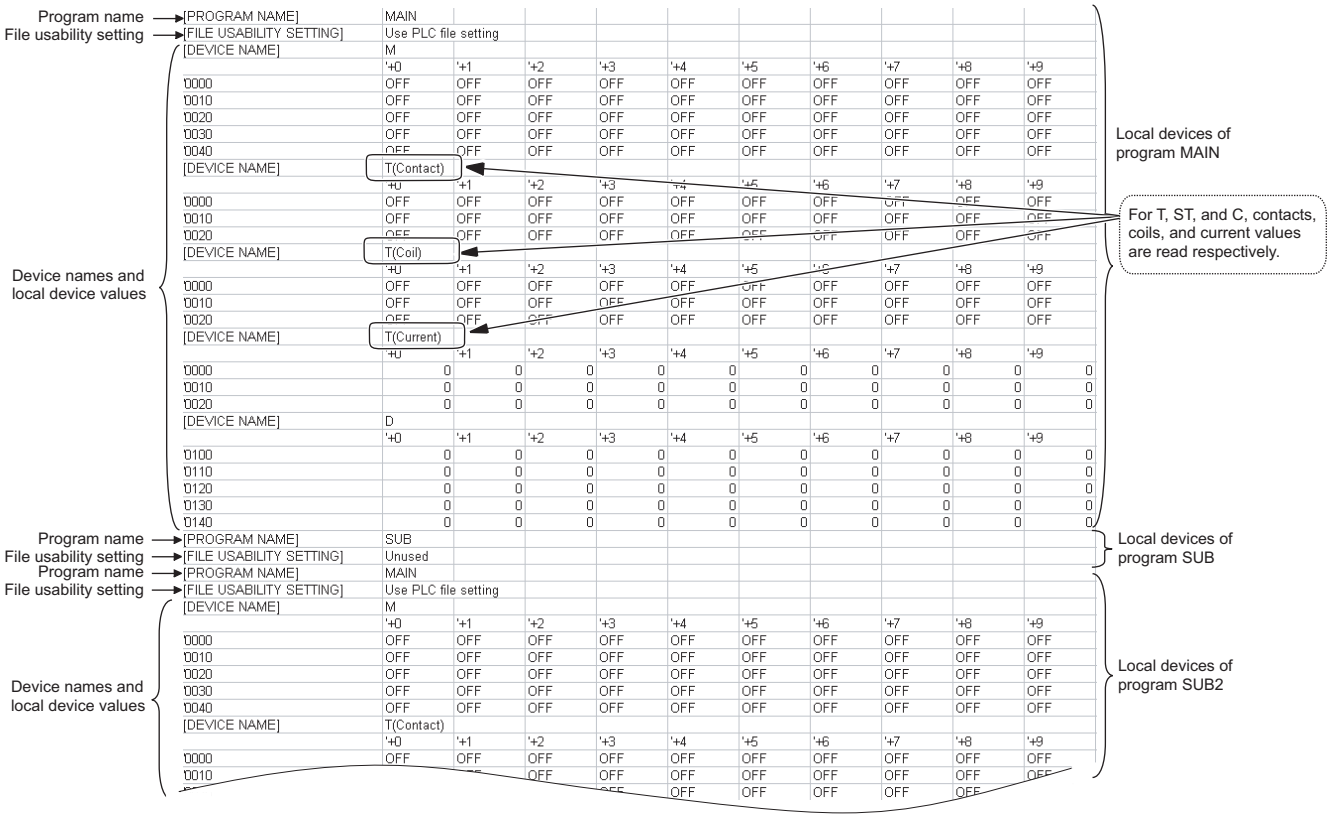
- Setting for programs and file usability

Program name	File usability setting
MAIN	Based on PLC file settings
SUB	Not used
SUB2	Based on PLC file settings

- Setting for local devices

Device name	Device range
M	0 to 49
T	0 to 29
D	100 to 149

<CSV file>



13 PROTECTING DATA

This chapter explains the function for protecting the project data and the programmable controller CPU data against such as falsification and leak.

13.1 Functions to Protect Data

Q CPU L CPU Remote Head FX

The function to protect data differs according to the target data or target CPU.
The following table shows the list of functions for protecting data.
For "(Structured)" indicated in the Reference column, refer to the following manual.
☞ **GX Works2 Version 1 Operating Manual (Structured Project)**

○: Supported ×: Not supported

Target data	Target CPU					Function	Reference
	QCPU (Q mode)	LCPU	Remote I/O module	Communication head module	FXCPU		
Project data	○	○	○	○	○	Security	Section 4.10
	○*1	×	×	×	×	Soft Security Key Management	Section 4.11
POU	○	○	×	×	○	Block password setting	Section 4.12
User library	○	○	×	×	○	Library password setting	(Structured)
Programmable controller CPU data	○	○	○	○*2	×	Remote password setting	Section 6.4
	○*3	×	×	×	×	Password	Section 13.2
	○*1	○	×	×	×		Section 13.3
	×	×	×	×	○	Keyword	Section 13.4
	○*1	×	×	×	×	Soft Security Key Management	Section 13.5
	×	×	×	×	○*4	Execution program protection (block password setting)	Section 4.12

*1 : For High-speed Universal model QCPU only
*2 : Supported by CC IE Field head module only.
*3 : Not supported by High-speed Universal model QCPU.
*4 : For FX3U/FX3UC version 3.00 or later only

■ Differences of functions

The following table shows the differences of functions for protecting data.

○: Applicable ×: Not applicable

Item	Function					
	Security	Soft Security Key Management	Block password setting	Library password setting	Remote password setting	Password/ Keyword
Protect project data	○	○	○	×	×	×
Protect programmable controller CPU	×	○	×	×	○	○
Protect library data	×	×	×	○	×	×
Limit users who can disable the protection function	○	○	○	×	○	○
Limit personal computers that can disable the protection function	×	○	×	×	×	×
Transfer the security setting to another personal computer	×	○	×	×	×	×

13.2 Registering/Changing Password (QCPU (Q mode))

*1 : Not supported by Universal model high-speed type QCPU.

This section explains how to register a password to protect data in QCPU (Q mode).
For registering/changing passwords on Universal model high-speed type QCPU, refer to Section 13.3.

To register a password, connect GX Works2 to a programmable controller CPU in advance.
Project data cannot be protected by using this function. Use the project security function to protect the project data. (☞ Section 4.10)

Point

● **Password management**
Keep passwords in a secure place.
If a registered password is lost, initialize the programmable controller CPU using the PLC memory format function (☞ Section 17.3) and write the project to the programmable controller CPU.

● **Registering a password**
- Set a password with 4 characters. For usable characters, refer to "Explanation of Registration Conditions" on the Input Password screen.
- A password can be set for the following items.
  - Program
  - Device comment
  - Device initial value

● **Registering/changing/canceling passwords when writing data to an IC memory card**
When the Create/Change Password screen or the Delete Password screen is opened from the IC Memory Card Operation screen, passwords of data in the project are registered/changed/canceled. Therefore, "Target Memory" is not displayed.

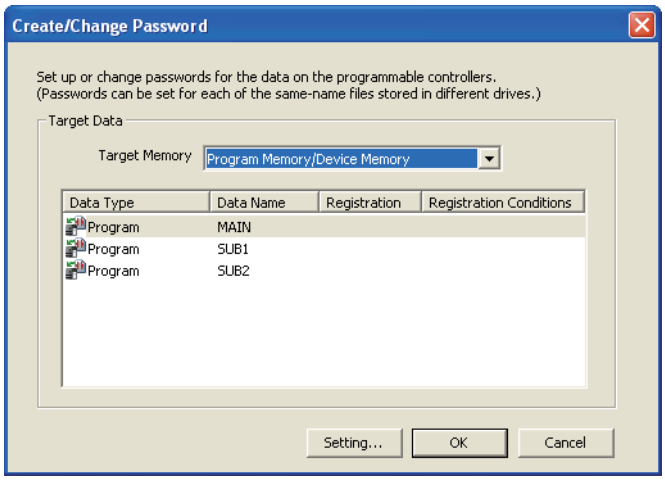
● **Unlocking password**
When files with the same name exist on the different drives (such as program memory and standard RAM), the password which is unlocked first is applied to the other file.
- With the same password
  When one file is unlocked, the other file with the same name is also unlocked.
- With the different password
  Enter the password to unlock the file with the same name.

13.2.1 Registering/changing password

Register a password to project data on a programmable controller CPU.

Screen display

Select [Online] ⇒ [Password/Keyword] ⇒ [New].



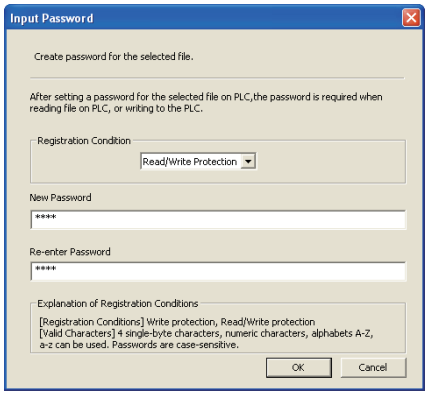
Operating procedure

1. **Select the target memory.**

2. **Select the target data for registering/changing a password in the data list.**

3. **Click the** Setting... **button.**

   The Input Password screen is displayed.



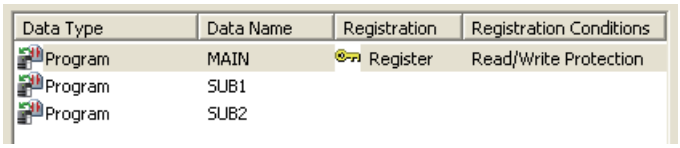
4. **Set the items on the screen.**

Item		Description
Registration Condition		Select a condition for password check.
	Read/Write Protection	Select this to check a password when data are read in addition to "Write Protection".
	Write Protection	Select this to check a password when data are written to the programmable controller CPU.
New Password		Enter a new password or a password after change.
Re-enter Password		Enter the new password again for confirmation.

5. **Click the** OK **button.**

   The screen returns to the Create/Change Password screen.

   Symbol is appended to the data for which a password is registered.



6. **Click the** OK **button.**

   The password is registered or changed for the data on the programmable controller CPU.

Point

● Registering a password

- A password can be set to multiple data by holding the Shift or Ctrl key and selecting the data in the data list.
- A password set to data in the transfer source memory of boot operation remains set in the transfer destination memory.

● Universal model QCPU

For Universal model QCPU, when a password is registered/changed while the programmable controller CPU is running, the program memory batch transfer is executed. (☞ Section 12.6)

● Changing a password

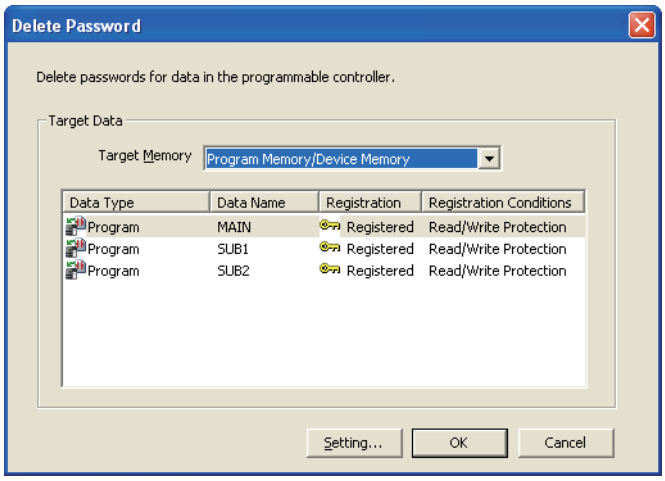
If a password has been already set for the selected data, the Disable Password screen is displayed. Enter the old password to unlock the password.

13.2.2 Canceling password

Cancel the password set to the data on the programmable controller CPU.

Screen display

Select [Online] ⇒ [Password/Keyword] ⇒ [Delete].

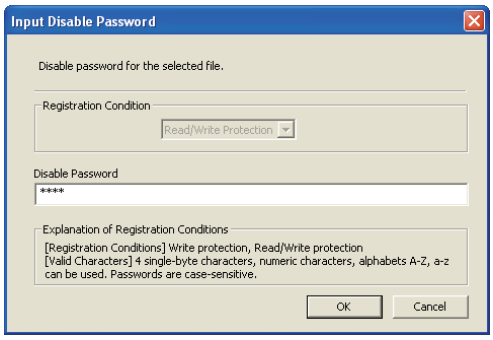


Operating procedure

1. **Select data whose password is to be canceled in the data list.**

2. **Click the Setting... button.**

   The Input Disable Password screen is displayed.
   This screen is not displayed when the password has already been canceled.



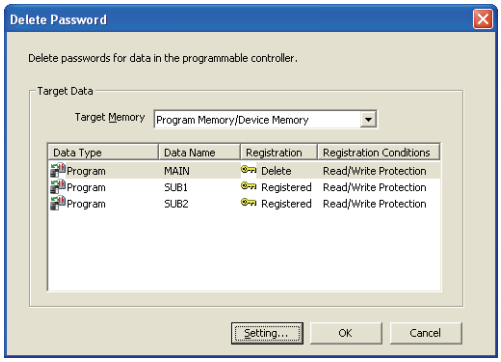
3. **Enter the password set to the data.**

4. **Click the OK button.**

   The screen returns to the Delete Password screen.

5. **Click the OK button.**

   The password set to the data on the programmable controller CPU is canceled.

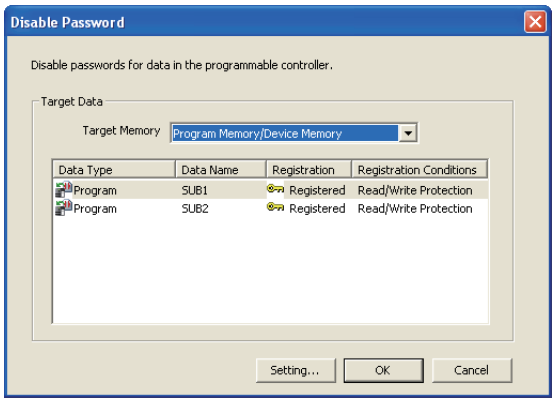


13.2.3 Unlocking password temporarily

Unlock a password temporarily, set to the data on the programmable controller CPU, by authenticating it.
When the password is unlocked, the corresponding data on the programmable controller CPU can be accessed freely until the project is closed.
This function does not cancel the password set for the data on the programmable controller CPU.

Screen display

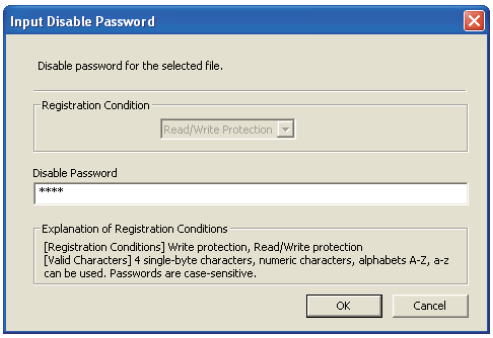
Select [Online] ⇒ [Password/Keyword] ⇒ [Disable].



Operating procedure

1. **Select data whose password is to be temporarily unlocked in the data list.**

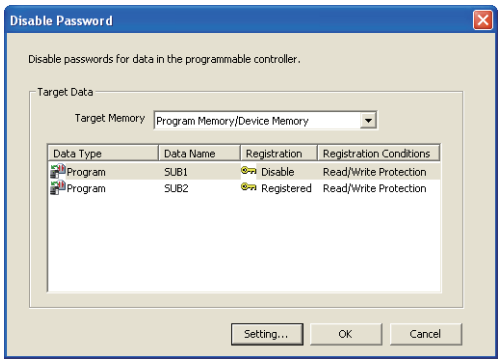
2. **Click the Setting... button.**
   The Input Disable Password screen is displayed.



3. **Enter the password set to the data.**

4. **Click the OK button.**
   The screen returns to the Disable Password screen.

5. **Click the OK button.**
   The password set to the data on the programmable controller CPU is temporarily unlocked.



13.3 Registering/Changing Password (File Password 32)

*1 : High-speed Universal model QCPU only

This section explains how to register a password to protect data in High-speed Universal model QCPU/LCPU.
To register a password, connect GX Works2 to a programmable controller CPU in advance.
Project data cannot be protected by using this function. Use the project security function to protect the project data. (☞ Section 4.10)

Point

● **Password management**
Keep passwords in a secure place.
If a registered password is lost, initialize the programmable controller CPU using the PLC memory format function (☞ Section 17.3) and write the project to the programmable controller CPU.

● **Registering a password**
- Set a password with the number of characters between 4 and 32. For usable characters, refer to "Explanation of Registration Conditions" on the Input Password screen.
- A password can be set for the following items.
  - Symbolic information
  - Program
  - PLC parameter, network parameter
  - Device comment
  - Device initial value

● **Registering/changing/canceling passwords when writing data to an IC memory card**
When the Create/Change Password screen or the Delete Password screen is opened from the IC Memory Card Operation screen, passwords of data in the project are registered/changed/canceled. Therefore, "Target Memory" is not displayed.

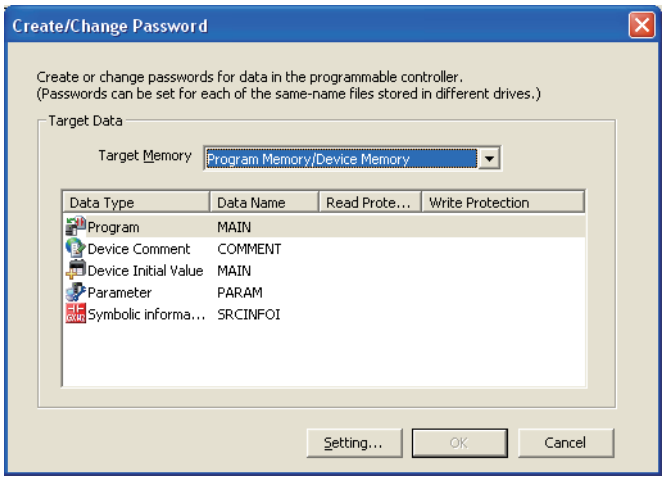
● **Unlocking password**
When files with the same name exist on the different drives (such as program memory and standard RAM), the password which is unlocked first is applied to the other file.
- With the same password
  When one file is unlocked, the other file with the same name is also unlocked.
- With the different password
  Enter the password to unlock the file with the same name.

13.3.1 Registering/changing password

Register a password to project data on a programmable controller CPU.

Screen display

Select [Online] ⇒ [Password/Keyword] ⇒ [New].

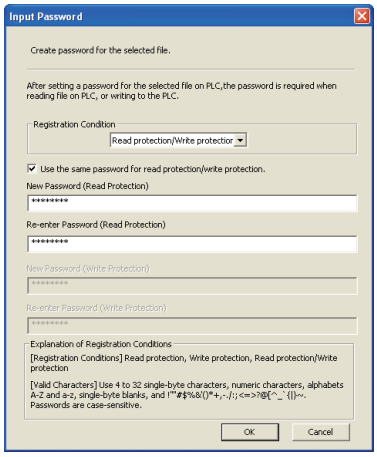


Operating procedure

1. **Select the target memory.**

2. **Select the target data for registering/changing a password in the data list.**

3. **Click the** Setting... **button.**
   The Input Password screen is displayed.



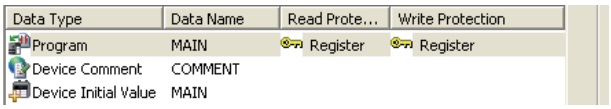
4. Set the items on the screen.

Item		Description
Registration Condition		Select a condition for password check.
	Read protection	Select this to check a password when data are read from the programmable controller CPU.
	Write protection	Select this to check a password when data are written to the programmable controller CPU.
	Read protection/Write protection	Select this to check a password when data are written in addition to "Read protection".
Use the same password for read protection/write protection		Select this to use the same password for the read protection and write protection when 'Read protection/Write protection' is selected in "Registration Condition".
New Password (Read Protection)		Enter a new password or a password after change. The password enables the read protection.
Re-enter Password (Read Protection)		Enter the new password again for confirmation.
New Password (Write Protection)		Enter a new password or a password after change. The password enables the write protection. This item cannot be set when "Use the same password for read protection/write protection" is selected.
Re-enter Password (Write Protection)		Enter the new password again for confirmation. This item cannot be set when "Use the same password for read protection/write protection" is selected.

5. Click the OK button.

The screen returns to the Create/Change Password screen.

Symbol is appended to the data for which a password is registered.



6. Click the OK button.

The password is registered or changed for the data on the programmable controller CPU.

Point

● **Registering a password**

- A password can be set to multiple data by holding the Shift or Ctrl key and selecting the data in the data list.
- A password set to data in the transfer source memory of boot operation remains set in the transfer destination memory.

● **Changing a password**

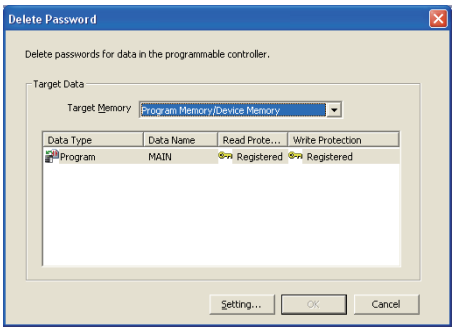
If a password has been already set for the selected data, the Disable Password screen is displayed. Enter the old password to unlock the password.

13.3.2 Canceling password

Cancel the password set to the data on the programmable controller CPU.

Screen display

Select [Online] ⇒ [Password/Keyword] ⇒ [Delete].

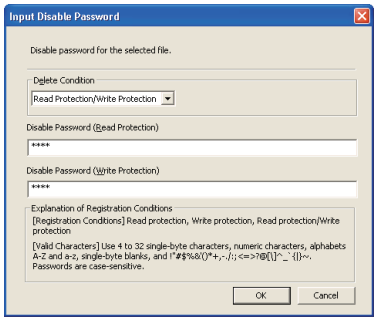


Operating procedure

1. **Select data whose password is to be canceled in the data list.**

2. **Click the Setting... button.**

   The Input Disable Password screen is displayed.
   This screen is not displayed when the password has already been canceled.



3. **Set the items on the screen.**

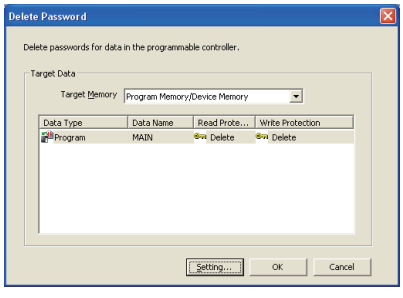
Item	Description
Delete Condition	Select the condition for password cancellation when the password registration condition of the data selected is "Read Protection/Write Protection".
Disable Password (Read Protection)	Enter the password set to the data.
Disable Password (Write Protection)	

4. **Click the OK button.**

   The screen returns to the Delete Password screen.

5. **Click the OK button.**

   The password set to the data on the programmable controller CPU is canceled.

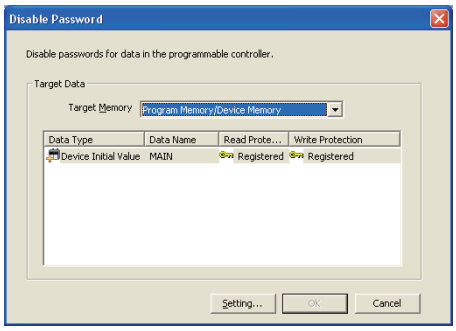


13.3.3 Unlocking password temporarily

Unlock a password temporarily, set to the data on the programmable controller CPU, by authenticating it.
When the password is unlocked, the corresponding data on the programmable controller CPU can be accessed freely until the project is closed.
This function does not cancel the password set for the data on the programmable controller CPU.

Screen display

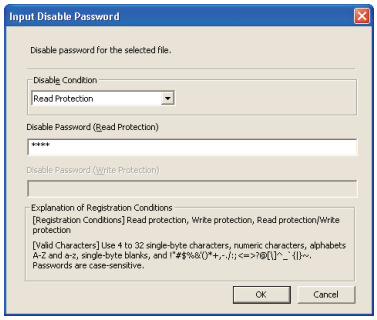
Select [Online] ⇒ [Password/Keyword] ⇒ [Disable].



Operating procedure

1. **Select data whose password is to be temporarily unlocked in the data list.**

2. **Click the Setting... button.**
   The Input Disable Password screen is displayed.



3. **Set the items on the screen.**

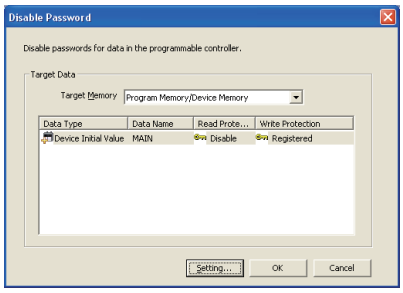
Item	Description
Disable Condition	Select the condition for password unlock when the password registration condition of the data selected is "Read Protection/Write Protection".
Disable Password (Read Protection)	Enter the password set to the data.
Disable Password (Write Protection)	

4. **Click the [OK] button.**

The screen returns to the Disable Password screen.

5. **Click the [OK] button.**

The password set to the data on the programmable controller CPU is temporarily unlocked.



13.4 Registering/Changing Keyword (FXCPU)

Q CPU L CPU Remote Head **FX**

This section explains how to register a keyword to protect data in FX series programmable controller CPU.
To register a keyword, connect GX Works2 to a programmable controller CPU in advance.
Project data cannot be protected using this function. Use the project security function to protect the project data. (☞ Section 4.10)
For the FX series versions which support this function, refer to the user's manual of the programmable controller CPU to be used.

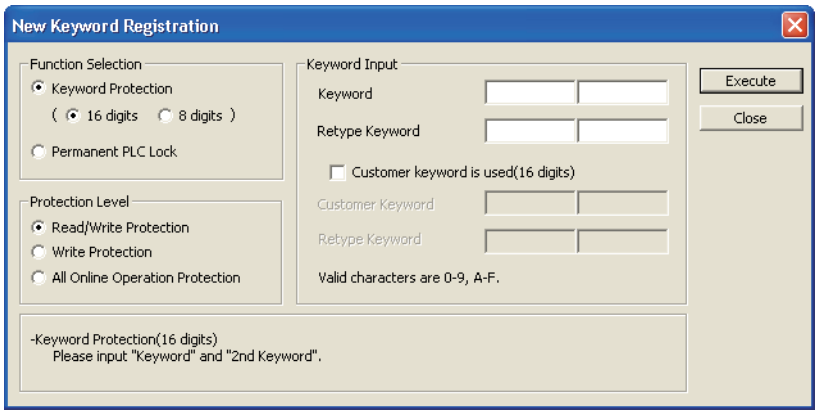
Point

● **Keyword management**
Do not lose the keywords.
If a registered keyword is lost, initialize the programmable controller CPU using the PLC memory clear function (☞ Section 17.4) and write the project to the programmable controller CPU.

13.4.1 Registering/changing keyword

Screen display

Select [Online] ⇒ [Password/Keyword] ⇒ [New].



Operating procedure

1. Select the function. (FX3G, FX3GC, FX3U, and FX3UC only)

Select either the terminable limitation or permanent limitation.

Item	Description
Keyword Protection	Set the keyword for the limitation. Limitation can be canceled.
Permanent PLC Lock	Setting the keyword is unnecessary. Limitation cannot be canceled.

2. For "Keyword Protection", set "Keyword Input".

For FX3G, FX3GC, FX3U and FX3UC, select '16 digits' or '8 digits'.

Item		Description
Keyword (8 digits)		Set 8 digits using characters 0-9 and/or A-F. This item can be set when "Keyword Protection" is selected and '8 digits' is selected. The Read/Write Protection is available.
Keyword (16 digits)		Set 16 digits using characters 0-9 and/or A-F. This item can be set when "Keyword Protection" is selected and '16 digits' is selected. This item is supported only by FX3G, FX3GC, FX3U, and FX3UC. The protection level can be selected from "Read/Write Protection", "Write Protection", and "All Online Operation Protection".
	Customer Keyword*1	Set 16 digits using characters 0-9 and/or A-F. This item can be set when "Keyword (16 digits)" is set and "Customer keyword is used (16 digits)" is selected. This item is supported only by FX3G, FX3GC, FX3U, and FX3UC. The protection level is the same as that for "Keyword (16 digits)".

*1 : Set this item combining with "Keyword (16 digits)" as necessary. The customer keyword can be disabled temporarily but it cannot be changed or canceled.

3. Select the protection level.

For the programmable controller CPU other than FX3G, FX3GC, FX3U and FX3UC, "Protection Level" is fixed to 'Read/Write Protection'.

Item	Description
Read/Write Protection	Limit the read, write, and verify operations.
Write Protection	Limit the write operation.
All Online Operation Protection	Limit the read, write, verify, and device monitor operations.

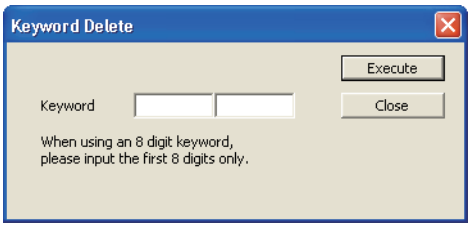
4. Click the Execute button.

13.4.2 Canceling keyword

Cancel the keyword set to the data on the programmable controller CPU.

Screen display

Select [Online] ⇒ [Password/Keyword] ⇒ [Delete].



Operating procedure

1. **Enter the keyword being registered.**

   Enter only the first 8 digits when 'Keyword Protection (8 digits)' is registered. The customer keyword cannot be canceled.

2. **Click the Execute button.**

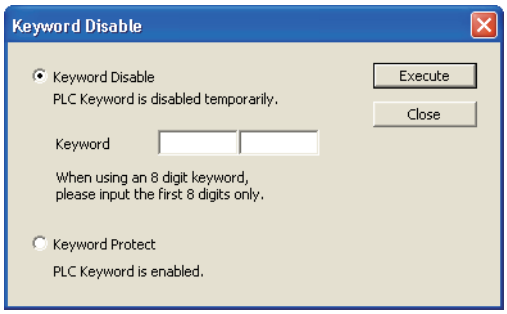
   The keyword registered on the programmable controller CPU is canceled.

13.4.3 Unlocking keyword temporarily

Unlock a password temporarily, set to the data on the programmable controller CPU, by authenticating it.
When the keyword is unlocked, the corresponding data on the programmable controller CPU can be accessed freely until the project is closed.
This function does not cancel the keyword set for the data on the programmable controller CPU.

Screen display

Select [Online] ⇒ [Password/Keyword] ⇒ [Disable].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Keyword Disable		Select this to unlock the keyword temporarily.
	Keyword	Enter the keyword registered to the programmable controller CPU. Enter only the first 8 digits when 'Keyword Protection (8 digits)' is registered. When the customer keyword is registered, the keyword can be disabled by entering the customer keyword.*1
Keyword Protect*1		Select this to get the keyword unlocked status to the locked status.

*1 : FX3G, FX3GC, FX3U, and FX3UC only

2. **Click the Execute button.**

The selected operation (Keyword Disable/Keyword Protect) is executed.

13.5 Locking with Security Key

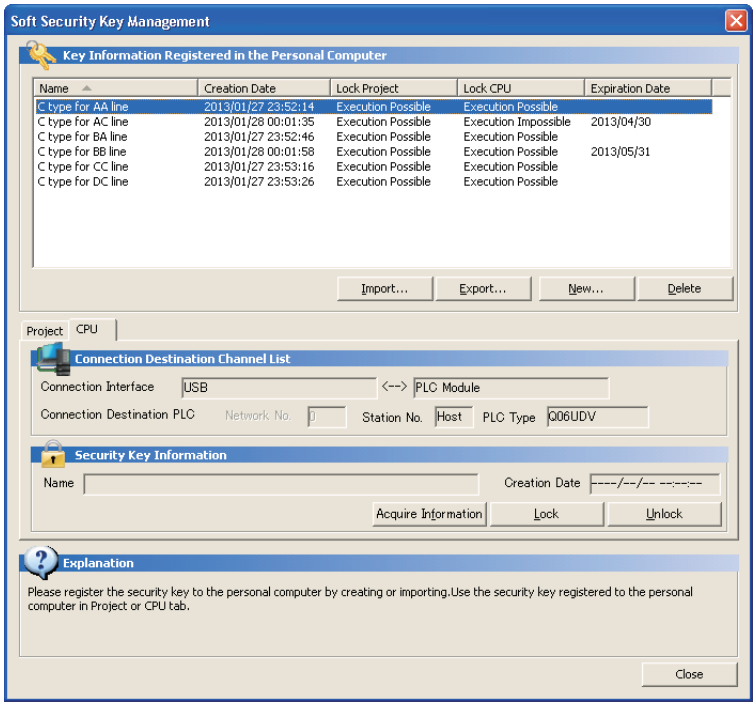
Q CPU *1 | L CPU | Remote | Head | FX

*1 : High-speed Universal model QCPU only

This section explains how to lock the programmable controller CPU with a security key and limit the access.
For creating, importing/exporting, or deleting security keys, refer to Section 4.11.

Screen display

Select [Online] ⇒ [Soft Security Key Management]



Display contents

Item	Description
Key Information Registered in the Personal Computer	Display the information of selected security key. (☞ Section 4.11.1)
<<CPU>>	Display the screen to lock/unlock the programmable controller CPU.
Connection Channel List	–
Connection Interface	Display the interface on the personal computer and the interface on the programmable controller CPU connected to the personal computer.
Network No.	Display the network number of the connection destination.
Station No.	Display the station number of the connection destination.
PLC Type	Display the programmable controller type of the connection destination.
Security Key Information	–
Name	Display the name of the security key which is used to lock the programmable controller CPU.
Creation date	Display the date of creation of the security key which is used to lock the programmable controller CPU.
Explanation	Display the information when the cursor is placed on the button on the screen.

Operating procedure

1. **Select the security key to lock the programmable controller CPU from "Key Information Registered in the Personal Computer".**

2. **Click the [Lock] button.**

   The programmable controller CPU is locked with the selected security key.

Screen button

- [Acquire Information]

  Acquires the security key information of the programmable controller CPU in the connection destination and displays it.

- [Unlock]

  Unlocks the locked programmable controller CPU.

Point

- **Considerations when locking programmable controller CPU**

  The programmable controller CPU cannot be locked with the security key when it is in RUN status. Set the programmable controller CPU to STOP status to lock it with the security key.

MEMO

14 MONITORING

This chapter explains how to monitor the execution status of the programmable controller CPU connected to the personal computer.

14.1 Monitoring Function

Q CPU L CPU Remote Head FX

This section explains how to monitor programs.
The monitoring function is a function used to check operating status of a programmable controller CPU by connecting a personal computer and a programmable controller CPU.

14.1.1 Starting/stopping monitoring

The monitoring function can be started/stopped by any of the following menus.

- [Online] ⇒ [Monitor] ⇒ [Start Monitoring (All Windows)]/[Stop Monitoring (All Windows)]
- [Online] ⇒ [Monitor] ⇒ [Start Monitoring]/[Stop Monitoring]
- [Online] ⇒ [Watch] ⇒ [Start Watching]/[Stop Watching]

The menu to start/stop monitoring differs according to the monitoring type.
The following table shows the monitoring type to which the execution is applied by each menu.
For (Simple), (Structured), and (Intelligent) indicated in the Reference column, refer to the following manuals respectively:

(Simple) … GX Works2 Version 1 Operating Manual (Simple Project)
(Structured) … GX Works2 Version 1 Operating Manual (Structured Project)
(Intelligent) … GX Works2 Version 1 Operating Manual (Intelligent Function Module)

○: Applicable ×: Not applicable

Monitoring type	Menu			Reference
	Start/Stop monitoring (All windows)	Start/stop monitoring*1	Start/stop watching*1	
Program monitoring	○	○	×	Section 14.2 (Simple) (Structured)
Device/buffer memory batch monitoring	○	○	×	Section 14.3
Program list monitoring	○	×*2	×	Section 14.4
Interrupt program monitoring	○	×*2	×	Section 14.5
SFC all block batch monitoring	○	○	×	(Simple)
Watch	○	×	○	Section 14.6
Intelligent function module monitoring	○	×	○	(Intelligent)

*1 : Applied to active windows.
*2 : The monitoring can be started/stopped by the buttons on the screen.

Point

● **When monitoring multiple projects using a single personal computer**

- When monitoring multiple projects using a single personal computer, and if an communication error occurs in one of the projects, the monitoring speed of the other projects may become slow.
  The operation will be back to normal when the error message displayed in the project in which the communication error occurred is closed.
- When monitoring multiple projects using a single personal computer, the following functions may not be performed normally.
  - Program list monitoring
  - Interrupt program list monitoring
  - Monitoring condition setting
  - Monitoring stop condition setting
  - Scan time measurement

● **Monitoring devices that cannot be monitored**

When devices that cannot be monitored are specified in a program monitoring, watch, or device/buffer memory batch monitoring execution, the monitoring result is displayed as "FFFFH(-1)".

14.1.2 Monitoring status

Monitoring status is displayed during monitoring on the work window.
Monitoring status is hidden when monitoring all items is stopped.

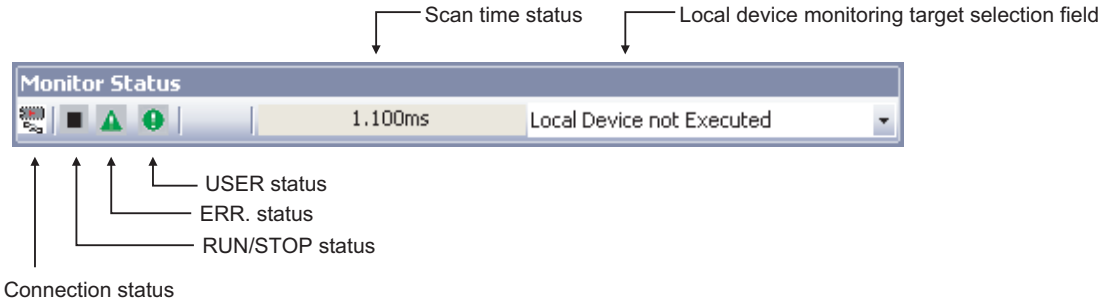
Screen display

At the start of monitoring

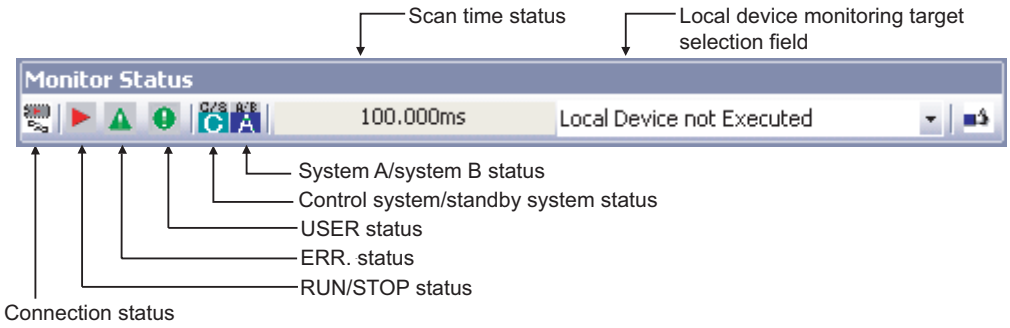
● **When connected to a programmable controller CPU**

Items displayed on the screen differ according to the programmable controller type. The following are the examples of the Monitor Status screen for High Performance model QCPU and Redundant CPU.

<High Performance model QCPU>



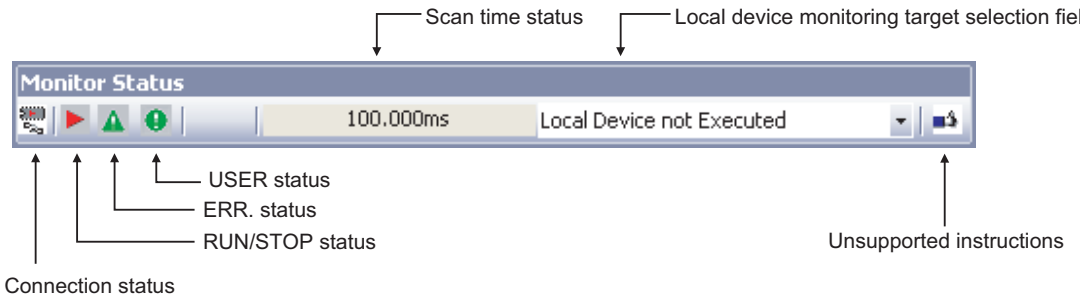
<Redundant CPU>



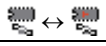
● **During simulation**

Items displayed on the screen differ according to the programmable controller type. The following is the example of the Monitor Status screen for High Performance model QCPU.

<High Performance model QCPU>



Display contents

Item		Description
Connection status		Display the connection status between a programmable controller CPU and personal computer in which the simulation function is started.
		When connected to a programmable controller CPU During simulation
RUN/STOP status		Display the programmable controller CPU status operated by the key switch on the programmable controller CPU or the remote operation from GX Works2.
		RUN
		STOP
	 *1	STEP-RUN
ERR. status		Display the ERR. LED status of the programmable controller CPU. The PLC Diagnostics screen is displayed when the icon is clicked. PLC diagnostics screen (☞ Section 18.1)
		ERR. is OFF.
		ERR. is ON.
		ERR. is flashing.
USER status*1,*2		Display the USER LED status of the programmable controller CPU. The PLC Diagnostics screen is displayed when the icon is clicked. PLC diagnostics screen (☞ Section 18.1)
		USER is OFF.
		USER is ON.
		USER is flashing.
Control system/standby system status		Display the control system/standby system status of Redundant CPU.
		Control system
		Standby system
		Unknown
System A/system B status		Display the system A/system B status of Redundant CPU.
		System A
		System B
		Unknown
Status of device test with execution condition*1		Display the status of the device test with execution condition.
		Flash when data on the programmable controller CPU and one being edited are not identical. The registered information on the programmable controller CPU is read out when the monitor is restarted. Return to ON when the both data are identical.
Execution program status*3		RAM, EPROM, EEPROM (FX3UC : FLROM)
Scan time status		Display the maximum scan time of the monitor target programmable controller CPU. For QCPU (Q mode), the display is given in units of 0.1ms.
Local device monitoring target selection field*1,*2		Select the name of the program for which local device monitoring is performed. If "Auto setting" is selected, the local devices in the program on the active screen are automatically monitored. Not displayed by Q00UJ.

Item		Description
Unsupported instructions		Display whether an unsupported instruction exists or not when the simulation function is executed. The Instructions Unsupported by Simulation screen is displayed when the icon is clicked. Checking unsupported instruction/device (☞ Section 15.3)
		Unsupported instruction exists.
		Unsupported instruction does not exist.

*1 : Not supported by FXCPU.
*2 : Not supported by communication head module and remote I/O module.
*3 : Not supported by QCPU (Q mode)/LCPU.

Point

● **Operation of the PLC Memory Clear function during the monitoring of local devices**
When the "Clear Device's whole Memory" operation is executed during the monitoring of local devices, local devices are cleared in the programs selected in the 'local device monitoring target selection field'.

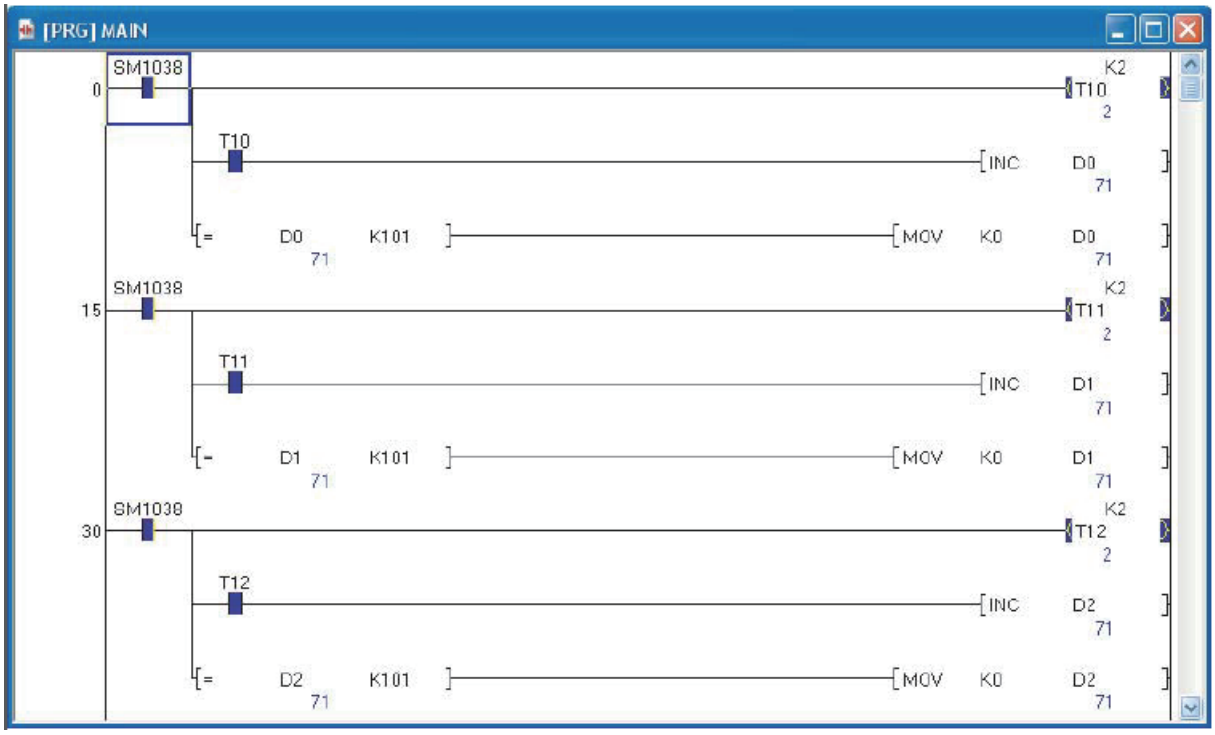
14.2 Monitoring Programs

Q CPU | L CPU | Remote | Head | FX

This section explains how to monitor the execution status of the programmable controller CPU.
The monitored items differ according to the programming language used.
For details, refer to the following manuals.
☞ GX Works2 Version 1 Operating Manual (Simple Project)
☞ GX Works2 Version 1 Operating Manual (Structured Project)

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).



14.3 Batch Monitoring Devices/Buffer Memory

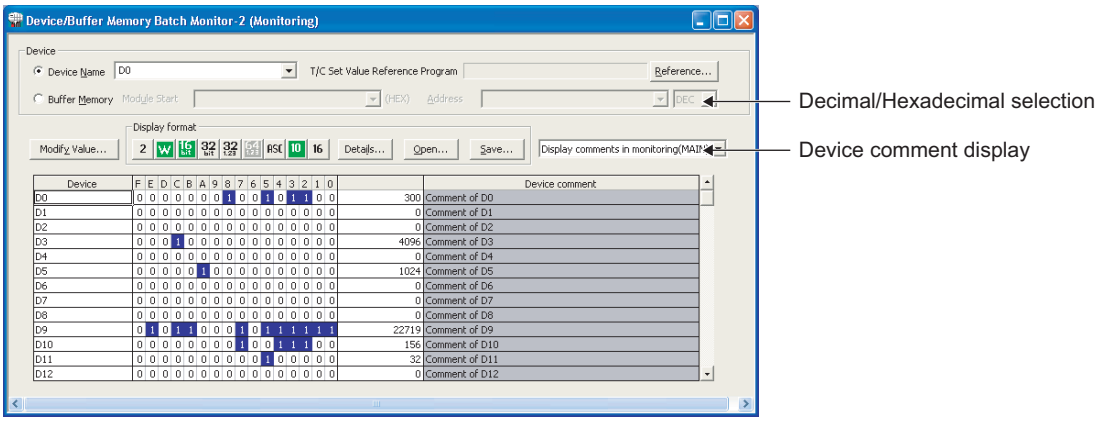
Q CPU L CPU Remote Head FX

This section explains how to monitor devices/buffer memory in batch.

For device batch monitoring, specify the target devices.
For buffer memory batch monitoring, specify the address of the intelligent function module.

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Device/Buffer Memory Batch] ( ).



Operating procedure

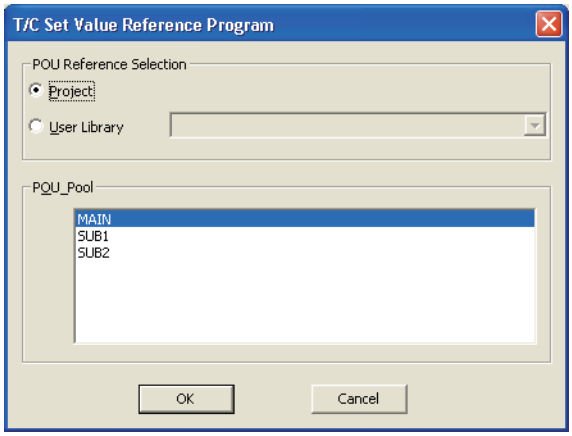
- **Set the items on the screen.**

Item		Description
Device		Select this to monitor devices in batch.
	Device Name	Select this to enter the name of a device to be monitored in batch.
	T/C Set Value Reference Program*1	Specify the program whose setting value is to be displayed when monitoring timer (T) or counter (C) in batch.
Buffer Memory		Select this to monitor buffer memory in batch.
	Module Start	Enter the start I/O number of the intelligent function module in hexadecimal number. • For FXCPU Enter the block number of the special extension device. (0 to 7) FX0N-3A, FX2N-2AD and FX2N-2DA cannot be the target of the buffer memory monitor. • For Multiple CPU system configuration Specify the programmable controller CPU to be monitored. CPU No. 1: 3E00, CPU No. 2: 3E10, CPU No. 3: 3E20, CPU No. 4: 3E30
	Address	Enter the address of buffer memory to be monitored in decimal or hexadecimal.
	Decimal/Hexadecimal selection	Select the address input format (decimal or hexadecimal).
Display format		Switch the display format of the monitoring values. Save and read batch monitor display format files.
Device comment display		Select whether to display device comments. When displaying device comments, device comments referred in the selected program are displayed.

*1 : Not supported by communication head module and remote I/O module.

Screen button

● Reference... **(Not supported by remote I/O module)**
Displays the T/C Set Value Reference Program screen.



Operation

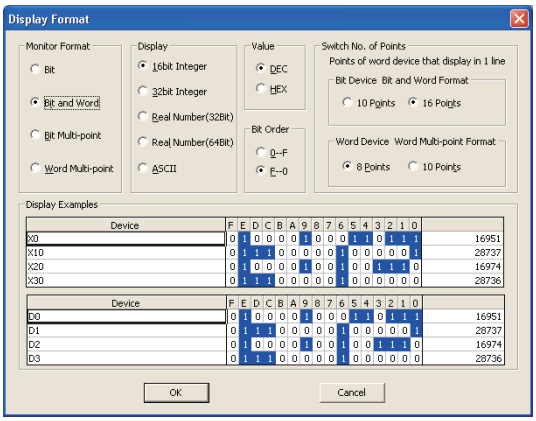
- **Set the items on the screen.**

Item		Description
Program Reference Selection/POU Reference Selection		Set the reference of POU. In Simple project, selection is fixed at "Project".
	Project	Select this to reference a program in the project.
	User Library	Select this to reference a POU in the user library by clicking ▼.
Program/POU_Pool		Select the POU to be referenced. Projects selected by "POU Reference Selection" or POU in "User Library" is displayed. Items to be displayed are as shown below. Simple project : Program file Structured project : POU

● Modify Value...
Displays the Modify Value screen. (☞ Section 16.1)

● Details...

Displays the Display Format screen.
Set the monitor display format.
The screen displays the settings as an example. Setting is possible while confirming the display.



Operation

- **Set the items on the screen.**

Item		Description
Monitor Format		Select the monitor format.
	Bit	Select this to monitor bits in unit of one point.
	Bit and Word	Select this to monitor both bits and words in unit of one point.
	Bit Multi-point	Select this to monitor bits in unit of multiple points.
	Word Multi-point	Select this to monitor words in unit of multiple points.
Display		Select the data type of the value stored in word device/buffer memory when "Bit and Word" or "Word Multi-point" is selected for "Monitor Format".
	16bit Integer	Select this to monitor in 16-bit integer.
	32bit Integer	Select this to monitor in 32-bit double word (signed) integer.
	Real Number (32Bit)	Select this to monitor in 32-bit (single-precision real number).
	Real Number (64Bit)	Select this to monitor in 64-bit (double-precision real number).
	ASCII	Select this to monitor in character string.
Value		Select either decimal or hexadecimal display format for 16-bit or 32-bit integer.
	DEC	Select this to monitor in decimal number.
	HEX	Select this to monitor in hexadecimal number.
Bit Order		Select the alignment sequence of bits to be monitored when "Bit and Word" or "Bit Multi-point" is selected for "Bit".
	0-F	Select this to monitor bit information from the left to the right on the screen. This method is appropriate for monitoring bit devices.
	F-0	Select this to monitor bit information from the right to the left on the screen. This method is appropriate for monitoring word devices or buffer memory.
Switch No. of Points*1		Select the number of points to be monitored per row.
	16 Points (8 Points)	Select this to monitor 8 points of word device or 16 points of bit device per row.
	10 Points (10 Points)	Select this to monitor 10 points per row.

*1 : For FXCPU, the display can be switched between 8 points and 16 points when an X/Y device is selected.

● Open...
Utilizes the saved display formats.

● Save...
Saves the current display format in the file.

Point

● **Opening multiple Device/Buffer Memory Batch Monitor screens**
The maximum number of Device/Buffer Memory Batch Monitor screens that can be opened is 64. A screen number is appended at the end of the screen title.

● **Monitoring time when multiple Device/Buffer Memory Batch Monitor screens are opened**
When the multiple Device/Buffer Memory Batch Monitor screens are opened, lead time to start monitoring and monitoring intervals may become longer.

● **Accessing multiple CPU shared memory**
Multiple CPU shared memory of multiple CPU system can be monitored only by the Device/Buffer Memory Batch Monitor function.

Restrictions

● **FXCPU that support the buffer memory batch monitor function**
FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3GC, FX3U, and FX3UC support the buffer memory batch monitor function.

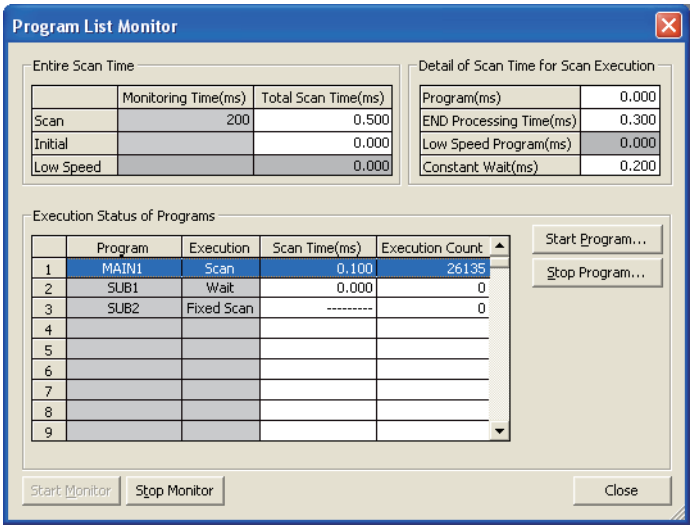
14.4 Monitoring Program List

Q CPU L CPU Remote Head FX

This section explains how to monitor the processing time of programs being executed.

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Program List].



Display contents

Item		Description
Entire Scan Time		Display the time set in the WDT setting of PLC RAS setting of PLC parameter.
	Monitoring Time	Display each monitoring time of the scan program, initial program, and low-speed program. When the scan time exceeds these time, a programmable controller CPU error occurs.
	Total Scan Time	Display the total time of each item of "Detail of Scan Time for Scan Execution".
Detail of Scan Time for Scan Execution		Display the processing time of each item. "Constant Wait" displays the waiting time of the constant scan when the constant scan is set. When the low-speed program execution time is also set, however, it displays '0.000' ms.
Execution Status of Programs		Display the execution status of programs specified in the program setting of PLC parameter.
	Program	Display the program names in the input order in PLC parameter.
	Execution	Display the execution type of the programs specified in PLC parameter.
	Scan Time	Display the actual scan time (current value). Display '0.000' ms in the program stop (standby) status.
	Execution Count	Display the number of executions, counted from 0 at the point of turning the programmable controller CPU to the RUN status. After reaching 65536, it returns to 0. It is stored even after the program stops.

Screen button

- Start Program...

  Displays the Start Program screen. (☞ ■ Starting programs)

- Stop Program...

  Displays the Stop Program screen. (☞ ■ Stopping programs)

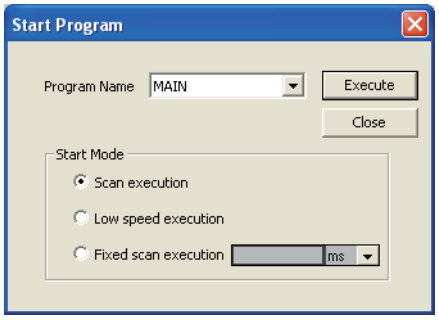
Point

● **Program list monitor**
In a simulation, only "Execution Count" in "Execution Status of Programs" is monitored.

■ Starting programs

Screen display

Select Program List screen ⇒ Start Program...



Operating procedure

1. **Set the items on the screen.**

Item		Description
Program Name		Select the name of a program to be started from ▼.
Start Mode		Select the execution type.
	Scan execution	Set the execution type to the scan execution.
	Low speed execution	Set the execution type to the low-speed execution.
	Fixed scan execution	Set the execution type to the fixed scan execution. The time input area in "Fixed scan execution" displays the value set in "Fixed Scan Interval" on the <<Program>> tab of PLC parameter. Change it as necessary.

2. **Click the** Execute **button.**
The selected program is started.

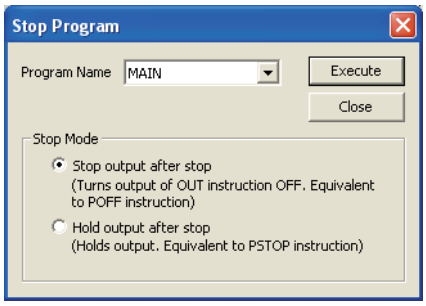
Point

● **Starting programs**
This function is supported only by High Performance model QCPU, Process CPU, and Redundant CPU.

■ Stopping programs

Screen display

Select Program List screen ⇒ Stop Program...



Operating procedure

1. Set the items on the screen.

Item		Description
Program Name		Select the name of a program to be stopped from ▼.
Stop Mode		Select the stop mode.
	Stop output after stop	• For the scan execution type program, turn outputs OFF (Non-execution processing) at the next scan. The program is set as the standby status after the subsequent scan. (The same behavior as the POFF instruction) • For the low-speed execution type program, stop its execution, and turn outputs OFF at the next scan. The program is set as the standby status after the subsequent scan.
	Hold output after stop	Place the scan execution type program in the standby status, and store the output of the OUT instruction.

2. Click the Execute button.

The selected program turns in the stopped status.

Point

● Stopping programs

- This function is supported only by High Performance model QCPU, Process CPU, and Redundant CPU.
- When "Stop output after stop" is selected, outputs may not turn OFF depending on instructions. For details, refer to the section explains the POFF instruction in the following manuals.
  ☞ MELSEC-Q/L Programming Manual (Common Instructions)
  ☞ MELSEC-Q/L Structured Programming Manual (Common Instructions)

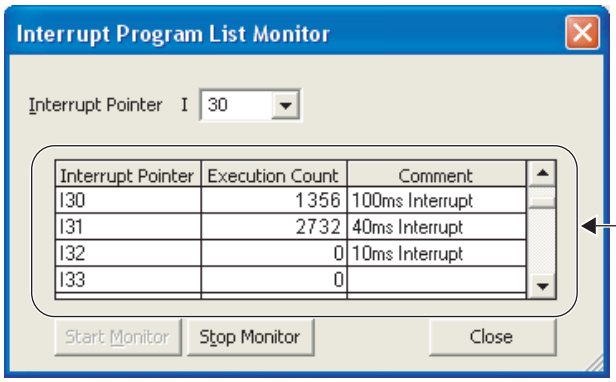
14.5 Monitoring Interrupt Program List

Q CPU | L CPU | Remote (×) | Head (×) | FX (×)

This section explains how to display the number of executions of interrupt programs used in a program.

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Interrupt Program List].



Operating procedure

- **Input the interrupt pointer number whose execution counts are to be displayed in "Interrupt Pointer".**

Display contents

Item		Description
Interrupt pointer monitor list		–
	Interrupt Pointer	Display the interrupt pointer entered in "Interrupt Pointer" on the top.
	Execution Count	Start counting when the programmable controller CPU turns to the RUN status and display the execution counts. When reaching 65536, returns to 0.
	Comment	Display the device comment.

14.6 Registering and Monitoring Devices

Q CPU L CPU Remote Head FX

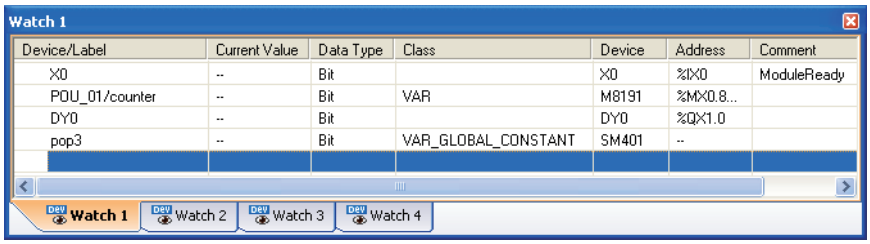
This section explains how to monitor devices.

14.6.1 Registering and monitoring devices

Register multiple devices/labels in single screen and monitor them simultaneously.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Watch 1] to [Watch 4].



Display contents

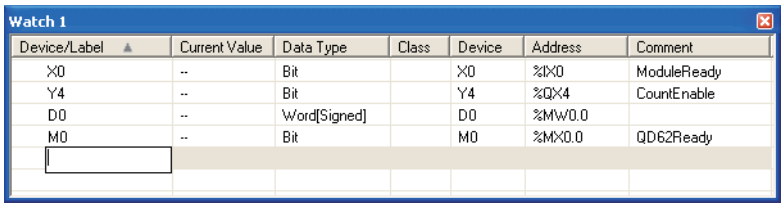
Item	Description
Device/Label	Display the device/label name.
Current Value	Display the current value of the device/label. The display format (decimal/hexadecimal) of the current value can be switched. (☞ Section 14.6.3) The display format (numerical display (1/0)/ ON/OFF display/ symbol display (●/○)) of the current value of bit device can be switched.
Data Type	Display the data type of the device/label.
Class	Display the class of the label. Nothing is displayed for the devices.
Device	Display the device, or device assigned to the label. For the labels with the class of VAR_CONSTANT or VAR_GLOBAL_CONSTANT, the initial value set on the label editor is displayed.
Address*1	Display the address of the device/label.
Comment	Display the comments of the device/label.

*1 : For Structured projects only

Operating procedure

1. **Select a row to be edited, and then click its "Device/Label" column.**

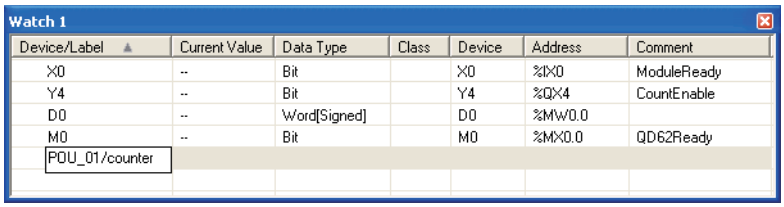
   The cell becomes the editing status.



2. **Enter a device/label to be registered.**

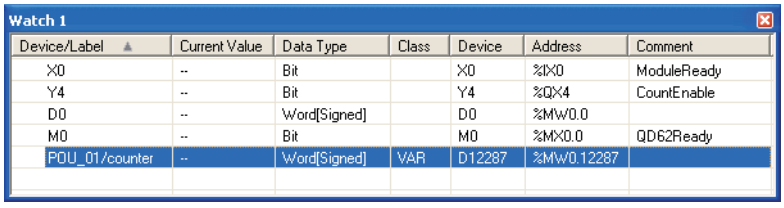
   For local labels, enter as 'program (program block) name/label name'.

   Example) POU_01/counter



3. **Press the Enter key.**

   The entered device/label is registered.
   When the device/label is registered, its relevant information such as data type and class is registered automatically.



4. **Select [Online] ⇒ [Monitor] ⇒ [Start Watching].**

   The current value of the registered device/label is displayed.

Point

- **Registered devices/labels on Watch windows**
  Once devices/labels are registered and the project is saved, registered devices/labels are displayed in registered status when the project is opened again.
- **Deleting registered devices/labels**
  A device/label can be deleted by right-clicking the specified cell and selecting [Delete] from the shortcut menu or pressing the Delete key.
- **Sorting items on Watch window**
  Items in the columns can be sorted in the ascending/descending order by clicking each column header.
  To sort the items by the "Current Value" column, display all registered devices. When the items are sorted without displaying the registered devices, scroll the screen.

14.6.2 Registering devices

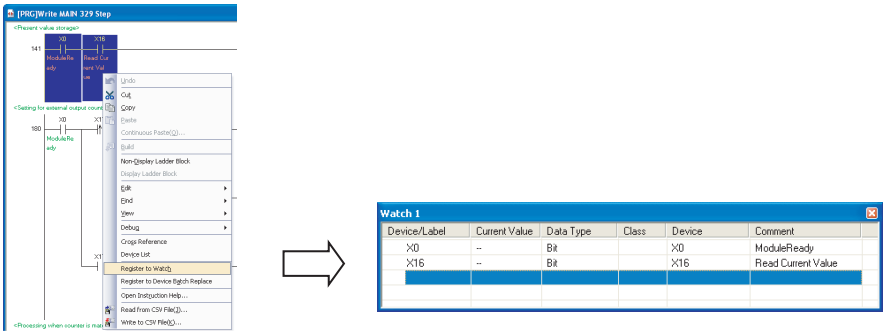
Register devices to the Watch window.

■ Registering devices/labels from program editor/label editor using shortcut menu

Register devices/labels from the program editor/label editor using a shortcut menu.
Multiple devices/labels can be registered in batch by selecting a range.

Operation

1. **Select devices/labels to be registered to the Watch window.**
2. **Right-click and select [Register to Watch] from the shortcut menu.**
   The devices/labels are registered to the Watch window.



Point

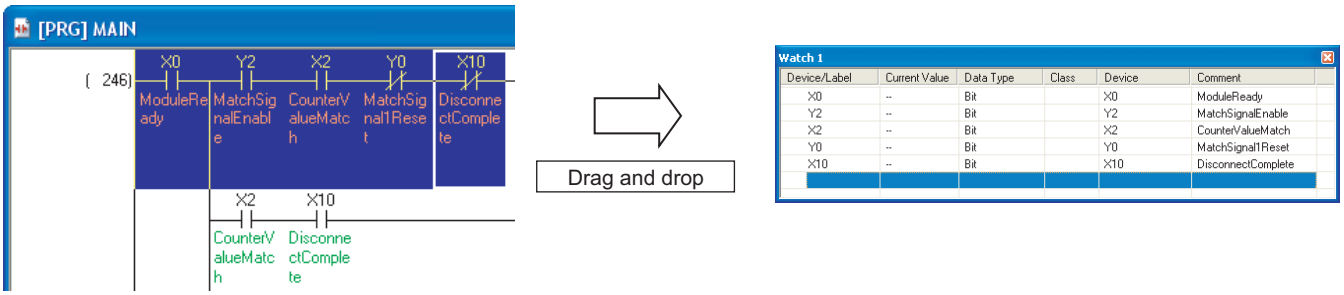
- **Registering devices/labels from the label editor**
  When registering devices/labels to the Watch window from the label editor, right-click a target row and select [Register to Watch] from the shortcut menu.
- **Registering device/labels with shortcut menu**
  With the shortcut menu, devices/labels are registered to the foreground Watch window.
  When two or more Watch windows are displayed in the foreground, devices/labels are registered to the Watch window with the younger Watch window number.
  When the Watch window is not displayed, the Watch window 1 is opened and devices/labels are registered to it.

■ Registering devices/labels from program editor/label editor with drag-and-drop operation

Register devices/labels from the program editor/label editor with the drag-and-drop operation.
Multiple devices/labels can be registered in batch by selecting a range.

Operation

- **Select devices/labels to be registered to the Watch window, and drag and drop them on to the Watch window.**



Point

● **Drag-and-drop operation of devices/labels to Watch window**
The drag-and-drop operation of devices/labels to the Watch window can be performed only from the program editor or the label editor.

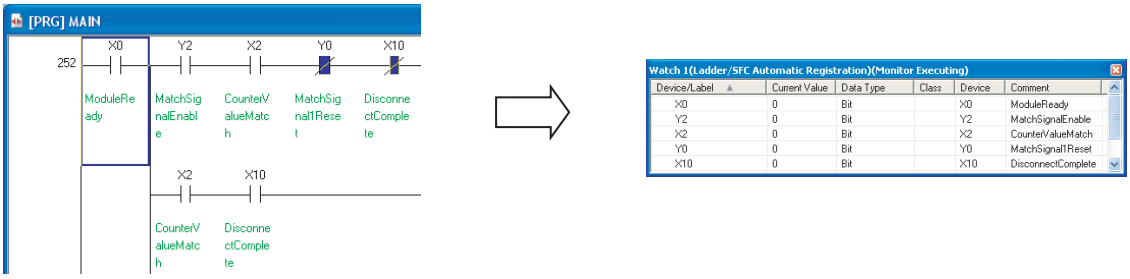
● **Drag-and-drop operation of devices/labels from ladder editor**
The drag-and-drop operation of devices/labels from the ladder editor can be performed when the cursor is changed to as it is moved to within the selected range.

■ Registering devices/labels at cursor position automatically

Register devices/labels in the ladder block at the cursor position to the Watch window automatically by setting the option.
When this option is set, "(Ladder/SFC Automatic Registration)" is displayed on the title bar of Watch window.
The automatic registration to the Watch window can be executed when the program is written in Ladder Diagram or Sequential Function Chart.

Operation

1. **Specify the automatic registration destination for "Setting for Automatic Registration to Watch Window" under [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Ladder/SFC".**
2. **Open the Watch window which is specified as an automatic registration destination.**
3. **Select [Online] ⇒ [Watch] ⇒ [Start Watching].**
4. **Move the cursor to the ladder block which is to be registered to the Watch window.**
   Devices/labels in the ladder block at the cursor position are displayed on the Watch window which is specified as an automatic registration destination. The displayed devices/labels are overwritten with the devices/labels in the ladder block to which the cursor is moved.

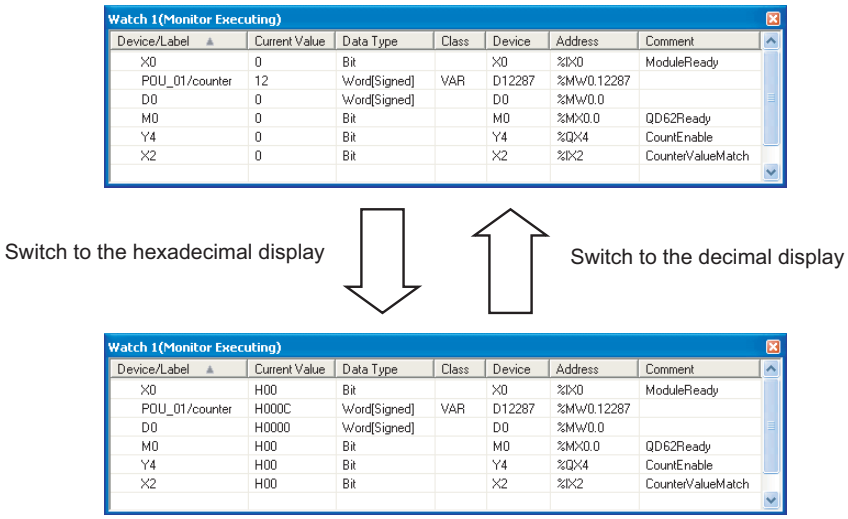


14.6.3 Changing display format (decimal/hexadecimal) of current values

Change the display format (decimal/hexadecimal) of the current values.

Operating procedure

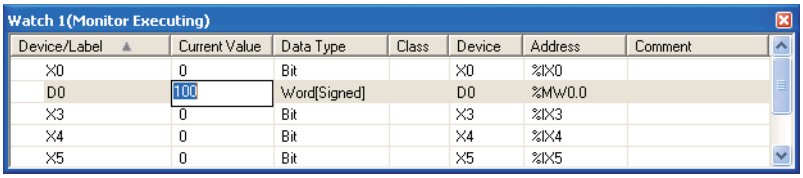
- **Right-click on the Watch window, and select [Change Value Format (Decimal)]/ [Change Value Format (Hexadecimal)] from the shortcut menu.**



Point

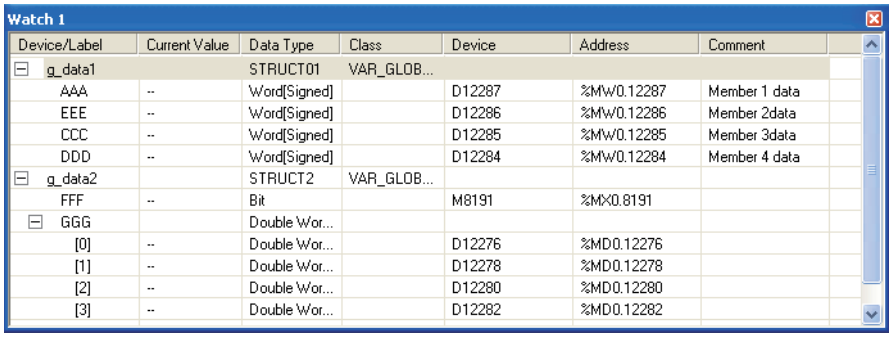
● Changing current values

The current value can be changed by entering a value directly in the "Current Value" column during monitoring. For bit devices, select a row and press the Shift and Enter keys or press the Shift key and double-click the row to change the current value.



● Displaying Watch window

If a registered device/label is a structure/function block/array label, the detail of the device/label is displayed in tree format.

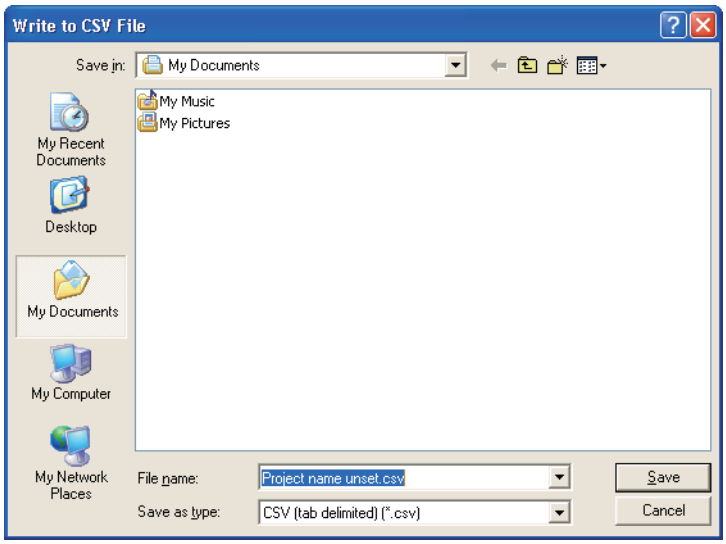


14.6.4 Writing/reading data to/from CSV file

Write/read devices/labels registered to the Watch window to/from the CSV file.

Screen display

Right-click and select [Write to CSV File]/[Read from CSV File] from the shortcut menu.



Operating procedure

1. **Enter a file name, or select a file to be opened.**

2. **Click the Save button, or the Open button.**

   The devices/labels are saved to the specified save destination, or the devices/labels are read from the specified location to the Watch window.

14.7 Monitoring Intelligent Function Modules

Q CPU L CPU Remote Head FX

For the method how to monitor input/output signals and buffer memory of intelligent function modules, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Intelligent Function Module)

14.8 Starting/Stopping Monitoring All Windows

Q CPU L CPU Remote Head FX

This section explains how to start/stop monitoring all open windows.

Operating procedure

- **Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring (All Windows)]/[Stop Monitoring (All Windows)].**

MEMO

15 SIMULATING PROGRAMS

This chapter explains how to debug programs offline using the simulation function.

15.1 Simulation Function

Q CPU *1 | L CPU | Remote | Head | FX

*1 : Not supported by High-speed Universal model QCPU.

This section explains how to debug a sequence program offline using the virtual programmable controller, without connecting to the programmable controller CPU.
This function is useful to test programs before operating them actually on the programmable controller CPU.
For the considerations and restrictions on the simulation function, refer to Appendix 2.

15.1.1 Safety and handling considerations of the simulation function

The following explains the considerations of safety and handling of the simulation function.

1) **The simulation function simulates the actual programmable controller CPU to debug a sequence program. However, this function does not guarantee the operation of the debugged sequence program.**

2) **The simulation function uses the memory for simulation to input and output data to/from the I/O module and intelligent function module. Some instructions/functions and device memory are not supported. Therefore, the operation results obtained with the virtual programmable controller may differ from those obtained using the actual programmable controller CPU.**

Point

After debugging programs using the simulation function, those programs must be debugged online before operating them actually on the programmable controller CPU.

15.1.2 Functions available for simulation function

The following table shows the GX Works2 functions that are available for the simulation function.

Function	Description	Reference
Write to PLC	Write parameter files and program files to the virtual programmable controller.	Section 12.1
Online program change*1,*2	Write programs to a virtual programmable controller in RUN status.	Section 12.9
Verify with PLC	Verify data in the virtual programmable controller against project data.	Section 12.2
Delete PLC Data	For QCPU (Q mode)/LCPU, delete data in the virtual programmable controller.	Section 12.3
Monitor	Monitor the status of operation processing.	Section 14.2
Monitor status	Display the monitoring status of the virtual programmable controller.	Section 14.1.2
Device memory/Buffer memory batch monitor	Batch-monitor the device memory/buffer memory of the virtual programmable controller.	Section 14.3
Program list monitor	For QCPU (Q mode)/LCPU, monitor the processing time of programs being executed on the virtual programmable controller.	Section 14.4
Entry Ladder Monitor	Register ladder blocks on the Entry Ladder Monitor screen, and monitor them.	(Simple)

Function	Description	Reference
Watch	Register and monitors data such as virtual programmable controller devices.	Section 14.6
Local Device Batch Read + Save CSV	Read local device data and save them on a personal computer.	Section 12.12
Device memory backup in simulation	Save and read device memory/buffer memory of the virtual programmable controller.	Section 15.2.1 Section 15.2.2
Modify value	Modify the current value of the virtual programmable controller.	Section 16.1
Forced input output registration/ cancellation	For QCPU (Q mode)/LCPU, register/cancel the forced input/output of X/Y devices of the virtual programmable controller.	Section 16.2
Device Test with Execution Condition	For QCPU (Q mode)/LCPU, register devices of the virtual programmable controller to the device test with execution condition.	Section 16.3
Sampling trace	For QCPU (Q mode)/LCPU, trace the device value of the virtual programmable controller.	Section 16.4
Step Execution*3	Debug the program by executing it partially.	Section 16.6
Remote Operation	Switch the execution status of the virtual programmable controller, such as STOP and PAUSE.	Section 17.1
PLC Memory Operation	Perform memory format, memory clear, memory arrangement for the virtual programmable controller.	Section 17.3 Section 17.4 Section 17.5
PLC Diagnostics	Check the virtual programmable controller status and errors.	Section 18.1
I/O System Setting	Simulate operations of external devices using the virtual programmable controller.	Chapter 19

*1 : The simulation function is not supported by FXCPU.
*2 : Online program change of SFC blocks is not supported.
*3 : Not supported by FXCPU.

15.2 Starting/Stopping Simulation

Q CPU *1 | L CPU | Remote | Head | FX

*1 : Not supported by High-speed Universal model QCPU.

This section explains how to start/stop simulation.

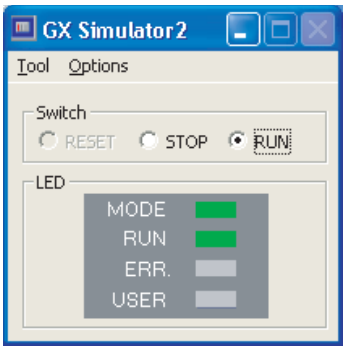
Operating procedure

- **Select [Debug] ⇒ [Start/Stop Simulation] ( ).**

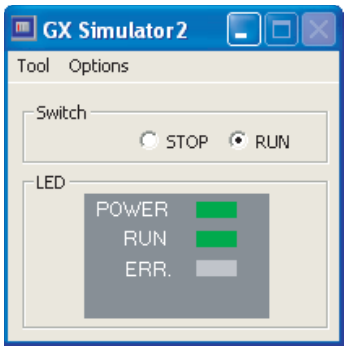
  The GX Simulator2 screen is displayed, and the simulation starts.
  To end the simulation function, select [Debug] ⇒ [Start/Stop Simulation] again.

  <Simulating a single project>

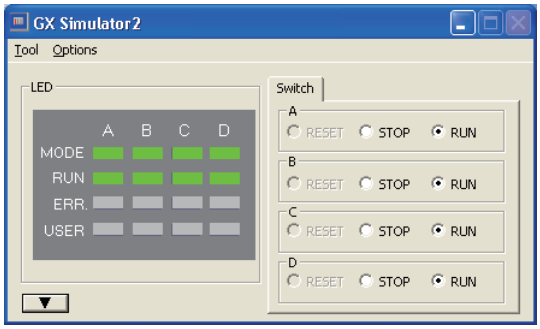
  · QCPU(Q mode)/LCPU



  · FXCPU



  <Simulating multiple projects>



Display contents

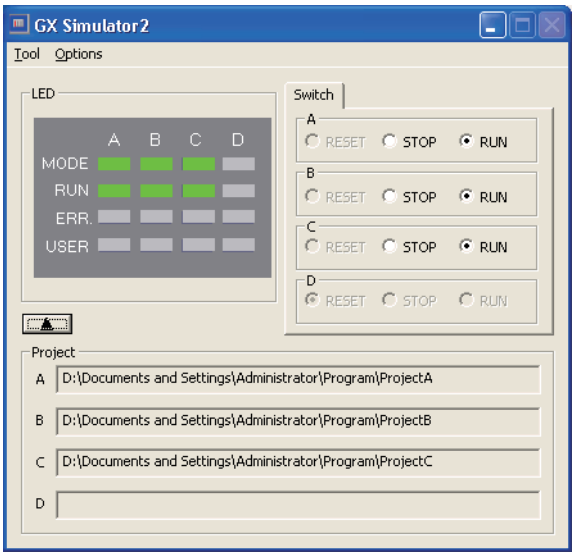
Item		Description
Switch		Display the operating status of the virtual programmable controller.
	RESET*1	Select this to switch the operating status of the virtual programmable controller.
	STOP	
	RUN	
LED		Display the operating status of the virtual programmable controller. For details of the LED, refer to the following manuals. ● **For QCPU (Q mode)/LCPU** ☞ User's Manual (Hardware Design, Maintenance and Inspection) of each CPU module ● **For FXCPU** ☞ User's Manual - Hardware Edition of each FXCPU ☞ HARDWARE MANUAL of each FXCPU For the operating status error, the icon on the upper left corner of the screen is displayed in red.

*1 : Not supported by FXCPU.

Screen button

● ▼/▲

Switches between display/hide of all project names during the simulation.



Point

● **Simulations of multiple projects**
The maximum of 4 projects can be simulated simultaneously by starting the simulation of other project during the simulation.

● **Simulation of FXCPU**
For FXCPU, more than one project cannot be simulated simultaneously.

● **Considerations when changing project names**
If a project name is changed during the simulation, the project name on the GX Simulator2 screen is not changed. To display the changed project name on the GX Simulator2 screen, exit the simulation, and then start the simulation again.

● **Minimized display at start up of simulation**
By setting the option, the GX Simulator2 screen can be started up in minimized mode when the simulation is activated. To start up the GX Simulator2 screen in minimized mode, select "Start in minimized status" from [Options] on the GX Simulator2 screen. From the next start up, the GX Simulator2 screen is not displayed but becomes in taskbar icon mode.

● **Stopping the simulation**
The simulation function may not be stopped by the GX Works2 simulation stop operation when another application such as MX Component is being connected to GX Simulator2. (GX Works2 is disconnected from GX Simulator2.) The simulation function stops when another application is disconnected.

15.2.1 Saving device memory/buffer memory

Save device memory/buffer memory of the virtual programmable controller temporarily.

Operating procedure

1. **Switch the operating status of the GX Simulator2 screen to STOP.**
2. **Select [Tool] ⇒ [Backup Device Memory in Simulation] ⇒ [Save] on the GX Simulator2 screen.**

Point

● **Saving device memory/buffer memory when stopping simulation**
By setting the option, device memory/buffer memory in the virtual programmable controller can be saved when the simulation is stopped.
To save device memory/buffer memory when the virtual programmable controller is stopped, select "Save device memory at stop" from [Options] on the GX Simulator2 screen.

15.2.2 Reading device memory/buffer memory

Read out the temporarily saved device memory/buffer memory to the virtual programmable controller.

Operating procedure

1. **Switch the operating status of the GX Simulator2 screen to STOP.**
2. **Select [Tool] ⇒ [Backup Device Memory in Simulation] ⇒ [Read] on the GX Simulator2 screen.**

15.2.3 List of device memory/buffer memory that can be saved/read

This section explains device memory/buffer memory that can be saved and read with the virtual programmable controller.

■ Device memory that can be saved/read

The following table shows the list of device memory that can be saved/read.

● QCPU (Q mode)/LCPU

Category	Type	Device
Internal user device	Bit	X (DX)
		Y (DY)
		M
		L
		F
		V
		S
		B
		SB
		T (contact)
		ST (contact)
		C (contact)
	Word	T (current value)
		ST (current value)
		C (current value)
		D (including Extended D)
		W (including Extended W)
		SW
Internal system device	Bit	FX
		FY
		SM
	Word	FD
		SD
Index register	Word	Z (including ZZ)
File register	Word	R
		ZR

● **FXCPU**

Category	Type	Device
Device	Bit	X
		Y
		M
		S
		T (contact)
		C (contact)*1
	Word	T (current value)
		C (current value)*1
		D
Special device	Bit	M (special M)
	Word	D (special D)
Index register	Word	V
		Z
Extended register	Word	R*2

*1 : High-speed counters (C235 and later) are not supported.
*2 : Supported by FX3G, FX3GC, FX3U, and FX3UC only.

■ Buffer memory that can be saved/read

Buffer memory that can be saved and read is an memory area of modules to which the I/O assignment settings are configured in the PLC parameter.
For QCPU (Q mode), the buffer memory [U3E0 to U3E3\G0 to 4095] and the multiple CPU high-speed transfer area [U3E0 to U3E3\G10000 to 65535] on the programmable controller CPU cannot be saved/read.
For LCPU/FXCPU, all buffer memory can be saved/read.

15.3 Checking unsupported instructions/devices

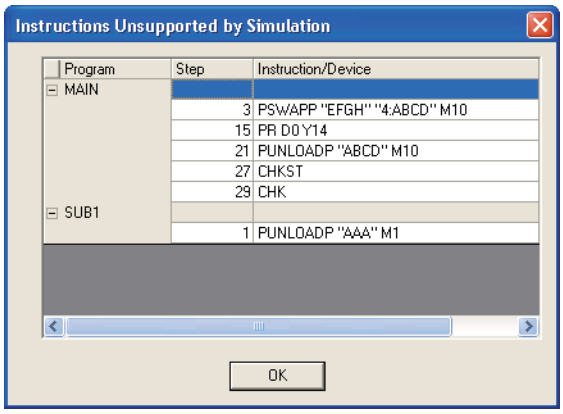
Q CPU *1 | L CPU | Remote | Head | FX

*1 : Not supported by High-speed Universal model QCPU.

The following explains how to display a list of instructions and devices used in a program and not supported by the simulation function.

Screen display

Select [Debug] ⇒ [Instructions Unsupported by Simulation].



Point

● **Display of unsupported instructions**
Unsupported instructions are not displayed when the programmable controller does not become in RUN status because of the CPU module error at the start of the simulation.
A status without a CPU module error is required for unsupported instructions to be displayed.

MEMO

16 DEBUGGING PROGRAMS

This chapter explains how to debug sequence programs.

16.1 Changing Current Values

Q CPU L CPU Remote Head FX

This section explains how to change current device values of the programmable controller CPU in ladder and SFC (Zoom) programs.

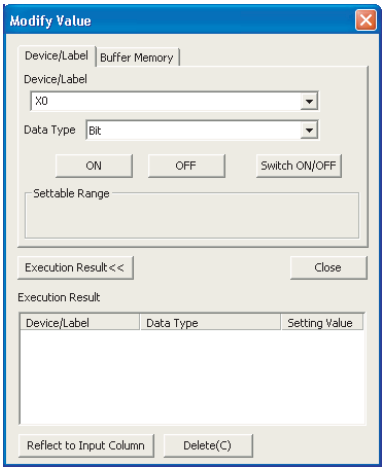
The following explains how to turn ON/OFF forcibly the bit device on the programmable controller CPU from the monitoring screen and also changing the current value of the word device and buffer memory.

16.1.1 Changing current value of devices/labels

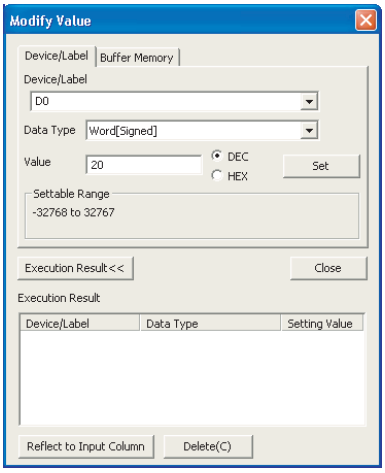
Screen display

Select [Debug] ⇒ [Modify Value] ( ).

<For bit device>



<For word device>



Operating procedure

1. Set the items on the screen.

Item	Description
Device/Label	Display the device or label selected on the monitoring screen. Also enter the device or label.
Data Type	Display the data type of the device or label. Also select the data type from ▼.
Value (For word device)	Enter a new value according to the data type as shown below:

Data Type	Entry
Word [Signed], Double Word [Signed], Word [Unsigned]/Bit String [16-bit], Double Word [Unsigned]/ Bit String [32-bit]	Enter a value in decimal or hexadecimal format.
FLOAT (Single Precision)	Enter a value in decimal or exponential form. Example: • Decimal form: -1.23456 • Exponential form: -1.23456E + 01
FLOAT (Double Precision)*1	Enter a value in decimal form.
String	Enter a character string. (Quotation marks (" ") are not necessary.)
Time	Enter a value in the time format. • T#0s (Applicable to Structured projects only)

*1 : Not supported by FXCPU.

2. For bit devices, click the ON / OFF / Switch ON/OFF button.

For word devices, click the Set button.

The current value of the programmable controller CPU is changed, and the result is displayed in "Execution Result".

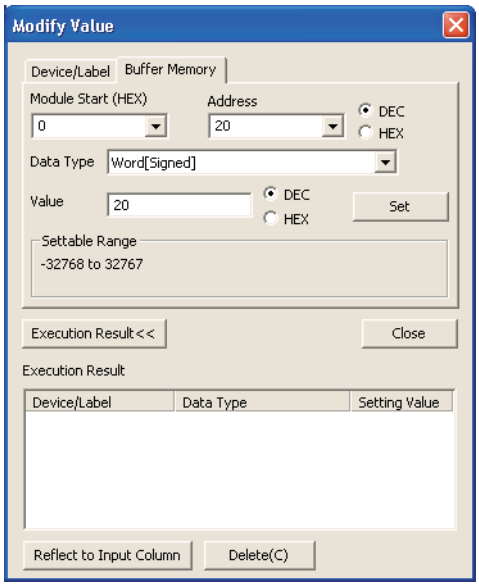
Restrictions

● **Devices whose current values cannot be changed**
The current values of indirectly specified devices (@D0) cannot be changed.

16.1.2 Changing current value of buffer memory

Screen display

Select [Debug] ⇒ [Modify Value] ( ).



Operating procedure

1. **Set the items on the screen.**

Item	Description
Module Start (HEX)	Enter the start I/O number of the intelligent function module.
Address	Enter the address of the intelligent function module.
Data Type	Display the data type of the buffer memory. Also select the data type from .
Value	Enter a new value according to the data type as shown below.

Data Type	Entry
Word [Signed], Double Word [Signed], Word [Unsigned]/Bit String [16-bit], Double Word [Unsigned]/Bit String [32-bit]	Enter a value in decimal or hexadecimal format.
FLOAT (Single Precision)	Enter a value in decimal or exponential form. Example: • Decimal form: -1.23456 • Exponential form: -1.23456E + 01
FLOAT (Double Precision)*1	Enter a value in decimal form.
String	Enter a character string. (Quotation marks (" ") are not necessary.)
Time	Enter a value in the time format. • T#0s (Applicable to Structured projects only)

*1 : Not supported by FXCPU.

2. **Click the Set button.**

The current value of the buffer memory is changed, and the result is displayed in "Execution Result".

Point

● **Modify Value screen**

- When the Modify Value screen is open, a device/label is displayed on the Modify Value screen if it is selected on the editor.
- The Modify Value screen of device/label and buffer memory can be switched by clicking tabs.

● **Execution result of current value change**

Display/hide of the execution result of current value change can be switched by Execution Result<< / Execution Result>>.
A device/label can be displayed in "Device/Label" area by selecting the device/label and clicking the Reflect to Input Column button or double-clicking it in "Execution Result".

● **Selecting devices/labels used in instructions that handle multiple devices**

When an instruction that uses multiple devices (such as FROM/TO instruction) is selected, all devices/labels used in the instruction are displayed in the "Device/Label" combo box.
Select a device from the combo box and then execute the Modify Value function.

● **Forcibly turning contacts ON/OFF during the program monitoring**

A contact can be forcibly switched ON/OFF by double-clicking the contact (or press the Enter key) while pressing the Shift key during the program monitoring.

16.2 Registering/Canceling Forced Input/Output

Q CPU *1 | L CPU | Remote | Head | FX

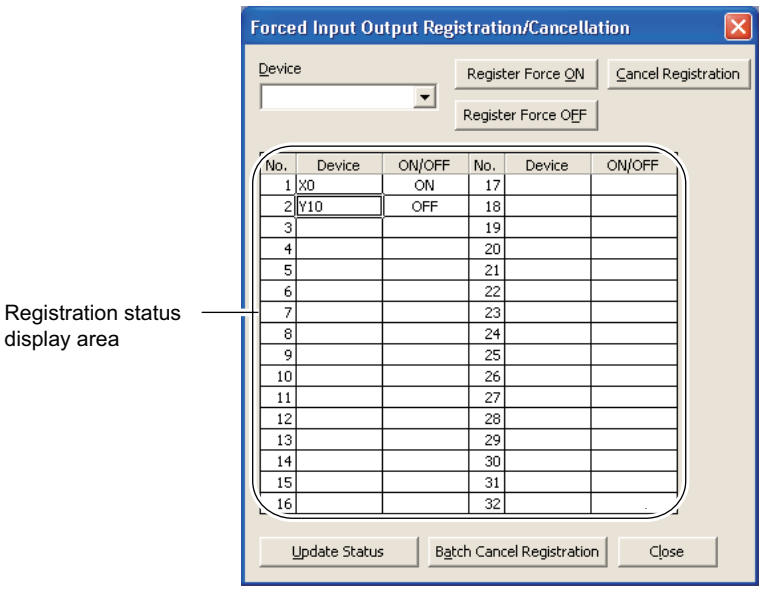
*1 : Not supported by Basic model QCPU.

**This section explains how to register/cancel the forced input/output of devices.
X/Y device can be forcibly turned ON/OFF without the effect of the input/output to/from external devices while the programmable controller CPU is in RUN status. This enables program debugs without external devices.**

16.2.1 Registering/canceling forced input to/output from QCPU (Q mode)/LCPU

Screen display

Select [Debug] ⇒ [Forced Input Output Registration/Cancellation].



Operating procedure

1. **Enter a device to be turned ON/OFF forcibly.**

   Clicking ▼ enables to select a device from the list of previously entered ones.

2. **Click the** Register Force ON / Register Force OFF **button.**

   The forced ON/OFF is registered to the programmable controller CPU.
   The current registration status of the forced ON/OFF is displayed in the 'registration status display area'.

Screen button

- Cancel Registration

  Cancels the forced ON/OFF of a device registered to the programmable controller CPU.

- Update Status

  Reads the registration status from the programmable controller CPU.

- Batch Cancel Registration

  Cancels all forced input/output registered to the programmable controller CPU.

Point

- **Canceling registration**

  The device registration can be canceled by placing the cursor on the device area in the registration status display area and pressing the Delete key.

- **Device forced input/output registration**

  The status of the device forced input/output registration may be changed by GX Works2 or external devices that can register/cancel such as forced input/output, for the exclusion control is not executed on the programmable controller CPU side.

- **Forced ON/OFF status**

  The ON/OFF status can be inverted by double-clicking the ON/OFF cell.

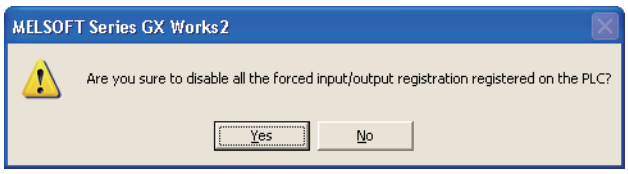
No.	Device	ON/OFF
1	X0	ON
2	Y10	OFF
3		
4		

Double-click

- **Closing the Forced Input Output Registration/Cancellation screen**

  The following message is displayed when the Close button is clicked on the Forced Input Output Registration/Cancellation screen.

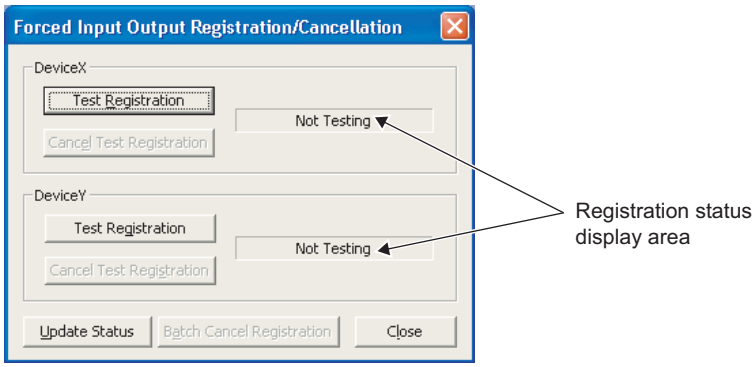
  Click the Yes button to cancel all forced input/output registrations.



16.2.2 Registering/canceling forced input to/output from remote I/O module

Screen display

Select [Debug] ⇒ [Forced Input Output Registration/Cancellation].



Operating procedure

- **Click the Test Registration / Cancel Test Registration button.**

  A disabled/enabled refresh of X/Y device is registered to the remote I/O module.
  The current registration status of disabled/enabled refresh is displayed in the 'registration status display area'.

Screen button

● Update Status
Reads the current registration status of the remote I/O module.

● Batch Cancel Registration
Cancels all disabled refreshes registered to the remote I/O module.

Point

● **Connection route in which forced input/output registration/cancellation can be performed**
In order to use this function on remote I/O module, the connection route must be set to "Serial Port NET/10(H) Remote Module Connection".

16.3 Device Test with Execution Condition

*1 : Universal model QCPU only.

This section explains how to change device value at the execution of programs and steps specified in advance.
This enables debugs of specific ladder blocks without changing programs.
This function can be executed only in a ladder program of Simple project.

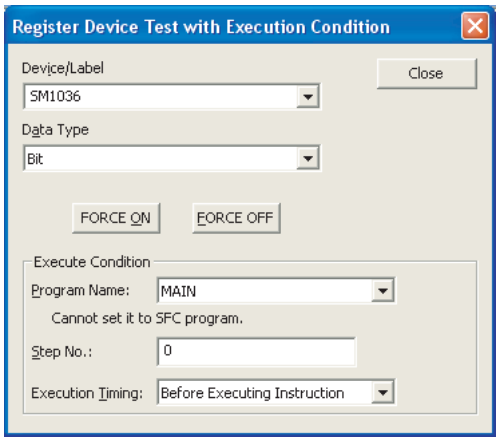
16.3.1 Registering device test with execution condition

Register the device test with execution condition.

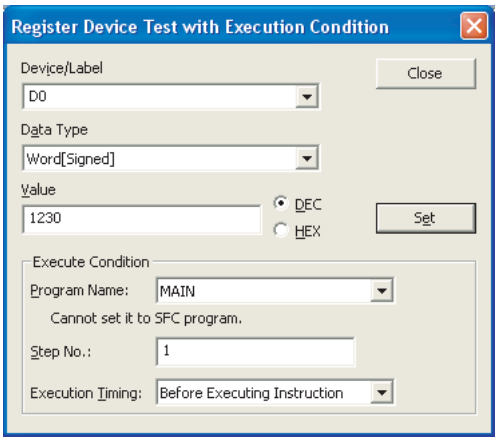
Screen display

Select [Debug] ⇒ [Device Test with Execution Condition] ⇒ [Register].

<For bit device>



<For word device>



Operating procedure

1. Set the items on the screen.

Item		Description
Device/Label		Display the device or label selected on the monitoring screen. Also enter the device or label.
Data Type		Display the data type of the device or label. Also select the data type from ▼.
Value (For word device)		Enter a new value according to the data type as shown below.

Data Type	Entry
Word [Signed], Double Word [Signed], Word [Unsigned]/Bit String [16-bit], Double Word [Unsigned]/Bit String [32-bit]	Enter a value in decimal or hexadecimal format.
FLOAT (Single Precision)	Enter a value in decimal or exponential form. Example: • Decimal form: -1.23456 • Exponential form: -1.23456E + 01
FLOAT (Double Precision)	Enter a value in decimal form.
String	Enter a value as a character string. (Quotation marks (" ") are not necessary.)
Time	Enter a value in the time format. • T#0s (Applicable to Structured projects only)

Execute Condition	Program Name	Specify the program name for the timing of the forced ON/OFF and current value change.
	Step No.	Specify the step number in the program for the timing of the forced ON/OFF and current value change.
	Execution Timing	Select 'before' or 'after' the instruction in the step number in the program for the timing of the forced ON/OFF and current value change.

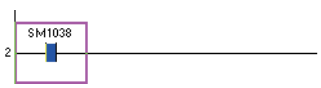
2. For bit devices, click the FORCE ON / FORCE OFF button.
For word devices, click the Set button.

The device/label is registered to the device test with execution condition.

Point

● **Registering devices**

- Up to 32 devices can be registered.
- The registration of the device test with execution condition is canceled by performing the following operations.
  - Online program change of the program in the range which includes the specified step
  - Write to PLC
- A box with the specified color appears at the instruction of the specified step.
  (Changing color ☞ Section 3.2.7)



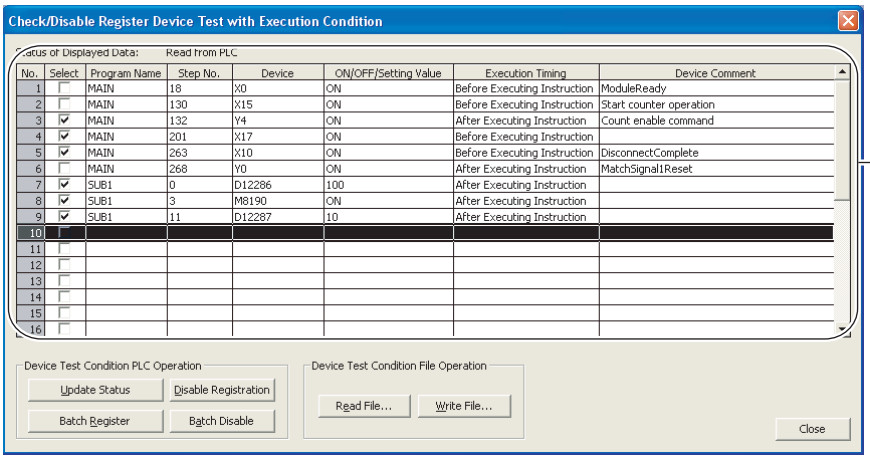
- The device value is changed at the specified step regardless of whether the instruction of the specified step is executed.

16.3.2 Checking/disabling registration of device test with execution condition

Check the registration of the device test with execution condition, write it to a file, read it out from a file, and disable it.

Screen display

Select [Debug] ⇒ [Device Test with Execution Condition] ⇒ [Registration Check/Disable].



Display contents

Item	Description
Status of Displayed Data	Display whether the data being displayed is read from the programmable controller CPU or from a file.
Registration information list	Display the registration of the device test with execution condition. Display up to 32 records.

Screen button

- Update Status
  Reads the registration information from the programmable controller CPU.
- Disable Registration
  Disables the registration selected in 'registration information list'.
- Batch Register
  Registers the registration information data to the programmable controller CPU in batch.
- Batch Disable
  Disables the registration information data on the programmable controller CPU in batch.
- Read File...
  Reads the registration information list from a file.
- Write File...
  Saves the registration information data being displayed in 'registration information list' to a file.

Point

● **Checking/disabling the device test with execution condition**

- The registration of devices specified in the device test with execution condition can be checked/disabled on the monitor screen of the ladder editor. Right-click on a device and select [Debug] ⇒ [Check Register Device Test with Execution Condition]/[Disable Register Device Test with Execution Condition] from the shortcut menu.
- Other than the above operation, registrations of device test with execution condition are canceled by the following operations.
  - Reset or turn from OFF to ON the programmable controller CPU.
  - Perform the Online program change including the specified step.
  - Write the program file to the program memory of the programmable controller CPU while the programmable controller CPU is in STOP status.
  - Delete the program file in the program memory of the programmable controller CPU while the programmable controller CPU is in STOP status.
  - Format the program memory of the programmable controller CPU while the programmable controller CPU is in STOP status.

16.3.3 Batch disabling device test with execution condition

Batch disable the registered device test with execution condition.

Operating procedure

- **Select [Debug] ⇒ [Device Test with Execution Condition] ⇒ [Batch Disable].**

16.4 Sampling Trace

Q CPU *1 | L CPU | Remote | Head | FX

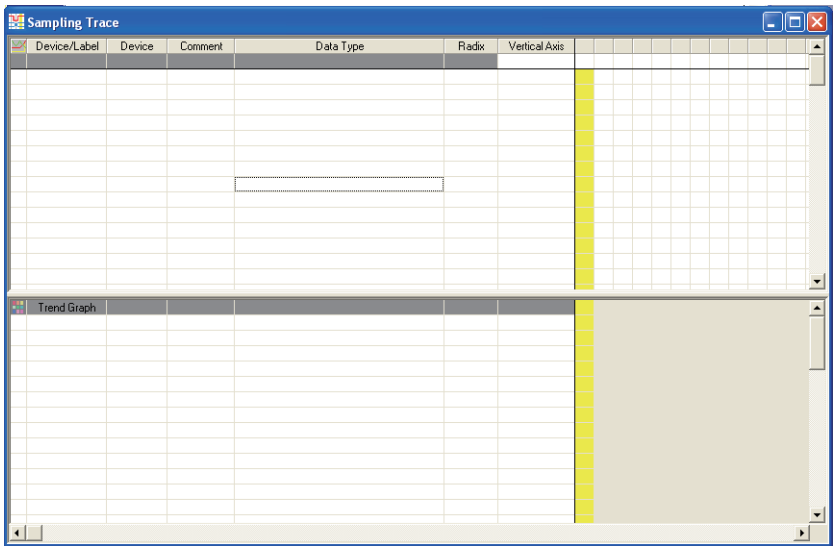
*1 : Not supported by Basic model QCPU and Q00UJ.

This section explains the operation of the sampling trace function.
The sampling trace function acquires the data at the preset timing to find how device values change during program operation and traces the changes by displaying them in time series.
For details of the sampling trace function, refer to the manual of each CPU module.

16.4.1 Opening sampling trace screen

Operating procedure

- **Select [Debug] ⇒ [Sampling Trace] ⇒ [Open Sampling Trace].**



Point

● **Devices displayed with red background**
When devices or data types which cannot be used in a new programmable controller CPU type are contained in the sampling trace data after the Change PLC Type operation, they are displayed with red background.
Modify them to devices appropriate for the new programmable controller CPU type, and execute the sampling trace again.

16.4.2 Setting executing condition of sampling trace

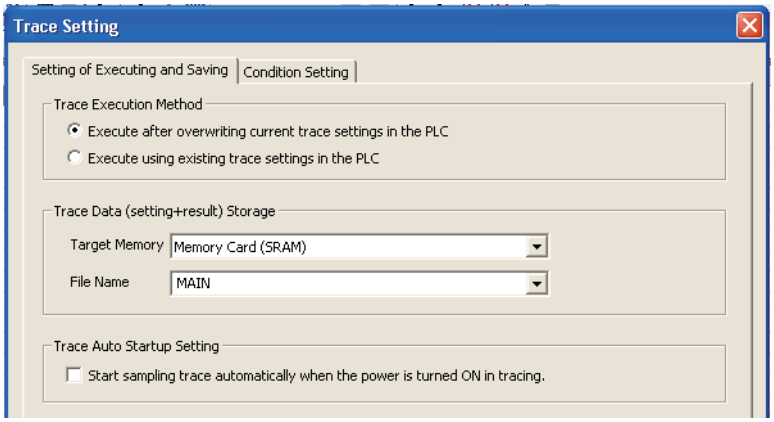
The following explains the settings required for executing sampling trace and the execution method.

■ Setting sampling trace execution method and data storage destination

Set the sampling trace execution method and the storage destination of the trace data.

Screen display

Select [Debug] ⇒ [Sampling Trace] ⇒ [Trace Setting] ( ) ⇒ <<Setting of Executing and Saving>>.



Operating procedure

- **Set the items on the screen.**

Item		Description
Trace Execution Method		Set the trace execution method.
	Execute after overwriting current trace settings in the PLC	Select this to execute sampling trace after overwriting the current trace setting to the programmable controller CPU.
	Execute using existing trace settings in the PLC	Select this to execute sampling trace using the trace setting stored on the programmable controller CPU.
Trace Data (setting+result) Storage		Set the memory and the file name where the trace data set on the <<Condition Setting>> tab and the trace result after execution are stored.
Trace Auto Startup Setting		Select this to perform the sampling trace automatically when the programmable controller CPU is in RUN. (Universal model QCPU/LCPU only*1)

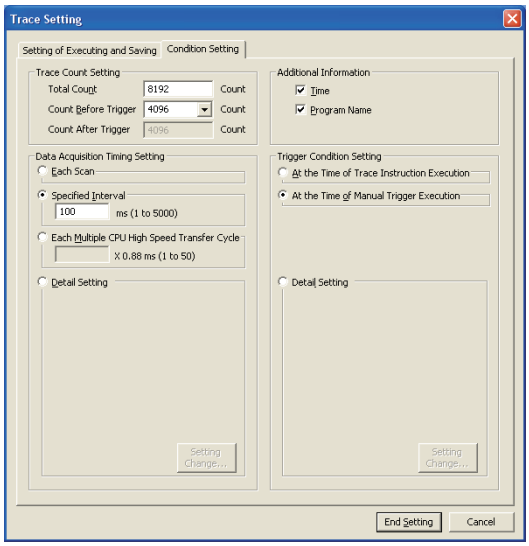
*1 : For the versions of Universal model QCPU that support this function, refer to the User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used.

■ Setting sampling trace conditions

Set the sampling trace conditions such as the number of traces and the trigger condition.

Screen display

Select [Debug] ⇒ [Sampling Trace] ⇒ [Trace Setting] ( ) ⇒ <<Condition Setting>>.



Operating procedure

- **Set the items on the screen.**

Item		Description
Trace Count Setting		Set the number of data acquisitions (samplings) before and after the trigger. Select a value using the combo box or enter a value directly. Setting range: Count Before Trigger < Total Count <= 8192
Additional Information		Set the information to be added to the trace result.
	Time	Add the time of the trace start.
	Program Name	Add the name of the program in which the sampling trace is executed.
Data Acquisition Timing Setting		Set the trace data acquisition timing.
	Each Scan	Select this to acquire the data every scan.
	Specified Interval	Select this to acquire the data in the set intervals. The setting unit is 1ms.
	Each Multiple CPU High Speed Transfer Cycle*1	Select this to acquire the data in the Each multiple CPU high-speed transfer cycle.
	Detail Setting	Select this to set the data acquisition timing depending on the device condition. Use the Setting Change... button to set the conditional expression.
Trigger Condition Setting		Set the trigger (condition) that is taken as the start point (0 point) of sampling trace execution.
	At the Time of Trace Instruction Execution	Select this to generate a trigger when the TRACE instruction in the program is executed. For the TRACE instruction, refer to the following manual. (☞ MELSEC-Q/L Programming Manual (Common Instructions)
	At the Time of Manual Trigger Execution	Select this to generate a trigger manually with GX Works2. Select [Debug] ⇒ [Sampling Trace] ⇒ [Execute Manual Trigger] to generate a trigger.
	Detail Setting	Select this to set a trigger timing depending on the device condition. A trigger is generated when the conditional expression is satisfied. Use the Setting Change... button to set the conditional expression.

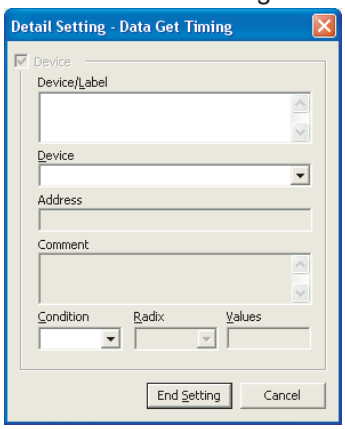
*1 : For Universal model QCPU only

Screen button

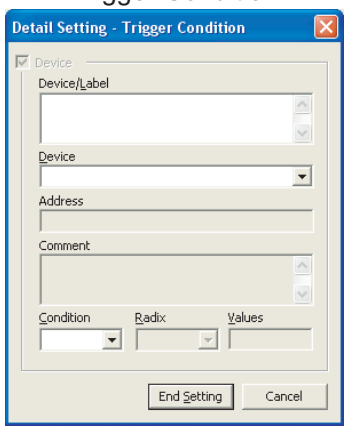
● Setting Change...

Displays the Detail Setting screen.
Setting of the conditional expression can be changed in the Data Get Timing screen or the Trigger Condition screen.

<Data Get Timing>



<Trigger Condition>



Operation

- **Set the items on the screen.**

Item	Description
Device /Label	Enter a device, address or label. ☞ Section 16.4.6
Device	Display the device corresponds to "Device /Label".
Address*1	Display the address corresponds to "Device /Label".
Comment	Display the device comment of "Device /Label".
Condition	Select the timing condition. • For the data get timing setting The data are collected at the end processing of one scan or when the condition of the specified device/label is satisfied.

Device	Condition	Description
Bit device	↑	Collect data at the rising of the specified device/label.
	↓	Collect data at the falling of the specified device/label.
Word device	=	Collect data when the current value of the specified device becomes the specified condition value.
	Change*2	Collect data when the current value of the specified device changes.

• For the trigger condition setting
Satisfaction of the condition of the specified device/label becomes a trigger.

Device	Condition	Description
Bit device	↑	Consider the rising of the specified device/label as a trigger.
	↓	Consider the falling of the specified device/label as a trigger.
Word device	=	Consider the time when the current value of the specified device becomes the specified condition value as a trigger.
	Write data*2	Consider the time when data are written to the specified device/label as a trigger.

Radix	Select the radix of the condition value. (Word device only)
Values	Set the condition value. (Word device only)

*1 : For Structured projects only
*2 : For Universal model QCPU/LCPU only

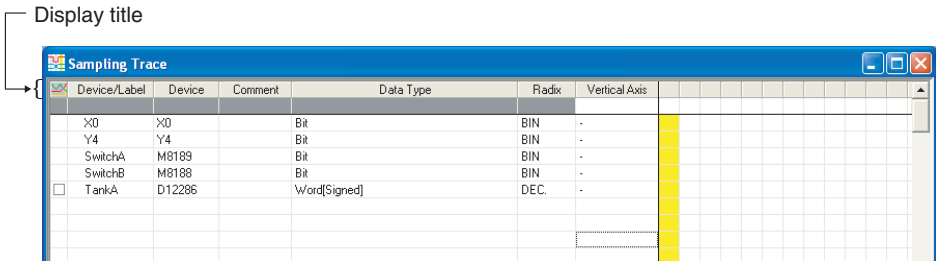
16.4.3 Registering devices/labels

Register the devices/labels on the Sampling Trace screen.

Operating procedure

- **Register the devices/labels to which the sampling trace is performed.**

  Devices/labels can be registered by entering them directly or copying them from the program editor or label editor by the drag-and-drop operation.



Display contents

Item		Description
Display title		-
	Device/Label	Set the device, address, label, structure, array, and function block to which the sampling trace is performed. 50 bit devices and 50 word devices can be registered.
	Device*1	Display the device corresponds to "Device /Label".
	Address*1, *2	Display the address corresponds to "Device /Label".
	Comment*1	Display the device comment for the address or device/label which are entered in "Device/Label".
	Data Type*1	Display the data type of "Device/Label". The data type of the word device can be changed after registration.
	Radix*1	If the device entered in "Device/Label" is the bit device, the radix is fixed as "Binary". If the device entered in "Device/Label" is the word device, the radix can be selected from "Binary", "Decimal", "Hexadecimal" or "ASCII". If the device entered in "Device/Label" is the single-precision/double-precision real number, the radix is fixed as "FLOAT".
	Vertical Axis	Display the time axis data of the selected cell as displaying the trace result.

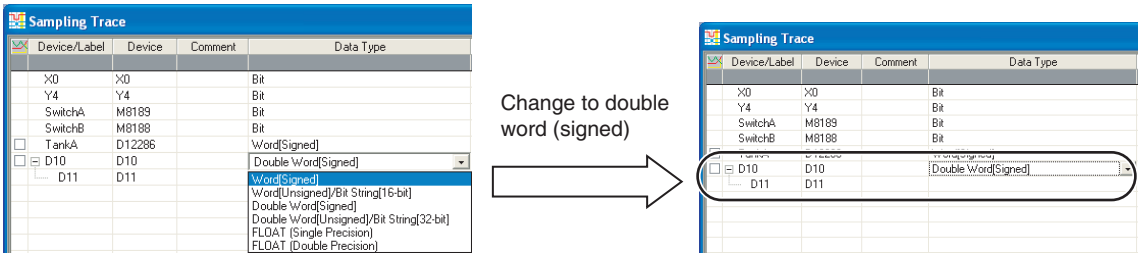
*1 : Items can be displayed by selecting [View] ⇒ [Switching Display Items].
*2 : For Structured projects only

Point

● **Editing with a selection of two or more rows**
Two or more rows can be selected by pressing the Shift key or the Ctrl key to copy or delete.
When non-consecutive rows are selected by pressing the Ctrl key and copied, blank rows are deleted when the selected rows are pasted.
Multiple rows cannot be selected during the sampling trace execution.

■ Changing data types of word devices

For word devices, data type can be changed after registration.
When the data type of a device/label that uses the multiple devices is changed, the necessary devices are displayed in the tree format.
Example:
Changing data type of D10 from "Word [Signed]" to "Double Word [Signed]"



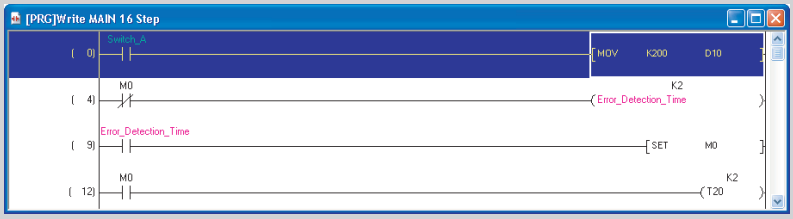
Restrictions

● **When 'Double Word'/'FLOAT (Single Precision)'/'FLOAT (Double Precision)' is set to "Data Type"**
The data acquired by the sampling trace function may become inconsistent.

■ Registering devices/labels from program editor/label editor with drag-and-drop operation

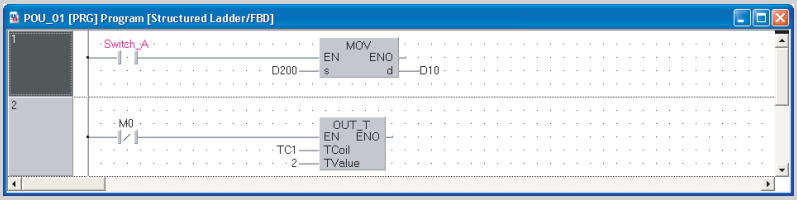
Register a device/label from the program editor/label editor with the drag-and-drop operation. Multiple devices/labels can be registered in batch by selecting a range.

<Ladder editor>



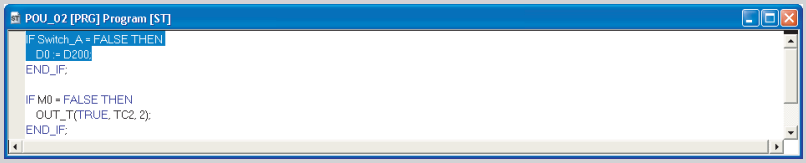
Select the device, instruction and ladder block.

<Structured Ladder/FBD editor>



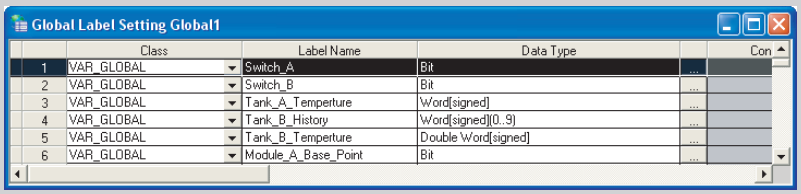
Select the device and ladder block.

<ST editor>



Select the device and line.

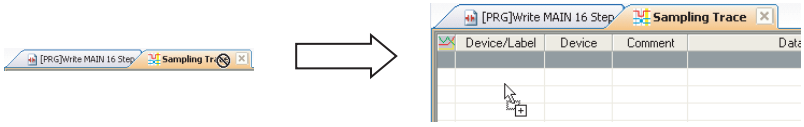
<Label editor>



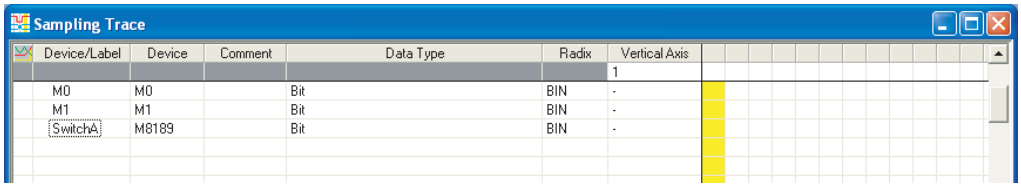
Select the device by a unit of row.

Drag & drop

Activate the window by placing the cursor on the Sampling Trace tab while dragging the data, and drop the data on the Sampling Trace screen.



The device is registered at the cursor position.



Point

● Drag-and-drop operation of data from ladder editor

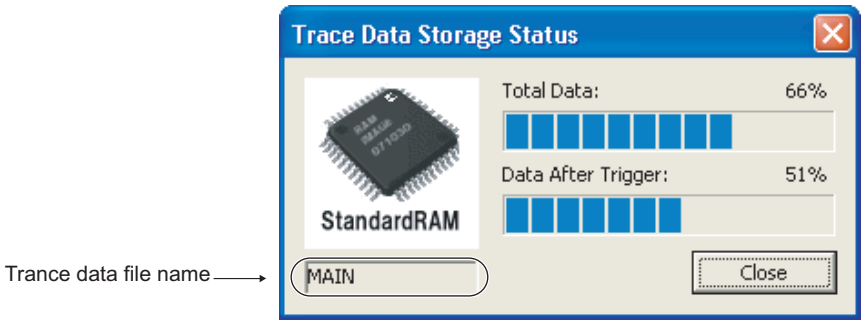
The drag-and-drop operation of data from the ladder editor can be performed when the cursor is changed to as it is moved to within the selected range.

16.4.4 Executing sampling trace

Operating procedure

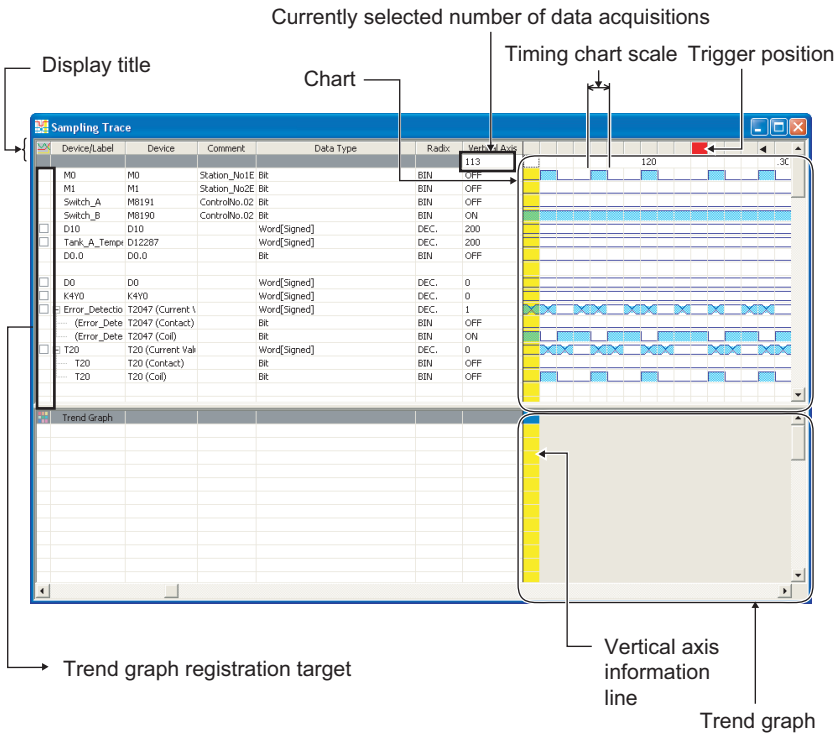
- **Select [Debug] ⇒ [Sampling Trace] ⇒ [Start Trace] ( ).**

  Sampling trace starts.
  The Trace Data Storage Status screen is displayed when the sampling trace is started.



Item	Description
Total Data	Display the current status of data acquisition (sampling) after the start of sampling trace in percentage in reference to the number of times set for "Trace Setting". Even after this status reaches 100%, sampling trace is continuously executed and the data are overwritten from the oldest data.
Data After Trigger	Display the current status of data acquisition (sampling) after the generation of trigger in percentage in reference to the number of times set for "Trace Setting". When this status reaches 100%, sampling trace stops.
Trace data file name	Display the trace data file name that is registered for the sampling trace on the programmable controller CPU.

After the stop or completion of sampling trace, the trace result is displayed on the Sampling Trace screen.



Display contents

Item		Description
Display title		-
	Vertical Axis	Display the device value of the selected cell position, on the 'vertical axis information line'.
	Currently selected number of data acquisitions	Indicate the number of data acquisitions on the column selected with the vertical axis information line. The line can be moved to the selected number of data acquisitions by entering a value.
Chart		Display the acquired data in chart.
Timing chart scale		One block corresponds to one data acquisition. The number of scale indicates the number of data acquisitions. To change the display width, select [View] ⇒ [Timing Chart Scale] ⇒ [-: Narrow Scale] ( )/[+: Wide Scale] ( ), or move a scroll wheel on a mouse while pressing the Shift key.
Trigger position		A red mark is displayed at the position corresponding to the trigger generated timing on the timing chart scale when a trigger is generated.
Vertical axis information line		This line is displayed at the position where a cell is selected on the chart in yellow. The device value on the vertical axis information line is displayed in cells under "Vertical Axis". When the vertical axis information line is double-clicked, the data at the right side of the line are displayed on the sampling trace (detailed data) screen. ☞ ■ Switching screen to the sampling trace (detailed data) screen
Trend graph registration target		Register the selected word device to the trend graph. Deregister them by clearing the check box. When the selected status is changed while two or more rows are selected, the change applies to the selected status of all the selected rows.
Trend graph		Display the changes of the word device values on the trend graph. ☞ ■ Displaying trace results on trend graphs

Point

- **Starting sampling trace from sequence program**
  Select [Debug] ⇒ [Sampling Trace] ⇒ [Register Trace].
  To start sampling trace, execute the Trace start command (SM801) in a program.
- **Displaying only the trace result stored on the programmable controller CPU without executing sampling trace**
  Select [Debug] ⇒ [Sampling Trace] ⇒ [Read from PLC]. (☞ Section 16.4.5)
- **Word devices whose data types can be changed after sampling trace results are displayed**
  The type of a word device can be changed to the double word type or the real type, only when the consecutive devices with the required points are registered as the trace data.
  Example) If the sampling trace is performed to D0, D1, D2, and D3, the data type of D0 can be changed to the double word type.
  If the data type of D2 is changed to the data type that uses multiple devices, such as the double word and single-precision real number, the data type of D0 cannot be changed as it has no consecutive 4-words devices.
- **Performing sampling trace from other peripherals during performing sampling trace**
  For Universal model QCPU/LCPU, the sampling trace currently being performed can be stopped by other peripherals and perform another sampling trace. When the sampling trace is performed by other peripherals, select [Debug] ⇒ [Sampling Trace] ⇒ [Forced Execution Registration Effective] to activate the forced registration.
- **Trace ready status (SM800) after sampling trace is completed**
  In GX Developer, the trace ready status (SM800=1) is held until the trace results are read, even if the sampling trace is completed. In GX Works2, the trace results are automatically read and displayed when the sampling trace is completed, and then the trace ready status (SM800=0) is canceled.

■ Switching screen to the sampling trace (detailed data) screen

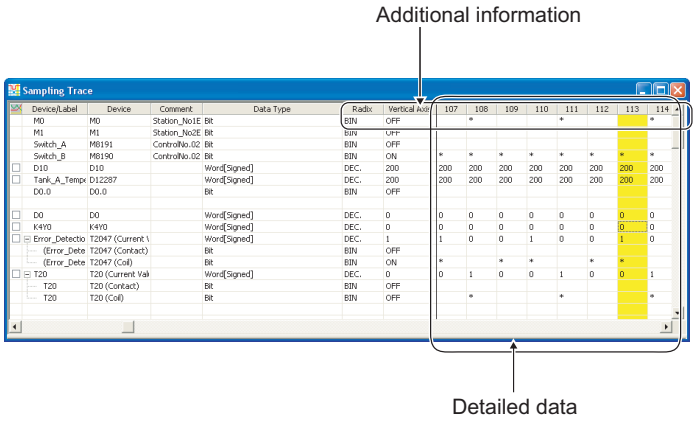
Display the device/label value change in numeric values.

Screen display

● **Click the tool button (Switch Chart/Detail).**

The sampling trace (detailed data) screen is displayed.

Click the tool button (Switch Chart/Detail) again to switch to the chart.



Display contents

Item	Description
Additional information	Display the additional information set for "Additional Information" on the <<Condition Setting>> tab on the Trace Setting screen. Select [View] ⇒ [Additional Information] ⇒ [Past Time]/[Program Name].
Detailed data	Confirm the device values. In the case of a bit device, '*' is displayed for ON, nothing is displayed (blank) for OFF. In the case of a word device, numeric values are displayed. The registered "Device /Label" are linked with the Sampling Trace screen (chart).

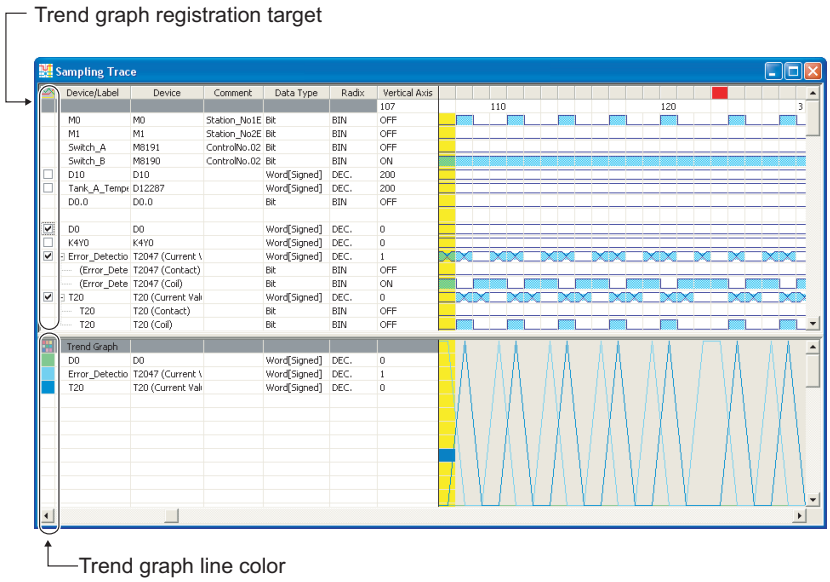
■ Displaying trace results on trend graphs

Display the changes of the word device values on the trend graph.

Operating procedure

- **Select the check box(es) of the 'trend graph registration target' on the Sampling Trace screen.**

  The selected word device is registered on the trend graph.
  Clear the check box to cancel the registration on the trend graph.



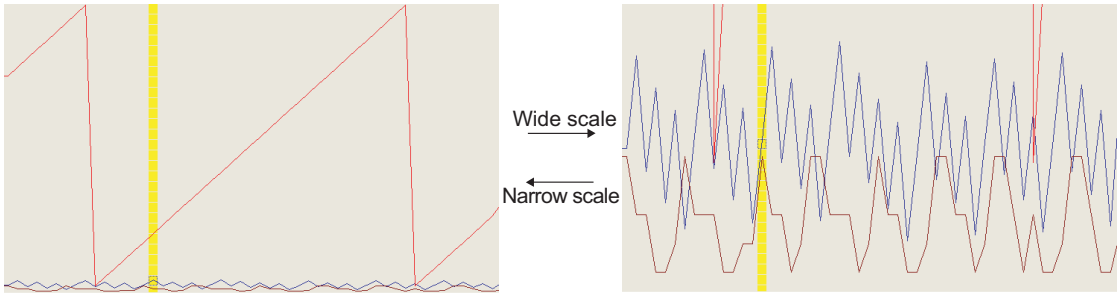
Display contents

Item	Description
Trend graph line color	Change the background color of cell under 'trend graph line color' to the line color of the trend graph. Double-click the cell, and the Color screen is displayed to allow changing of the trend graph line color.

Point

● **Wide/narrow scales of trend graphs**

Place the cursor at the base point to widen/narrow, and select [View] ⇒ [Trend Graph Scale] ⇒ [-: Narrow Scale] ( )/ [+: Wide Scale] ( ) or move a scroll wheel on a mouse while pressing the Ctrl key. The widened/narrowed graph with the specified base point as the center is displayed.
Select [View] ⇒ [Trend Graph Scale] ⇒ [Initial Display] to recover the display to the initial state.



● **Moving trend graphs**

Double-click the trend graph to move the graph up or down with the double-clicked point as the center.

16.4.5 Saving trace data

Save the trace data of sampling trace (sampling trace target devices/labels, trace setting, and trace results) on a personal computer or a programmable controller CPU.

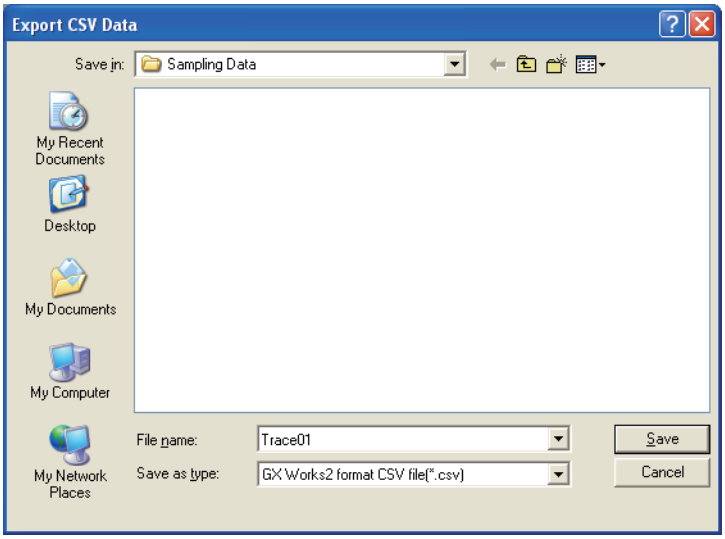
■ Saving trace data on personal computer

Save the trace data on a personal computer in the CSV file format.
The menu item of the function cannot be selected when a trace result does not exist.

Operating procedure

1. **Select [Debug] ⇒ [Sampling Trace] ⇒ [Export CSV Data].**

   The Export CSV Data screen is displayed.



2. **Enter the file name to be saved.**

3. **Select the file type.**

   For checking the trace setting or the trace result using Excel, select "GX Works2 format CSV file".
   For checking the trace result read by using GX LogViewer, select "GX LogViewer format CSV file".

4. **Click the Save button.**

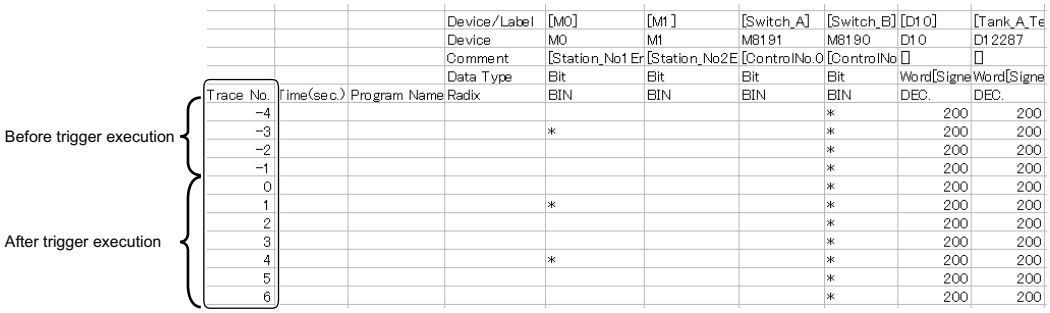
   The trace data is saved on the personal computer.

Point

● **Checking triggers in CSV file**

For the trace numbers of the sampling trace when the trace data are output to the file selected for "GX Works2 format CSV file", the number at the time of the trigger execution is set to 0, and the numbers are displayed with the negative values for the numbers before the trigger execution and positive values for the numbers after the trigger execution.

Example) If M0, which was obtained at the fifth time after the trigger execution, is ON, M0 with the trace number '4' is displayed as 'ON' in the CSV file.



			Device/Label	[M0]	[M1]	[Switch_A]	[Switch_B]	[D10]	[Tank_A_Te
			Device	M0	M1	M8191	M8190	D10	D12287
			Comment	[Station_No1 Er	[Station_No2 E	[ControlNo.0	[ControlNo		
			Data Type	Bit	Bit	Bit	Bit	Word[Signe	Word[Signe
Trace No.	Time(sec.)	Program Name	Radix	BIN	BIN	BIN	BIN	DEC.	DEC.
-4							*	200	200
-3				*			*	200	200
-2							*	200	200
-1							*	200	200
0							*	200	200
1				*			*	200	200
2							*	200	200
3							*	200	200
4				*			*	200	200
5							*	200	200
6							*	200	200

Before trigger execution

After trigger execution

When the trace data are output to the file selected for "GX LogViewer format CSV file", "*" is displayed on the data rows at the time of the trigger execution.

● **Display of CSV files opened in Excel**

To display the file selected for "GX Works2 format CSV file" in Excel similar to the display of the sampling trace result, copy the devices and the range of the result, select "Transpose" in "Paste Special", and then paste them on to Excel.

● **Display of Counter (C), Timer (T), and Retentive timer (ST)**

When the file selected for "GX LogViewer format CSV file" is read in GX LogViewer, device names are displayed in the format displayed on the Sampling Trace screen. Therefore, as shown in the following table, the display of device names differs between the file selected for "GX LogViewer format CSV file" and the CSV file output using the logging configuration tool.

File selected for "GX LogViewer format CSV file"	CSV file output using the logging configuration tool
T (Current value)	T
T (Contact)	TS
T (Coil)	TC
C (Current value)	C
C (Contact)	CS
C (Coil)	CC
ST (Current value)	ST
ST (Contact)	SS
ST (Coil)	SC

■ Formatting CSV files

Saved CSV files are displayed as shown below when they are opened by Excel.

● **Example of "GX Works2 format CSV file"**

	A	B	C	D	E	F	G
1	SW1DNC-GXW2 Trace Result						
2	<Output Version>	1.98C					
3							
4	<<Setting of Executing and Saving>>						
5	<Trace Execution Method>	[*]	Execute after overwriting current trace settings in the PLC				
6		[ ]	Execute using existing trace settings in the PLC				
7							
8	<Trace Data Storage>						
9	Target Memory		Memory Card (SRAM)				
10	File Name		[MAIN]				
11							
12	<Trace Auto Startup Setting>	[ ]	Aute Startup				
13							
14	<<Condition Setting>>						
15	<Trace Count Setting>						
16	Total Count	100					
17	Count Before Trigger	3					
18	Count After Trigger	97					
19							
20	<Additional Information>	[*]	Time				
21		[*]	Program Name				
22							
23	<Data Get Timing>	[*]	Each Scan				
24		[ ]	Specified Interval				
25		[ ]	Each Hi-Speed Transfer Cycle among Multi CPU				
26		[ ]	Detail Setting				
27							
28	<Trigger Condition Setting>	[*]	At the Time of Trace Instruction Execution				
29		[ ]	At the Time of Manual Trigger Execution				
30		[ ]	Detail Setting				
31							
32				Device/Label	[M0]	[M1]	[SwitchA]
33				Device	M0	M1	M8190
34				Address	%MX0.0	%MX0.1	%MX0.8190
35				Comment	[Station_No1	[Station_No2	[ControlNo0
36				Data Type	Bit	Bit	Bit
37	Trace No.	Time(sec.)	Program Name	Radix	BIN	BIN	BIN
38	-3	0	[MAIN1]				
39	-2	0	[MAIN1]				
40	-1	0.001	[MAIN1]		*		

● **Example of "GX LogViewer format CSV file"**

	A	B	C	D	E	F
1	[LOGGING]	SamplingTrace_1	2	3	4	
2	INDEX	BIT[1;0]	BIT[1;0]	BIT[1;0]	SHORT[DEC.0]	TRIGGER[*]
3	INDEX	M0	M1	M8190	D0	Trigger
4	1	0	0	0	78947352	
5	2	0	0	0	78979536	
6	3	1	0	0	0	
7	4	1	0	0	0	
8	5	1	0	0	0	
9	6	1	0	0	0	
10	7	1	0	0	0	

■ Writing/reading trace data to/from programmable controller CPU

Write/read the trace data to/from a programmable controller CPU.

Operating procedure

- **Select [Debug] ⇒ [Sampling Trace] ⇒ [Read from PLC]/[Write to PLC].**

  The Write to PLC function writes the trace data to the target memory set on the <<Setting of Executing and Saving>> tab on the Trace Setting screen.

Point

● **Reading trace data to programmable controller CPU**
The word data, which was read by the Read from PLC function, is read as the word (signed) type regardless of the data type settings at the time of writing the data.

16.4.6 Applicable devices/labels for sampling trace

■ List of applicable devices for sampling trace

○: Applicable ×: Not applicable

Category	Device type		Device	Sampling trace screen	Data acquisition timing	Trigger condition
Internal user device	Input		X	○*1	○*1	○
	Output		Y	○*1	○*1	○
	Internal relay		M	○*1	○*1	○
	Latch relay		L	○*1	○*1	○
	Annunciator		F	○*1	○*1	○
	Edge relay		V	○*1	○*1	○
	Step relay		S	×	×	×
	Link relay		B	○*1	○*1	○
	Link special relay		SB	○*1	○*1	○
	Timer	Current value	T	○	○	○
		Contact	TS	○*2	○*2	○*2
		Coil	TC	○*2	×	×
	Counter	Current value	C	○	○	○
		Contact	CS	○*2	○*2	○*2
		Coil	CC	○*2	×	×
	Retentive timer	Current value	ST	○	○	○
		Contact	STS	○*2	○*2	○*2
		Coil	STC	○*2	×	×
	Data register		D	○*1	○*1	○*1
	Link register		W	○*1	○*1	○*1
	Link special register		SW	○*1	○*1	○*1
Internal system device	Function input		FX	○	○	○
	Function output		FY	○	○	○
	Special relay		SM	○*1	○*1	○
	Function register		FD	○*1	○*1	○*1
	Special register		SD	○*1	○*1	○*1
Link direct device	Link input		J□\X□	○*1	○*1	×
	Link output		J□\Y□	○*1	○*1	×
	Link register		J□\W□	○*1	○*1	×
	Link special register		J□\SW□	○*1	○*1	×
	Link relay		J□\B□	○*1	○*1	×
	Link special relay		J□\SB□	○*1	○*1	×
File register	File register		R	○*1	○*1	○*1
			ZR	○*1	○*1	○*1
Index register	Index register		Z	○	○	×
			ZZ	×	×	×
Intelligent function module device	Intelligent function module device		U□\G□	○*1	○*1	×
	Cyclic transmission area device		U3E□\G□	○*1	○*1	×
Nesting	Nesting		N	×	×	×

Category	Device type		Device	Sampling trace screen	Data acquisition timing	Trigger condition
Pointer	Pointer		P	×	×	×
	Interrupt pointer		I	×	×	×
Others	SFC block device		BL	×	×	×
	SFC transition device		TR	×	×	×
	Network number specified device		J	×	×	×
	I/O number specified device		U	×	×	×
	Macro instruction argument device		VD	×	×	×
Constant	Decimal constant		K	×	×	×
	Hexadecimal Constant		H	×	×	×
	Real constant	Single-precision floating-point data	E	×	×	×
		Double-precision floating-point data	E	×	×	×
	String constant		""	×	×	×

*1 : Following modification settings are applicable.
- Digit-specified bit device (K1 to K8 and K1 to K4 can be used for the Sampling Trace screen and data acquisition timing respectively.)
- Bit-specified word device
- Index setting (not available under the trigger condition)

*2 : For Structured projects only

■ Applicable label types for sampling trace

Label type	Description	Example
Global label*1	Register and display as 'label name'.	Label1
Local label*1	Register and display as 'program/label name'.	POU_01/ Label1
Structure*1	Register and display as 'label name.member name'. Register all members when the whole structure labels are registered.	G_data.AAA
Function block*1	Register and display as 'instance name.label name in function block'. Register all labels in the function block when the whole instances (function blocks) are registered.	FB_01.IN01
Array*1	Register and display as 'label name [one-dimensional element number] [two-dimensional element number] [three-dimensional element number]'. Register all elements/all members when the whole array labels are registered.	Array[0,0,0]
Structure array*1	Register and display as 'label [one-dimensional element number] [two-dimensional element number] [three-dimensional element number]. member name'. Register and display arrays when the structure contains member labels of arrays. Register all elements/all members when the whole structure array labels are registered.	Array2[0,0,0]. AAA
Nested function block*1	Register and display as 'instance name.label name in function block.label in nested function block'. Register and display structures when the nest function block contains structure labels. Register all labels in the instance when the whole instances (nested function blocks) are registered.	FB1_01.FB2_ 01.Label1

*1 : The following data types are applicable.
Bit, Word [Signed], Word [Unsigned], Word [Unsigned]/Bit String [16-bit], Double Word [Signed], Double Word [Unsigned]/Bit String [32-bit], FLOAT (Single Precision), FLOAT (Double Precision), Timer, Counter, Retentive Timer

16.4.7 Considerations when performing sampling trace

The following explains the considerations when performing the sampling trace.

● **When files for both local device and trace data exist in standard RAM**

Perform the following operation to change the local device when the files for both the local device and trace data exist in the standard RAM.
If the following operation is not performed, the files for the trace data may be deleted.

Operation

1. **Select [Debug] ⇒ [Sampling Trace] ⇒ [Read from PLC].**
   Read the file for trace data from the standard RAM.
2. **Change the settings for the local device, and write the changes to the programmable controller CPU.**
3. **Select [Debug] ⇒ [Sampling Trace] ⇒ [Write to PLC].**
   Write the file for the trace data, which was read in the procedure 1, to the standard RAM.

16.4.8 Compatibility with sampling trace data in GX Developer

The sampling trace data which are saved by "Trace settings file operation" using GX Developer cannot be read in GX Works2.
The sampling trace data which are set in GX Works2 cannot be saved as the format that can be read in GX Developer.

Perform the following operation when utilizing the sampling trace data.

● **Utilizing GX Developer sampling trace data in GX Works2**

Operation

1. **Write the sampling trace data, which are set in GX Developer, to the programmable controller CPU.**
   Perform the "Write to PLC" function of "Trace settings PLC operation" in GX Developer.
2. **Read the sampling trace data from the programmable controller CPU in GX Works2.**
   Select [Debug] ⇒ [Sampling Trace] ⇒ [Read from PLC] in GX Works2.

● **Utilizing GX Works2 sampling trace data in GX Developer**

Operation

1. **Write the sampling trace data, which are set in GX Works2, to the programmable controller CPU.**
   Select [Debug] ⇒ [Sampling Trace] ⇒ [Write to PLC] in GX Works2.
2. **Read the sampling trace data from the programmable controller CPU in GX Developer.**
   Perform the "Read from PLC" function of "Trace settings PLC operation" in GX Developer.

16.5 Measuring Scan Time

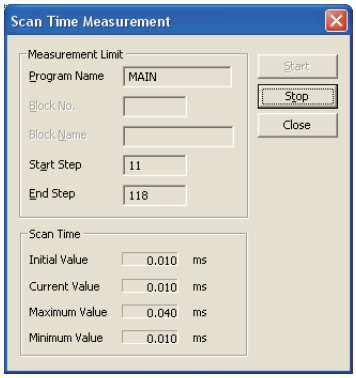
Q CPU *1 | L CPU | Remote | Head | FX

*1 : Not supported by Basic model QCPU.

This section explains how to measure the initial, current, maximum, and minimum scan time for a user-defined section of a ladder or SFC program.
The processing time can be measured even in subroutines and interrupt programs.
This function can be performed in Simple projects only.

Screen display

Select [Debug] ⇒ [Scan Time Measurement].



Operating procedure

1. Set the items on the screen.

Item		Description
Measurement Limit		Set the measurement range.
	Program Name	Display the name of the program being opened.
	Block No.*1	Display the SFC block number.
	Block Name*1	Display the SFC block name.
	Start Step	Set the start step. For SFC program, set the SFC step number.
	End Step	Set the end step. For SFC program, set the SFC step number.

*1 : SFC programs only

2. Click the Start button.

The first value, current value, maximum value, and minimum value are measured.
0.000ms is displayed when the measured time is shorter than 0.100ms.
For Universal model QCPU, the scan time 0.001ms or longer can be measured.

Point

● Scan time measurement range

- By selecting a range on the ladder editor/SFC diagram editor and selecting [Debug] ⇒ [Scan Time Measurement], the selected range can be set to "Start Step" and "End Step".
- For a ladder program, when a step specified as "Start Step" or "End Step" exists in the ladder program, the measurement range is set in units of ladder blocks which include the selected range.

16.6 Debugging Programs with Simulation Function

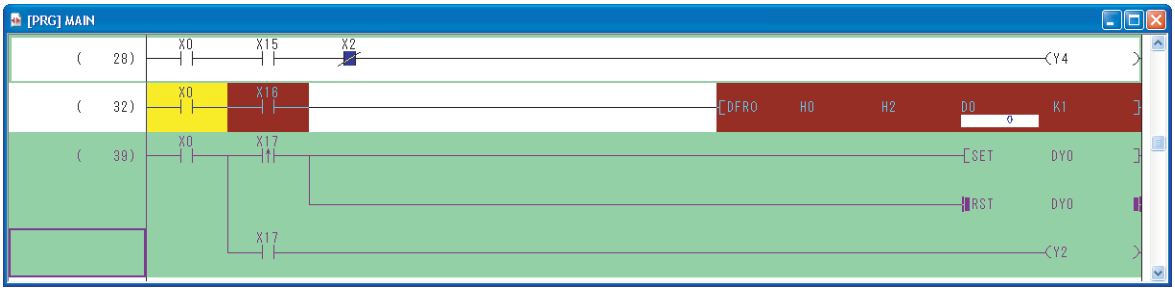
Q CPU | L CPU | Remote | Head | FX

This section explains how to debug programs with the simulation function.
This function is supported only by ladder and ST programs of Simple project.
The following table shows the main step execution functions.

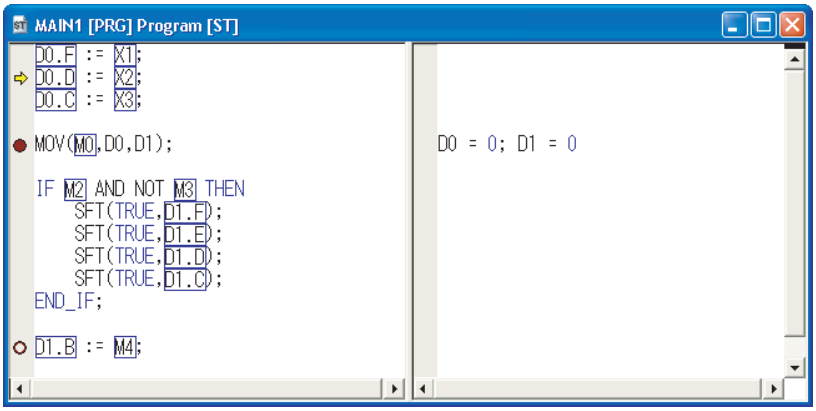
Item	Description
Break execution	Execute a program until set break conditions are satisfied. Break conditions are set with break points or break devices.
Step execution	Execute a program one step at a time.
Partial execution	Execute a program partially from the specified point. A partial execution is executed by executing a break execution with set break points and break devices.

The following are program editors in a debugging process with the step execution functions.

<Example of step execution in ladder program>



<Example of step execution in ST program>



Point

● **Online functions which can be performed during step execution**

The RUN/STOP status of monitor status becomes STEP-RUN ( ) when the step execution is executed.
The following are the Online functions which can be performed when the monitor status is STEP-RUN.

- Write to PLC function (SFC file batch online program change is not supported.)
- Verify with PLC function
- Remote operation
- Delete PLC Data function

● **Editing programs during step execution**

For ladder programs, programs can be edited even when the step execution is being executed.
Note that, however, when the step execution is executed in the status in which the program in GX Works2 and the program in the virtual programmable controller do not match, then the step execution function is executed on the program in the virtual programmable controller as the basis. Therefore, the cursor position of canceled position may be displayed at a different position.

● **Ladder blocks with yellow background**

In a ladder program, the step execution may not be executed normally in ladder blocks with yellow background which indicates a program cannot be displayed as a ladder program.

● **Programs with "Standby" execution type**

The step execution cannot be executed on programs in which "Standby" is set for execution type in the program setting.
However, the step execution can be executed on a program in which the execution start position is set for "From current cursor position" in the execution option setup (☞ Section 16.6.8), and the cursor is positioned in a program in which "Standby" is set.

Restrictions

● **Restrictions after setting break conditions and skip range**
All settings of break condition and skip range are canceled when a data name or a library name is changed/deleted in a project.

● **Break in ST control syntax**
The following are the considerations when executing the step execution on an ST program contains ST control syntax.

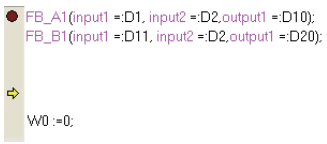
- A break execution may be executed in a line of control syntax which is not calculated.
  When the step execution is executed on the following program in which W10=0 is set for the break condition, the break execution is executed in the 6th line. Note that, however, since a calculation is not processed in the line where the break execution is executed, this break does not affect the calculation result.

ST line number	ST program	Operation
1	FOR W10 := 0 TO 3 DO	–
2	CASE W10 OF	–
3	0:	–
4	D0 := D0 + 1;	–
5	1..3:	–
6	D1 :=D1 +1;	When W10=0, this line is not processed but the break execution is executed.
7	END_CASE;	–
8	END_FOR;	–

- In step execution, a break execution is not executed in a RETURN syntax and an EXIT syntax.
  When the step execution is executed on the following program, the break execution is not executed in the 3rd and 4th lines even if the break condition is satisfied.

ST line number	ST program	Operation
1	W0 := 0;	–
2	IF X0 THEN	–
3	RETURN;	The break execution is not executed in the RETURN syntax when X0=ON in the step execution. (The break execution is executed in the first line.)
4	END_IF;	–
5		–
6	FOR W0 := 0 TO 4 DO	–
7	IF X1 THEN	–
8	EXIT;	The break execution is not executed in the EXIT syntax when X1=ON in the step execution. (The break execution is executed in the 11th line.)
9	END_IF;	–
10	END_FOR;	–
11	W0 := 0;	–

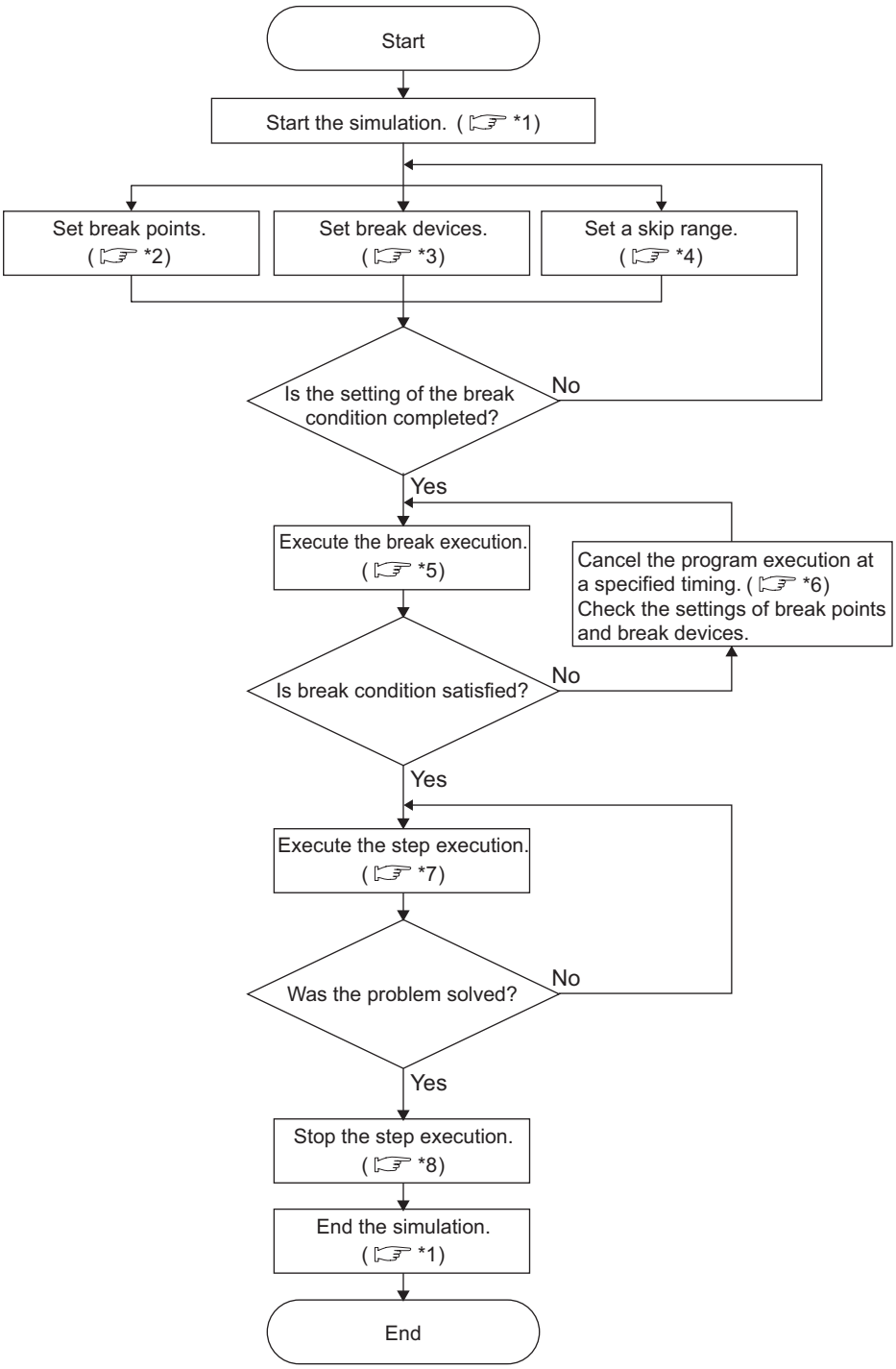
● **Step execution on successive function blocks**
When function blocks are used successively in the ST program, even if a step execution is canceled in the process of the function blocks, the canceled-position cursor may be placed at one step before the next function block instruction. The following program is an example when a step execution is canceled in the process of the successive function blocks.



● **When using the same function blocks multiple times**
When the step execution is executed, a break position may move to the first instance at the timing of entering the second and the following instances. This phenomenon occurs when the instance created from the same function block in the program file is used multiple times.

16.6.1 Debugging procedure

The following flow chart explains the procedure to debug programs.



*1 : ☞ Section 15.2
*2 : ☞ Section 16.6.2
*3 : ☞ Section 16.6.3
*4 : ☞ Section 16.6.4
*5 : ☞ Section 16.6.6
*6 : ☞ Section 16.6.7
*7 : ☞ Section 16.6.5
*8 : ☞ Section 16.6.9

16.6.2 Setting break points

By setting a break point, a step execution can be canceled at a specific position in a program.
Break points are set in: step unit for ladder program, and line unit for ST program.
Break points can be set up to 64 points in an entire project.

■ Setting/canceling break points

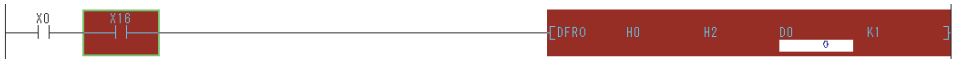
Set/cancel break points.

Operating procedure

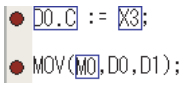
1. **Move the cursor to the position to set a break point or cancel the set break point.**

2. **Select [Debug] ⇒ [Break Setting] ⇒ [Set/Cancel Break Point] ( ).**
   A break point is set at the cursor position. When the break point is already set, it is canceled.
   Set break points are registered on the Break Point window.

<Example of break points (for ladder)>



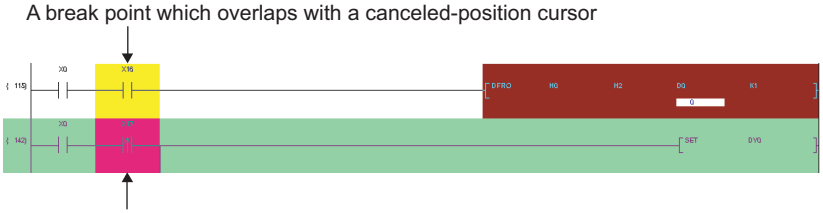
<Example of break points (for ST)>



Point

● **When break point overlaps with other indications**
When a break point overlaps with a canceled-position cursor on the ladder editor, the canceled-position cursor is displayed as a priority. When a break point overlaps with other indications such as a skip range and mixed color is displayed at the overlapped position.
The following program is an example of overlapped indications.

A break point which overlaps with a canceled-position cursor



A break point which overlaps with a skip range

■ Enabling/disabling break points

Enable/disable set break points.
The break point function is executed at the position with enabled break point.
The break point function is not executed when the break point is disabled.

Operating procedure

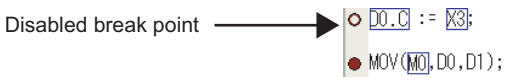
1. **Move the cursor to the break point to be enabled/disabled.**

2. **Select [Debug] ⇒ [Break Setting] ⇒ [Enable/Disable Break Point] ( ).**
   The break point at the cursor position is enabled/disabled.

<Example of disabled break point (for ladder program)>

Disabled break point

<Example of disabled break point (for ST)>



■ Canceling all break points

Cancel all break points.

Operating procedure

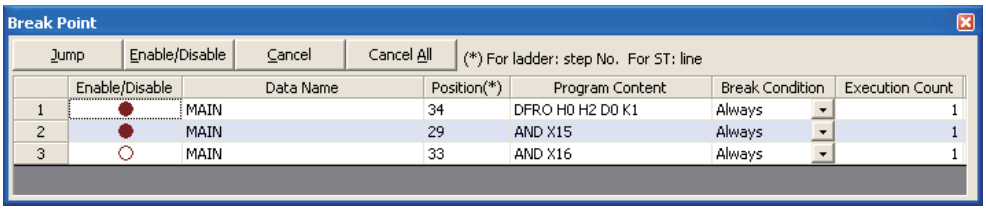
- **Select [Debug] ⇒ [Break Setting] ⇒ [Cancel All Break Points] ( ).**
  All break points are canceled.

■ Setting break conditions on Break Point window

Display a list of set break points.
Set break conditions and the number of execution counts for break points.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Debug] ⇒ [Break Point] ( ).



Operating procedure

- **Set the items on the screen.**

Item	Description
Enable/Disable	Display enabled/disabled status of break points. ●: Enabled ○: Disabled
Data Name	Display program names to which break point is set.
Position	Display positions of set break points in a program. For ladder program: Step numbers displayed on the editor. For ST program: Line numbers
Program Content	Display program content of set break points. For ladder program: Instructions (list format), pointers (P), or interrupt pointers (I) For ST program: Text
Break Condition	Set break conditions. This item can be set for ladder programs only.
Always	Execute the break execution when scans are completed for a set number of times.
ON	Execute the break execution when the specified step/pointer is ON after scans are completed for a set number of times.
OFF	Execute the break executions when the specified step/pointer is OFF after scans are completed for a set number of times.
Rising	Execute the break execution when the specified step/pointer turns ON from OFF after scans are completed for a set number of times.
Falling	Execute the break execution when the specified step/pointer turns OFF from ON after scans are completed for a set number of times.
Execution Count	Set the number of scans until break execution is executed. This item can be set for ladder programs only.

Screen button

- Jump
  Jumps to the selected break point.
- Enable/Disable
  Enables/disables the selected break point.
- Cancel
  Cancels the selected break point.
- Cancel All
  Cancels all break points.

Point

● Counting and resetting number of execution counts

The number of execution counts is counted/reset according to the following rules.

- When two or more break points are passed in one scan, the passed number of times is counted as the number of execution counts.
- Break points which are not passed by an instruction such as the jump instruction are not counted as the number of execution counts.
- The execution count of all break points is reset for each break.
- When changing the number of execution counts, the corresponding execution count of break point is reset.

16.6.3 Setting break devices

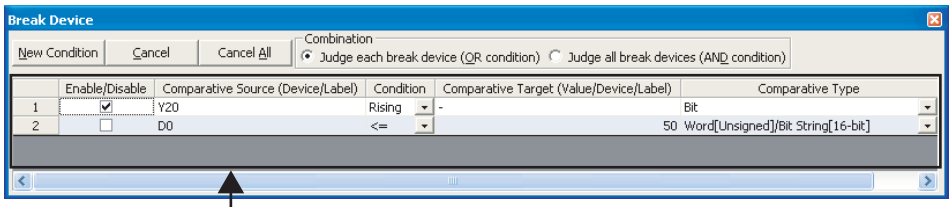
By setting a break device, a step execution can be canceled when the value of device/label satisfies the specific condition.
Break devices can be set up to 16 points in total of bit devices and word devices.
When a break device is set, a break execution is executed at the instruction which is the one after the execution of the calculation to satisfy the break condition.
In order to execute the break execution after the break condition is satisfied, disable or cancel the break devices.

■ Setting/canceling break devices

Set/cancel break devices, or enable/disable set break devices.
The break device function is executed at the position with enabled break device.
The break device function is not executed when the break device is disabled.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Debug] ⇒ [Break Device] ( ).



Break device information list

Operating procedure

1. **Click the [New Condition] button.**

   A blank row is added to the last row of the break device information list.

2. **Set the items on the screen.**

Item		Description
Combination		–
	Judge each break device (OR condition)	Select this to execute the break execution when any condition of break devices is satisfied.
	Judge all break devices (AND condition)	Select this to execute the break execution when conditions of all break devices are satisfied.
Enable/Disable		Enable/disable the break device. Selected: Enabled Cleared: Disabled
Comparative Source (Device/Label)		Enter the comparative source device/label. For a local label, enter data in a 'program name/label name' format.
Condition		Select the comparative condition. The condition selection changes according to the comparative source device/label.
	Rising	Execute the break execution when the comparative device/label rises.
	Falling	Execute the break execution when the comparative device/label falls.
	=	Execute the break execution when the value of comparative source device/label matches with the value of comparative target device/label.
	<	Execute the break execution when the value of comparative source device/label is smaller than the value of comparative target device/label.
	>	Execute the break execution when the value of comparative source device/label is larger than the value of comparative target device/label.
	<=	Execute the break execution when the value of comparative source device/label is the same as or less than the value of comparative target device/label.
	>=	Execute the break execution when the value of comparative source device/label is the same as or more than the value of comparative target device/label.
	<>	Execute the break execution when the value of comparative source device/label does not match with the value of comparative target device/label.
Comparative Target (Value/Device/Label)		Enter a comparative target device/label.
Comparative Type		Set the data type to compare comparative source and comparative target.

Screen button

- [Cancel]
  Cancels the selected break device.
- [Cancel All]
  Cancels all break points.

■ Canceling all break devices

Cancel all break devices.

Operating procedure

- **Select [Debug] ⇒ [Break Setting] ⇒ [Cancel All Break Devices] ( ).**

  All break devices are canceled.

16.6.4 Setting skip ranges

A skip range is a range in which a program will not be executed during the step execution. A range can be set in ladder block unit for ladder programs.
Up to 16 ranges can be set in a project.

■ Setting/canceling skip ranges

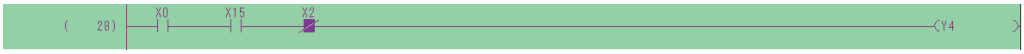
Set a skip range, or cancel the set skip range.

Operating procedure

1. **Select a ladder block to set a skip range.**
   Multiple ladder blocks can be selected by selecting a range.

2. **Select [Debug] ⇒ [Skip Setting] ⇒ [Set/Cancel Skip Range] ( ).**
   The skip range is set. When the skip range is already set, it is canceled.
   Multiple skip ranges set within the selected ladder blocks are all canceled.
   Set skip ranges are registered on the Skip Range window.

<Example of skip range>



Point

- **Skip range setting in ST programs**
  Skip ranges cannot be set in ST programs.
- **When skip range overlaps with other indications**
  When a skip range overlaps with other indications such as a break point and mixed color is displayed at the overlapped position.

■ Enabling/disabling skip ranges

Enable/disable the skip range at the cursor position.
The program of the ladder block with enabled skip range is not executed.
When the skip range is disabled, the program of the ladder block with set skip range is also executed.

Operating procedure

1. **Move the cursor to the skip range to be enabled/disabled.**

2. **Select [Debug] ⇒ [Skip Setting] ⇒ [Enable/Disable Skip Range] ( ).**
   The skip range at the cursor position is enabled/disabled.

<Example of disabled skip range>

■ Canceling all skip ranges

Cancel all skip ranges.

Operating procedure

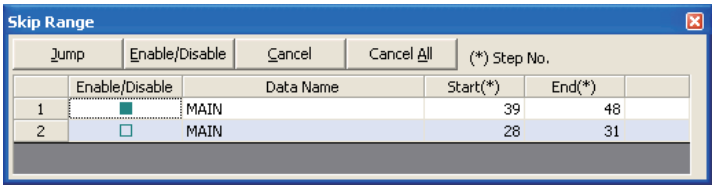
- **Select [Debug] ⇒ [Skip Setting] ⇒ [Cancel All Skip Ranges] ( ).**
  All skip ranges are canceled.

■ Displaying Skip Range window

Display a list of set skip ranges.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Debug] ⇒ [Skip Range] ( ).



Display contents

Item	Description
Enable/Disable	Enable/disable the skip range. ■: Enabled □: Disabled
Data Name	Display the program name to which the skip range is set.
Start	Display the start position of the skip range with a step number.
End	Display the end position of the skip range with a step number.

Screen button

- Jump
  Jumps to the start position of the selected skip range.
- Enable/Disable
  Enables/disables the selected skip range.
- Cancel
  Cancels the selected skip range.
- Cancel All
  Cancels all skip ranges.

16.6.5 Executing program one step at a time

Execute programs one step at a time.

Operating procedure

- **Select [Debug] ⇒ [Step Execution] ⇒ [Step Execution] ( ).**

  One instruction of a program is executed for ladder program, and one line of a program is executed for ST program.
  When the step execution is executed on a function block in the program, the step execution is executed on the program in the function block.
  The canceled-position cursor is displayed on the function block while the step execution is being executed on the program in the function block.

16.6.6 Executing program until condition is satisfied

Execute a program until the condition is satisfied.

Operating procedure

- **Select [Debug] ⇒ [Step Execution] ⇒ [Break Execution] ( ).**

  When the break condition is satisfied, the break execution is stopped.

Point

● **When multiple break conditions are satisfied simultaneously**
When the conditions of break point and break device are satisfied simultaneously, the Break Point window is activated and the cursor moves to the break point where the condition is satisfied.

16.6.7 Canceling step execution

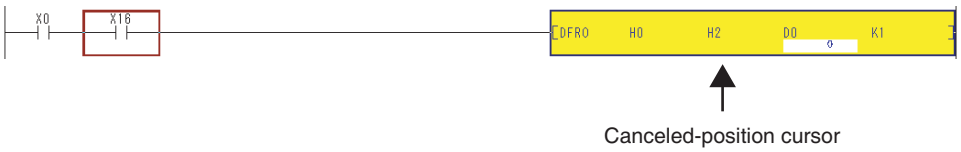
Cancel the step execution.

Operating procedure

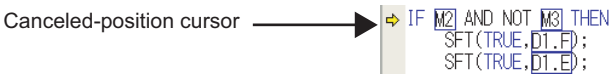
- **Select [Debug] ⇒ [Step Execution] ⇒ [Cancel] ( ).**

  The step execution is canceled.
  The canceled-position cursor is displayed at the canceled position.

<Example of canceled-position cursor (for ladder program)>



<Example of canceled-position cursor (for ST)>



Point

● Canceled-position cursor

The canceled-position cursor is displayed on the program editor in which the step execution is executed as described below.

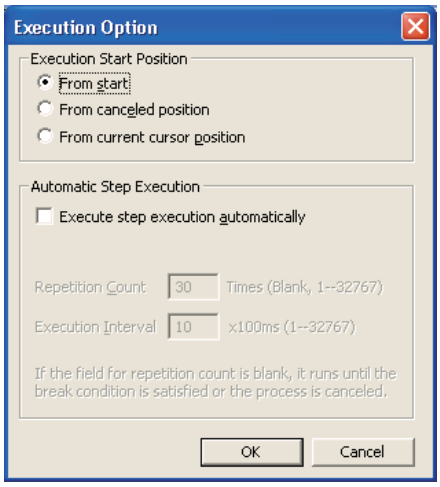
- The step execution is canceled.
- The step execution completed without satisfying the break condition.
- The break condition is satisfied and the step execution is canceled.

16.6.8 Setting options for step execution

Set options for the step execution function.
Set the start position of the step execution and the setting for the automatic step execution.

Screen display

Select [Debug] ⇒ [Step Execution] ⇒ [Execution Option] ( ).



Operating procedure

1. **Set the items on the screen.**

Item		Description
Execution Start Position		Set the execution position of the step execution. The setting will be changed depending on the last operation that is performed. For details, refer to Point in this section.
	From start	Execute the step execution from the start of the program according to the setting set on the <<Program>> tab of PLC parameter.
	From canceled position	Execute the step execution from the canceled position.
	From current cursor position	Execute the step execution from the current cursor position on the active program editor. When the program editor is not active, the operation is the same as that of "From start".
Automatic Step Execution		–
	Execute step execution automatically	Select this to execute the step execution automatically. The automatic step execution is executed by executing the step execution after setting this item.
	Repetition Count	Set the number of times the step execution is executed automatically. When this item is blank, the step execution is executed repeatedly until the break condition is satisfied or the step execution is canceled. This item is applicable when "Execute Step execution automatically" is selected.
	Execution Interval	Set the cycle of automatic step execution in 100ms unit. This item is applicable when "Execute Step execution automatically" is selected.

2. **Click the OK button.**

Point

● **Setting execution start position**

The setting of the execution start position will be changed depending on the last operation that is performed.
The following table shows the execution start position corresponding to the operation that is performed.

Last-performed operation	Execution Start Position
Simulation start, step execution stop	From start
Cancellation, break execution, step execution	From canceled position

16.6.9 Stopping step execution

Stop the step execution.

Operating procedure

- **Select [Debug] ⇒ [Step Execution] ⇒ [Stop] ( ).**

  The step execution is stopped.
  The canceled-position cursor on the program editor is hidden.

16.7 Using QnUDVCPU & LCPU Logging Configuration Tool

Q CPU *1 | L CPU *2 | Remote | Head | FX

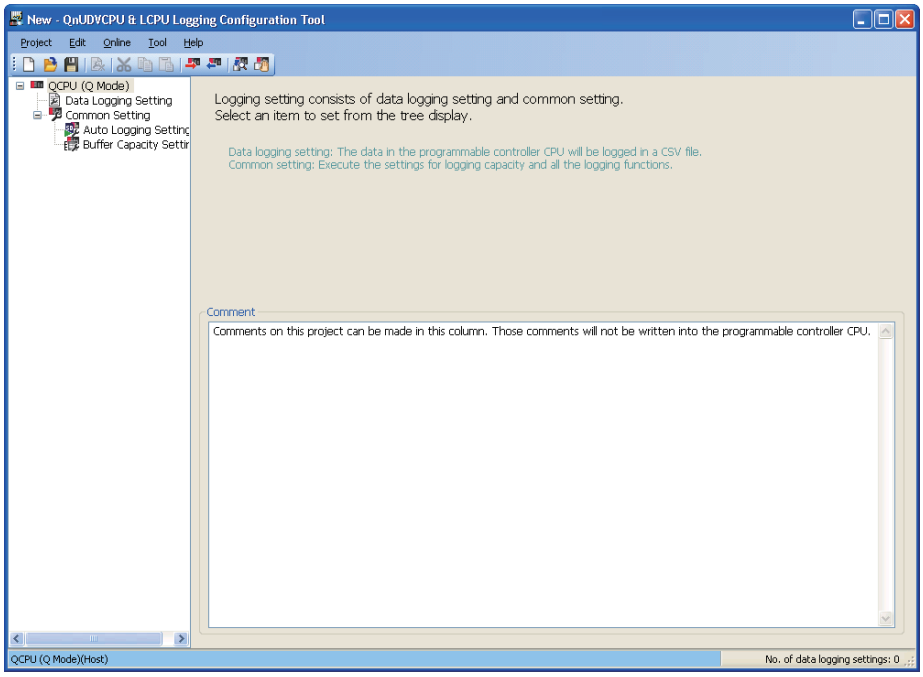
*1 : High-speed Universal model QCPU only

*2 : Not supported by L02S.

This section explains how to start QnUDVCPU & LCPU Logging Configuration Tool from the menu of GX Works2.
To start QnUDVCPU & LCPU Logging Configuration Tool, install the logging configuration tool in advance.
For the installation and operation methods, refer to the following manual.
☞ QnUDVCPU/LCPU User's Manual (Data Logging Function)

Screen display

Select [Tool] ⇒ [Logging Configuration Tool].



Point

● **Supported versions of logging configuration tool**
Install the logging configuration tool version 1.26C or later for High-speed Universal model QCPU.

MEMO

17 OPERATING PROGRAMMABLE CONTROLLER CPU

This chapter explains how to change the execution status and setting the clock of the programmable controller CPU from GX Works2.

17.1 Remote Operation of Programmable Controller CPU

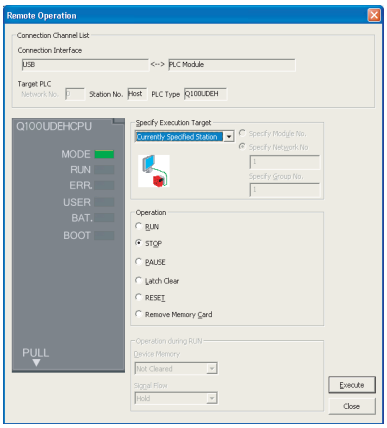
Q CPU | L CPU | Remote | Head | FX

This section explains how to switch the RUN/STOP status of the programmable controller CPU and allowing the memory card removal from GX Works2.

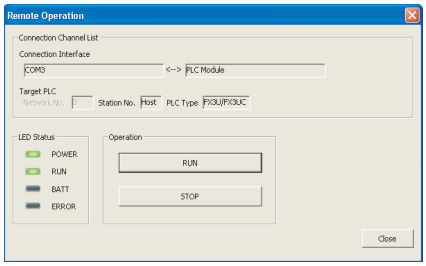
Screen display

Select [Online] ⇒ [Remote Operation].

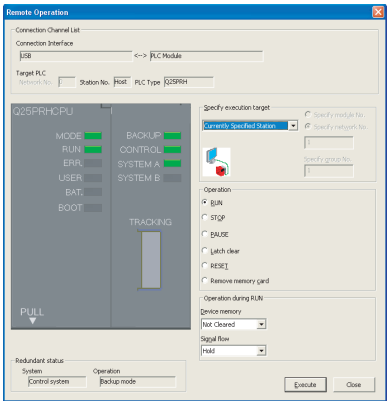
<High Performance model QCPU>



<FXCPU>



<Redundant CPU>



Operating procedure

1. Set the items on the screen.

Item		Description
Connection Channel List		Display the information of the connection destination.
Specify Execution Target*1,*2		Set the target station of remote operation.
	Currently Specified Station	Select this to perform the remote operation only on the station specified in the connection destination setting.
	All Stations	Select this to perform the remote operation on the station specified in the connection destination setting and all the stations on the same network. Set a target network with "Specify Module No."*3 or "Specify Network No.".
	Specified Group	Select this to perform the remote operation on the station specified in the connection destination setting and each station of the specific group on the specified network. Set a target network with "Specify Module No." or "Specify Network No.", and set a group number with "Specify Group No.".
	Specify both systems	Select this to perform the remote operation on the both systems (control system and standby system) with the route specified on the Transfer Setup screen. This item is applicable to Redundant CPU only.
Operation		Select the operation details.
	RUN	Select this to switch the operating status of the programmable controller CPU.
	STOP	
	PAUSE*2	
	Latch Clear*2	
	RESET*2	
	Remove Memory Card*2, *3	Select this to remove the memory card while the programmable controller CPU is ON.
Operation during RUN*2		Set the status of the device memory and signal flow when the programmable controller CPU is switched to RUN.
	Device Memory	Select whether to clear the device memory.
	Signal Flow	Select whether to retain the signal flow.
Redundant status*2,*3		Display the operation mode and system status of Redundant CPU. This item is applicable to Redundant CPU only.

*1 : When the target network is CC-Link IE Field Network, the target station can be specified with "Currently Specified Station" and "All Stations".
*2 : Not supported by FXCPU.
*3 : Not supported by LCPU.

2. Click the Execute button.

The operating status of the programmable controller CPU is changed.

Point

● **Remote operation and RUN/STOP switch for QCPU (Q mode)/LCPU**

When operation to the programmable controller CPU differs among controls by the remote operation, RUN/STOP switch, and remote RUN/PAUSE contact, the programmable controller CPU operates according to the priority shown below:

Operation to the programmable controller CPU	Priority
STOP	1
PAUSE	2
RUN	3

The following table shows the operating status after RUN/STOP switching on the programmable controller CPU or remote RUN/PAUSE contact operation.

-		Programmable controller CPU switch		Remote RUN/STOP contact is ON. (The programmable controller CPU is in STOP.)
		RUN	STOP	
Remote operation	RUN	RUN	STOP	STOP
	STOP	STOP	STOP	STOP
	PAUSE	PAUSE	STOP	STOP
	Latch clear	Inoperable*1	Latch clear	Latch clear
	RESET*2	Inoperable*1	RESET	RESET

*1 : Operable when the programmable controller CPU is switched to STOP by remote operation.

*2 : The remote reset operation must be enabled on the <<PLC System>> tab of PLC parameter.

● **Remote reset operation on Redundant CPU**

A remote reset operation on Redundant CPU may not be performed depending on the status of the control system or the standby system.

The following table shows the CPU status at a remote reset operation and the operation results.

○: Applicable
×: Not applicable

Current redundant CPU status		Remote reset operation result	
Control system status	Standby system status	Control system	Standby system
RUN/PAUSE	RUN/PAUSE	×	×
	STOP*1/Stop error		○
STOP*1/Stop error	RUN*2/PAUSE	○	×
	STOP*1/Stop error		○

*1 : A remote reset operation cannot be performed when a remote operation is performed on a Redundant CPU from other GX Works2.

*2 : A system switch occurs and the system is activated.

● **Considerations for removing a memory card**

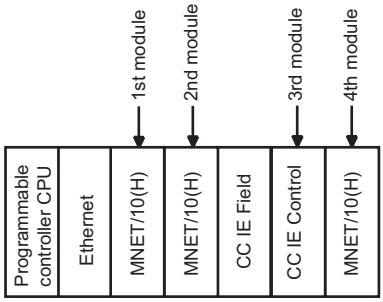
Turn OFF SM605 to allow the memory card removal.

If the memory card is removed when not allowed, the programmable controller CPU becomes in an error status.

Point

● **Counting modules to set "Specify Module No."**

Physically count the module from the programmable controller side, and specify the number.
However, note that the target modules to be counted are MELSECNET/H network modules and CC-Link IE Controller Network modules only. Do not include other modules such as Ethernet modules, CC-Link master/local modules, and CC-Link IE Field Network modules.
The following figure shows an example of counting modules.



<Terms on the figure>
Ethernet : Q series-compatible E71
MNET/10(H) : MELSECNET/H network module
CC IE Field : CC-Link IE Field Network module
CC IE Control : CC-Link IE Controller Network module

● **Remote operation of FXCPU**

M8035 (forced RUN mode), M8036 (forced RUN command), and M8037 (forced STOP command) are controlled.
The remote operation is possible regardless of the status of the programmable controller CPU side RUN/STOP switch.
Programmable controller CPUs that support the remote operation are as follows:
FX1S, FX1N, FX2N, FX1NC, FX2NC, FX3G, FX3GC, FX3U, and FX3UC

Restrictions

● **Performing remote operation on other stations**

When performing the remote operation on other stations with "All Stations" or "Specified Group", the remote operation cannot be performed on the following modules.

- ACPU/QnACPU

17.2 Operating Redundant CPUs

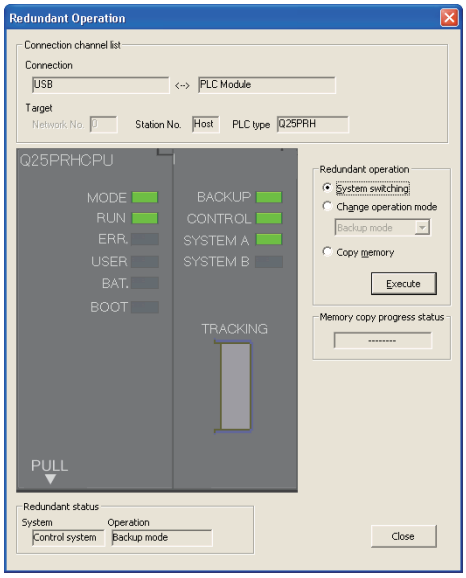
Q CPU *1 | L CPU | Remote | Head | FX

*1 : Redundant CPU only

This section explains how to switch the system, change the operation mode, and copy memory data from the control system to the standby system from GX Works2.
This function cannot be performed in the debug mode.

Screen display

Select [Online] ⇒ [Redundant Operation].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Connection channel list		Display the information of the specified connection target.
Redundant operation		Select a redundant operation to be performed.
	System switching	Change the system of the current connection target from the control system to the standby system.
	Change operation mode	Change the operation mode on the current connection target. The mode can be changed from backup mode to separate mode, and vice versa.
	Copy memory	Copy data of standard RAM, standard ROM, and program memory from the control system to the standby system.
Memory copy progress status		Display memory copy progress. "Memory copy failed" is displayed when the memory copy fails.
Redundant status		Display the operation mode and the system status of Redundant CPU.

2. **Click the** Execute **button.**

Point

● **Considerations of memory copy function**

The following functions cannot be performed on the control system while the memory copy function is being performed.

- Writing data to a running CPU.
- Writing data to a programmable controller CPU (flash ROM)
- Switching systems
- Changing operation mode
- Copying memory data in a redundant operation
- Formatting programmable controller CPU memory
- Copying program memory data to ROM

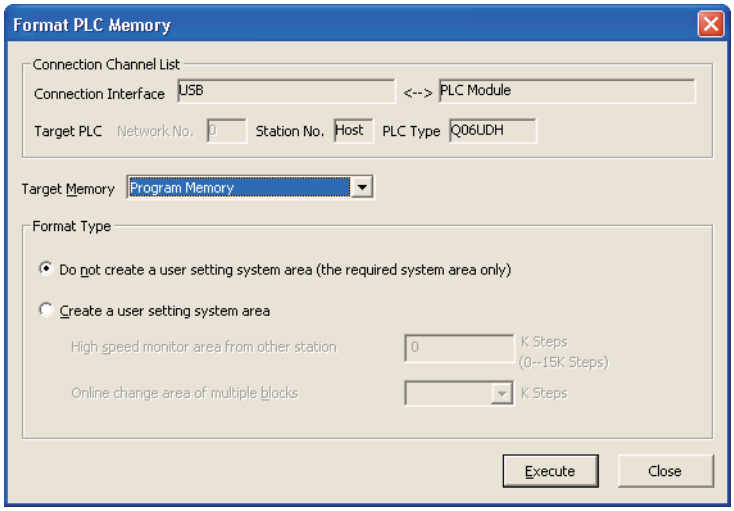
17.3 Formatting Programmable Controller CPU Memory

Q CPU | L CPU | Remote | Head | FX

This section explains how to format the programmable controller CPU memory or the memory card. The function is used when using the programmable controller CPU and the memory card for the first time or clearing all data stored in them.
However, the Flash card cannot be formatted using this function. (Flash cards do not require formatting.)

Screen display

Select [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Connection Channel List		Display the information of the connection destination setting.
Target Memory		Set the memory to be formatted.
Format Type		Select the format type.
	Do not create a user setting system area (the required system area only)	Select this to create the necessary system area only.
	Create a user setting system area	Select this to create the necessary system area, the area for high-speed monitoring from another station, and the area for enabling Online program change of multiple blocks.

2. **Click the** Execute **button.**

The target memory is formatted.

■ Format types

The system area is an area created on the programmable controller CPU memory. The system area consists of the 'Necessary system area' automatically created upon formatting the programmable controller CPU memory and 'User setting system area' created by the user.
In the necessary system area, data such as local devices are stored.

The user setting system areas are set for the following purposes:

● **Area for enabling high-speed monitoring from another station**

The area is set to accelerate monitoring from peripheral such as GX Works2 connected to a serial communication module and other communication module.
Change the capacity according to the number of device points (capacity) to be monitored through a serial communication module or other communication module and the volume of other user data to be stored in the program memory.
The setting range for Basic model QCPU, and Universal model QCPU (Q00UJ/Q00U/Q01U) is 0 to 3k steps.
The setting range for High Performance model QCPU, Process CPU, Redundant CPU, Universal model QCPU (except for Q00UJ/Q00U/Q01U), and LCPU is 0 to 15k steps.

● **Area for enabling Online program change of multiple blocks**

This area is set to enable Online program change of multiple locations (multiple blocks) simultaneously.
The following table shows the restrictions on Online program change of multiple blocks according to the capacity.
Since 4k steps are secured automatically other than for the program memory, this setting is not required for Universal model QCPU and LCPU.

<table>
<tr><th rowspan="3">Description</th><th colspan="7">Secured system area capacity for Online program change of multiple blocks</th></tr>
<tr><th colspan="4">Basic model QCPU</th><th colspan="3" rowspan="2">High Performance model QCPU/ Process CPU/Redundant CPU</th></tr>
<tr><th>Function version A</th><th colspan="3">Function version B or later</th></tr>
<tr><th>–</th><th>0k steps</th><th>1.25k steps</th><th>2.5k steps</th><th>0k steps</th><th>2k steps</th><th>4k steps</th></tr>
<tr><td>The number of blocks for simultaneous writing</td><td rowspan="3">Online program change of multiple blocks is not possible.</td><td rowspan="3">Online program change of multiple blocks is not possible.</td><td>Max. 32 blocks</td><td>Max. 64 blocks</td><td rowspan="3">Online program change of multiple blocks is not possible.</td><td>Max. 32 blocks</td><td>Max. 64 blocks</td></tr>
<tr><td>The number of steps per block for writing</td><td>Max. 512 steps</td><td>Max. 1024 steps</td><td>Max. 512 steps</td><td>Max. 1024 steps</td></tr>
<tr><td>The number of used pointers (P, I) per block for writing</td><td colspan="2">Not limited</td><td>Max. 50</td><td>Max. 100</td></tr>
</table>

Point

● **Device memory**
The device memory values cannot be cleared with the Memory format function.
To clear the device memory values, execute [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory].
(☞ Section 17.4)

● **Formatting a memory card**
To format an SRAM card, ATA card or SD memory card to be used on the programmable controller CPU, select [Online] ⇒ [PLC Memory Operation] ⇒ [Format PLC Memory].
If it is formatted using other functions such as the Windows®, the card may not be usable when it is installed to a programmable controller CPU.

● **Memory in which user setting system areas can be created**
The areas can be created only in the program memory.

17.4 Clearing Programmable Controller Memory

Q CPU | L CPU | Remote | Head | FX

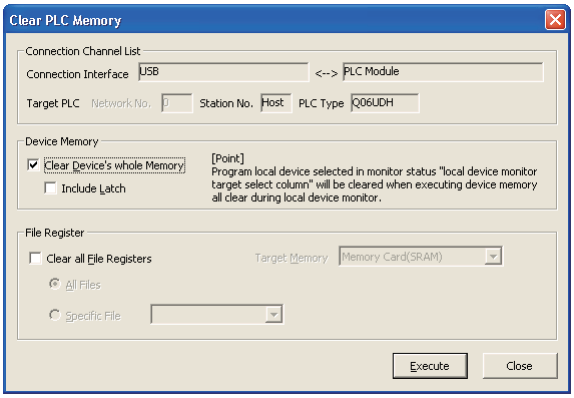
This section explains how to initialize device memory data on the programmable controller CPU and file registers stored in the memory card and setting them to '0'.

■ QCPU (Q mode)/LCPU

Initialize device memory data on the programmable controller CPU and file registers stored in the memory card and set them to '0'.
However, the memory clear function is not available for standard ROM/Flash cards/SD memory cards.

Screen display

Select [Online] ⇒ [PLC Memory Operation] ⇒ [Clear PLC Memory].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Connection Channel List		Display the information of the connection destination setting.
Clear Device's whole Memory		Select this to clear the device memory data.
	Include Latch	Select this to clear device data in the latch range also. The device data for which latch clear is disabled is also cleared.
Clear all File Registers		Select this to clear the file register data.
	Target Memory*1	Select the memory in which file registers are stored.
	All Files*1	Select this to clear all file registers in the target memory.
	Specific File*1	Select this to clear the selected file register memory. Select a file name of the file register.

*1 : For QCPU (Q mode) only

2. **Click the Execute button.**

The target memory data is cleared.

Point

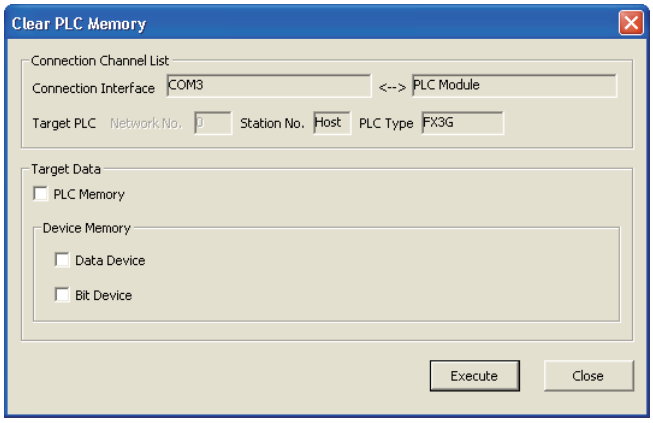
● **Operation of the PLC Memory Clear function during the monitoring of local devices**
When the "Clear Device's whole Memory" operation is executed during the monitoring of local devices, local devices are cleared in the programs selected in the 'local device monitoring target selection field'.

■ FXCPU

Initialize device memory data in FXCPU and resetting them to '0'.

Screen display

Select [Online] ⇒ [PLC Memory Operation] ⇒ [Clear PLC Memory].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Connection Channel List		Display the information of the connection destination setting.
Target Data		Select the device memory to be cleared.
	PLC Memory	Select this to clear all data. (Programs, comments, parameters, file registers, device memory, and extended file registers)
	Data Device	Select this to clear all registers. (Data registers, file registers, RAM file registers, special registers, extended registers, and extended file registers)
	Bit Device	Select this to clear all bit devices. (X, Y, M, S, T, and C) Additionally, the current values of 'T' and 'C' are reset to '0'.

2. **Click the Execute button.**
The target data is cleared.

Point

● **Executing condition of the memory clear for FXCPU**

Item	Memory
PLC memory	Available for the built-in memory, and RAM/EEPROM (PROTECT switch OFF)/FLASH memory (PROTECT switch OFF) cassette. Not available for the EEPROM (PROTECT switch ON)/FLASH memory (PROTECT switch ON) and EPROM cassette.
Data device	Equivalent to executing condition to PLC memory
Bit device	Available for all the memory.

● **Considerations when using FXCPU**

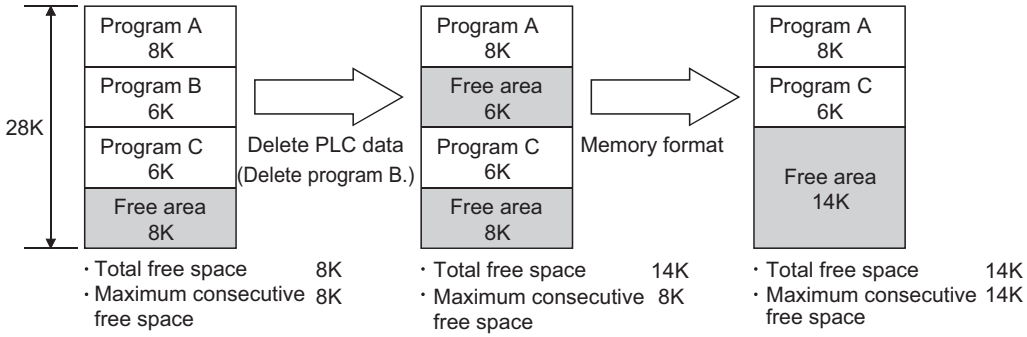
- Execute this function when the programmable controller CPU is in STOP status. Memory data cannot be cleared in RUN status.
- When the status of the programmable controller CPU is changed to STOP by the remote operation, bit devices cannot be cleared. Execute the PLC memory clear function after switching the status of the programmable controller CPU to STOP.
- When the PLC memory clear function is executed while an FX3G/FX3GC programmable controller CPU and an Ethernet port are connected directly, a communication error caused by Windows Firewall may occur.
  In this case, open the Control Panel and specify GX Works2 as an 'allowed program' or 'exception' in the Windows Firewall setting.

17.5 Arranging Programmable Controller Memory

Q CPU | L CPU | Remote | Head | FX

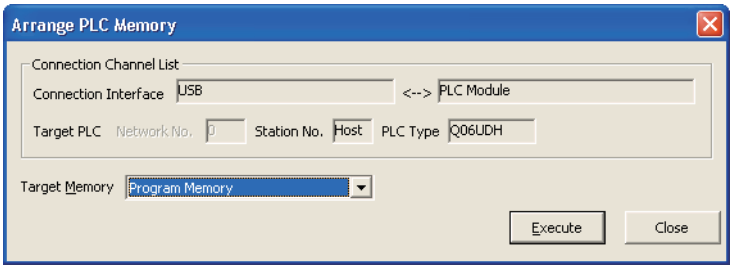
This section explains how to secure consecutive free memory areas by arranging the data stored in program memory/standard RAM of the programmable controller CPU or memory card.
Use this function to rearrange files whose arrangement became discontinuous by operations such as Delete PLC Data.
However, the Memory arrangement function is not available for standard ROM/Flash cards/SD memory cards.

The following figure shows how consecutive free areas are created with the Memory arrangement function after Delete PLC Data.



Screen display

Select [Online] ⇒ [PLC Memory Operation] ⇒ [Arrange PLC Memory].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Connection Channel List	Display the information of the connection destination setting.
Target Memory	Set the memory to be arranged.

2. **Click the Execute button.**
   The target memory is arranged.

17.6 Setting Clock on Programmable Controller CPU

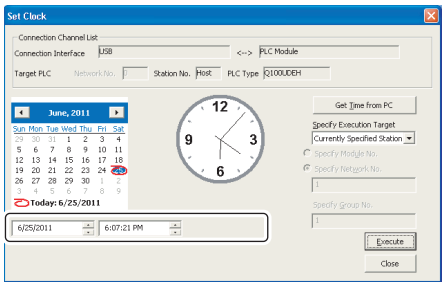
Q CPU L CPU Remote Head FX

This section explains how to set the clock on a programmable controller CPU.
The clock setting function is not supported by FX0S, FX0, and FX1.

Screen display

Select [Online] ⇒ [Set Clock].

Date and time →



Operating procedure

1. **Set the items on the screen.**

Item		Description
Date and time		Set the date and time.
Specify Execution Target*1,*2		Set the target station whose clock is to be set.
	Currently Specified Station	Select this to set the clock only upon the station specified in the connection destination setting.
	All Stations	Select this to perform the remote operation to the station specified in the connection destination setting and all the stations on the specified network. Set a target network with "Specify Module No."*3 or "Specify Network No.".
	Specified Group	Select this to perform the remote operation to the station specified in the connection destination setting and each station of the specific group on the specified network. Set a target network with module mounted on the station specified in the connection destination setting for "Specify Module No." or "Specify Network No.", and set a group number with "Specify Group No.".

*1 : Not supported by FXCPU.
*2 : The target station can be specified with "Currently Specified Station" or "All Stations" when the target network is CC-Link IE Field Network.
*3 : Not supported by LCPU.

2. **Click the Execute button.**

The programmable controller CPU clock is set.

Screen button

- Get Time from PC

Applies the time of personal computer to the 'date and time' boxes.

Point

● **Clock setting for QCPU (Q mode)/LCPU**
For QCPU (Q mode)/LCPU, the clock setting can be set regardless of the ON/OFF status of the clock setting device 'SM1028'.
Note that the ON/OFF status of 'SM1028' does not change upon clock setting.

● **Considerations of the clock setting**
In the clock setting, a time-lag error may appear due to the span of transfer.

● **Counting modules to set "Specify Module No."**
Refer to Point in Section 17.1.

Restrictions

● **Performing clock setting to other stations**
When performing the clock setting to other stations with "All Stations" or "Specified Group", the clock setting cannot be performed to the following modules.

- ACPU/QnACPU

17.7 Registering/Canceling Display Module Menu

Q CPU | L CPU *1 | Remote | Head | FX

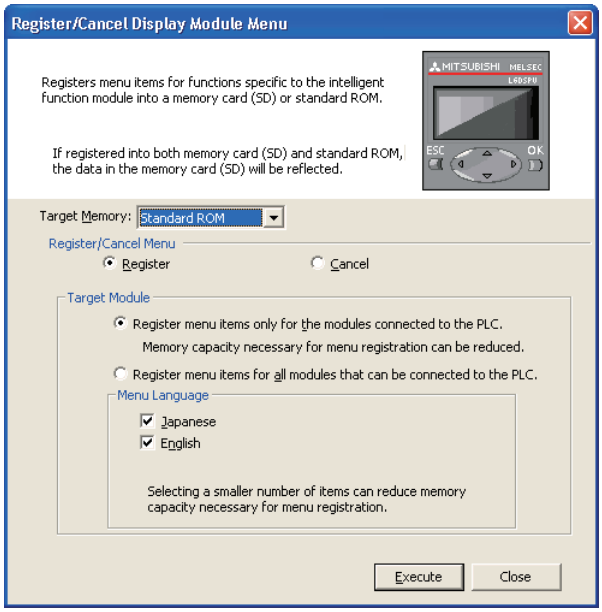
*1 : Not supported by L02S.

This section explains how to register/cancel menu items to/from a standard ROM or SD memory card to operate the intelligent function modules using the LCPU display module.
Use this function to confirm or change each setting of intelligent function module by operating the display module.
For details of functions and operations of display module, refer to the following manual.
☞ MELSEC-L CPU Module User's Manual (Function Explanation, Program Fundamentals)

For details of intelligent function modules which support registration/cancellation of display module menu, and functions which can be performed on each intelligent function module, refer to the following manual.
☞ Manual of the intelligent function module to be used

Screen display

Select [Online] ⇒ [Register/Cancel Display Module Menu].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Target Memory	Select the target memory to which the display module menu items are to be registered/canceled.
Register/Cancel Menu	Select registration/cancellation of the menus.
Target Module	Select the target module of the menu items to be registered.
Menu Language	Select the language of the menu items.

2. **Click the** Execute **button.**

The display module menu items are registered/canceled.

Point

● **Modules and corresponding GX Works2 versions**

The following table shows the modules and corresponding GX Works2 versions for registering/canceling the display module menu.

Module type	Module name	Version
Analog	L60AD4 L60DA4	GX Works2 Version 1.24A
Temperature control	L60TCTT4 L60TCTT4BW L60TCRT4 L60TCRT4BW	GX Works2 Version 1.62Q
Counter	LD62 LD62D	GX Works2 Version 1.31H
Serial communication	LJ71C24 LJ71C24-R2	GX Works2 Version 1.24A
CC-Link	LJ61BT11	

17.8 Start Ethernet Adapter Module Configuration Tool

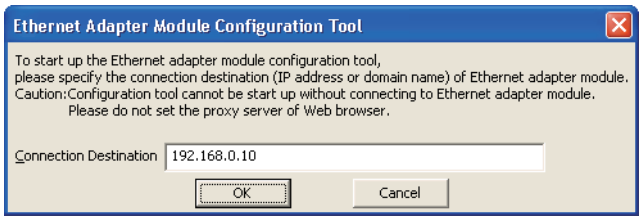
Q CPU L CPU Remote Head FX

This section explains how to start the Ethernet adapter module configuration tool.
For details of Ethernet adapter module configuration tool, refer to the following manual.
☞ CC-Link IE Field Network Ethernet Adapter Module User's Manual

Operating procedure

1. **Select [Tool] ⇒ [Ethernet Adapter Module Configuration Tool].**

   The Ethernet Adapter Module Configuration Tool screen is displayed.



2. **Enter the IP address or domain name of the Ethernet adapter module to "Connection Destination", and click the OK button.**

   A default web browser is activated and a start screen of the Ethernet adapter module configuration tool is displayed.

18 DIAGNOSING PROGRAMMABLE CONTROLLER STATUS

This chapter explains how to display system status and error codes of the programmable controller CPU.

18.1 Diagnosing Programmable Controller CPU

This section explains how to display system status and error codes of the programmable controller CPU.

18.1.1 Diagnosing QCPU (Q mode), LCPU, communication head module, and remote I/O module

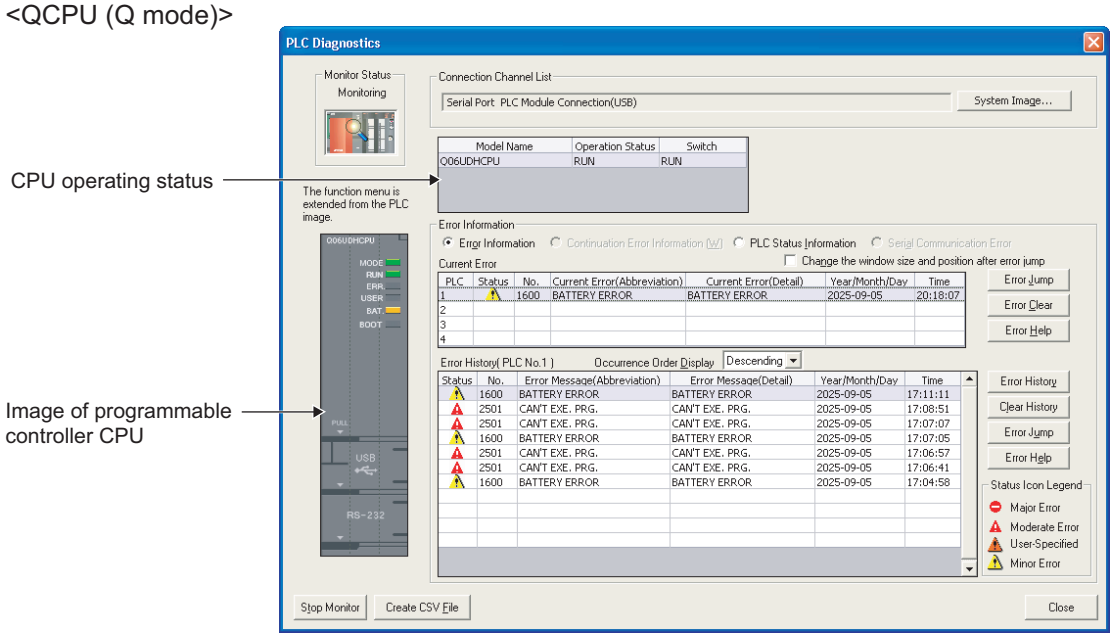
Q CPU | L CPU | Remote | Head | FX

Display the programmable controller CPU status.

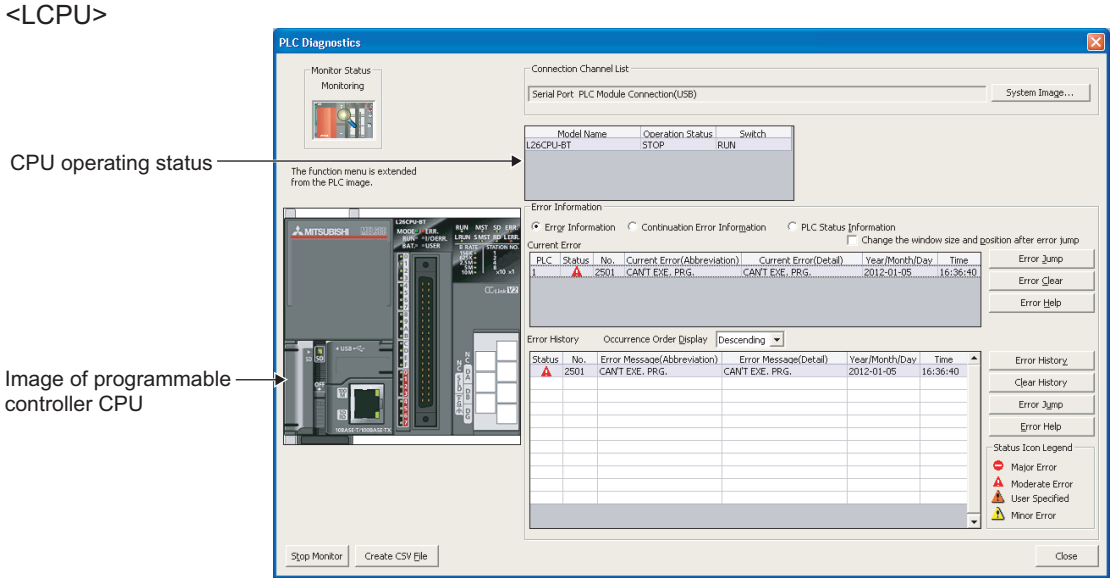
Screen display

Select [Diagnostics] ⇒ [PLC Diagnostics].

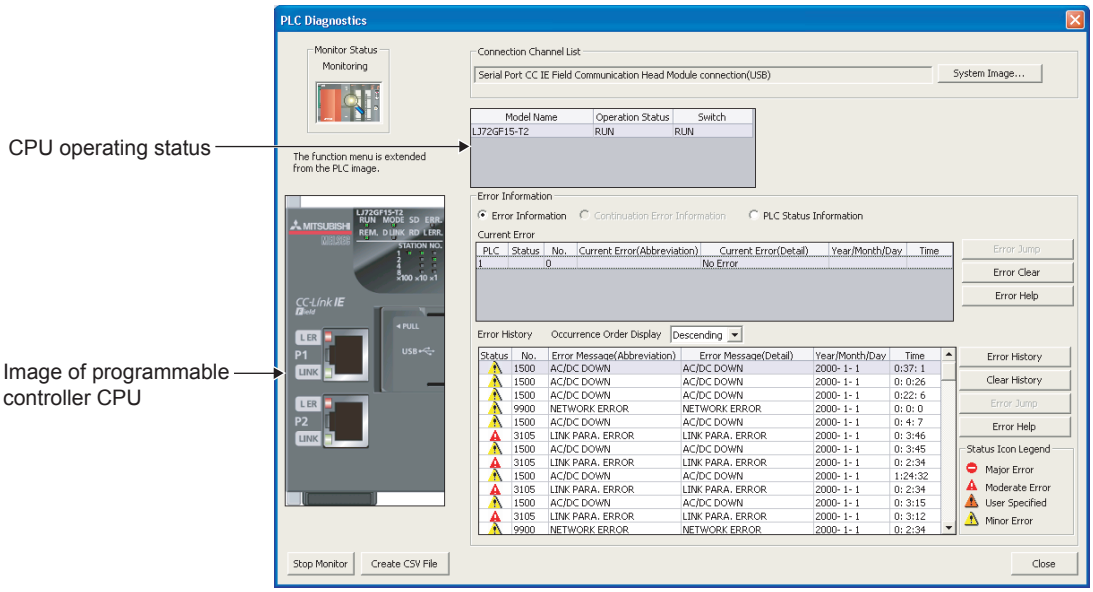
<QCPU (Q mode)>



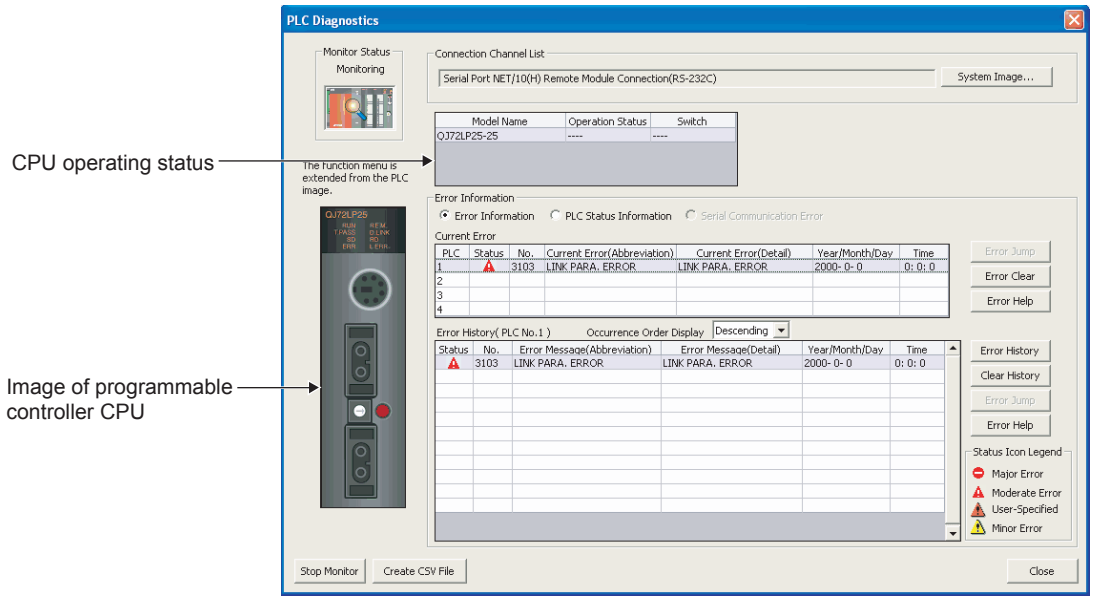
<LCPU>



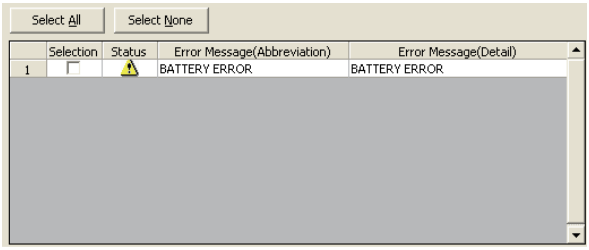
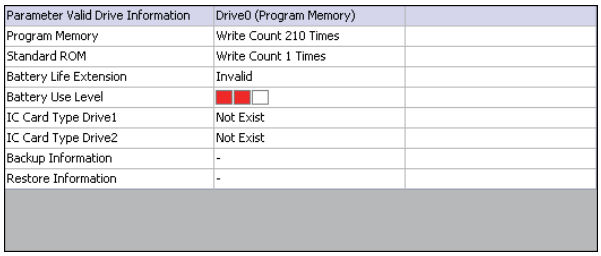
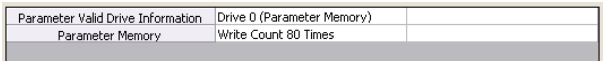
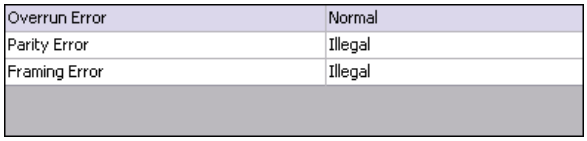
<Communication head module>



<Remote I/O module>



Display contents

Item	Description
Monitor Status	Display the current monitor status.
Connection Channel List	Display the connection route which has been set.
CPU operating status	● Single CPU system Display the operating status and switch status of the programmable controller CPU. For Redundant CPU, an enable/disable state of manual switching and a tracking communication status are also displayed. ● Multiple CPU system (QCPU (Q mode) only) Display the operating status and the switch status of CPU No. 1 to No. 4. • "Uninstallable/Blank" is displayed for a slot with no module mounted.
Image of programmable controller CPU	Perform online operations of the programmable controller CPU. (For details, ☞ Section 18.1.4 "Online operations")
Error Information	Select this to display the current error information of the programmable controller CPU.
Continuation Error Information*1	Select this to clear user specified errors and minor errors. To clear errors, select the errors and click the Clear Continuation Error button. 
PLC Status Information	Select this to display the status information of the programmable controller CPU. Display contents differ according to the programmable controller CPU. QCPU (Q mode)/LCPU  Communication head module/Remote I/O module 
Serial Communication Error*2	Monitor the programmable controller CPU when the serial communication function is set. Error information is cleared by clicking the Clear button. 
Change the window size and position after error jump	Select this to downsize the PLC Diagnostics screen and move it to the upper left of the entire screen when the error jump is executed.
Error History	Display the latest error history by clicking the Error History button.
Occurrence Order Display	Sorts error history in ascending/descending order.
Status Icon Legend	Display the status icons on the screen. (☞ Section 18.1.3 "Error icons")

*1 : For High-speed Universal model QCPU and LCPU only
*2 : For Q00UJ/Q00U/Q01U/Q02U/QnUD(H)CPU only

Screen button

- System Image...

  Displays the illustration of the connection route which has been set.

- Error Jump / Error Jump **(Not supported by communication head module and remote I/O module)**

  Jumps the screen display to the sequence program step number corresponding to the selected error item/error history item.

  However, jump is not applicable in the following cases.

  - The error is not a program error.
  - The error step information does not exist.
  - The information of the program number and SFC step number of SFC block or the transition number does not exist.
  - SFC program error of FXCPU.
  - The label program is not compiled.

- Error Clear

  Clears the current error information.

- Error Help / Error Help

  Displays the explanation screen corresponding to the error number of the selected error item/error history item.

- Error History

  Displays the latest error history.

- Create CSV File

  Saves the currently displayed error history in a file in the CSV file format.

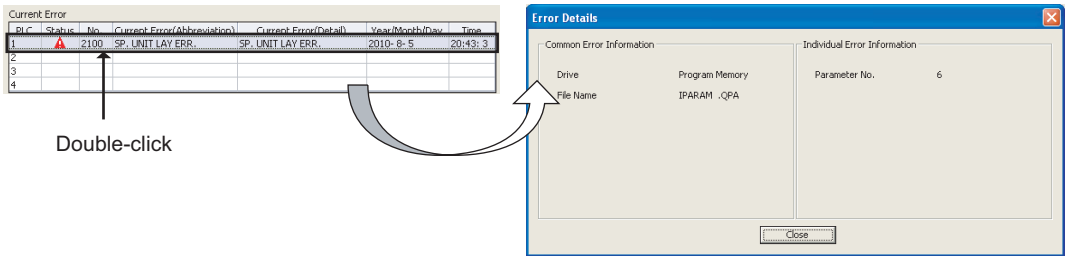
Point

● **Displaying the Error Details screen**

The following Error Details screen is displayed by double-clicking the Present Error column or the error item in the Error History display column.

SD5 to 15 (Common Error Information) and SD16 to 26 (Individual Error Information) of the programmable controller CPU are displayed on the Error Details screen.

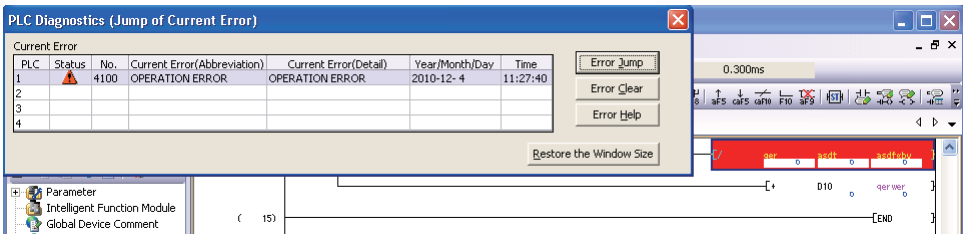
For details, refer to the manual of the programmable controller CPU module.



● **"Change the window size and position after error jump" check box**

When "Change the window size and position after error jump" is selected and the error jump is executed, the PLC Diagnostics screen is downsized as shown below. This function applies when executing the error jump on either Present Error column or Error History display column.

The screen returns to the original size by clicking the Restore the Window Size button.



● **When error is not found at error jump destination**

In the following conditions, an error may not be found at the error jump destination.

- When the program of the open project does not match with the program on the programmable controller CPU.
- When diagnosing programmable controller other than the one set as a connection destination in the project.

  Example) When a module is selected from the CC IE Control Diagnostics and the System Monitor is activated, and the PLC Diagnostics is activated from the activated System Monitor.

● **Confirming operation mode of Redundant CPU**

The operation mode of Redundant CPU can be confirmed with the 'BACKUP' LED displayed on the 'image of programmable controller CPU'.

'BACKUP" LED status	Operation mode
ON (green)	Backup mode
ON (red)	Backup mode (In a state in which the control (RUN) cannot be continued by the system switching.)
ON (orange)	Separate mode
OFF	Debug mode

For details of CPU module LED, refer to the following manual.

☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection)

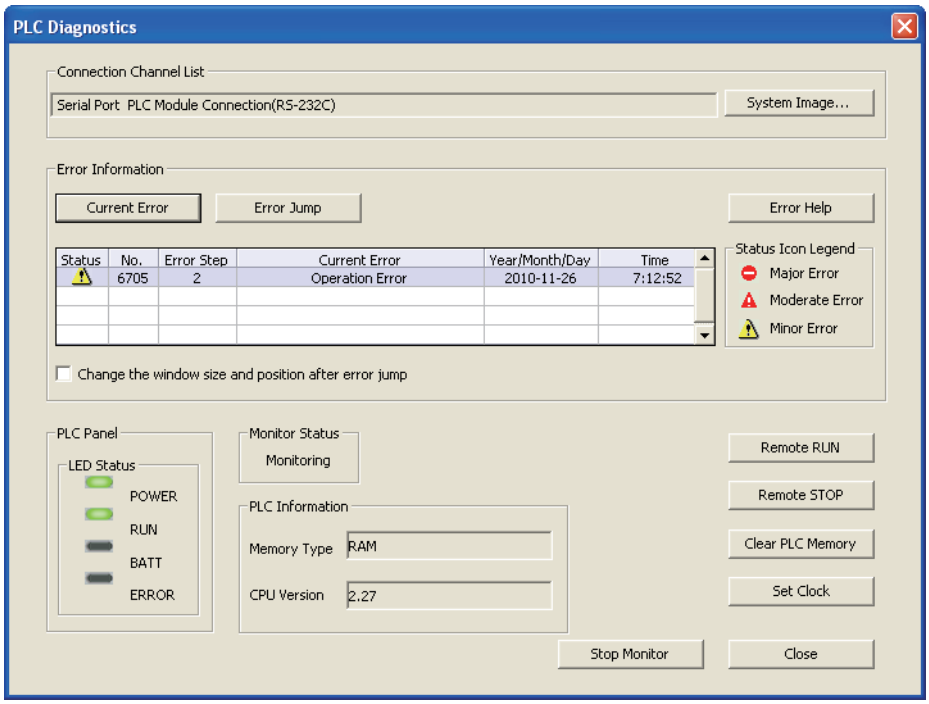
18.1.2 Diagnosing FXCPU

Q CPU L CPU Remote Head **FX**

Display the programmable controller CPU status.

Screen display

Select [Diagnostics] ⇒ [PLC Diagnostics].



Display contents

Item	Description
Connection Channel List	Display the connection route which has been set.
Error Information	Display errors being occurring. The corresponding error help is displayed by double-clicking the row of error information. (It is also displayed by clicking the Error Help button.)
PLC Panel	Display the status of the connection destination CPU module.
PLC Information	Display the memory type and version of the connection destination CPU module.
Monitor Status	Display the current monitor status.

Screen button

For the screen buttons, refer to Section 18.1.1.

- Remote RUN
  Switches the execution status of the programmable controller CPU to RUN.
  Not supported by FX0, FX0S, FX1, FXU, and FX2C.
- Remote STOP
  Switches the execution status of the programmable controller CPU to STOP.
  Not supported by FX0, FX0S, FX1, FXU, and FX2C.
- Clear PLC Memory
  Displays the Clear PLC Memory screen.
- Set Clock
  Displays the Set Clock screen.
  Not supported by FX0S, FX0, and FX1.

18.1.3 Error icons

Q CPU | L CPU | Remote | Head | FX

The following table shows the details of the error information icons of the programmable controller CPU.

Icon	Programmable controller CPU status
Serious error	RESET and others
Moderate error	STOP due to error in parameter or instruction codes
User specified error*1	The error that allow "STOP"/"Continue" to be specified as an "Operating Mode When There is an Error" on the <<PLC RAS>> tab of PLC parameter.
Minor error	Errors that allow RUN status such as battery low and annunciator ON

*1 : Not supported by FXCPU.

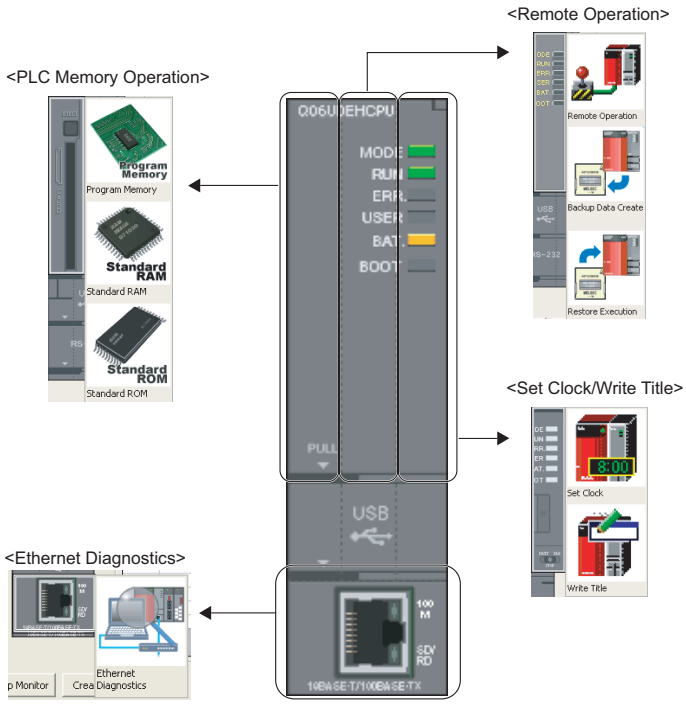
18.1.4 Online operations

Q CPU | L CPU | Remote | Head | FX

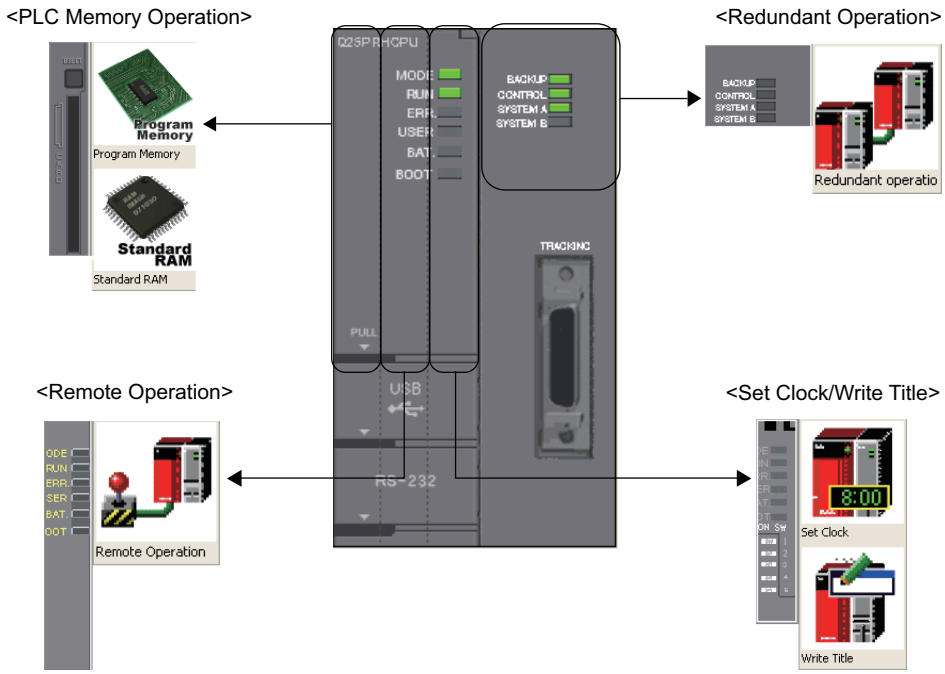
The PLC Memory Operation function and the Remote Operation function can be executed from the figure of programmable controller CPU.
When the cursor is moved to the figure of programmable controller CPU, the function menu is expanded. Click the figure of programmable controller CPU to display the items to be set.

Screen display

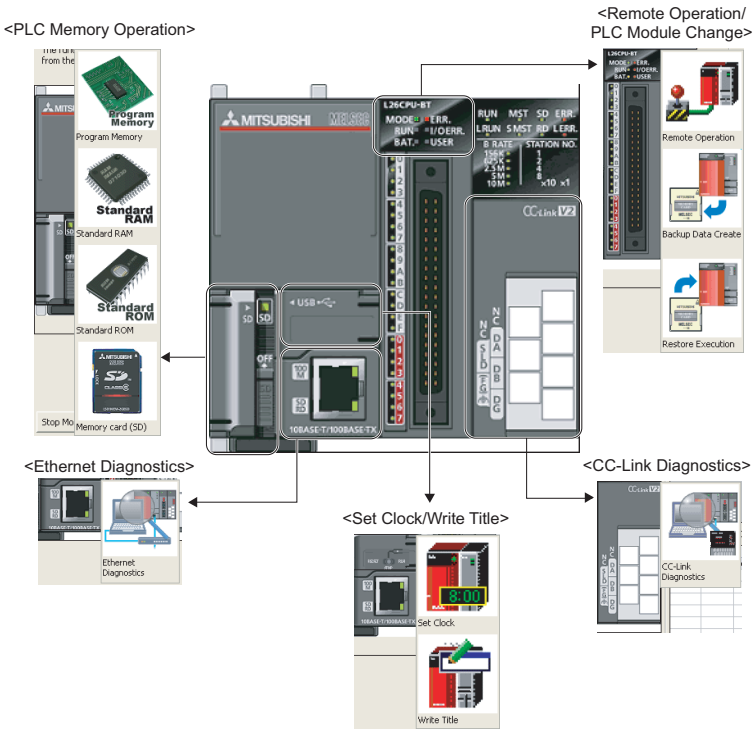
<QCPU (Q mode) (For Universal model CPU)>



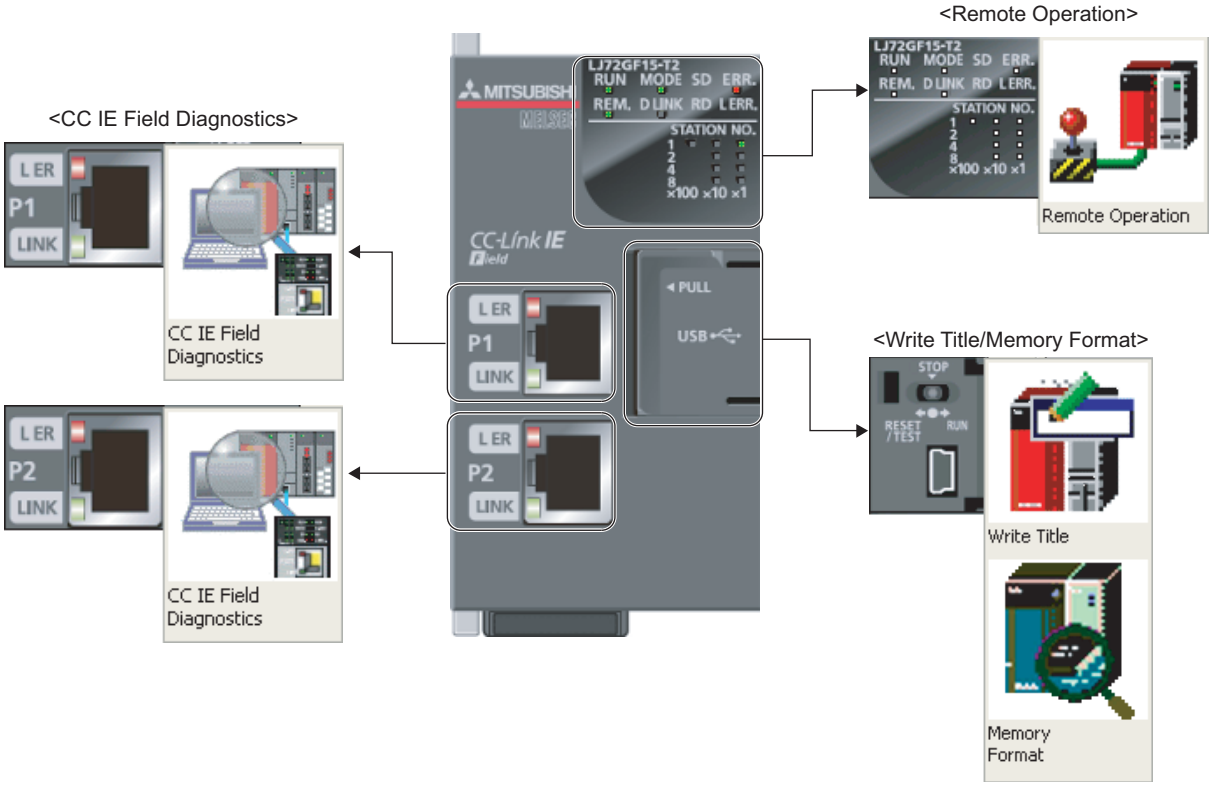
<QCPU (Q mode) (For Redundant CPU)>



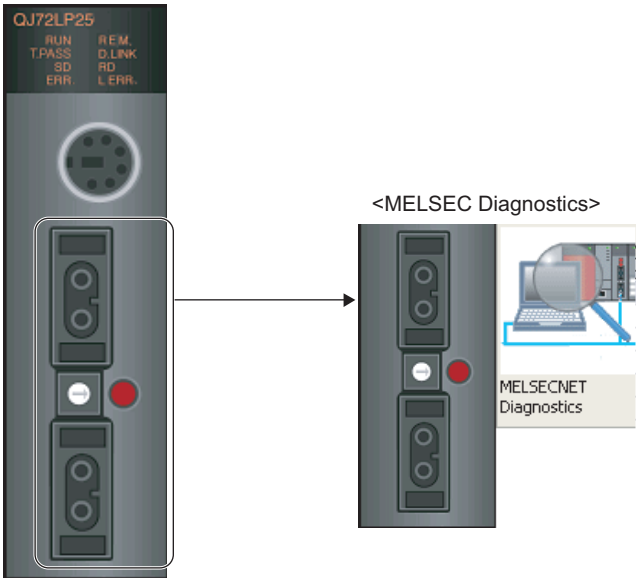
<LCPU>



<Communication head module (CC IE Field head module)>



<Remote I/O module>



Display contents

Item			Reference
PLC Memory Operation	(Type of memory operation)	Memory format	Section 17.3 Section 17.4 Section 17.5
		Memory clear	
		Memory arrangement	
Remote Operation/PLC Module Change	Remote operation		Section 17.1
	Backup data creation		Section 12.8.1
	Data restoration		Section 12.8.2
Redundant Operation			Section 17.2
Ethernet Diagnostics			Section 18.6
Set Clock/Write Title	Set clock		Section 17.6
	Write title		Section 12.1
CC-Link Diagnostics			Section 18.5.1
CC-Link IE Field Diagnostics			Section 18.4
MELSECNET Diagnostics			Section 18.2

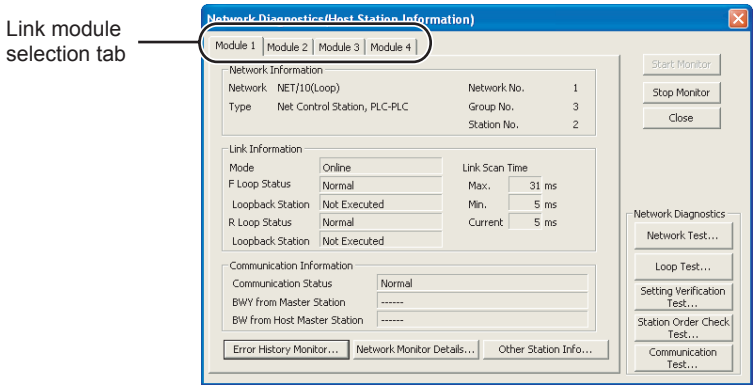
18.2 Diagnosing MELSECNET

Q CPU | L CPU | Remote | Head | FX

This section explains how to check the MELSECNET/10(H) status connected to the selected module.

Screen display

Select [Diagnostics] ⇒ [MELSECNET Diagnostics].



Display contents

Item	Description
Link module selection tab	Switch the MELSECNET diagnostics result display screen for each link modules from 1 to 4. The information whether a link module is mounted or not is acquired from the mounted status.
Network Information	Display the network information of the selected module.
Link Information	Display the network status.
Communication Information	Display the communication status of the target network.

Screen button

- Network Test...
  Displays the Network Test screen. (☞ Section 18.2.1)
- Loop Test...
  Displays the Loop Test screen. (☞ Section 18.2.2)
- Setting Verification Test...
  Displays the Setting Confirmation Test screen. (☞ Section 18.2.3)
- Station Order Check Test...
  Displays the Station Order Check Test screen. (☞ Section 18.2.4)
- Communication Test...
  Displays the Communication Test screen. (☞ Section 18.2.5)
- Error History Monitor...
  Displays the Error History Monitor screen. (☞ Section 18.2.6)
- Network Monitor Details...
  Displays the Network Monitor Details screen. (☞ Section 18.2.7)

● Other Station Info...

Displays the Other Station Information screen. (☞ Section 18.2.8)

Point

● **Network to be diagnosed**
To change a network to be diagnosed, change the target station in the connection destination setting.

● **When another station is set in the connection destination setting**
Test functions such as network test cannot be executed when the connection destination setting is set to other than "No Specification".

● **MELSECNET/H (bus) connection**

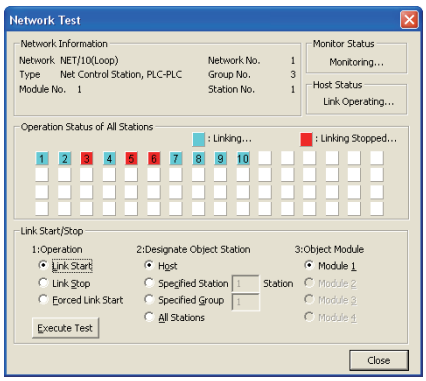
- The loop test and station order test cannot be executed with the MELSECNET/H (bus) connection with the coaxial cable.
- The loop test, setting verification test, and station order test cannot be executed with the MELSECNET/H (bus) connection with the twisted pair cable.

18.2.1 Network test

Perform link start/stop (cyclic transmission stop/restart) on the host station, specified station, and all stations in MELSECNET/10(H).
Use this function to avoid receiving data from another stations or to avoid sending data from host station when starting up (debugging) the system.

Screen display

Click the Network Test... button on the MELSECNET Diagnostics screen.



Display contents

Item	Description
Network Information	Display the network information on the host station of the selected module.
Monitor Status	Display the current monitor status.
Host Status	Display the operating status of the host station for the selected module.
Operation Status of All Stations	Display the link status of all stations on the tested network.

Operating procedure

1. **Set the items on the screen.**

Item			Description
Link Start/Stop			Set the items to execute the test.
	Operation	Link Start	• Select this to start the station that was stopped by the host station. • The station that was stopped by another station cannot be started.
		Link Stop	Select this to stop a station from the host/another station.
		Forced Link Start	• Select this to forcibly perform the link start on a station stopped by the host station or another station, or to forcibly perform the link start on a station to which the link stop is performed by special relay/special register. However, forced start in units of stations is not possible while all stations are stopped. • To check whether the station is stopped by stop specification of all stations, check SW0000. • This function can be executed when "PLC side I/F" in the connection destination setting is set to "C24". • This function cannot be executed when the MELSECNET/10(H) board is used. • This function cannot be executed via the A series-compatible E71/QE71 module. (The route via A series-compatible E71/QE71 is not supported by GX Works2.)
	Designate Object Station		Specify the object station of the network test.
	Object Module		Select the object module of the network test.

2. **Click the Execute Test button.**

The network test is executed according to the settings.

Point

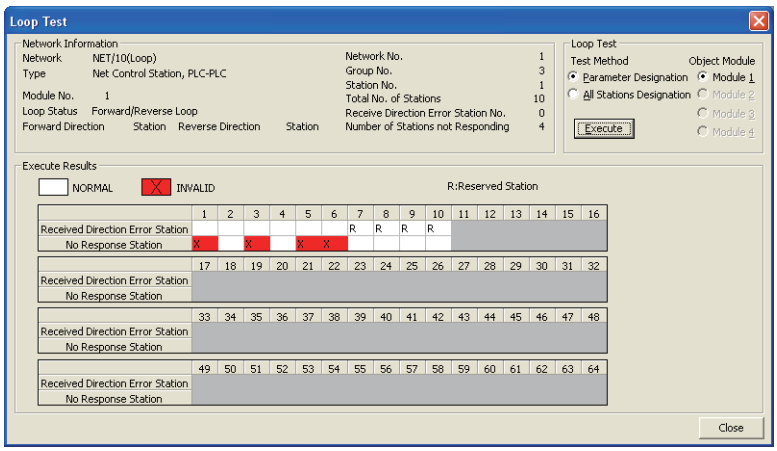
● **When another station is set in the connection destination setting**
The network test function cannot be executed when the connection destination setting is set to other than "No Specification".

18.2.2 Loop test

Check the loop status of MELSECNET/10(H).
Use this function to perform the loop test in the forward loop/reverse loop status with the completion of the optical loop system wiring.
Wiring status of data link cables (IN/OUT) can be checked.

Screen display

Click the [Loop Test...] button on the MELSECNET Diagnostics screen.



Display contents

Item	Description
Network Information	Display the network information on the host station of the selected module.
Execute Results	Display the number of stations and the result (normal/invalid, reserved station: R) of loop test.

Operating procedure

1. **Set the items on the screen.**

Item			Description
Loop Test			Set the items to execute the test.
	Test Method	Parameter Designation	Select this to test all the (slave) stations specified by the network parameter (except for reserved stations). All stations are tested, if network parameter does not exist.
		All Stations Designation	Select this to test all stations.
	Object Module		Select the module for which loop test is executed.

2. **Click the [Execute] button.**

The loop test is executed according to the settings.

Point

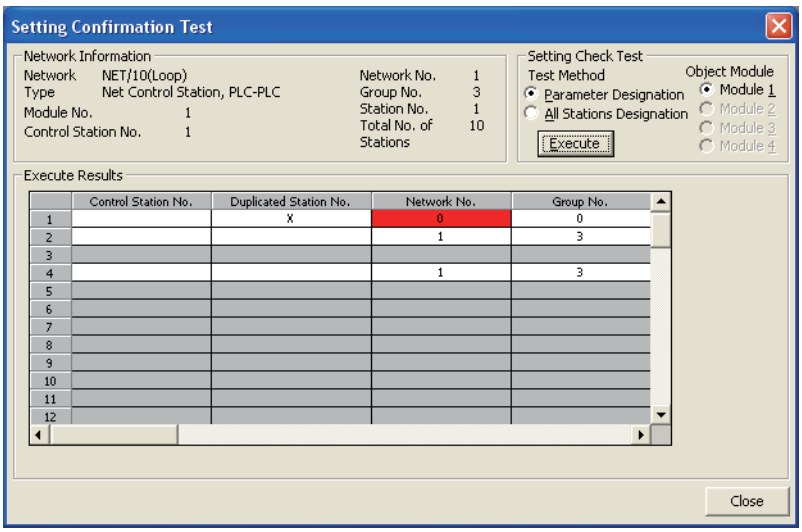
● **When another station is set in the connection destination setting**
The loop test function cannot be executed when the connection destination setting is set to other than "No Specification".

18.2.3 Setting verification test

Check the status of the station number, network number, and group number set for each station.
Use this function to check duplicates of control stations or station numbers, or whether the network number set to the station to which GX Works2 is connected matches with the network number set in the network parameter of host station.

Screen display

Click the Setting Verification Test... **button on the MELSECNET Diagnostics screen.**



Display contents

Item		Description
Network Information		Display the network information on the host station of the selected module.
Execute Results		Display the test result.
	Station No.	Display the station number of the stations for which the setting verification test was executed. Up to 64 stations are displayed.
	Control Station No.	Display "○" symbol at the target station if control station is set at two or more places.
	Duplicated Station No.	Display "○" symbol at the target station if the same station number is set at two or more places.
	Network No.	Display the network number of the stations for which the setting verification test was executed. If the network number differs from that of the host station, it is identified by red.
	Group No.	Display the group number of the stations for which the setting verification test was executed. For the remote I/O network, the station in error is blank.
	Reserved Station	Display "○" symbol for the station reserved by parameter setting. (When "Parameter Designation" is set in the test execution method.)
	Error Station	Display "○" symbol for the station when it is reserved by parameter setting or if a module is faulty in all station specification.
	Network Type Error Station	Display "○" symbol for the station where the parameter setting and the actual connection type disagree.
	Duplex R Sub M Station Duplication	Display "○" symbol for the station where multiple sub-master stations exist on the same network.
	Parallel R Sub M Station Duplication	Display "○" symbol for the station where multiple sub-master stations exist on the same network.

Operating procedure

1. Set the items on the screen.

Item			Description
Setting Check Test			Set the items to execute the test.
	Test Method	Parameter Designation	Select this to test all the (slave) stations specified by the network parameter (except for reserved stations). All stations are tested, if network parameter does not exist.
		All Stations Designation	Select this to test all stations.
	Object Module		Select the module for which setting verification test is executed.

2. Click the Execute button.

The setting verification test is executed according to the settings.

Point

● **Considerations for executing the test**
The test cannot be executed to multiple stations simultaneously.
If executed, cyclic transmission stops.

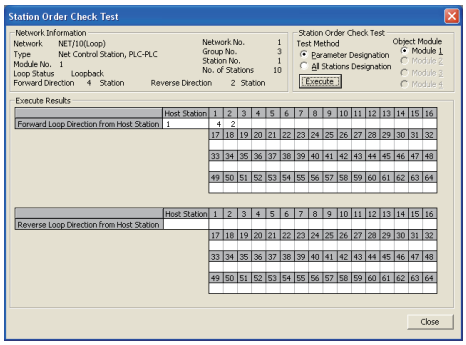
● **When another station is set in the connection destination setting**
The setting verification test cannot be executed when the connection destination setting is set to other than "No Specification".

18.2.4 Station order check test

Check the station number of the connected stations in the optical loop system of MELSECNET/10(H).

Screen display

Click the Station Order Check Test... **button on the MELSECNET Diagnostics screen.**



Display contents

Item	Description
Network Information	Display the network information on the host station of the selected module. The loop status indicates the forward/reverse loop, forward loop, reverse loop or loopback status. "No. of Stations" indicates the number of stations that have been checked, including the reserved station.
Execute Results	Display the station number in "Forward Loop Direction from Host Station" and "Reverse Loop Destination from Host Station". In the loopback status, the test is executed only in "Forward Loop Direction from Host Station". The number for the reserved station is not displayed.

Operating procedure

1. **Set the items on the screen.**

Item			Description
Station Order Check Test			Set the items to execute the test.
	Test Method	Parameter Designation	Select this to test all the (slave) stations specified by the network parameter (except for reserved stations). All stations are tested, if network parameter does not exist.
		All Stations Designation	Select this to test all stations.
	Object Module		Select the module for which station order check test is executed.

2. **Click the** Execute **button.**

   The station order check test is executed according to the settings.

Point

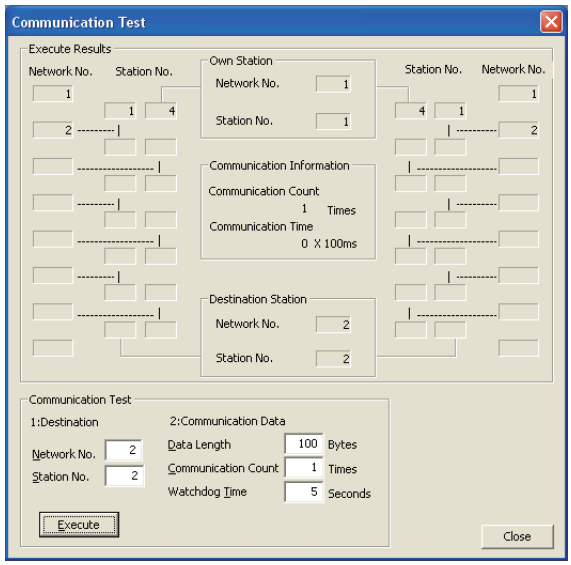
- **Considerations for executing the test**
  The test cannot be executed to multiple stations simultaneously.
  If executed, cyclic transmission stops.
- **When another station is set in the connection destination setting**
  The station order check test cannot be executed when the connection destination setting is set to other than "No Specification".

18.2.5 Communication test

Perform the communication test between networks on MELSECNET/10(H).
Use this function to check whether communication can be performed between the host station and the communication target.
Especially, when the communication target is located on another network, the routing parameter setting can be checked by the relayed network numbers and station numbers displayed on the screen.

Screen display

Click the Communication Test... **button on the MELSECNET Diagnostics screen.**



Display contents

Item	Description
Execute Results	Display the result of communication test executed between networks.

Operating procedure

1. **Set the items on the screen.**

Item		Description
Communication Test		Set the items to execute the test.
	Destination	Set the network number and station number.
	Communication Data	Set the data length (1 to 900 bytes), number of communications (1 to 100 times), and monitoring time (1 to 100 seconds) to execute the test.

2. **Click the** Execute **button.**

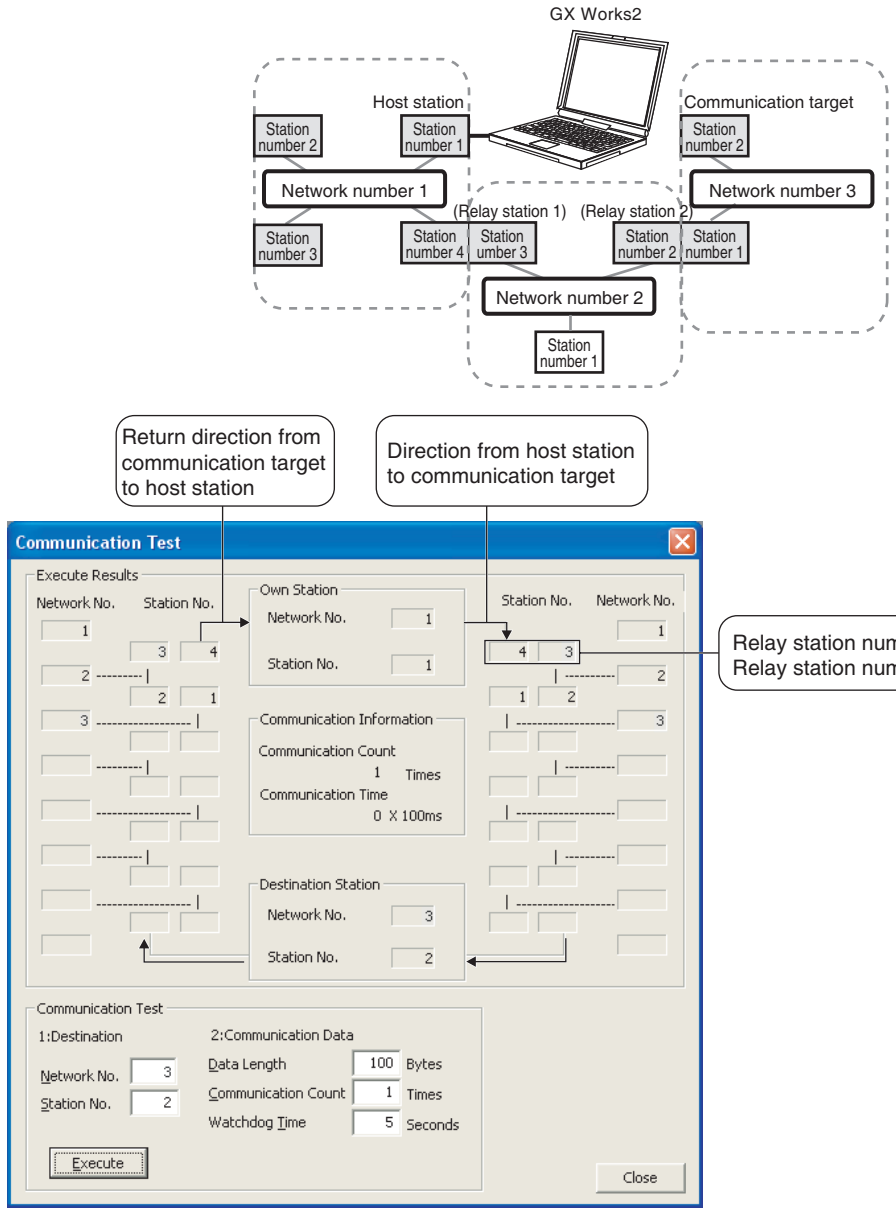
   The communication test is executed according to the settings.

Point

● **When another station is set in the connection destination setting**
The communication test cannot be executed when the connection destination setting is set to other than "No Specification".

■ Example of communication test

The following shows an example of the communication test between the host station (network number 1, station number 1) and the communication target (network number 3, station number 2) with the network configuration described below.

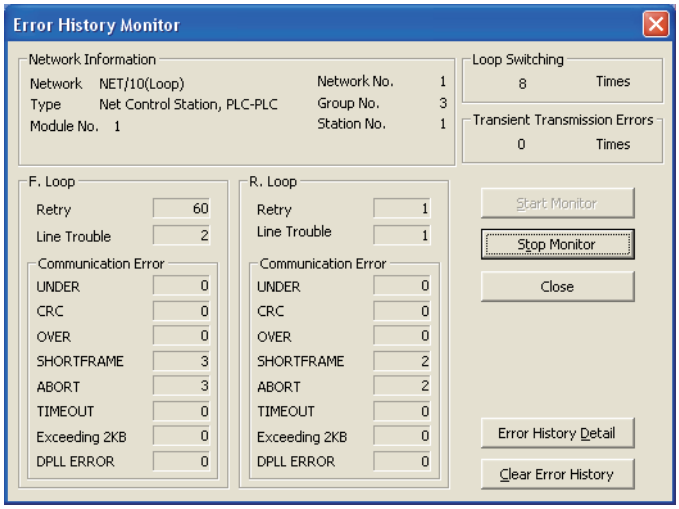


18.2.6 Error history monitoring

Display the error history of MELSECNET/10(H).

Screen display

Click the [Error History Monitor...] button on the MELSECNET Diagnostics screen.



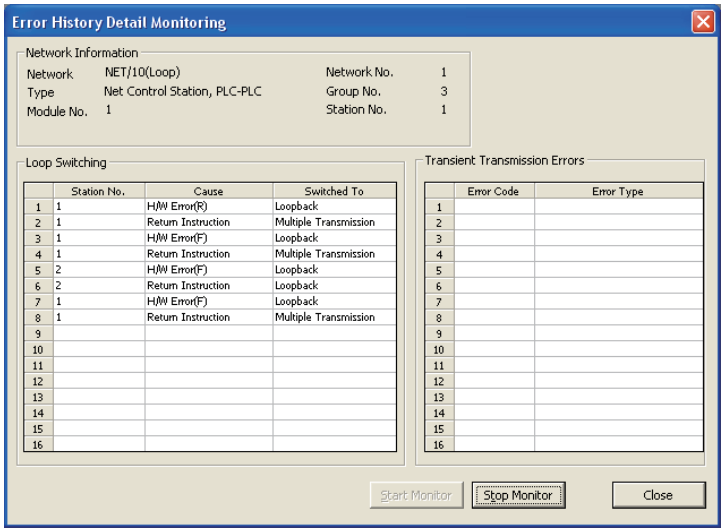
Display contents

Item	Description
Network Information	Display the network information of the selected host station.
Loop Switching	Display the number of times that the loop is switched.
Transient Transmission Errors	Display the number of occurrences of transient transmission error.
F.Loop/R.Loop	Display the items during monitoring.

Screen button

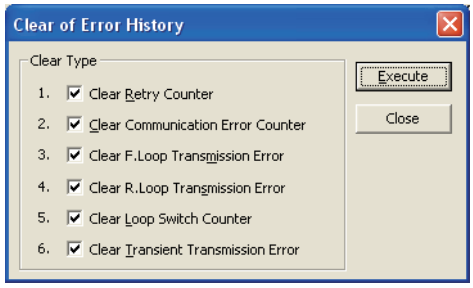
- [Error History Detail]

  Displays the Error History Detail Monitoring screen that lists the details of loop switching and transient transmission error.



● Clear Error History

Displays the Clear of Error History screen. Select the items to be cleared and click the Execute button.

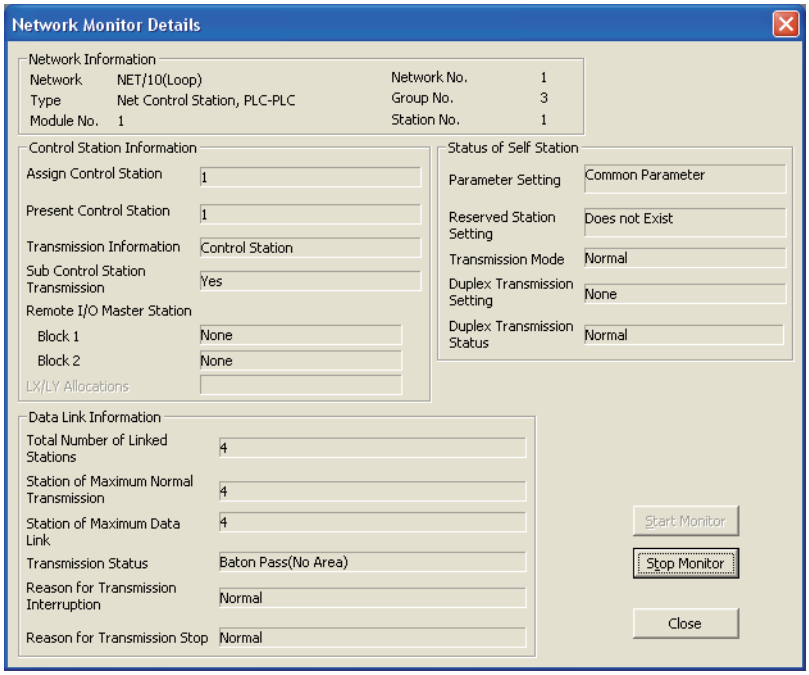


18.2.7 Network monitor details

Display the network line status of MELSECNET/10(H).

Screen display

Click the Network Monitor Details... button on the MELSECNET Diagnostics screen.



Display contents

Item	Description
Network Information	Display the network information of the selected host station.
Control Station Information	Display the control station information. For the remote I/O master station, the information is displayed only for PLC to PLC network.*1 LX/LY assignment is displayed only for the remote I/O network.*1
Data Link Information	Display the data link information.
Status of Self Station	Display the host station status. Parameter setting is displayed only for PLC to PLC network.

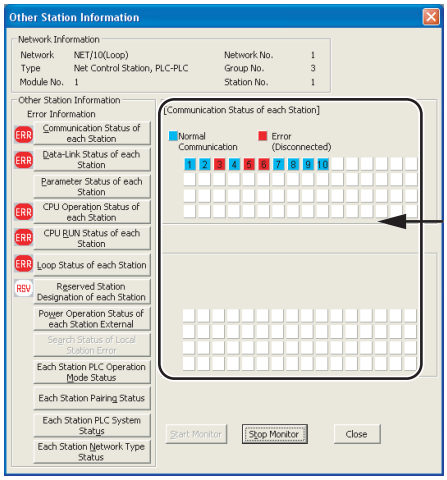
*1 : Not supported by remote I/O module.

18.2.8 Monitoring other station information

Monitor other station connected to MELSECNET/10(H).

Screen display

Click the Other Station Info... button on the MELSECNET Diagnostics screen.



Display contents

Item	Description
Network Information	Display the network information of the selected host station.
Other Station Information	Display detailed information on the error details display field when an item button is clicked. • "ERR" is displayed on the error information display field if a faulty station or a stop station is detected. • "RSV" is displayed on the error information display field if a reserved station exists. • "PWR" is displayed on the error information display field if a power is supplied to a module with external power supply.
Error details display field	Display the status of each station for the items selected in "Other Station Information".

The table below shows the items that can be selected in "Other Station Information" of QCPU (Q mode).

○: Applicable ×: Not applicable (grayed out)

	MELSECNET/10(H)					
	PLC to PLC network				Remote I/O network	
	Control station		Normal station		Master station	
	Loop	Bus	Loop	Bus	Loop	Bus
Communication Status of each Station	○	○	○	○	○	○
Data-Link Status of each Station	○	○	○	○	○	○
Parameter Status of each Station*1	○	○	×	×	○	○
CPU Operation Status of each Station	○	○	○	○	○	○
CPU RUN Status of each Station*1	○	○	○	○	×	×
Loop Status of each Station	○	×	○	×	○	×
Reserved Station Designation of each Station	○	○	○	○	○	○
Power Operation Status of each Station External*1	○	×	○	×	○	×
Search Status of Local Station Error*1	×	×	×	×	×	×
Each Station PLC Operation Mode Status*1,*2	○	○	○	○	×	×
Each Station Pairing Status*1,*2	○	○	○	○	×	×
Each Station PLC System Status*1,*2	○	○	○	○	×	×
Each Station Network Type Status*1,*2	○	○	○	○	×	×

*1 : Not supported by remote I/O module.

*2 : For MELSECNET/H network module only

18.3 Diagnosing CC-Link IE Controller Network

Q CPU | L CPU | Remote | Head | FX

This section explains how to check the CC-Link IE Controller Network status of a selected module.

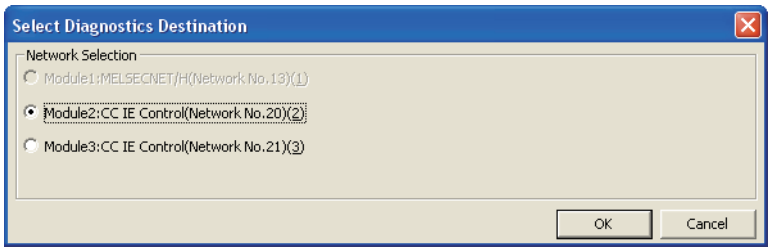
Point

- **When another station is set in the connection destination setting**
  When another station is set in the connection destination setting, the function cannot be executed.
- **Details of CC-Link IE Controller Network diagnostics**
  Refer to CC-Link IE Controller Network Reference Manual.

■ Selecting the diagnostics target

When two or more CC-Link IE Controller Network modules are connected to the connected station, the Select Diagnostics Destination screen as shown below is displayed before starting diagnostics.

Select a network to be diagnosed and click the OK button.

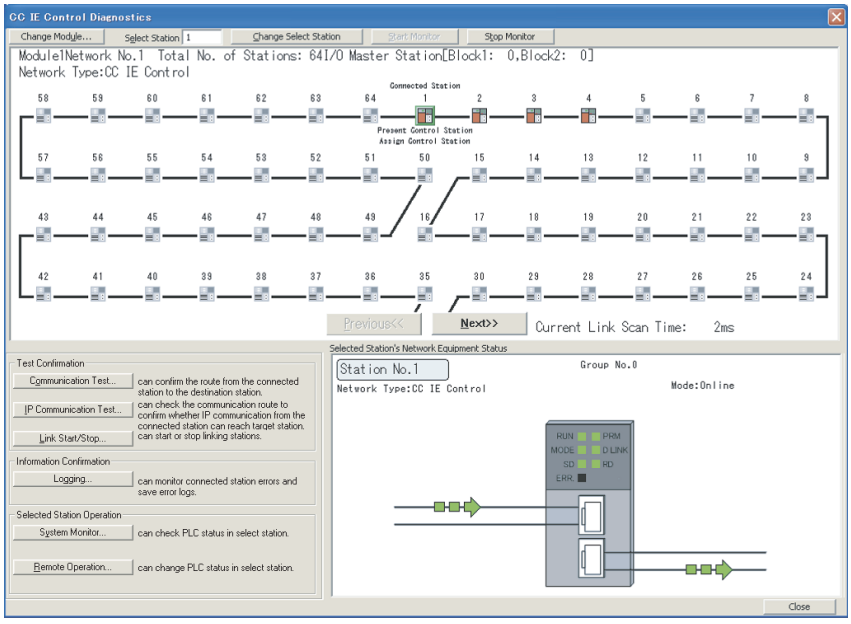


■ Diagnostics screen

Screen display

Select [Diagnostics] ⇒ [CC IE Control Diagnostics].

Network information



Display contents

Item	Description
Network information	Display the network information of the selected module. The status is displayed by icons shown below. **Icon** / **Module** / **Board** / **Station status**  /  / Normally operating station  /  / Focusing (icon enclosed by dotted line)  /  / Selected station  /  / Error (cyclic transmission stopped)  /  / Warning (Although cyclic transmission is executed, an error occurred with a module and/or a cable)  /  / Module whose shared group is different  / – / Reserved station (gray)  / – / Disconnected station (black) Connected Station  / – / Current connected station, specified in the connection destination setting Undef.  / – / Number unspecified station (Although "Specify Station No. by Program" is selected in parameter (normal station only), a station number is not set in the program.) Clicking an icon sets the corresponding station as the selected station and displays the details in "Selected Station's Network Equipment Status". The selected station can also be determined by moving the focus with the right and left arrow keys and pressing the Space or Enter key. Double-clicking an icon displays the System Monitor screen (☞ Section 18.8) of the corresponding station.
Selected Station's Network Equipment Status	Display the status of the CC-Link IE Controller Network module in the station selected in the network information display field and the status of the connecting cable.

Screen button

- Change Module...
  Displays the Select Diagnostics Destination screen. The diagnostic target module can be changed.
- Change Select Station
  Changes the selected station to the station to which the station number specified in "Select Station" is assigned. The status of the selected station is displayed in "Selected Station's Network Equipment Status".
- Previous<< / Next>>
  Switches the screen display of the network information when the total number of station is 61 or more.
- Communication Test...
  Displays the Communication Test screen. The communication route from the connected station to the specified destination station can be confirmed. (☞ Section 18.3.1)
- IP Communication Test... **(Universal model QCPU (except for Q00UJ/Q00U/Q01U/Q02U) only)**
  Displays the IP Communication Test screen. The IP communication route from the connected station to the communication destination station can be confirmed. (☞ Section 18.3.2)
- Link Start/Stop...
  Displays the Link Start/Stop screen. The data link start/stop can be performed to the specified station. (☞ Section 18.3.3)

- Logging...

  Displays the Logging screen. The communication route switch information and the transient transmission error of the connected station can be monitored. The monitor information can be saved in a file. (☞ Section 18.3.4)

- System Monitor...

  Displays the System Monitor screen. The system status of the selected station can be confirmed. (☞ Section 18.8)

- Remote Operation...

  Displays the Remote Operation screen. The remote operation can be performed to the programmable controller CPU of the selected station. (☞ Section 17.1)

Point

- **Connection destination for executing CC-Link IE Controller Network diagnostics**
  The communication test and the link start/stop can be executed only when the connected station is selected.
- **When an unsupported CPU module is specified as the selected station, or a CC-Link IE Controller Network interface board is specified as the selected station**
  The system monitor or remote operation cannot be performed when an unsupported CPU module is specified as the selected station. The system monitor cannot be performed when a CC-Link IE Controller Network interface board is specified as the selected station.
- **When the total number of stations is set to 65 or more**
  In a case where the total number of stations is set to 65 or more and High Performance model QCPU is specified as the connected station, an error occurs when a station whose station number is 65 or more is selected. The error, however, does not occur where Universal model QCPU is connected with a cable in a multiple CPU configuration.

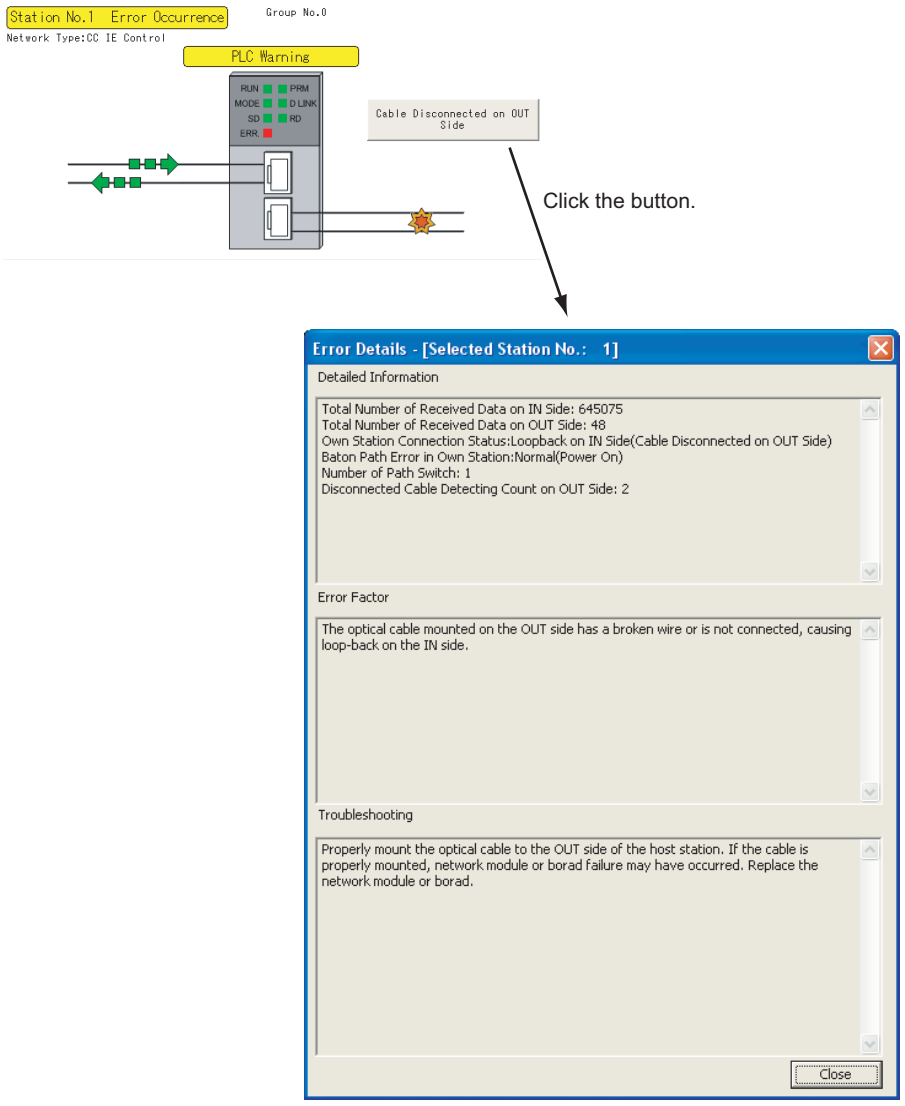
Restrictions

- **Communication test and link start/stop**
  To execute the communication test or link start/stop, a target station must be connected using a USB/RS-232 cable.

■ Display on the "Selected Station's Network Equipment Status" field when an error occurs

When an error occurs on a CC-Link IE Controller Network module or connection cable, the button is displayed on the "Selected Station's Network Equipment Status" field as shown below. The detailed information, error factor, and troubleshooting can be displayed by clicking the button.

The icon ( ) is displayed as shown below when a destination station is disconnected.

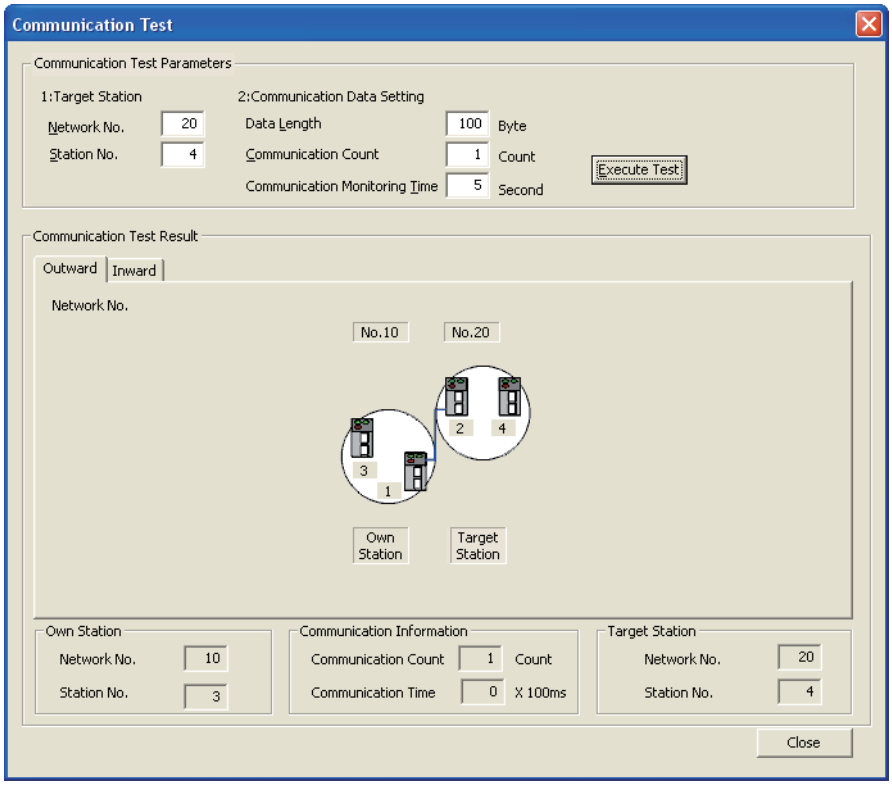


18.3.1 Communication test

Perform the communication test on CC-Link IE Controller Network.

Screen display

Click the Communication Test... button on the CC IE Control Network Diagnostics screen.



Operating procedure

1. **Set the items on the screen.**

Item		Description
Communication Test Parameters		Set the items to execute the test.
	Target Station	Set the network number and station number.
	Communication Data Setting	Set the data length (1 to 900 bytes), the number of communications (1 to 100 times), and monitoring time (1 to 100 seconds) to execute the test.

2. **Click the Execute Test button.**

   The communication test is executed according to the settings.

Display contents

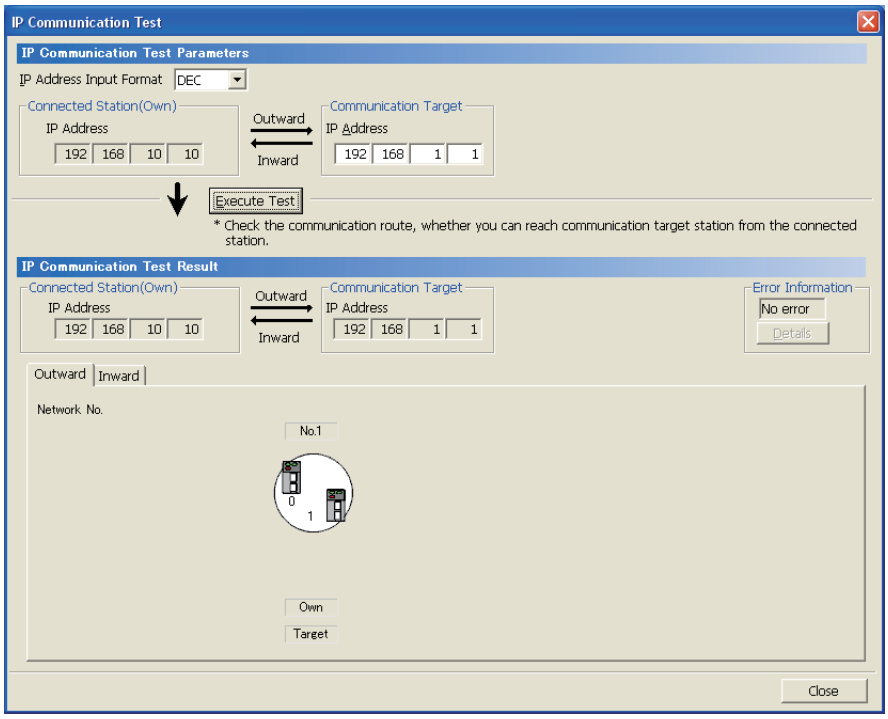
Item	Description
Communication Test Result	Display the result of inter-network communication test. Networks and stations routed from the own station (connected station) to the target station are displayed on the <<Outward>> tab and those routed from the target station to the own station (connected station) are displayed on the <<Inward>> tab.

18.3.2 IP communication test

Perform the IP communication test on CC-Link IE Controller Network.

Screen display

Click the IP Communication Test... button on the CC IE Control Network Diagnostics screen.



Operating procedure

1. **Set the items on the screen.**

Item		Description
IP Communication Test Parameters		Set the information for the test.
	IP Address Input Format	Select the input format (decimal/hexadecimal) of the IP address.
	Connected Station (Own)	Display the IP address of the Built-in Ethernet type CPU.
	Communication Target	Set the IP address of the target station.

2. **Click the Execute Test button.**

   The IP communication test is performed according to the set information.

Display contents

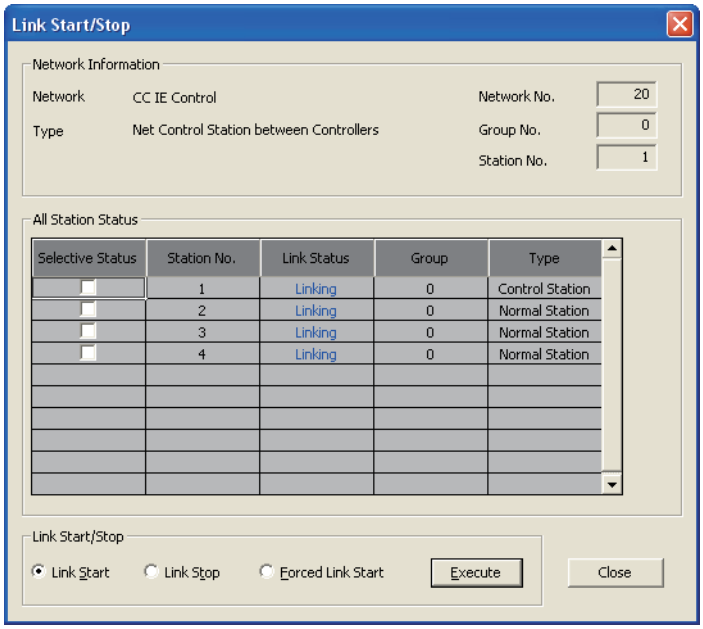
Item	Description
IP Communication Test Result	Display the result of the IP communication test between the networks. Network numbers and station numbers routed from the own station to the target station are displayed on the <<Outward>> tab. Network numbers and station numbers routed from the target station to the own station are displayed on the <<Inward>> tab.

18.3.3 Link start/stop

Start/stop the data link of individual stations on CC-Link IE Controller Network.

Screen display

Click the [Link Start/Stop...] button on the CC IE Control Network Diagnostics screen.



Operating procedure

1. **Set the items on the screen.**

Item		Description
Network Information		Display the network information of the connected station.
All Station Status		Display the link status of all stations on the same network which are performing the data link with the connected station. Target stations of the link start/stop operation can be selected in "Selective Status".
Link Start/Stop		–
	Link Start	Select this to start the data link.
	Link Stop	Select this to stop the data link.
	Forced Link Start	Select this to forcibly start the data link of a station which has been stopped by another station or a special relay/special register.

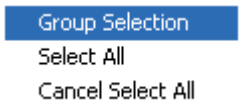
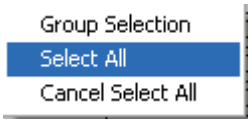
2. **Click the [Execute] button.**

The link start/stop is executed for all selected stations at once.

Point

● **Selection of link start/stop**

The target stations of the link start/stop operation can also be selected by the following methods.

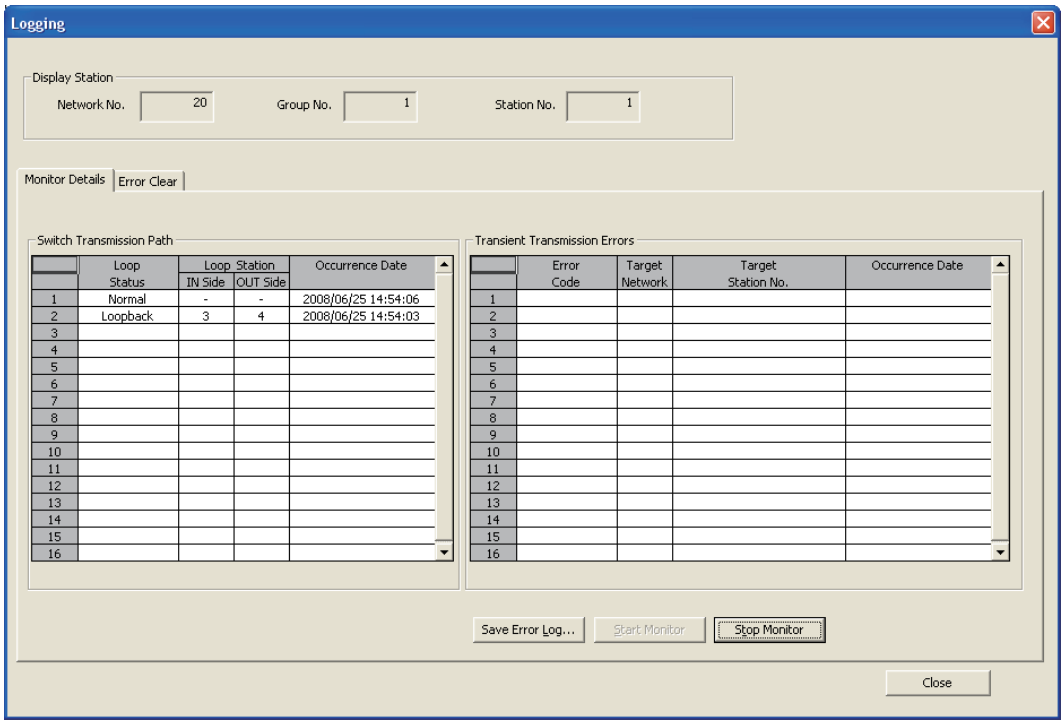
Selection	Operating procedure	
Group Selection	Right-click on the "Group" column of a station and select "Group Selection" from the shortcut menu. Stations which have the same group number as the selected line become selected. When the "Group" column whose value is 0 is right-clicked, this shortcut menu cannot be selected.	
Select All	Right-click the "Station No." column of a station and select "Select All" from the shortcut menu.	

18.3.4 Logging

Display the communication route switch information and transient transmission error information of the selected station.

Screen display

Select the Logging... button on the CC IE Control Network Diagnostics screen.



Display contents

Item	Description
Display Station	Display the network information of the currently selected station.

■ Displaying the communication route switch information and transient transmission error information

The <<Monitor Details>> tab displays the communication route switch information and transient transmission error information.
Maximum 100 logs can be displayed. If the number of logs exceeds 100, the logs are deleted from the oldest one.

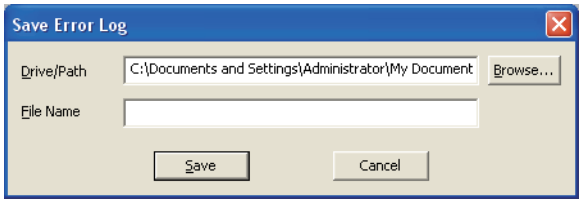
Display contents

Item	Description
Switch Transmission Path	Display the loop status of communication route, the number of station where loopback occurred, and the date when communication route switching occurred.
Transient Transmission Errors	Display the error code, network number and station number of the transient request target, and the date of error occurrence if transient transmission error occurs.

Screen button

● Save Error Log...

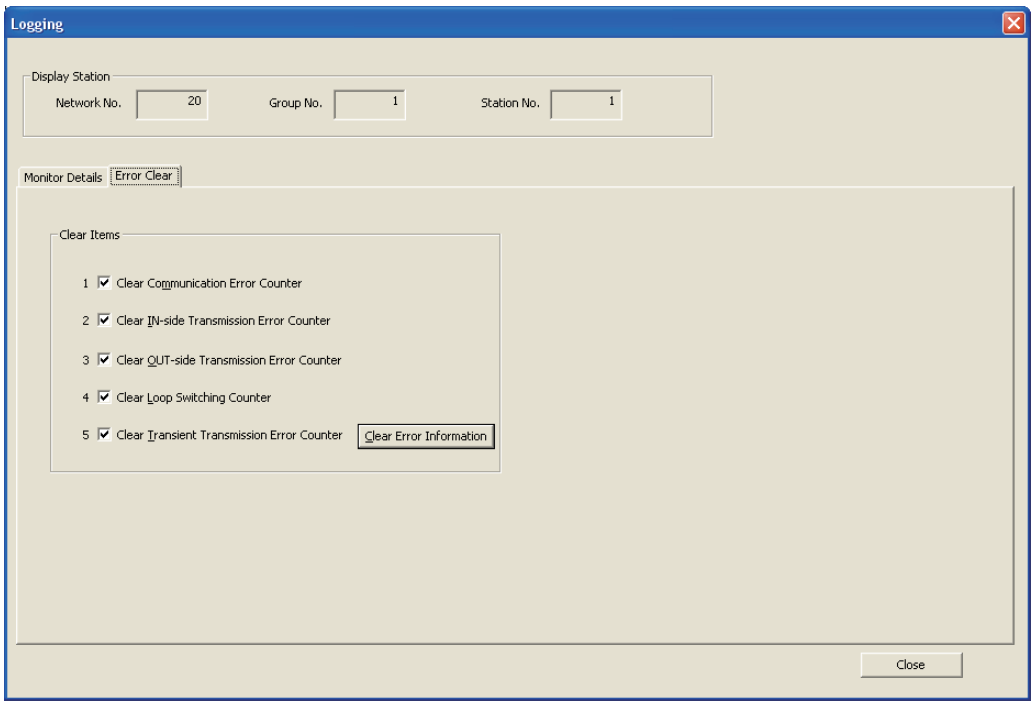
Displays the Save Error Log screen and the contents displayed on the <<Monitor Details>> tab can be saved in a CSV file.



■ Clearing errors

Clear the errors of the currently selected station using the <<Error Clear>> tab.

Screen display



Operating procedure

1. **Select the item to be cleared.**
2. **Click the** Clear Error Information **button.**

18.4 Diagnosing CC-Link IE Field Network

*1 : Universal model QCPU only
*2 : CC IE Field head module only

This section explains how to check the CC-Link IE Field Network status of a selected module.

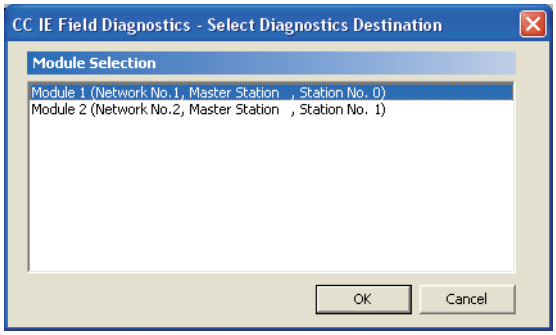
Point

- **When another station is set in the connection destination setting**
  When another station is set in the connection destination setting, the function cannot be executed.
- **Details of CC-Link IE Field Network diagnostics**
  Refer to the User's Manual of each module.

■ Selecting the diagnostics target

When two or more CC-Link IE Field Network modules are connected to the connected station, the Select Diagnostics Destination screen as shown below is displayed before starting diagnostics.

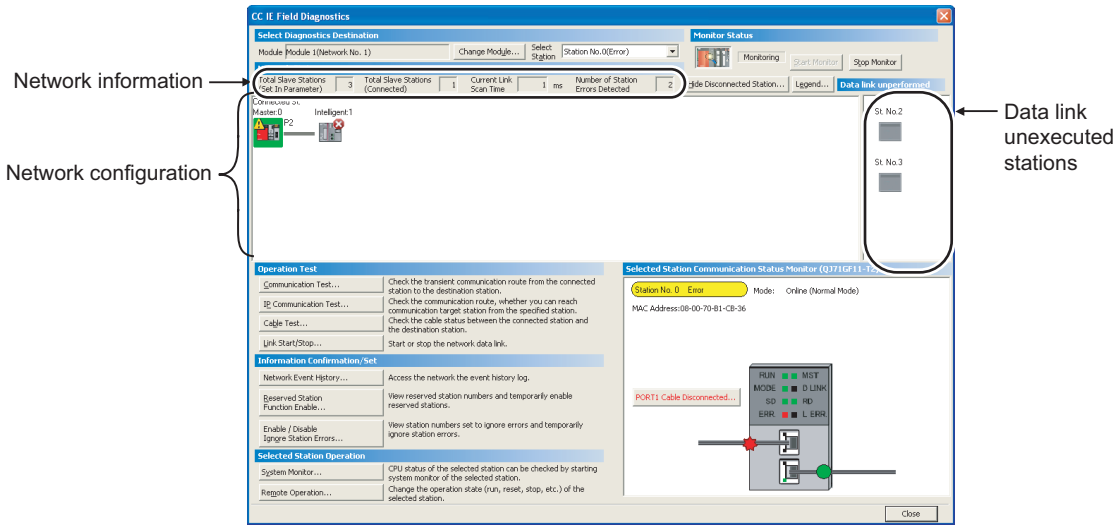
Select a network to be diagnosed and click the OK button.



■ Diagnostics screen

Screen display

Select [Diagnostics] ⇒ [CC IE Field Diagnostics].
The following is an example of setting screen when QCPU (Q mode) is selected.



Display contents

Item		Description
Select Diagnostics Destination		–
	Module	Display the module and network number of the diagnostics target.
	Select Station	Display the station number of the station selected in the network information. When the connected station is CC IE Field head module, this item is fixed to the own station.
Network Status*1		–
	Network information	Display the total number of slave stations, the link scan time (in units of ms), and the number of error-detected stations on the network being displayed.
	Network configuration	Display the state of the network. The status of each station is displayed with icons. Descriptions of displayed icons can be checked by clicking the Legend... button. Clicking an icon sets the corresponding station as the selected station and displays the details on the "Selected Station Communication Status Monitor" field. The selected station can also be determined by moving the focus with the right and left arrow keys and pressing the Space or Enter key.
	Data link unexecuted stations	Display stations on which the data link is not established among the stations set to the parameter. The disconnected stations which are deleted by the "Hide Disconnected Station" function are also displayed.
Selected Station Communication Status Monitor*2		Display the communication status of the own station.

*1 : Not displayed when the connected station is a CC IE Field head module.
*2 : When the master station is duplicated, the icon for QJ71GF11-T2 is displayed even if the selected station is QD77GF16.

Screen button

- Change Module... **(Not supported by CC IE Field head module)**
  Displays the Select Diagnostics Destination screen. The diagnostic target module can be changed. (☞ ■ Selecting the diagnostics target)

- Hide Disconnected Station...
  Deletes the disconnected station from the network configuration.

- Legend...
  Displays the explanation for icons displayed on the diagnostics screen.

- Communication Test...
  Displays the Communication Test screen. The communication route from the connected station to the specified destination station can be confirmed. (☞ Section 18.4.1)

- IP Communication Test...
  Displays the IP Communication Test screen. The IP communication route from the connected station to the communication target station can be confirmed. (☞ Section 18.4.2)

- Cable Test...
  Displays the Cable Test screen. The cable connection status can be tested. (☞ Section 18.4.3)

- Link Start/Stop... **(Not supported by CC IE Field head module)**
  Displays the Link Start/Stop screen. The data link start/stop can be performed to the specified station. (☞ Section 18.4.4)

- Network Event History... **(Not supported by CC IE Field head module)**
  Displays the Network Event History screen. Displays the history of events that have occurred on the own station and the network, and the various network information. (☞ Section 18.4.5)

- Reserved Station Function Enable... **(Not supported by CC IE Field head module)**
  Displays the Reserved Station Function Enable screen. The reserved stations can temporarily be disabled, and the temporarily disabled reserved stations can be enabled. (☞ Section 18.4.6)

- Enable / Disable Ignore Station Errors... **(Not supported by CC IE Field head module)**
  Displays the Enable/Disable Ignore Station Errors screen. The temporary error invalid stations can be set, and the registered temporary error invalid stations can be canceled. (☞ Section 18.4.7)

● System Monitor... **(Not supported by Ethernet adapter module/CC-Link IE Field Network board/CC-Link IE Field Network communication unit)**
Displays the System Monitor screen. The system status of the selected station can be confirmed. (☞ Section 18.8)

● System Error History... **(Supported by Ethernet adapter module/CC-Link IE Field Network CC-Link bridge module only)**
Displays the Error History screen. The system status of the selected station can be confirmed. (☞ Section 18.8)

● Remote Operation... **(Not supported by Ethernet adapter module/CC-Link IE Field Network board/CC-Link IE Field Network communication unit)**
Displays the Remote Operation screen. The remote operation can be performed to the programmable controller CPU of the selected station. (☞ Section 17.1)

Point

● **Connection destination for executing CC-Link IE Field Network diagnostics**
The communication test and the link start/stop can be executed only when the connected station is selected.

● **When an unsupported CPU module is specified as the selected station**
The IP communication test, system monitor, or remote operation cannot be performed when an unsupported CPU module is specified as the selected station.

● **When the selected station is a remote device station**
- The system monitor cannot be performed.
- For the remote operation, only remote reset operations can be performed on the selected station.
- Extension modules are displayed on the "Selected Station Communication Status Monitor" field only when a CC-Link IE Field Network master/local module is connected.
  For the versions (serial numbers) of master/local modules which can display the extension modules, refer to the following manuals.
  ☞ MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual
  ☞ MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual

● **Considerations of sub-master station display**
When a sub-master station is specified in the network parameter of the master station, a slave station whose station number is the same as that of the sub-master station is indicated as "Sub-Master".
In this case, review the network parameter and the system configuration.

Restrictions

● **Communication test and link start/stop**
To execute the communication test or link start/stop, a target station must be connected using a USB/RS-232 cable.

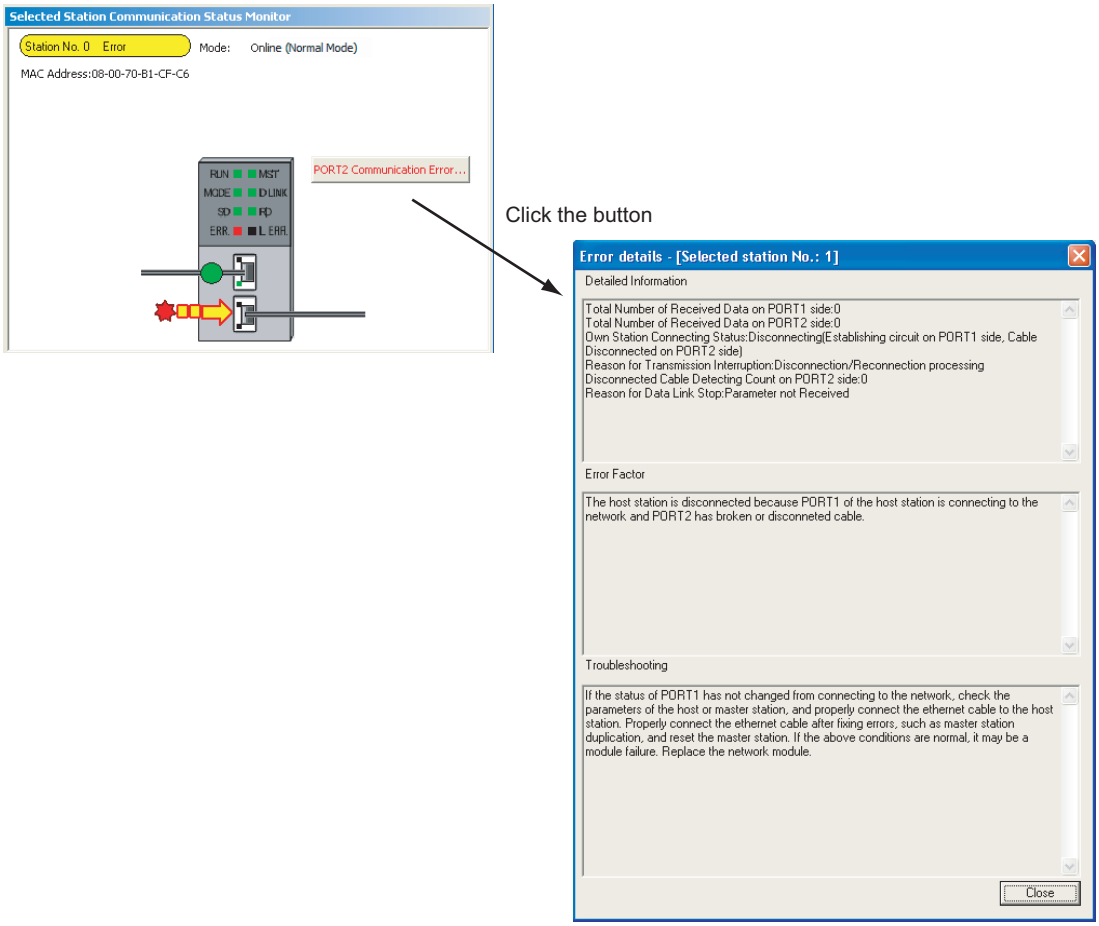
■ Display on the "Selected Station Communication Status Monitor" field

The button as shown below is displayed on the "Selected Station Communication Status Monitor" field for any of the following situations:

- an error occurs on a CC-Link IE Field Network master/local module, CC IE Field head module, or Ethernet adapter module;
- an error occurs on a connection cable; or
- a station number is not specified.

The detailed information, error factor, and troubleshooting can be displayed by clicking the button.

The icon () is displayed as shown below when a destination station is disconnected.



Point

● Setting a station number of CC IE Field head module

A station number of CC IE Field head module can be set or changed when connecting a CC IE Field head module whose station number is not set.

Specify "CC IE Field Head Module" for "Select Station" on the CC IE Field Diagnostics screen for the master station, and click the Station No. Setting... button displayed on the "Selected Station Communication Status Monitor" field.

Station numbers of the following modules used in the master station can be reset.

- QJ71GF11-T2 (With a serial number whose first five digits are "12072" or higher)
- LJ71GF11-T2

For details of setting station numbers, refer to the following manual.

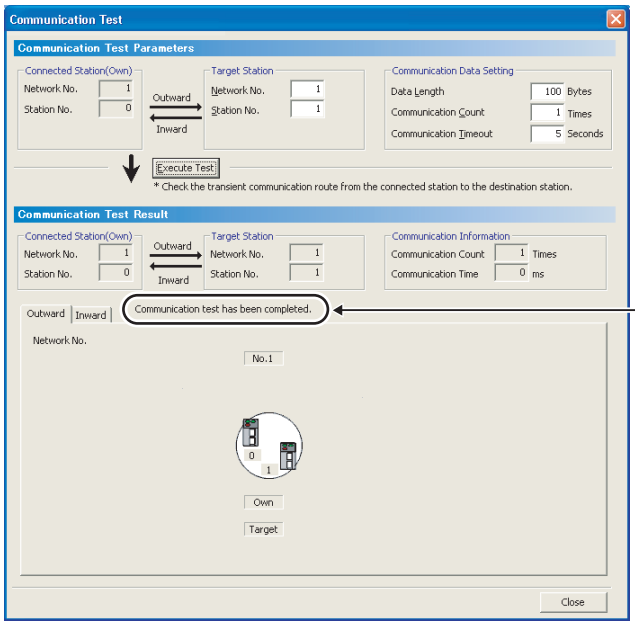
☞ MELSEC-L CC-Link IE Field Network Head Module User's Manual

18.4.1 Communication test

Perform the communication test on CC-Link IE Field Network.

Screen display

Click the Communication Test... button on the CC IE Field Diagnostics screen.



Presence or absence of errors on the communication test

Operating procedure

1. **Set the items on the screen.**

Item		Description
Communication Test Parameters		Set the items to execute the test.
	Connected Station (Own)	Display the network number and station number of the connected station.
	Target Station	Set the network number and station number.
	Communication Data Setting	Set the data length (1 to 900 bytes), the number of communications (1 to 100 times), and monitoring time (1 to 100 seconds) to execute the test.

2. **Click the Execute Test button.**

   The communication test is performed according to the settings.

Display contents

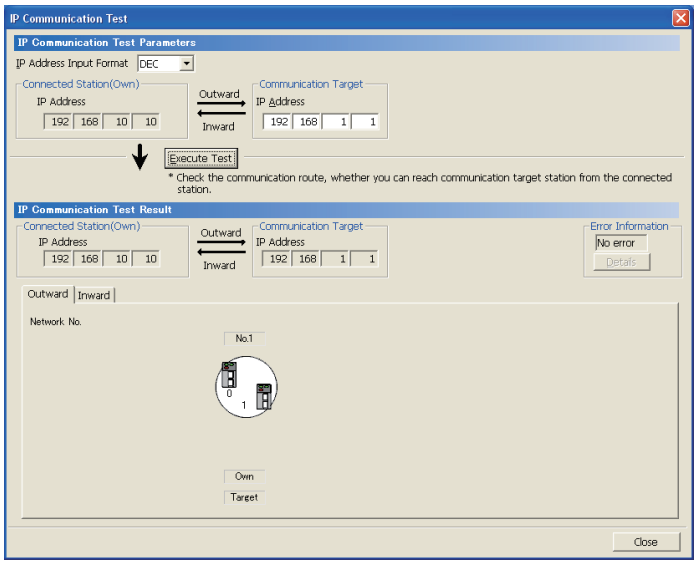
Item	Description
Communication Test Result	Display the result of inter-network communication test. Also in 'Presence or absence of errors on the communication test', display whether the communication test has been executed normally. Networks and stations routed from the own station (connected station) to the target station are displayed on the <<Outward>> tab and those routed from the target station to the own station (connected station) are displayed on the <<Inward>> tab.

18.4.2 IP communication test

Perform the IP communication test on CC-Link IE Field Network.

Screen display

Click the IP Communication Test... button on the CC IE Field Diagnostics screen.



Operating procedure

1. **Set the items on the screen.**

Item		Description
IP Communication Test Parameters		Set the information for the test.
	IP Address Input	Select the input format (decimal/hexadecimal) of the IP address.
	Connected Station (Own)	Display the IP address of the Built-in Ethernet type CPU.
	Communication Target	Set the IP address of the target station.

2. **Click the Execute Test button.**

The IP communication test is performed according to the set information.*1

*1 : A maximum of two minutes may be required for the cancellation processing when the module is not connected with the serial/USB cable.

Display contents

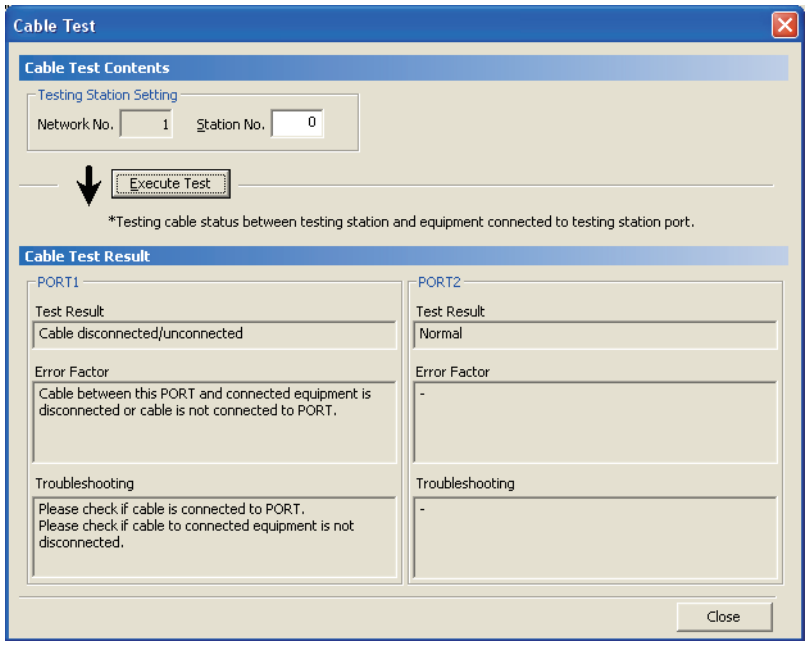
Item	Description
IP Communication Test Result	Display the result of the IP communication test between the networks. Network numbers and station numbers routed from the own station to the target station are displayed on the <<Outward>> tab. Network numbers and station numbers routed from the target station to the own station are displayed on the <<Inward>> tab.

18.4.3 Cable test

Test the status of the cable connections between the testing station and the devices connected to the ports of the testing station.

Screen display

Click the Cable Test... **button on the CC IE Field Diagnostics screen.**



Operating procedure

1. **Set the items on the screen.**

Item		Description
Cable Test Contents		–
	Testing Station Setting	Set the network number and station number of the station which executes the cable test.

2. **Click the** Execute Test **button.**

   The cable test is executed on the testing station.

Display contents

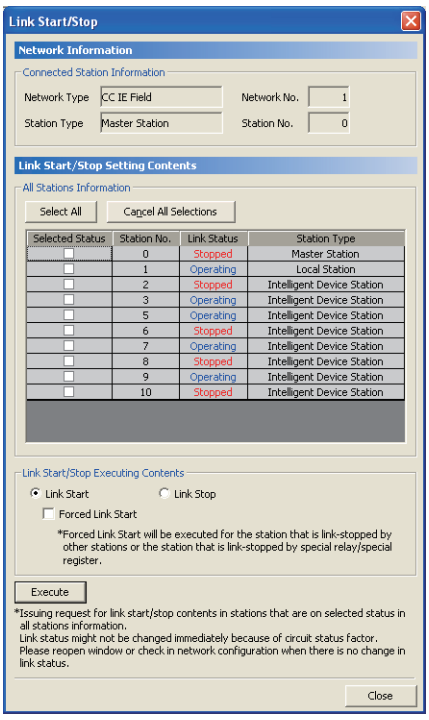
Item	Description
Cable Test Result	Display the cable test result, error factor, and troubleshooting of each port.

18.4.4 Link start/stop

Start/stop the data link of a specified station. This function can be used for debugging purposes to stop the station from receiving data from other stations and sending its own data.
The data link cannot be started/stopped to the stations other than the own station when the connected station is the master station operating as a sub-master station.

Screen display

Click the [Link Start/Stop...] button on the CC IE Field Diagnostics screen.



Operating procedure

1. **Set the items on the screen.**

Item		Description
Network Information		–
	Connected Station Information	Display the network information of the connected station.
Link Start/Stop Setting Contents		–
	All Stations Information	Display the link status of all stations on the same network which are performing the data link with the connected station. Target stations of the link start/stop operation can be selected in "Selected Status".
	Link Start/Stop Executing Contents	Select "Link Start"/"Link Stop". To forcibly start the data link of a station which has been stopped by another station or a special relay/special register, select "Forced Link Start".

2. **Click the [Execute] button.**

The link start/stop is executed for all selected stations at once.
When the process is completed, "Selected Status" are cleared and the contents of "Link Status" are updated.

Screen button

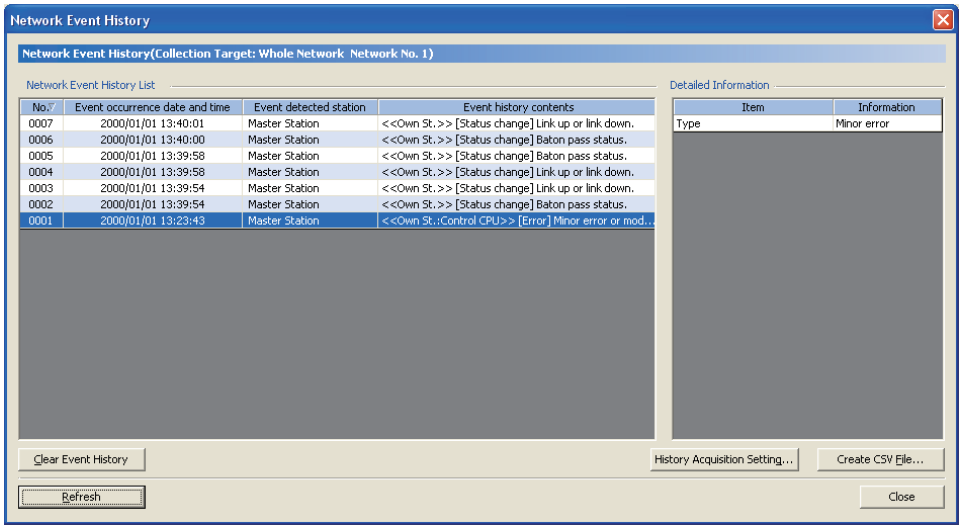
- Select All
  Selects all stations displayed in the list.
- Cancel All Selections
  Cancels the selection status of all stations selected in the list.

18.4.5 Network event history

Display the list of event history occurred on the own station and on the network.

Screen display

Click the Network Event History... button on the CC IE Field Diagnostics screen.



Display contents

Item	Description
Network Event History List	Display the list of network event history. Each column can be sorted in ascending/descending order by clicking on the column header.
Detailed Information	Display the detailed information of an event selected in "Network Event History List".

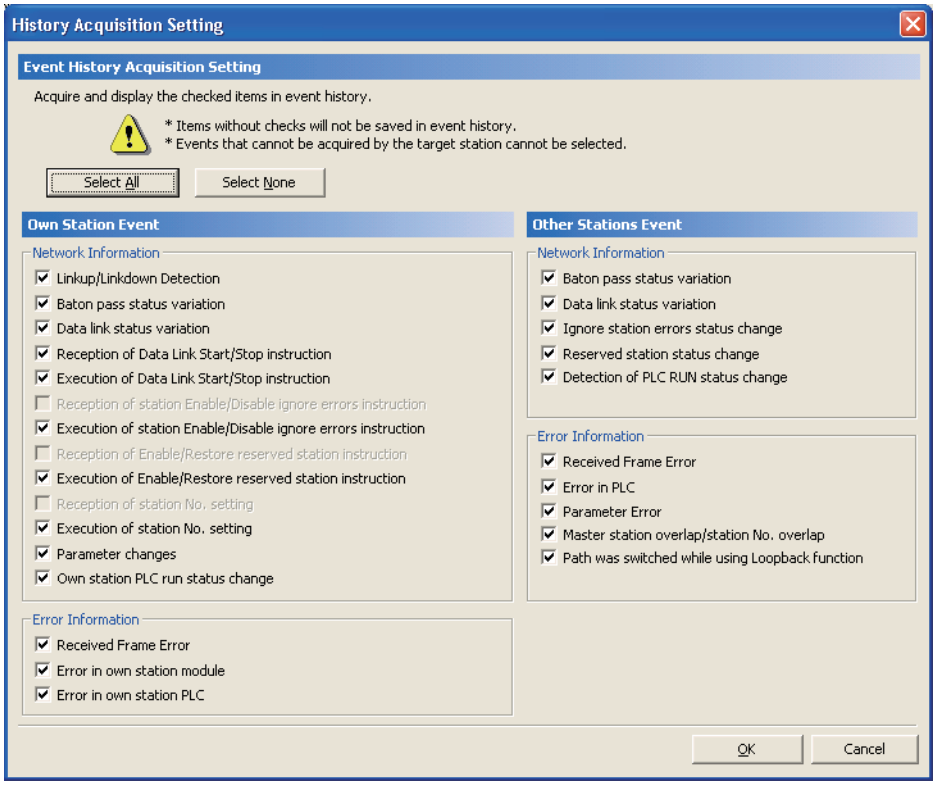
Screen button

- Clear Event History

  Clears the network event history exists on the programmable controller CPU.

- History Acquisition Setting...

  Displays the History Acquisition Setting screen.
  Select events to be acquired.



  - All events displayed in the list are selected by clicking the Select All button.
  - The selection status of all events selected in the list are canceled by clicking the Select None button.

- Create CSV File

  Saves the network event history in CSV file format.

- Refresh

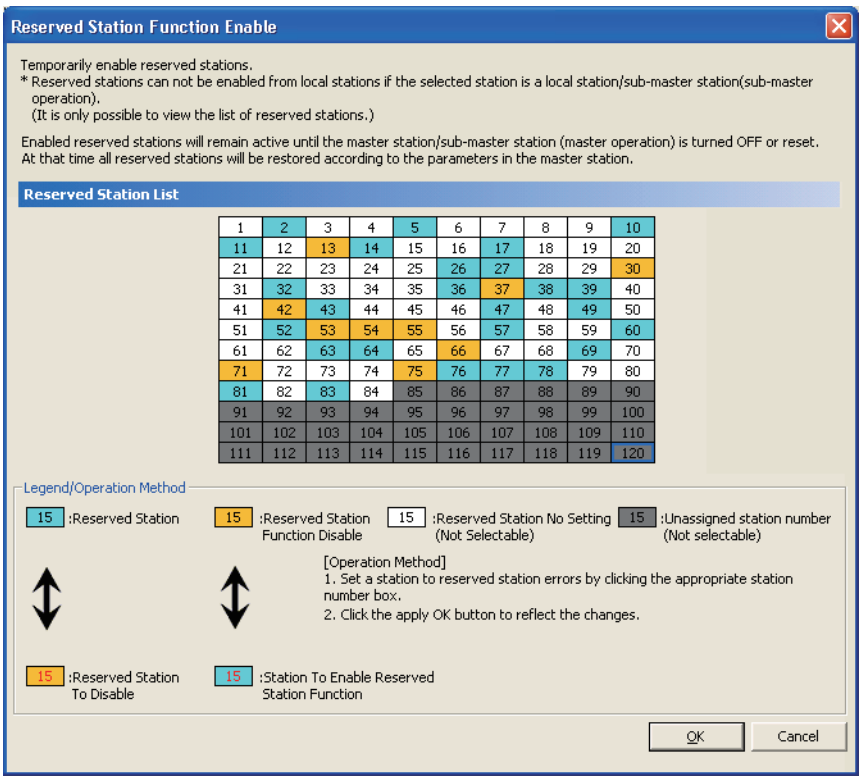
  Updates "Network Event History List".

18.4.6 Reserved station function enable

Disable the reserved stations temporarily, and enable the temporarily disabled reserved station.
This function cannot be performed when the connected station is a local station or the master station operating as a sub-master station.

Screen display

Click the Reserved Station Function Enable... **button on the CC-Link IE Field Diagnostics screen.**



Operating procedure

1. **Select reserved stations to be disabled temporarily/enabled from "Reserved Station List".**

2. **Click the** End Setting **button.**

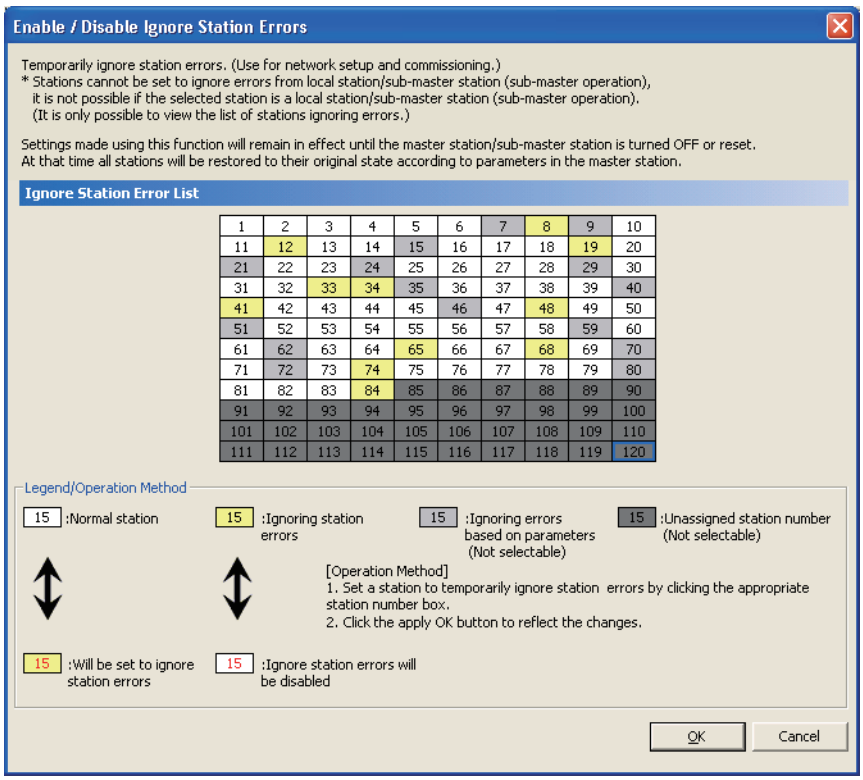
   The selected reserved stations are disabled temporarily/enabled.
   When the process is completed, the contents of "Reserved Station List" are updated.

18.4.7 Temporary error invalid station setting/restore

Set/cancel temporary error invalid stations.
This function cannot be performed when the connected station is a local station or the master station operating as a sub-master station.

Screen display

Click the Enable / Disable Ignore Station Errors... **button on the CC-Link IE Field Diagnostics screen.**



Operating procedure

1. **Select stations to be set/canceled as temporary error invalid stations from "Ignore Station Error List".**

2. **Click the** End Setting **button.**

   The temporary error invalid stations are set/canceled.
   When the process is completed, the contents of "Ignore Station Error List" are updated.

18.5 Diagnosing CC-Link and CC-Link/LT

This section explains how to monitor the network information of each station, diagnosing the network status, and testing.

18.5.1 Monitoring line (host station/other stations)

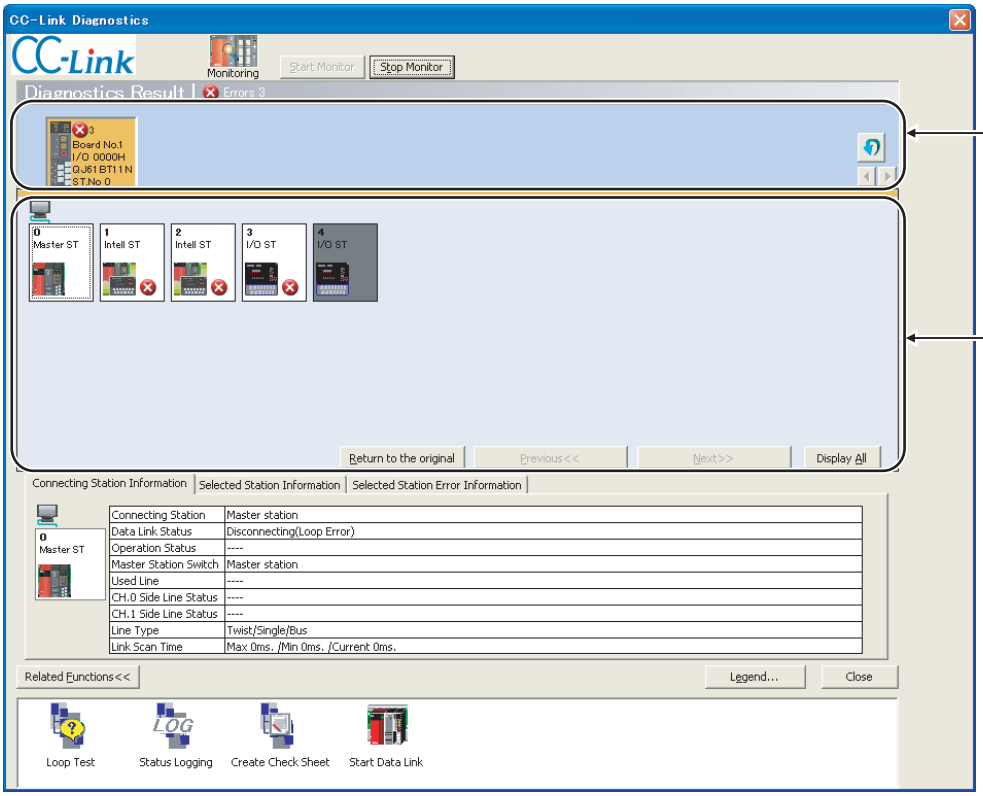
Q CPU | L CPU | Remote | Head *1 | FX

*1 : CC IE Field head module only

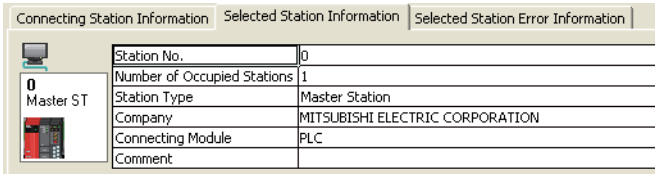
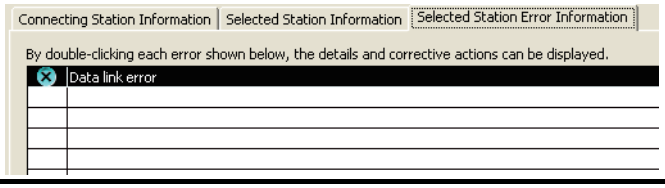
Monitor host station line/another station line in CC-Link or CC-Link/LT.

Screen display

Select [Diagnostics] ⇒ [CC-Link Diagnostics].
The following is an example of setting screen when QCPU (Q mode) is selected.



Display contents

Item	Description
Diagnostics Result	Display the number of all errors/warnings being occurring in the modules.
Module list/diagnostic target selection	Display CC-Link and CC-Link/LT modules exist in the connected station. The number of errors (errors and warnings) is also displayed. The diagnostic target can be changed by clicking a desired module.
Station list	Display the icons of stations configuring the CC-Link network. In the detail display, the 33rd station and later are displayed by clicking the Next>> button. The display can be switched by the Display All / Detail Display button. The information of all stations are displayed on the screen at once in the all-station display. Click the Legend... button to check the description of each icon.
<<Connecting Station Information>>	Display such as the data link status of the connecting station (host station).
<<Selected Station Information>>	Display such as the data link status of the station (another station) selected in the station list. 
<<Selected Station Error Information>>	Display the error information of the station selected in the station list. 

Screen button

- 
  Updates the module list/diagnostic target selection.
-  **(Not supported by FXCPU)**
  Switches modules to be displayed in units of eight modules.
- Return to the original
  Reset the icon layout in the station list to the station number order.
  For the layout edit of the station list, refer to Point in this section.
- Previous<< / Next>> **(Not supported by FXCPU)**
  Switches the screen of the station list.
  When an error or warning exists on each screen, the icon indicating the error information is displayed on the button.
- Display All / Detail Display **(Not supported by FXCPU)**
  Switches the all-station display and detail display.

● Related Functions>> / Related Functions<<

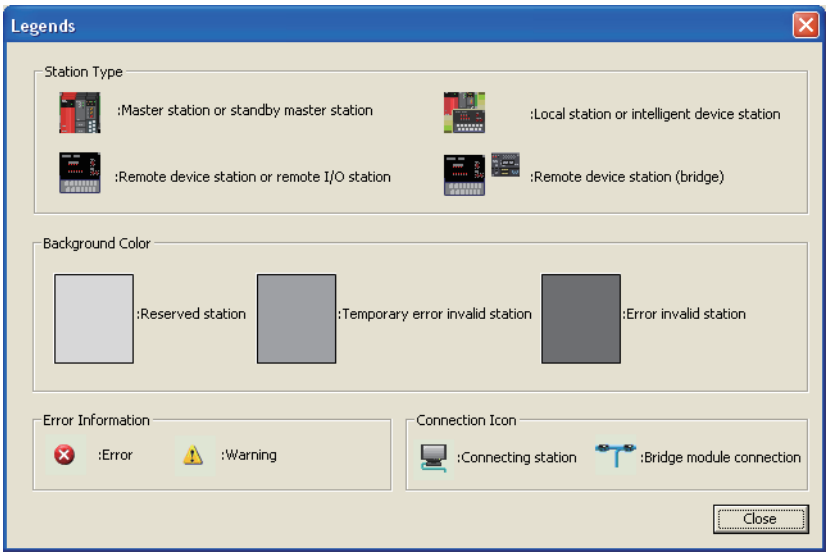
Displays/hides the related function buttons.
For details of related functions, refer to the following sections.

- Loop Test*1 ☞ Section 18.5.2 "Loop test/transmission speed test"
- Status Logging*2 ☞ Section 18.5.3 "Displaying logs of station information (status logging)"
- Create Check Sheet ☞ Section 18.5.4 "Creating check sheets"
- Start Data Link/Stop Data Link*1 ☞ Section 18.5.5 "Starting/stopping data link"

*1 : Not supported by remote I/O module.
*2 : Not supported by FXCPU.

● Legend...

Displays the explanation for icons displayed on the diagnostics screen.
The following is an example of setting screen when QCPU (Q mode) is selected.

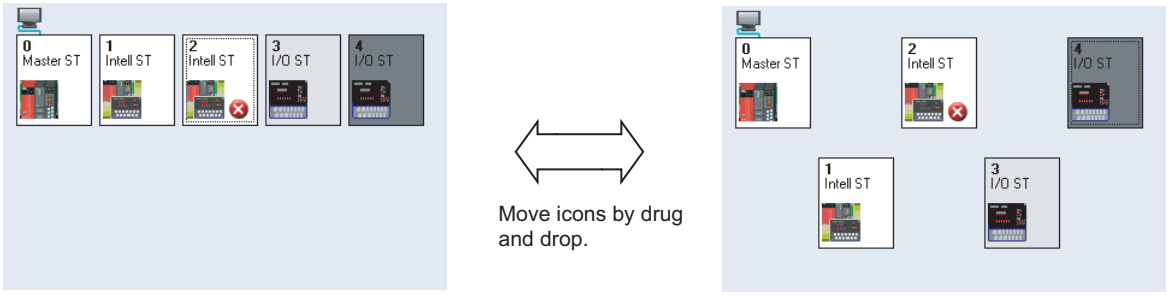


Point

● **Update of the number of errors and warnings displayed in "Diagnostics Result"**
During the monitoring, the number of errors/warnings being occurring on the network of a module selected in "Module list/diagnostic target selection" is only updated.

To also update the number of errors/warnings on other modules, update the module list using .

● **Editing layout of station list**
Icons in the station list can be moved and allocated freely with the drag-and-drop operation.

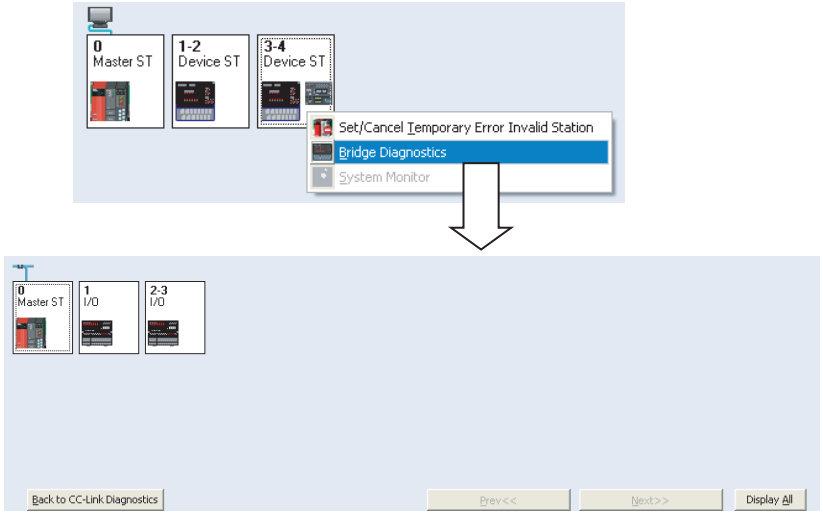


● **Diagnostic target**

- For QCPU (Q mode)/LCPU, only QJ61BT11, QJ61BT11N, and LJ61BT11 are diagnosed in the CC-Link system configuration, and only QJ61CL12 and LJ61CL12 are diagnosed in the CC-Link/LT system configuration.
- For FXCPU, the diagnostic target is CC-Link system only. Remote I/O, remote device stations, and intelligent device stations are diagnosed.

Point

● **Diagnosing CC-Link bridge modules (Not supported by FXCPU)**
When a CC-Link bridge module is selected in the station list, the bridge diagnostics can be executed by right-clicking it and selecting [Bridge Diagnostics] from the shortcut menu.



To return to the CC-Link Diagnostics screen, click the Back to CC-Link Diagnostics button.

● **Considerations for executing each function**
Do not execute the following functions by a sequence program and peripheral at the same time. If executed, they may not be executed correctly.

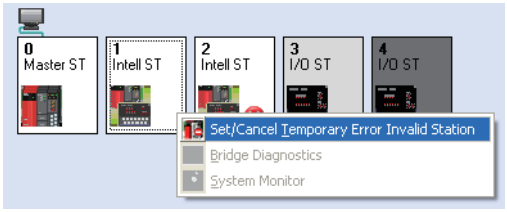
- Start data link/stop data link
- Set/cancel temporary error invalid station
- Loop test
- Obtain transmission speed setting (including the acquisition of the transmission speed setting in the Check Sheet Creation Wizard)

Restrictions

● **Restrictions on bridge diagnostics, loop test, and check sheet creation**
Bridge diagnostics, loop test, and check sheet creation can be performed only when the connected station is a master station.

■ Setting/canceling temporary error invalid station

Replacing a module in online is possible without detecting an error in the corresponding remote station.
To set the temporary error invalid station, select the desired station in the station list and right-click it, and select [Enable/Disable Ignore Station Errors] from the shortcut menu.
If multiple stations are set as occupied stations, specify the start station number of each occupied station for the temporary error invalid station. If setting is set for a station that is not the start station in actual assignment, invalid setting is ignored.
In addition, do not set the temporary error invalid station by a sequence program or peripheral at the same time. If set, the temporary error invalid station may not be set correctly.



■ Company names in other station information

1) The field displays the company name or manufacturer code of the device connected in CC-Link.

2) The field displays the manufacturer code if company name is not entered in the manufacturer code list.

3) The manufacturer code list (partner_English.dat) is saved in the following folder and can be edited using text editor available in market.
C:/Program Files/MELSOFT/DnaviZero/DnaviSatellite/CCLink

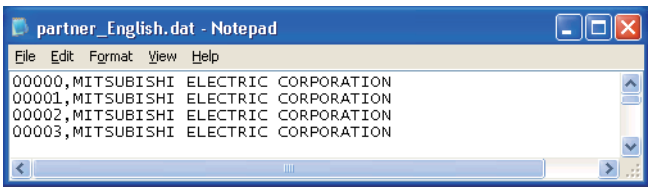
4) The company names can be edited on the diagnostics screen, however, changes are not applied to partner_English.dat.

For some manufacturers, manufacturer codes are not listed. Edit the file according to the following file format specifications.

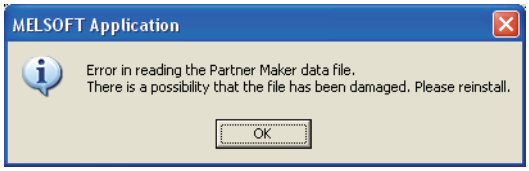
	Manufacturer code	Company name
Max. number of characters	5	255
Usable characters*1	0 to 9	• Alphanumeric characters • Symbols
Remarks	Manufacturer code other than 5 digits is ignored.	Display differs depending on the screen width. With small fonts, up to 75 characters are displayed, characters exceeding the limit are not displayed.

*1 : If "," is used in a company name, enclose the company name by double quotations (" ").
Example: "xxxxx Co., Ltd"

The following is an example of partner_English.dat displayed using a text editor.



If the manufacturer code list does not exist in the install destination of GX Works2 or if it is corrupted, the following message is displayed.



18.5.2 Loop test/transmission speed test

Q CPU | L CPU | Remote | Head *1 | FX

*1 : CC IE Field head module only

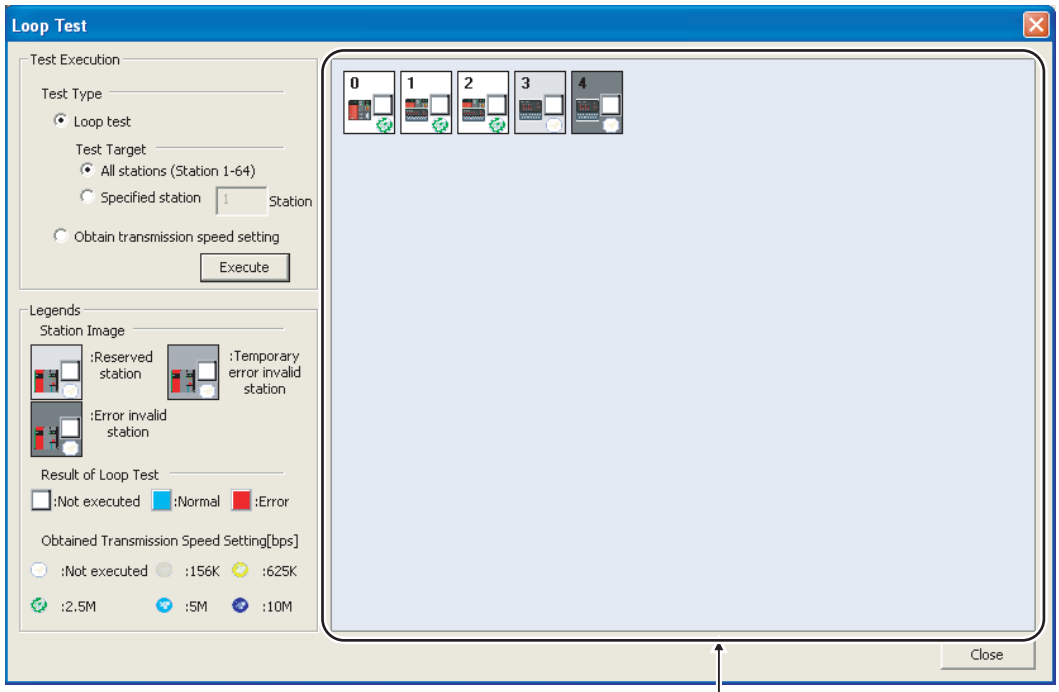
Check operating status of lines for all stations or specified stations, and checking the transmission speed settings of all stations.

Screen display

Double-click  **on the CC-Link Diagnostics screen.**

Loop Test

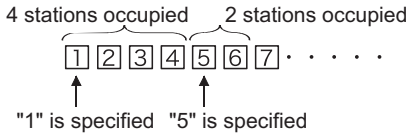
The following is an example of setting screen when QCPU (Q mode) is selected.



Test result

Operating procedure

1. Set the items on the screen.

Item	Description
Loop Test	Execute the loop test according to the specification of "All Stations" or "Selected Station No.". Setting is not possible when CC-Link/LT is selected. All Stations: Select this to execute the test for all stations. QCPU (Q mode)/LCPU: 64 stations FXCPU : 16 stations Selected Station No.: Select this to execute the test for the specified stations. To specify a station, specify the start address of an occupied station. Example) When four occupied stations and two occupied stations are connected  If 2, 3, 4, or 6 is specified, the station becomes faulty station.
Obtain transmission speed setting	Obtain the transmission speed settings of all stations.

2. Click the Execute button.

The loop test/acquisition of the transmission speed setting is executed and the result is displayed in the 'Test result'.
Check 'Legends' for the descriptions of the icons displayed in the 'Test result'.

Point

● **Considerations for executing the test**
Do not execute the loop test/acquisition of the transmission speed setting by a sequence program or peripheral at the same time. If executed, the loop test/acquisition of the transmission speed setting may not be executed correctly.
In addition, when executing the acquisition of the transmission speed setting, do not execute the acquisition of the transmission speed setting in the Check Sheet Creation Wizard at the same time.

18.5.3 Displaying logs of station information (status logging)

Q CPU | L CPU | Remote | Head *1 | FX

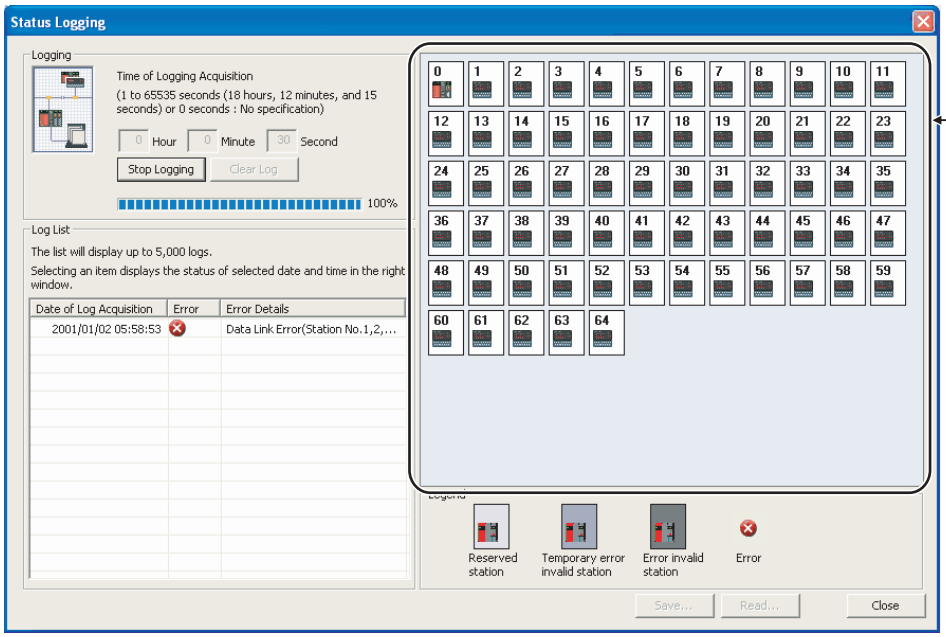
*1 : CC IE Field head module only

Collect logs of the station information (the data link status of other stations, date of acquisition).

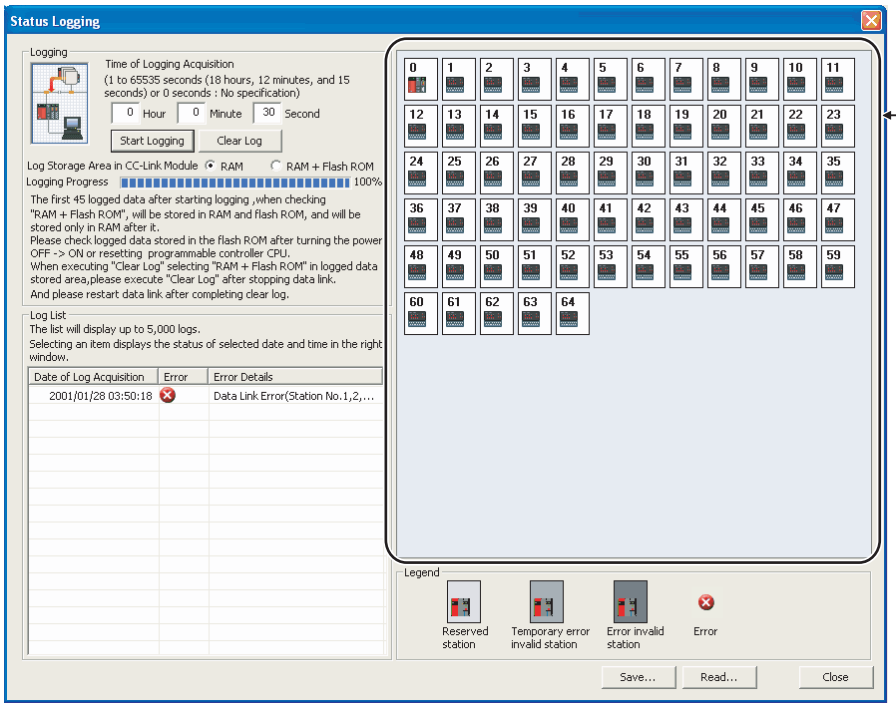
Screen display

Double-click  **on the CC-Link Diagnostics screen.**

<Q series CC-Link module whose serial number is lower than 12032>



<Q series CC-Link module whose serial number is 12032 or higher/LCPU>



Operating procedure

1. Set the items on the screen.

Item	Description
Time of Logging Acquisition	Specify the period of time to collect the log on the second time scale. The log is collected during the time of period between when the logging starts and when the specified time elapses.
Log Storage Area in CC-Link Module	Specify the logging storage destination. Since the log which is stored on a RAM is deleted when the programmable controller CPU is turned from OFF to ON or reset, select "RAM + Flash ROM" to keep the log stored. The log on a flash ROM can remain stored on the flash ROM of the CC-Link master/local module even if the programmable controller CPU is turned from OFF to ON or reset.

2. Click the Start Logging button.

The log is collected during the specified log acquisition time and displayed in "Log List".
The log displayed in "Log List" is read out from the RAM.
The log collection stops when the number of log records reaches 5000.

When '0' is specified, the log collection continues until the Stop Logging button is clicked or the number of log records reaches 5000.
The status as of the date selected in "Log List" is displayed in the 'Log data display area'.
Check "Legends" for the descriptions of the icons displayed in the 'Log data display area'.

Screen button

- Clear Log

  Clears the log in the module.
  Also clears the log stored on a flash ROM when "RAM + Flash ROM" is selected.

- Save... / Read...

  Saves information of the log list in CSV format. Also reads out a log file saved in CSV format and displays in "Log List".

Point

- **Log collection when "RAM + Flash ROM" is selected**
  When "RAM + Flash ROM" is selected, the first 45 records of the log are stored on a flash ROM and the following records are stored on a RAM.
- **Checking the log stored on a flash ROM**
  The log stored on a flash ROM is transferred to a RAM when the programmable controller CPU is turned from OFF to ON or reset. The log stored on the flash ROM can be displayed in "Log List" by reopening the Status Logging screen.
- **Log collection**
  In the case where GX Works2 cannot always be connected, select "RAM + Flash ROM".
  The log (up to 45 records) stored on a flash ROM can be displayed when GX Works2 is reconnected after the logging.
  In the case where GX Works2 can always be connected, up to 5000 records of the log can be collected whichever "RAM" or "RAM + Flash ROM" is selected.

18.5.4 Creating check sheets

Q CPU | L CPU | Remote | Head *1 | FX

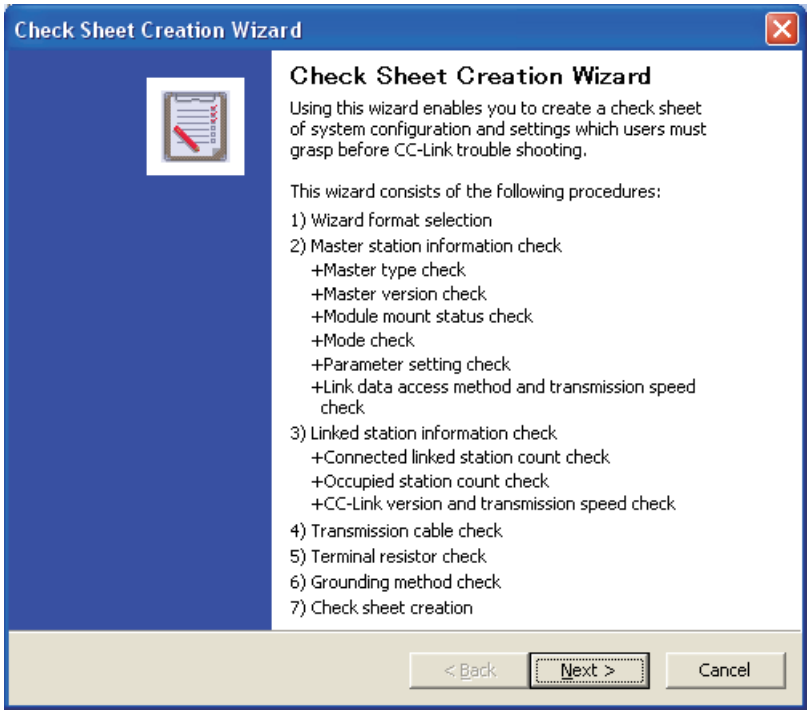
*1 : CC IE Field head module only

Create a check sheet for troubleshooting by the wizard.

Operating procedure

1. **Double-click** 

on the CC-Link Diagnostics screen.



2. **Set the items according to the terms on the screens.**

For details of setting items, refer to the following guide.
☞ Open Field Network CC-Link Troubleshooting Guide
The created check sheet is saved in Excel format.

Point

● **Considerations for checking the transmission speed**
Do not execute the check (acquisition) of the transmission speed setting by a sequence program or peripheral at the same time. If executed, the check (acquisition) of the transmission speed setting may not be executed correctly.

● **Check sheets**
"System Configuration" can be output when Excel 2000 or later is installed.

Example of a check sheet:
The following shows an example of a check sheet in case where Excel 2000 or later is installed.

	Confirmation Item		Contents	
1.	Master Station	[1]Master Type	Programmable Controller PLC	Q06UDHCPU
			Master Module	QJ61BT11
		[2]Master Version	Programmable Controller PLC	H0819A000000000B
			Master Module	020810000000000B
		[3]Module Mount Status	I/O Address:	0010H
		[4]Other Network Module	Other Network Module:	QJ61BT11
		[5]Mode	Mode Setting:	[*]Remote Net Mode([*]Ver.1/ [ ]Additional /[ ]Ver.2) / [ ]Remote I/O Net Mode
			Scan Mode:	[ ]Synchronous/[*]Asynchronous Mode
			Module Mode:	[ ]I/O mode / [ ]intelligent mode (SW8:A Series Only)
		[6]Parameter	Checking the parameter matching status between the specification and PLC	
			Parameter	Setting
			Number of PLCs	4Count
			Standby Master Station Setting	None
			PLC Down Drive Specification	[*]Stop/[ ]Continue
			Reserved Station	Station No.3
			Error Invalid Station	Station No.4
			Station Information	Written in the system configuration
		[7]Parameter Setting	[*]GX WORKS2/ [ ]Dedicated Instruction/ [ ]FROM/TO Instruction	
		[8]Link Start Method	[ ]Startup by Buffer Memory:Y6 / [ ]Startup by E2PROM:Y8 (Only QnA, A, FX Series)	
		[9]Link Data Access	[*]Auto Refresh/ [ ]Dedicated Instruction/ [ ]FROM/TO Instruction	
		[10]Transmission Speed	[ ]10M/ [ ]5M / [*]2.5M / [ ]625k / [ ]156kbps	
2.	Linked Station	[11]Connected Count	4Count	
	*:The details have been describe	[12]Station Type*	Remote I/O Station:2Count, Remote Device Station:0Count, Intelligent Device Station:2Count	
		[13]Number of Occupied S	[*]Number of occupied stations of each station(Please check it when you confirm it.)	
		[14]CC-Link Version*	[*]Ver.1 / [ ]Ver2(Expanded Cyclic Setting:[ ]1Times, [ ]2Times, [ ]4Times, [ ]8Times)	
		[15]Transmission Speed	[*]10M/ [ ]5M / [*]2.5M / [ ]625k / [ ]156kbps	
3.	Transmission Cable	[16]Cable Type	Cable Model Name:	
		[17]Transmission Distance	Total Extension Distance:	m
		[18]Inter-Station Distance	Distance between Shortest Stati	m
4.	Terminal Resistor	[19]Resistance Value	[*]110ohm / [ ]130ohm / [ ]Not Exist	
		[20]Connected Terminal	[ ]Connection between DA-DB of terminal resistor(Please check it when you confirm it.)	
5.	Grounding	[21]FG Terminal	[ ]Grounding of FG terminal of each station(Please check it when you confirm it.)	
			Describe the installation status to "6.System Configuration" when it is not set up in each station.	
6.	System Configuration	[22]		
	Station No., Station Type			
	Number of Occupied Stations			
	Length of Cable			

18.5.5 Starting/stopping data link

Q CPU | L CPU | Remote | Head *1 | FX

*1 : CC IE Field head module only

Start/stop the data link.
The following operating procedure is explained with icons of QCPU (Q mode) as an example.

Operating procedure

- **Double-click**  **on the CC-Link Diagnostics screen.**

  Stop Data Link

  The data link is stopped. The icon is switched to  .

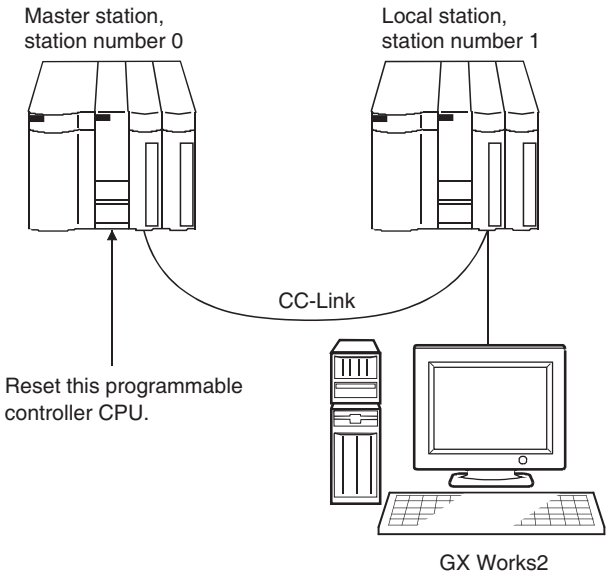
  Start Data Link

  To start the data link, click  .

  Start Data Link

■ Considerations of data link stop

Performing 'data link stop' disables data transmission from GX Works2 when the personal computer is connected to a master station via CC-Link as shown in the system configuration below.
To re-establish the connection to send data from GX Works2, reset the programmable controller CPU to which the data link stop is performed and restart the data link.



18.6 Diagnosing Ethernet

Q CPU | L CPU | Remote | Head | FX

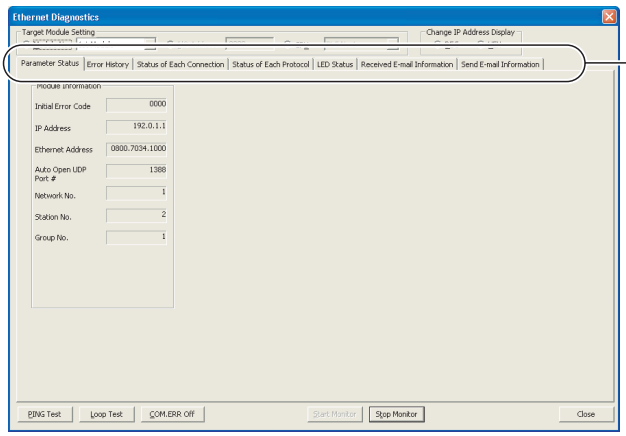
This section explains how to check various setting status of Ethernet module, Built-in Ethernet type CPU, and FXCPU with Ethernet adapter.

18.6.1 Q series-compatible E71/L series-compatible E71 module

Check Q series-compatible E71/L series-compatible E71 module parameter status, error history, status of each connection, status of each protocol, LED status, received e-mail information, and send e-mail information.
For details of each displayed item, refer to the following manuals.
☞ Q Corresponding Ethernet Interface Module User's Manual (Basic)
☞ MELSEC-L Ethernet Interface Module User's Manual (Basic)
The screens of QCPU (Q mode) are used in this section.

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics].



Display contents

Item	Description
Target Module Setting	Select "Module No.", and specify an Ethernet module to be monitored. The following is the setting range. QCPU: 1 to 4 LCPU: 1 to 2
Change IP Address Display	Switch decimal/hexadecimal notation of IP address display.
Monitoring information	The following Ethernet module information can be monitored. • Parameter status (☞ ■ Monitoring the parameter status) • Error history (☞ ■ Monitoring the error history) • Status of each connection (☞ ■ Monitoring the status of each connection) • Status of each protocol (☞ ■ Monitoring the status of each protocol) • LED status (☞ ■ Monitoring the LED status) • Received e-mail information (☞ ■ Monitoring the received e-mail information) • Send e-mail information (☞ ■ Monitoring the send e-mail information)

Screen button

● PING Test
Displays the PING Test screen. (☞ Section 18.6.3)

● Loop Test **(Supported by QCPU (Q mode) only)**
Displays the Loopback Test screen. (☞ Section 18.6.4)

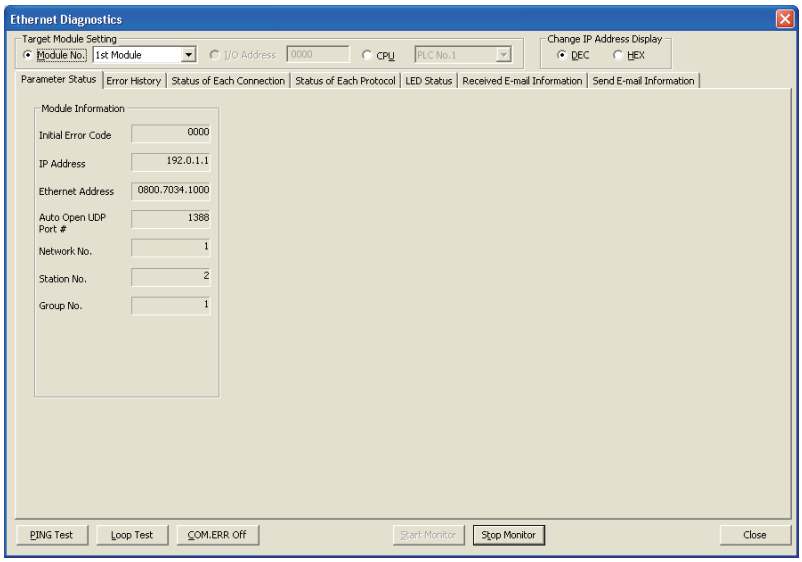
● COM.ERR Off **(Supported by QCPU (Q mode) only)**
Turns OFF the [COM ERR] LED.

■ Monitoring the parameter status

Monitor the Ethernet module parameter status.

Screen display

Select the <<Parameter Status>> tab on the Ethernet Diagnostics screen.

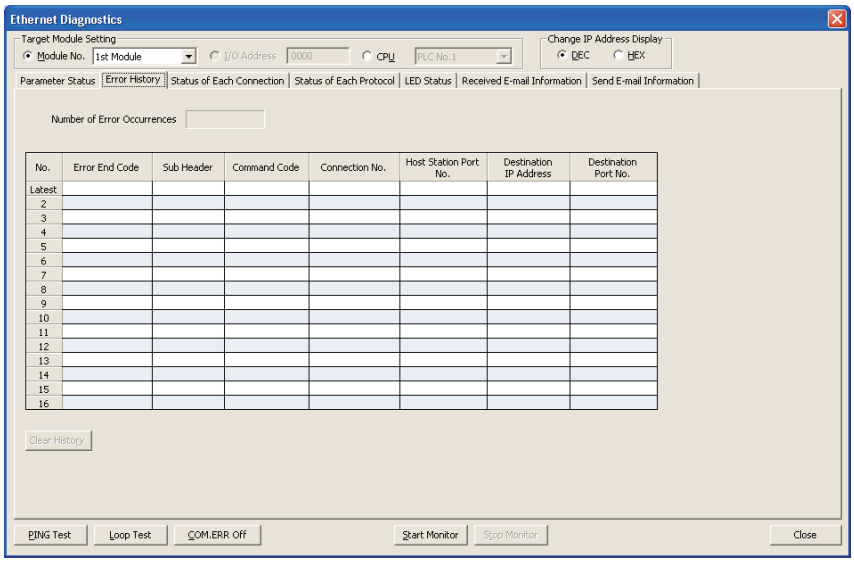


■ Monitoring the error history

Monitor the error history area.

Screen display

Select the <<Error History>> tab on the Ethernet Diagnostics screen.



Screen button

● Clear History

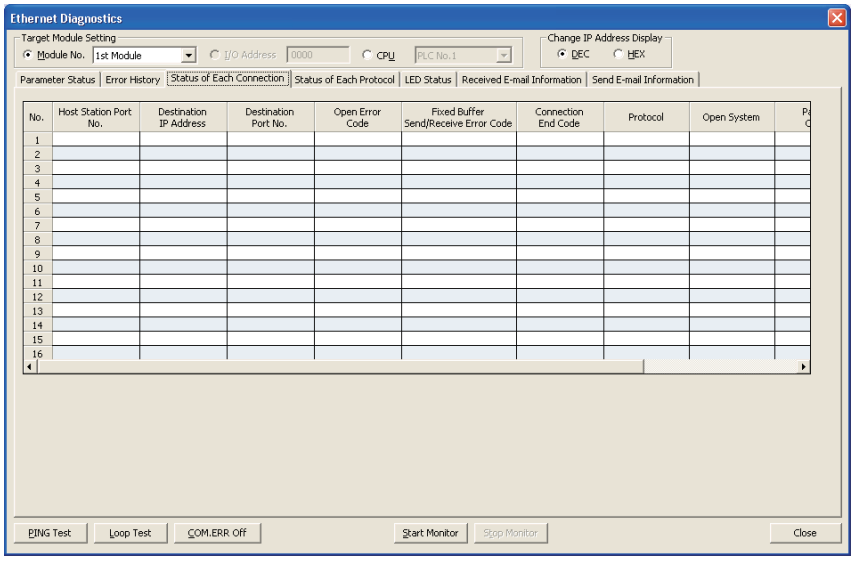
Clears the error history.

■ Monitoring the status of each connection

Monitor the status of each connection.

Screen display

Select the <<Status of Each Connection>> tab on the Ethernet Diagnostics screen.

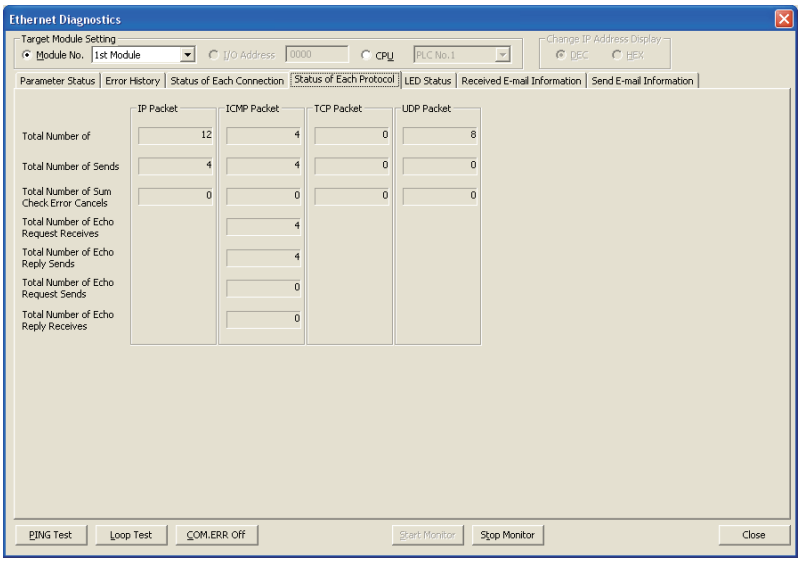


■ Monitoring the status of each protocol

Monitor the status of each protocol.

Screen display

Select the <<Status of Each Protocol>> tab on the Ethernet Diagnostics screen.

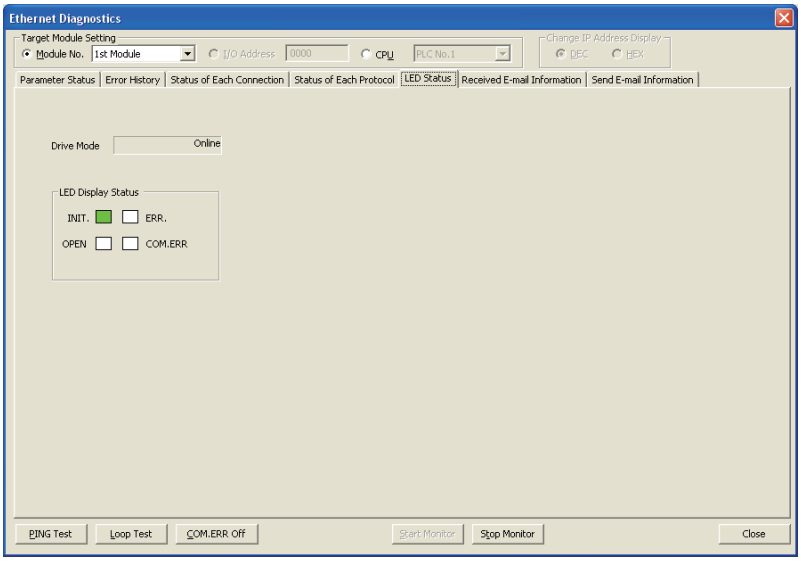


■ Monitoring the LED status

Monitor the status of LED on the front of the Ethernet module.

Screen display

Select the <<LED Status>> tab on the Ethernet Diagnostics screen.



Point

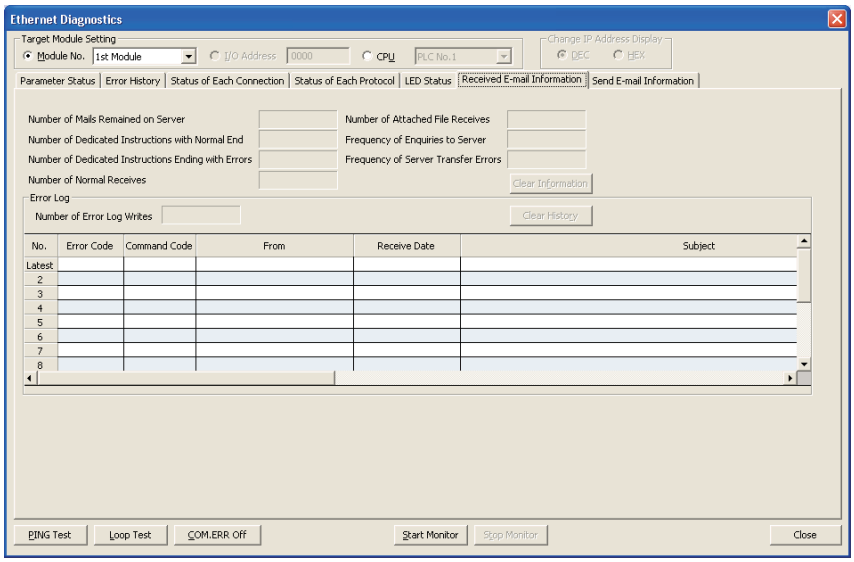
● **Considerations for monitoring**
If RAM test or ROM test is set with the switch setting of an Ethernet module, programmable controller communication error occurs.

■ Monitoring the received e-mail information

Monitor the received e-mail information.

Screen display

Select the <<Received E-mail Information>> tab on the Ethernet Diagnostics screen.



Screen button

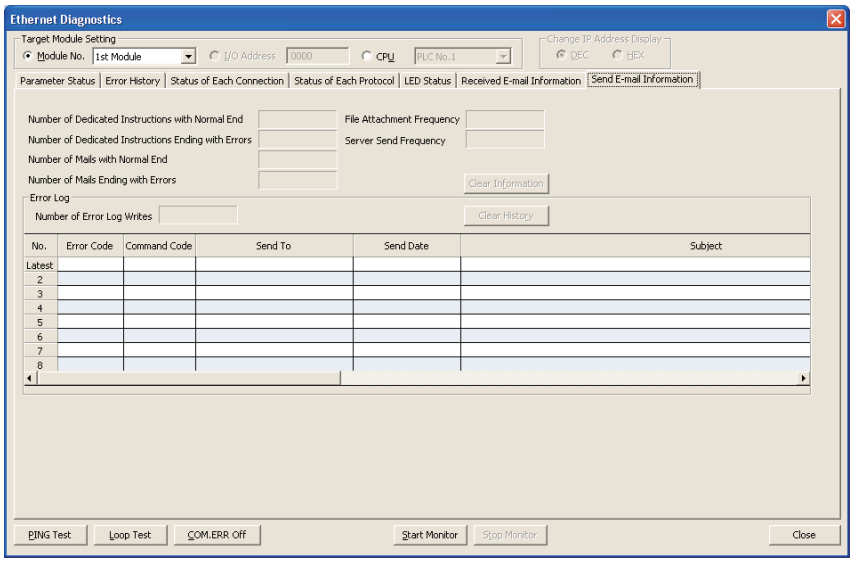
- Clear Information
  Clears the number of times set in each item by '0'.
- Clear History
  Clears "Number of Error Log Writes" by '0' and the contents of "Error Log".

■ Monitoring the send e-mail information

Monitor the send e-mail information.

Screen display

Select the <<Send E-mail Information>> tab on the Ethernet Diagnostics screen.



Screen button

● Clear Information

Clears the number of times set in each item by '0'.

● Clear History

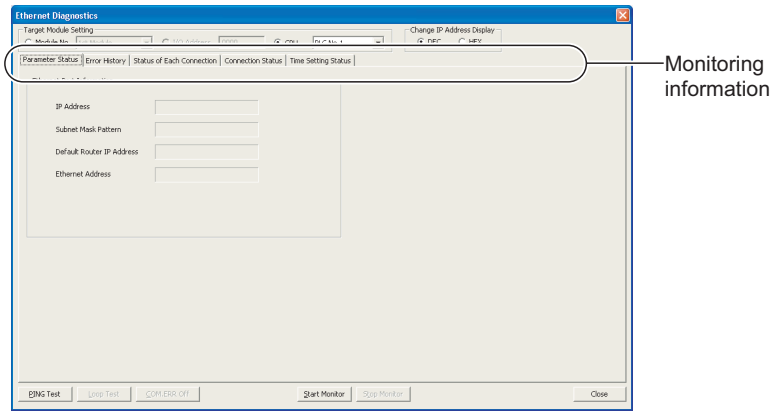
Clears "Number of Error Log Writes" by '0' and the contents of "Error Log".

18.6.2 Built-in Ethernet type CPU, FXCPU with Ethernet adapter connection

Check parameter status, error history, status of each connection, connection status, and time status setting of Built-in Ethernet type CPU or FXCPU with Ethernet adapter.
For details of displayed items, refer to the following manuals.
☞ QCPU User's Manual (Hardware Design, Maintenance and Inspection)
☞ QnUCPU User's Manual (Communication via Built-in Ethernet Port)
☞ MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
☞ MELSEC-L CPU Module User's Manual (Built-in Ethernet Function)
☞ FX3U-ENET-ADP User's Manual

Screen display

Select [Diagnostics] ⇒ [Ethernet Diagnostics].
The following is a screen of LCPU.



Display contents

Item	Description
Target Module Setting*1	Select "CPU", and specify the CPU to be monitored. Setting range is CPU number 1 to 4.
Change IP Address Display	Switch decimal/hexadecimal notation of IP address display.
Monitoring information	The following built-in Ethernet port information can be monitored. • Parameter status (☞ ■ Monitoring the parameter status) • Error history (☞ ■ Monitoring the error history) • Status of each connection (☞ ■ Monitoring the status of each connection) • Access history*2 (☞ ■ Monitoring the status of each connection) • Connection status (☞ ■ Monitoring the connection status) • Time status setting (☞ ■ Monitoring the time setting status) • Simple PLC communication status*3 (☞ ■ Monitoring the simple PLC communication status) • Protocol status*2 (☞ ■ Monitoring the protocol status)

*1 : For QCPU (Q mode) only
*2 : For FXCPU only
*3 : For LCPU only

Screen button

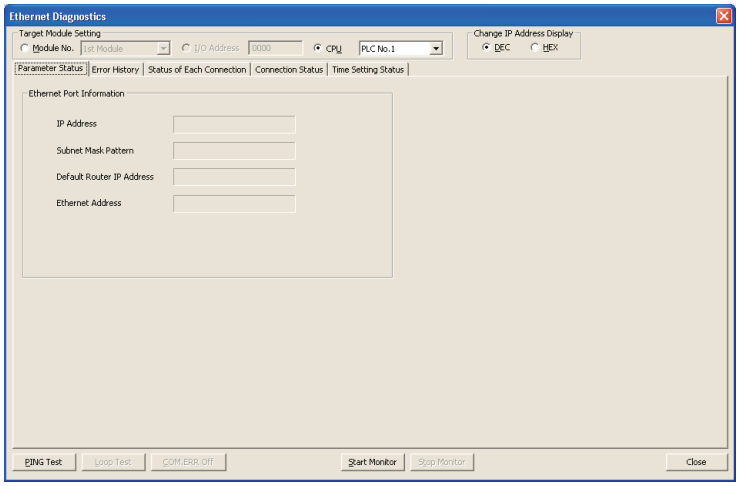
For the buttons on the screen, refer to Section 18.6.

■ Monitoring the parameter status

Monitor the parameter status of Built-in Ethernet type CPU or FXCPU with Ethernet adapter.

Screen display

Select the <<Parameter Status>> tab on the Ethernet Diagnostics screen.
The following is a screen of LCPU.

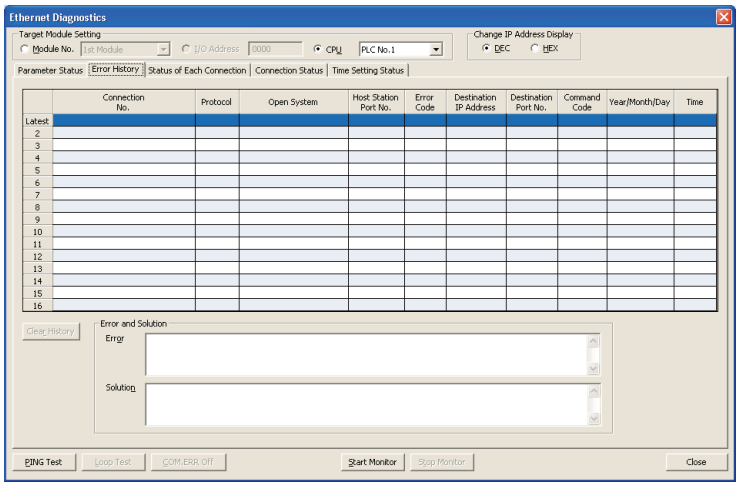


■ Monitoring the error history

Monitor the error history area.

Screen display

Select the <<Error History>> tab on the Ethernet Diagnostics screen.
The following is a screen of LCPU.



Screen button

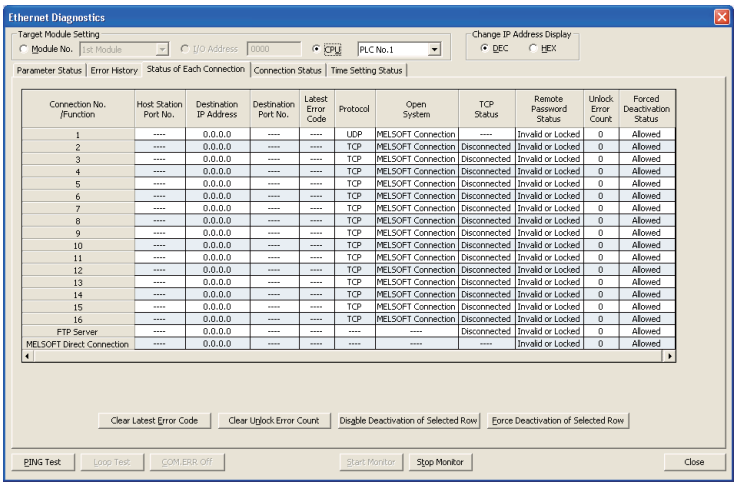
● Clear History
Clears the error history.

■ Monitoring the status of each connection

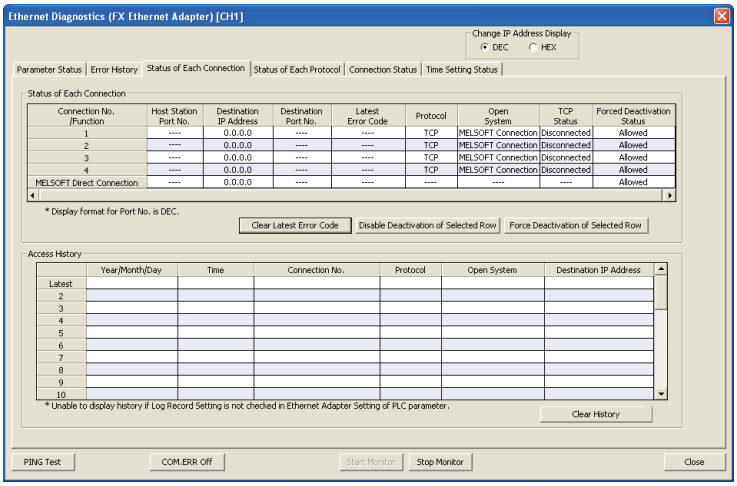
Monitor the status of each connection.
For FXCPU, the status of each connection can be monitored by the access history function.

Screen display

Select the <<Status of Each Connection>> tab on the Ethernet Diagnostics screen.
<QCPU (Q mode)/LCPU>



<FXCPU>



Screen button

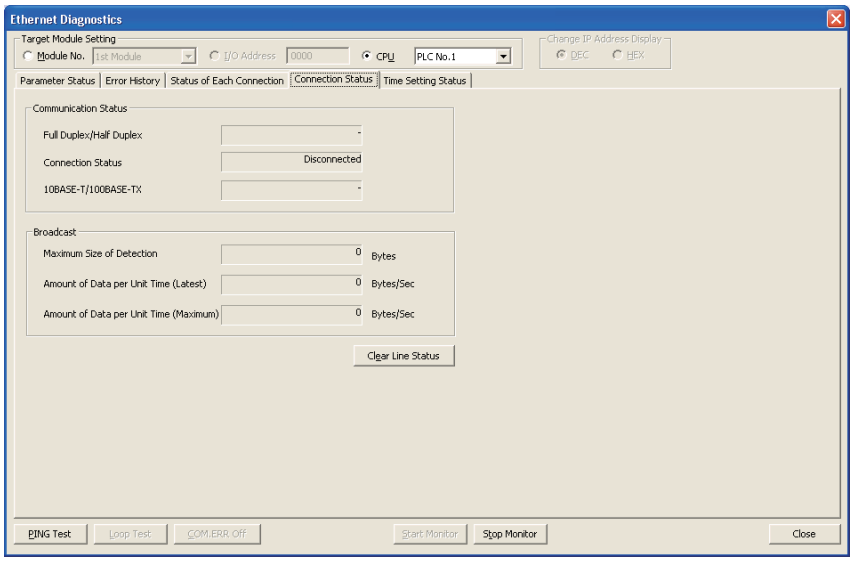
- Clear Latest Error Code
  Clears the error codes.
- Clear Unlock Error Count **(QCPU (Q mode)/LCPU only)**
  Clears "Unlock Error Count".
- Disable Deactivation of Selected Row
  Allows the connection of the selected row.
- Force Deactivation of Selected Row
  Cancels the connection of the selected row.
- Clear History **(FXCPU only)**
  Clears the access history.

■ Monitoring the connection status

Monitor the connection status.
For FXCPU, the broadcast information is not monitored.

Screen display

Select the <<Connection Status>> tab on the Ethernet Diagnostics screen.
The following is a screen of LCPU.



Screen button

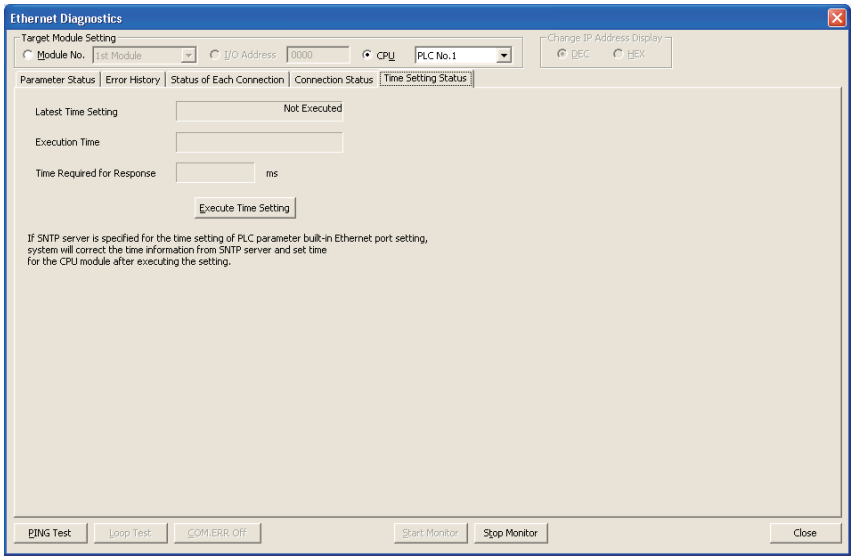
● Clear Line Status **(QCPU (Q mode)/LCPU only)**
Clears the number of receive buffer overflows and broadcast information.

■ Monitoring the time setting status

Monitor the time setting status.

Screen display

Select the <<Time Setting Status>> tab on the Ethernet Diagnostics screen.
The following is a screen of Built-in Ethernet port QCPU.



Screen button

● Execute Time Setting

Sets the time according to the time setting on the <<Built-in Ethernet Port Setting>> tab of PLC parameter written to the programmable controller CPU.

Point

● **Setting time**

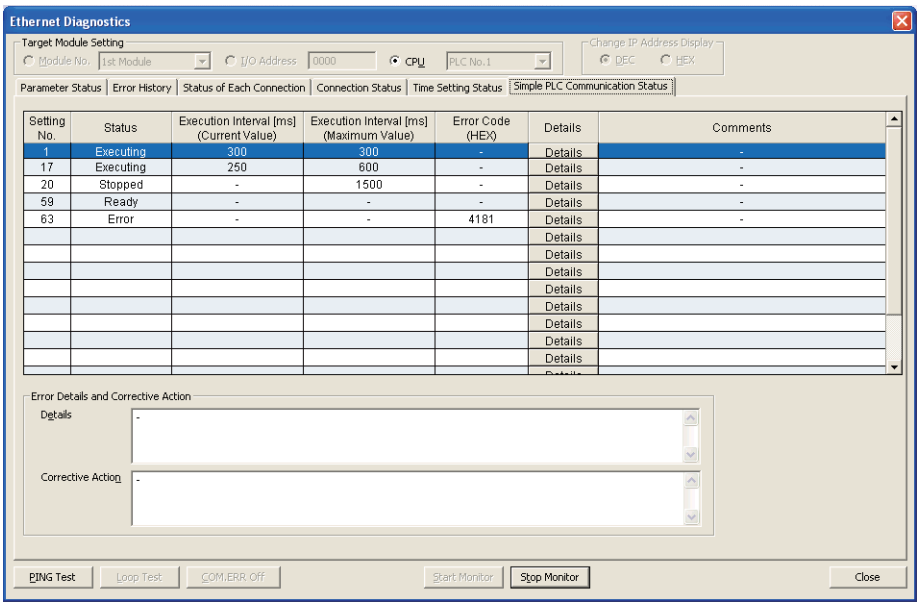
For Built-in Ethernet type CPU and FXCPU with Ethernet adapter, the time on a programmable controller CPU can be set automatically by collecting the time information from the time information server (SNTP server) connected to the LAN according to the time setting on the <<Built-in Ethernet Port Setting>> tab of PLC parameter.
For details of the time setting, refer to the following manuals.
☞ QnUCPU User's Manual (Communication via Built-in Ethernet Port)
☞ MELSEC-L CPU Module User's Manual (Built-in Ethernet Function)
☞ FX3U-ENET-ADP User's Manual

■ Monitoring the simple PLC communication status

Monitor the simple PLC communication status.
This function can be executed only when using LCPU with a serial number whose first five digits are '13042' or higher.

Screen display

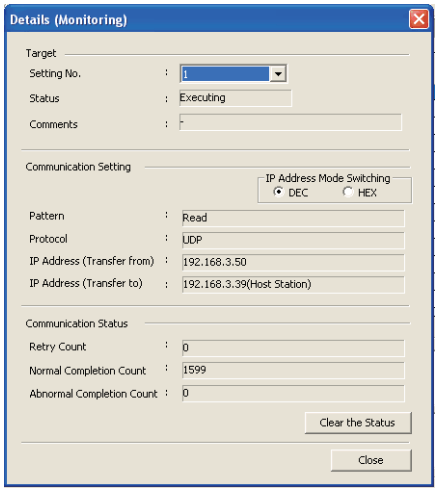
Select the <<Simple PLC Communication Status>> tab on the Ethernet Diagnostics screen.



Screen button

● Details

Displays the Details screen which shows detailed information of each setting.



Point

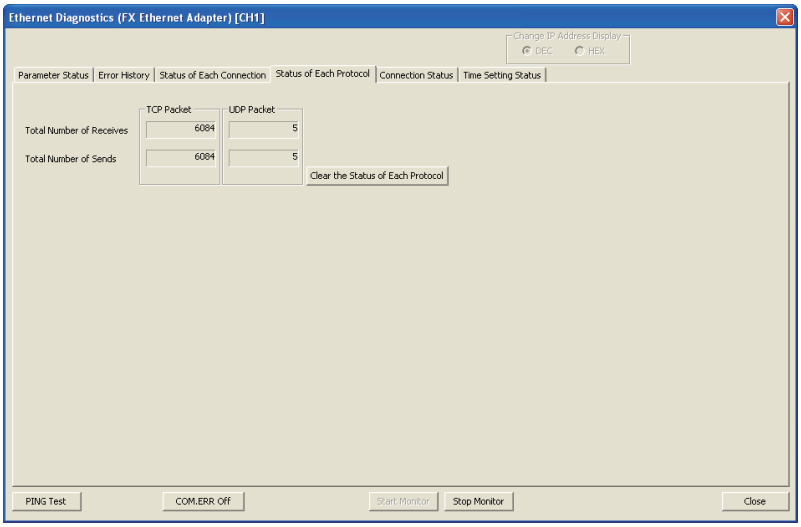
● **Displaying simple PLC communication status**
Since the simple PLC communication status indicates the current status, the error history may not be confirmed. Confirm errors on the <<Error History>> tab.
(☞ ■ Monitoring the error history)

■ Monitoring the protocol status

Monitor the total number of communication packets.
This function can be executed only when using FXCPU with Ethernet adapter.

Screen display

Select the <<Protocol Status>> tab on the Ethernet Diagnostics screen.



Screen button

● Clear the Status of Each Protocol
Clears the protocol status.

18.6.3 PING test

A PING test is a test to check the existence of Ethernet modules to which the initial processing has been completed, or devices with specified IP address on the same Ethernet line.

The following checks are performed when the PING test is executed on Ethernet module, Built-in Ethernet type CPU, or FXCPU with Ethernet adapter.

- Whether the line is connected correctly between the host station and the target device.
- Whether the parameters are set correctly for the Ethernet module on host station.
- Whether the initial processing has been completed correctly for the Ethernet module on host station. (For Ethernet module only)

Point

● **Required setting items**
Make sure to check the following before executing the PING test when using an Ethernet module.
- "Station No. ⇔ IP Information" of Ethernet parameter is set.
- RUN LED and INT LED on the Ethernet module are ON.

● **System configuration where the PING test can be executed**
- A PING test is valid for the system configured with Ethernet, MELSECNET/10(H), and CC-Link IE Controller Network. It cannot be executed via CC-Link, CC-Link IE Field Network, and serial communication.
- A PING test can only be executed to the Ethernet module on the same segment as the target station. However, it cannot be executed to a host station.

● **Administrator authority required to execute the PING test**
To execute the PING test, the user must log on Windows® as the user having the administrator authority.

■ PING test overview

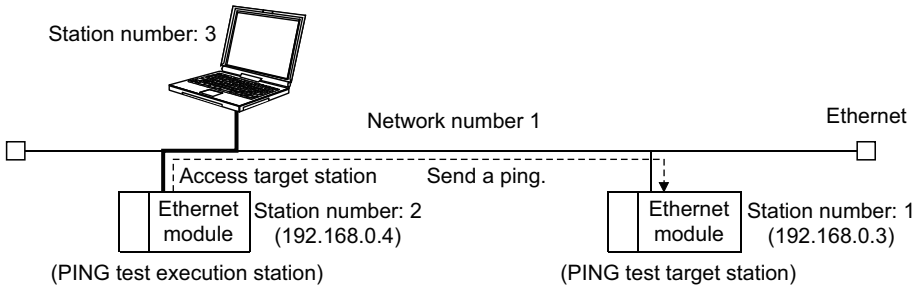
The following are the two methods to execute a PING test.

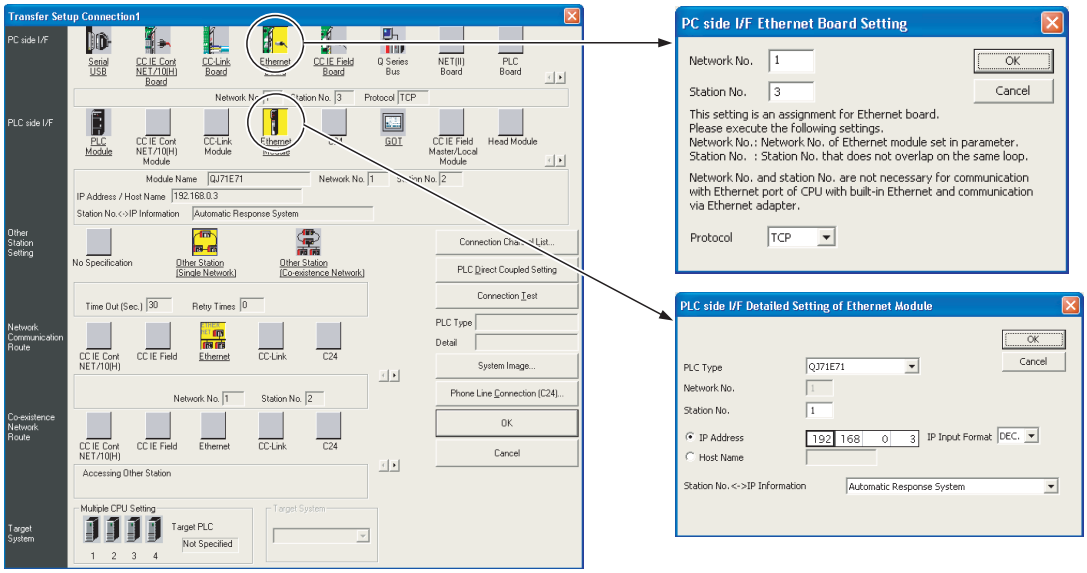
- Sending a ping from an Ethernet module*1
  Execute a PING test on a device (PING test target station) exists on the same network as the Ethernet module (PING test execution station) which sends a ping.
  When "Ethernet Module" is selected for "PLC side I/F" on the Transfer Setup screen, specify a PING test target station only.
  When "PLC Module" is selected for "PLC side I/F" on the Transfer Setup screen, specify a PING test execution station and a PING test target station.
  *1 : Not supported by FXCPU with Ethernet adapter.
- Sending a ping from an Ethernet board on a personal computer
  The same operation as a PING test executed by the command prompt of Windows®. A PING test is executed on a device on the network via Ethernet from a personal computer.

● **Sending a ping from an Ethernet module (when "Ethernet Module" is selected for "PLC side I/F")**

A PING test is executed on a device on the same network from the access station when accessing the programmable controller CPU via Ethernet module.
This function is not supported by FXCPU with Ethernet adapter.
PING test execution station: Access target station (A station does not need to be specified.)
PING test target station: Specify a device on the same network as the access target station.

Select "Module No." for "Target Module Setting" on the Ethernet Diagnostics screen.
For the settings on the Transfer Setup screen, refer to the following example.
For the system configuration described in the following figure, configure the settings of the connection destination as shown below to execute a PING test for station number 1 from the station number 2.



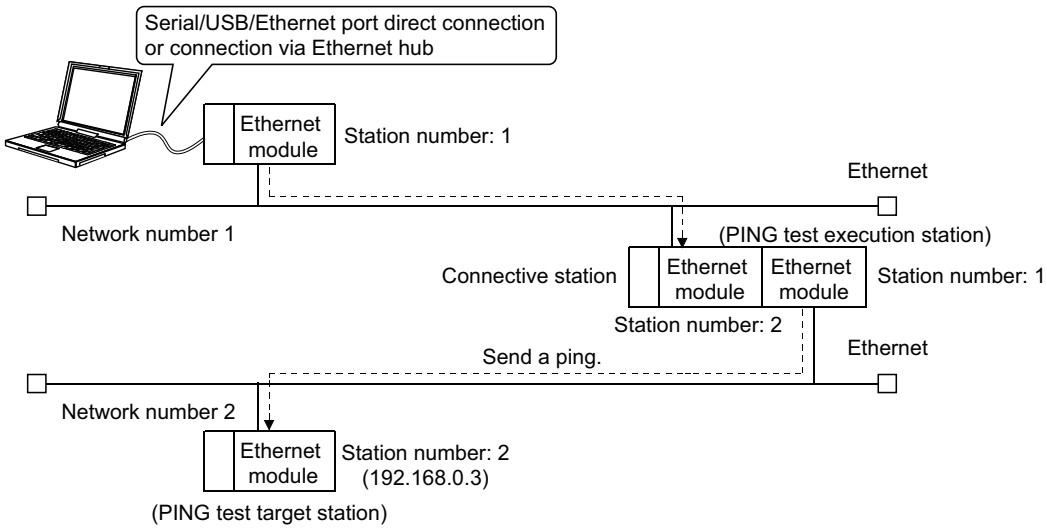


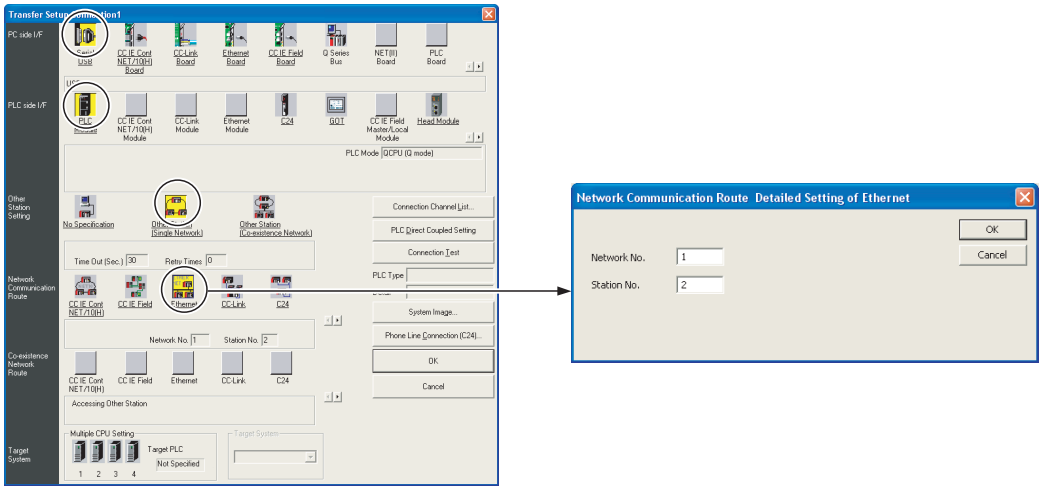
● **Sending a ping from an Ethernet module (when "PLC Module" is selected for "PLC side I/F")**

A PING test is executed on a device on the same network from an Ethernet module which exists on the same base unit as the connected station when accessing the programmable controller CPU with a serial/USB/Ethernet port direct connection or a connection via Ethernet hub.
This function is not supported by the programmable controller CPU accessed via a built-in Ethernet port of Built-in Ethernet type CPU or FXCPU with Ethernet adapter.
PING test execution station: Specify an Ethernet module which exists on the same base unit as the connected station.
PING test target station: Specify a device on the same network as the PING test execution station.

Select "Module No." for "Target Module Setting" on the Ethernet Diagnostics screen.
For the settings on the Transfer Setup screen, refer to the following example.
For the system configuration described in the following figure, configure the settings of the connection destination as shown below to execute a PING test for the station number 2 on the network number 2.

When the Ethernet module (station number 1 on network number 1 in the system shown below) is Q series-compatible E71 module, a PING test can be executed with the function version B or later only.





● **Sending a ping from an Ethernet board on a personal computer**

Select "CPU" for "Target Module Setting" on the Ethernet Diagnostics screen.
Settings on the Transfer Setup screen is not necessary. The already-set connection destination settings do not affect the execution of PING test.
For FXCPU with Ethernet adapter, the specification of target module is not necessary.

Screen display

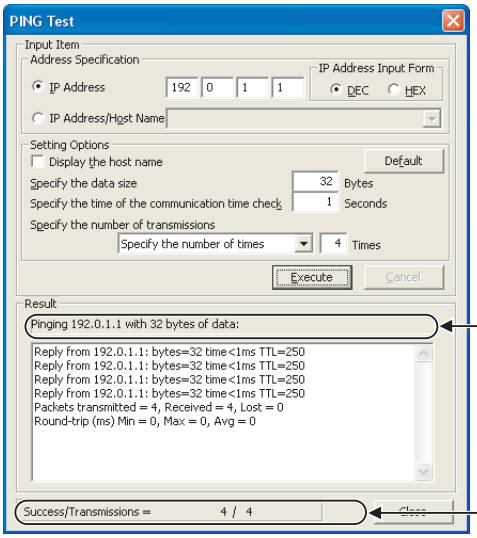
Perform any of the following operations.

Click the [PING Test] button on the Ethernet Diagnostics screen.

Click the [Loop Test] button the Ethernet Diagnostics screen and click the [PING Test] button on the Loop Test screen.

● **Sending a ping from an Ethernet module (when "Module No." is selected for "Target Module Setting")**

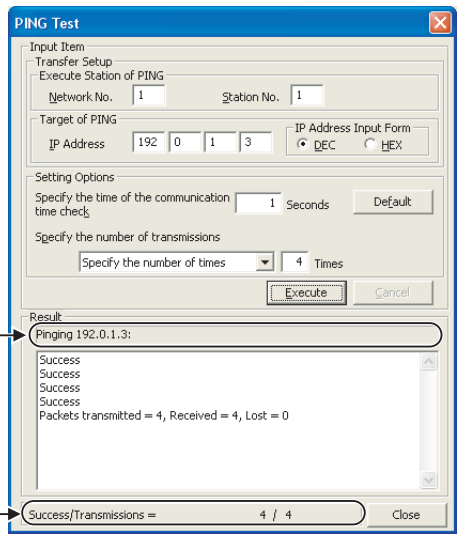
<<"Ethernet Module" is selected for "PLC side I/F">>



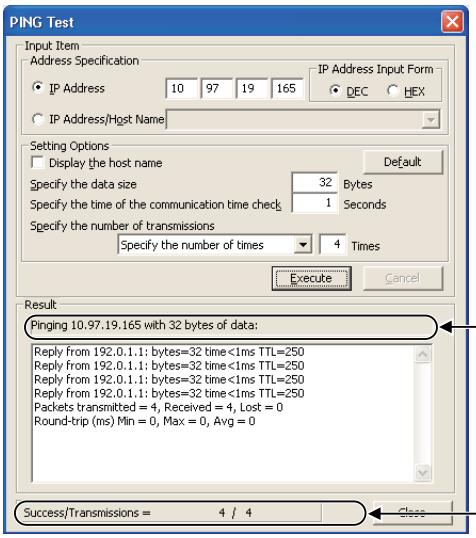
PING test information

Sub status bar

<<"PLC Module" is selected for "PLC side I/F">>



● **Sending a ping from an Ethernet board on a personal computer (when "CPU" is selected for "Target Module Setting")**



PING test information

Sub status bar

Operating procedure

1. Set the items on the screen.

Item			Description
Input Item			–
	Address Specification		Set the IP address of the target Ethernet module for PING test.
	Transfer Setup		Specify the connection destination of the PING test.
		Execution Station of PING	Set the network number and station number of the Ethernet module which executes the PING test.
		Target of PING	Set the IP address of the Ethernet module which is a target of the PING test.
	Setting Options		Set whether to display a host name in the result. Also set data size (For Q series-compatible E71 and FXCPU with Ethernet adapter: 1 to 8,192 bytes, for Built-in Ethernet type CPU: 1 to 1,460 bytes), communication time check (1 to 30 seconds), number of transmissions (1 to 50 times, or until interrupted).

2. Click the Execute button.

The PING test is executed according to the settings.

Display contents

Item	Description
PING test information	Display the IP address and data size to which the PING test is executed.
When "Module No." is selected for "Target Module Setting" ("Ethernet Module" is selected for "PLC side I/F")*1 When "CPU" is selected for "Target Module Setting*1	● **Transmitting data** • When successful IP address (example: Reply from 10.97.29.75): Data size (example: bytes=32) Communication speed (example: time<1ms TTL=128) • When unsuccessful Request timed out. ● **Completion of data transmission** Packets transmitted Received Lost Minimum packet round-trip time (ms) Maximum packet round-trip time (ms) Average packet round-trip time (ms) "Packets transmitted" and "Received" are updated each time a packet is sent.
When "Module No." is selected for "Target Module Setting" ("PLC Module" is selected for "PLC side I/F")*1	● **Transmitting data** • When successful Success • When unsuccessful Time Out ● **Completion of data transmission** Packets transmitted Received Lost "Packets transmitted" and "Received" are updated each time a packet is sent.
Sub status bar	Display the number of send successes and total number of packet transmissions.

*1 : Not supported by FXCPU.

Screen button

● Default

Resets the setting items of option setting to their defaults.

18.6.4 Loopback test

A loopback test is a test to check whether the initial processing of each module has been completed by sending a loopback test message to the Q series-compatible E71 modules (function version B or later) of the specified network number or station number.

The following checks are performed when the loopback test is executed.

- Whether the line is connected correctly between the host station and the target device.
- Whether the parameters are set correctly for the Ethernet module on host station.
- Whether the initial processing has been completed correctly for the Ethernet module on host station.

Point

● **Required setting items**
Make sure to check the following before executing the loopback test when using an Ethernet module.
- "Station No. ⇔ IP Information" of Ethernet parameter is set.
- RUN LED and INT LED on the Ethernet module are ON.

● **System configuration where the loopback test can be executed**
- A loopback test is available only with Q series-compatible E71 modules (function version B or later). Ethernet modules (function version A) are treated as "No Response" even if connected.
  A loopback test is valid for the system configured only with Ethernet.
- A loopback test can only be executed to the Ethernet module on the same segment as the target station.

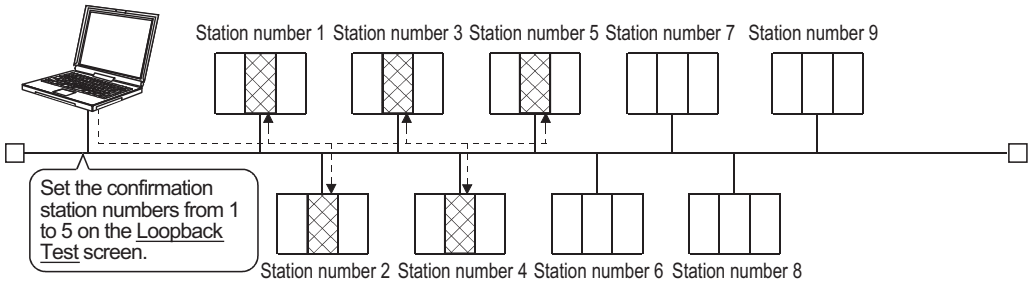
● **Considerations for executing the loopback test**
In a multiple network system, to execute the loopback test by specifying a station number in another network number, setting the routing parameters is necessary.

■ Loopback test overview

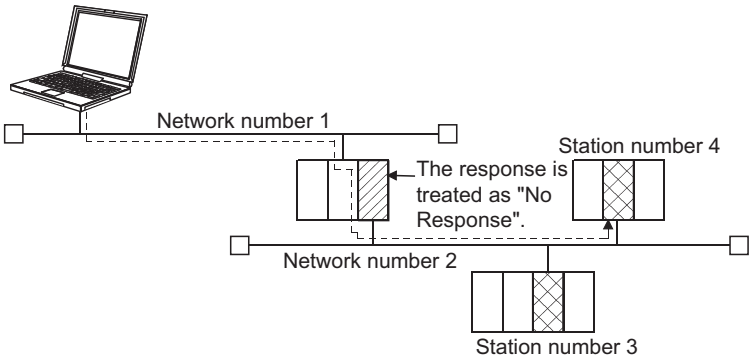
For a loopback test, a target station differs according to the connection destination setting described below.

- When "Ethernet Module" is selected for "PLC side I/F" on the Transfer Setup screen.
- When "PLC Module" is selected for "PLC side I/F" on the Transfer Setup screen.

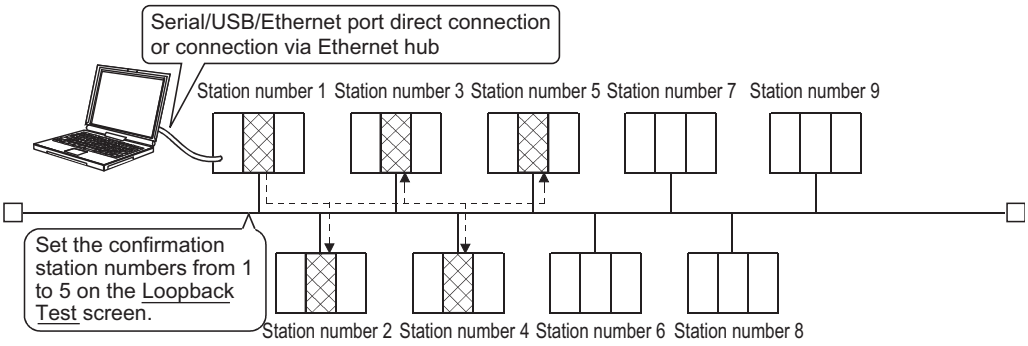
● When "Ethernet Module" is selected for "PLC side I/F"



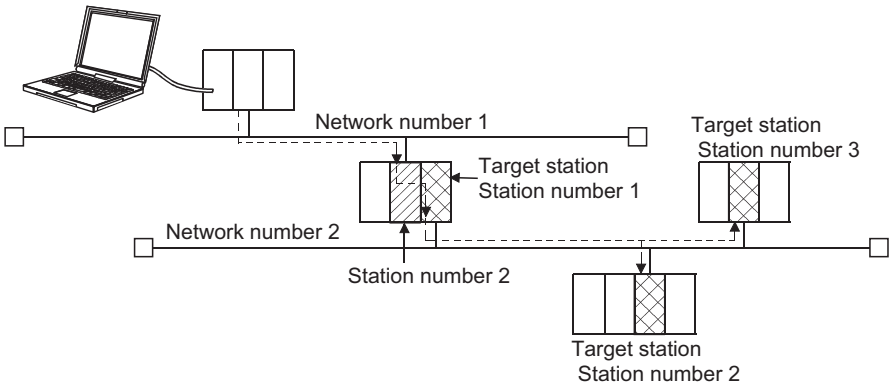
A loopback test is executed to the network number specified on the Loopback Test screen when accessing the programmable controller CPU via Ethernet module.
In the system as shown below, when the loopback test is executed for station numbers 2 to 4 in network number 2, the response from the station number 2 (loopback test execution station) is treated as "No Response".

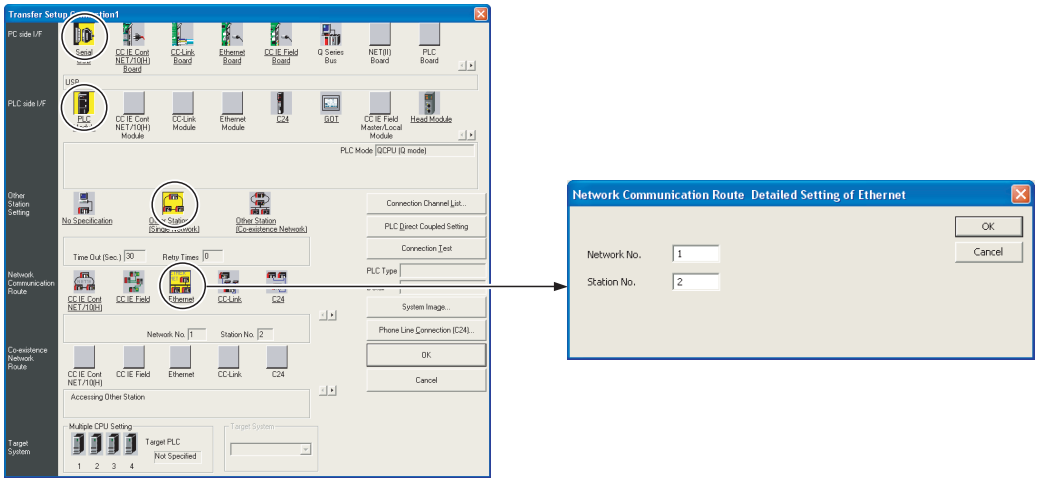


● **When "PLC Module" is selected for "PLC side I/F"**



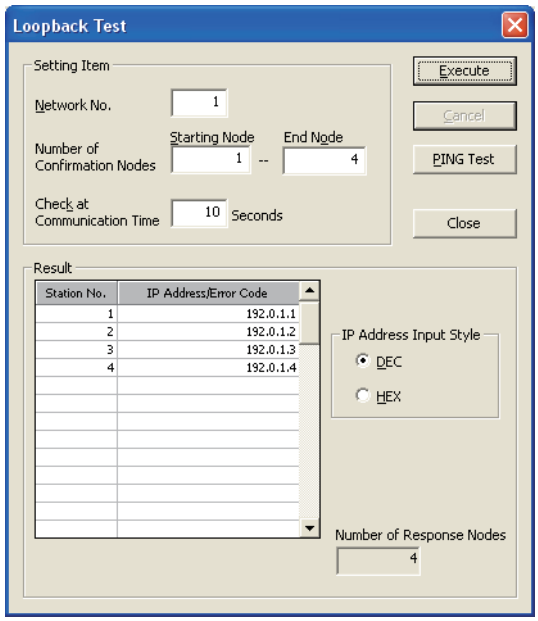
A loopback test is executed to the network number specified on the Loopback Test screen when accessing the programmable controller CPU with a serial/USB/Ethernet port direct connection or a connection via Ethernet hub.
For the system configuration described in the following figure, configure the settings of the connection destination as shown below to execute a loopback test for the Ethernet module on the network number 2.





Screen display

Click the [Loop Test] button on the Ethernet Diagnostics screen.



Display contents

Item	Description
Network No.	Set the network number for which the loopback test is executed. Setting range: 1 to 239
Number of Confirmation Nodes	Set the station number to be checked. Setting range: 1 to 64
Check at Communication Time	Setting range: 1 to 99 seconds. [Initial Setting] of Ethernet parameter includes TCP Resend Timer. The communication time check value of loopback test must be larger than the value set for TCP Resend Timer. If not, the tested Ethernet module may be judged inexistent even if it is connected correctly.
Result	The loopback test is executed in order from the start station number and whether or not the response is returned within the set communication time check value is displayed in the order of station numbers. If an IP address is duplicated, such IP address is displayed in red.
IP Address Input Style	Switch decimal/hexadecimal notation of IP address display.

18.7 Executing Sensor/Device Monitor

Q CPU L CPU Remote Head FX

Check the status of the equipment connected with AnyWireASLINK or CC-Link.
For details of monitoring equipment connected with AnyWireASLINK or CC-Link, refer to the following manual.
☞ **iQ Sensor Solution Reference Manual**

18.8 System Monitor

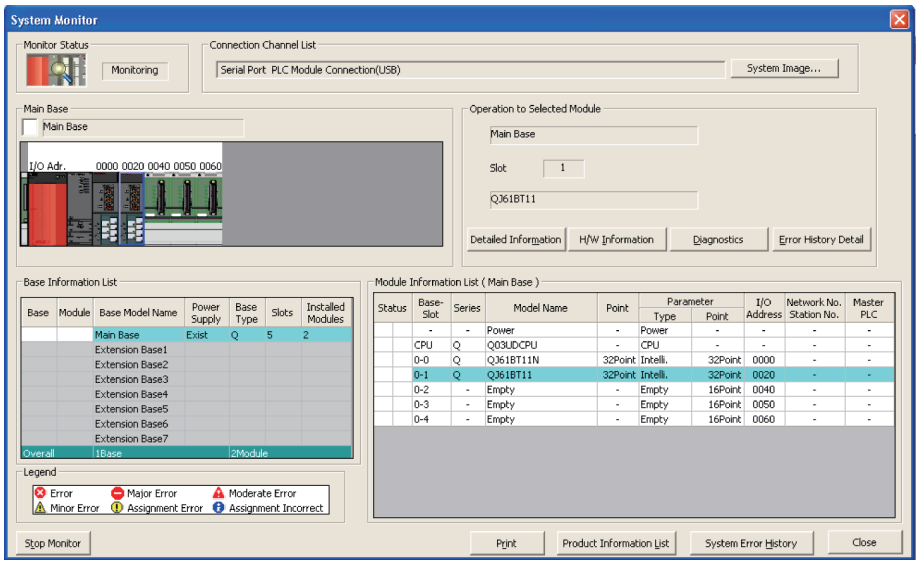
Q CPU L CPU Remote Head FX

This section explains how to display the system status of the programmable controller CPU.

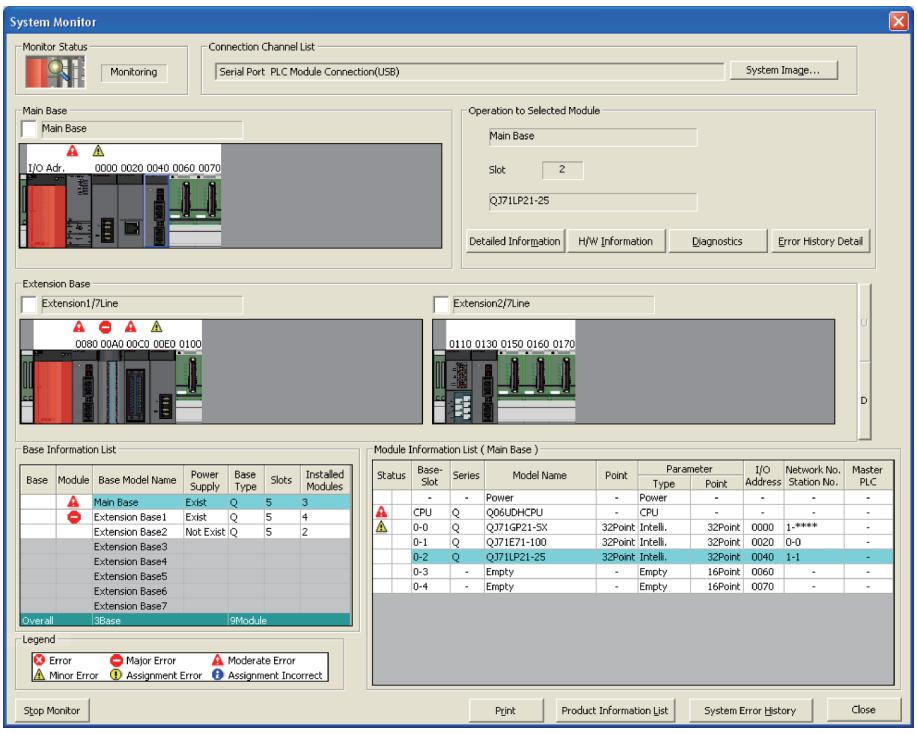
Screen display

Select [Diagnostics] ⇒ [System Monitor].
Some terms and module images are different but the screen configurations are same between the screens of QCPU (Q mode) and LCPU. The screens of QCPU (Q mode) are used in this section.

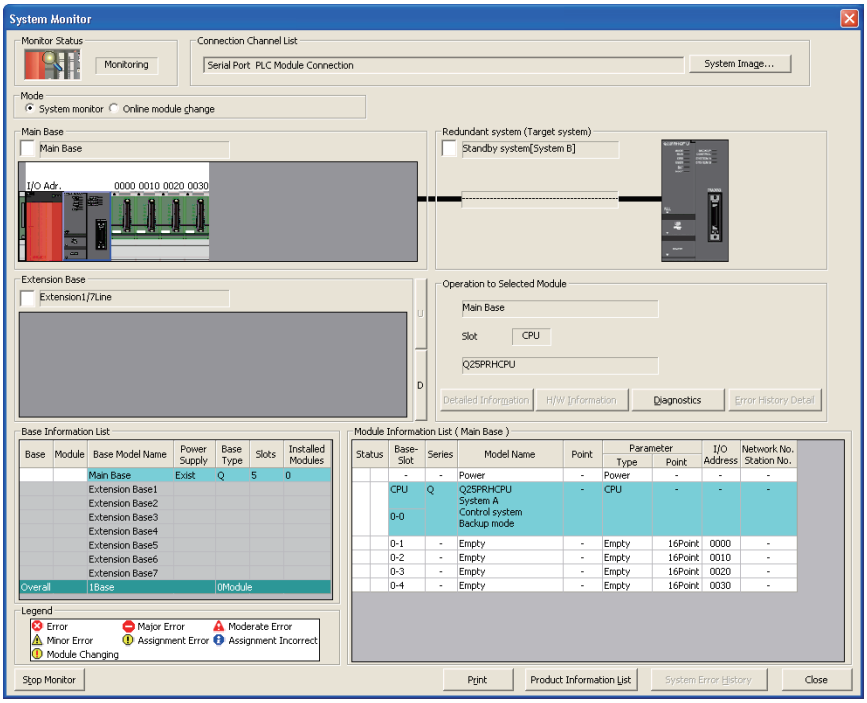
<QCPU (Q mode) (without extension base unit)>



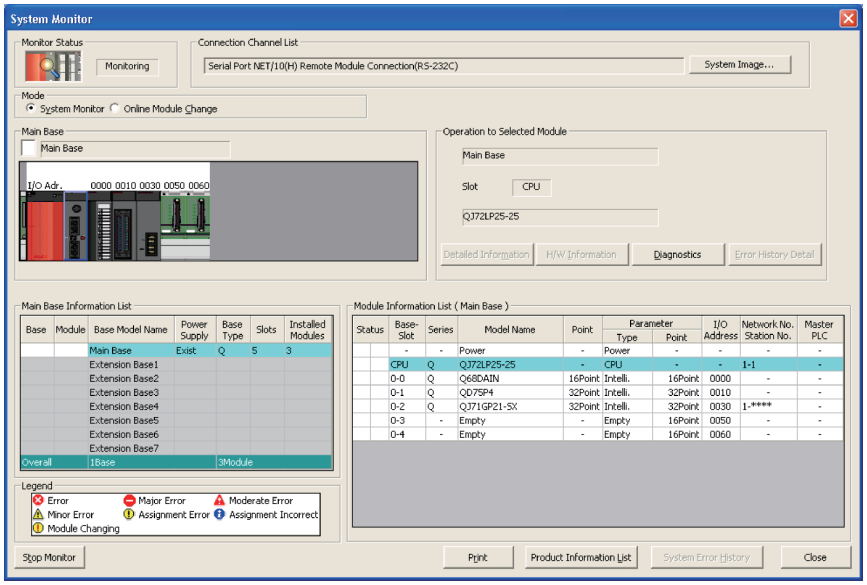
<QCPU (Q mode) (with extension base unit)>



<Redundant CPU>



<Remote I/O module>



Display contents

Item	Description
Monitor Status	Display the current monitor status.
Connection Channel List	Display the information of the route to the connection destination.
Mode*1	Select this to perform either system monitor or online module change function.
System Monitor	Execute the system monitor.
Online Module Change	Execute the online module change. (For details, refer to ☞ Section 18.9)
Main Base*2	Display the operating status of the module and I/O address.
Redundant system (Target system)*3	Display the information of the target system.
Operation to Selected Module	Display the name, slot number, and model name of the base unit/block to which the selected module is mounted.*4
Extension Base*2	This item is displayed when the extension base unit/block is connected. Switch the display by pressing the arrow button on the right. The base unit/block, operating status of the module, and I/O address are displayed.
Base Information List*2	Display the status of each base unit/block.
Base*2	Display the status of the base unit/block.
Module	Display the error status of each module mounted to the base unit/block.
Base Model Name*2	Display the base name set to the parameter on the programmable controller CPU. If the parameter is not set, "Main Base", "Extension Base 1" to "Extension Base 7" are displayed.
Power Supply	Display whether there is power supply.
Base Type*5,*6	Display the type of the base unit (Q or QA).
Slots*5	Display the slot number.
Installed Modules*5	Display the number of modules mounted to the base unit.
Number Of Total Modules Occupations*7	Display the total number of modules counted for all mounted modules.*8
Module Information List	Display the information of modules on the base unit/block where the selected module is mounted.
Status	Display the status of each module.
Base-Slot*2	Display the slot number of each module.
Series*4	Display the series of each module.
Model Name*4	Display the model name of each module.
Point*4	Display the number of occupied I/O points of each module.
Parameter: Type	Display the type/points of each module set to the parameter on the programmable controller CPU. If the parameter is not set, type/points of the mounted module is displayed.
Parameter: Point*4	
I/O Address*4	Display the I/O address of each module set to the parameter on the programmable controller CPU.
Network No. Station No.*4	Display the network number and the station number set to each module.
Master PLC*5	Display the programmable controller CPU number that controls each module in a multiple CPU configuration. "-" is displayed for the programmable controller CPU or the blank slot.
Number Of Module Occupied*7,*8	Display the number of modules counted for each module.
Legend	Display the legend of the icon displayed on the screen.

*1 : For Process CPU, Redundant CPU, and remote I/O module only.

*2 : Each item is displayed as shown below according to the programmable controller series.

QCPU (Q mode)	LCPU
Main Base	Main Block
Extension base	Extension block
Base Information List	Block Information List
Base	Block
Base Model Name	Block Name
Base-Slot	Block-Slot

*3 : For Redundant CPU only
*4 : "*****", "-", and "**" are displayed if the module is not mounted or the parameter is different with the mounting status.
*5 : For QCPU (Q mode) only
*6 : "QA" is displayed for QA extension base unit. "Q" is displayed for other base units.
*7 : For LCPU only
*8 : A module with width exceeding 28.5mm logically counts as two modules.
Be sure that "Number Of Total Modules Occupations" does not exceed the number of modules that can be mounted.
☞ MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

Point

● **Connection Channel List**
In "Connection Channel List", the route information of the connection destination setting is displayed at all times.

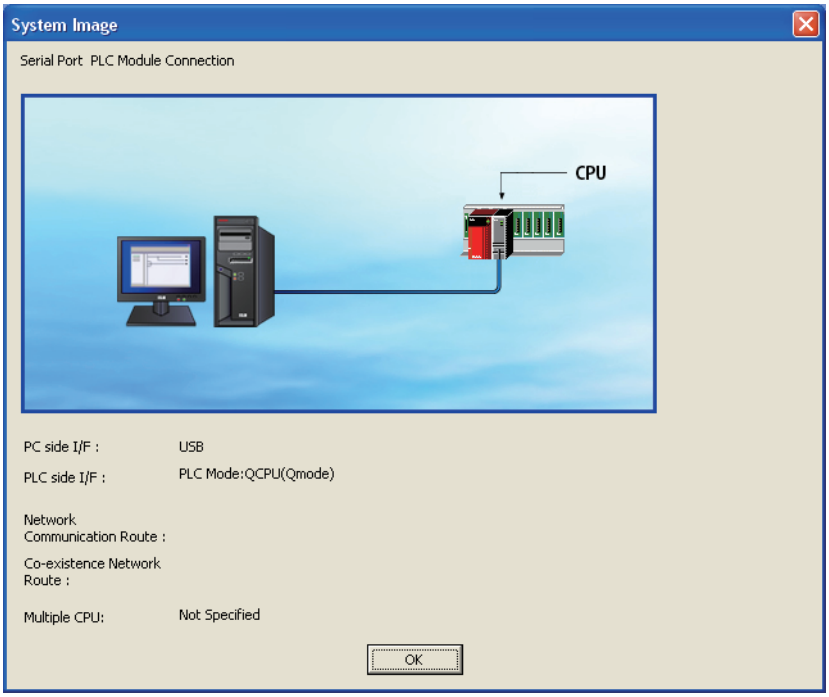
● **QA extension base unit**
The following are the considerations when using a QA extension base unit.
- High Performance model QCPU and Universal model QCPU with a serial number whose first digits are '12102' or higher support QA extension base unit, and for those programmable controller CPUs which do not support it, QA extension base unit is not displayed on the System Monitor screen.
- When it is mounted on A series module or QnA series module, the images are common on the system monitor of both A series and QnA series modules. Furthermore, a module type is displayed for Model Name of Module Information List.
- When A series or QnA series module is selected, the functions under "Operation to Selected Module" cannot be performed.

● **System monitor when a GOT is connected via bus**
When a GOT is connected via bus, a single row of extension base unit (16 points x 10 slots) is displayed on the System Monitor screen, and the GOT is displayed as an intelligent function module with 16 I/O points.
The displayed slot position is the position set on the GOT side.
For details of GOT bus connection, refer to the following manuals.
☞ GOT1000 Series Connection Manual
☞ GOT-A900 Series User's Manual (Connection System Manual)

Screen button

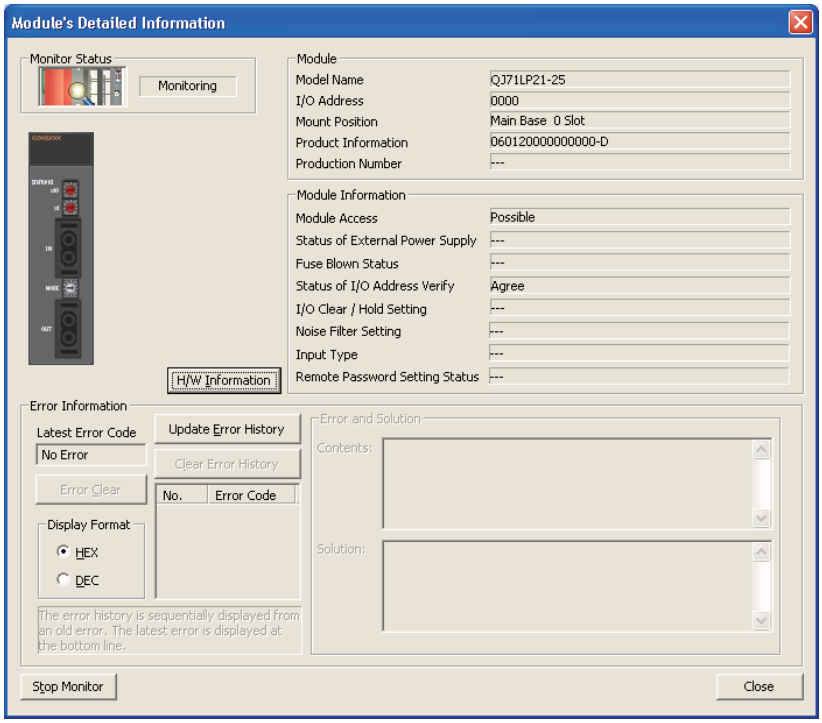
● System Image...

Displays the illustration of the connection route.
(☞ Section 11.1.1)



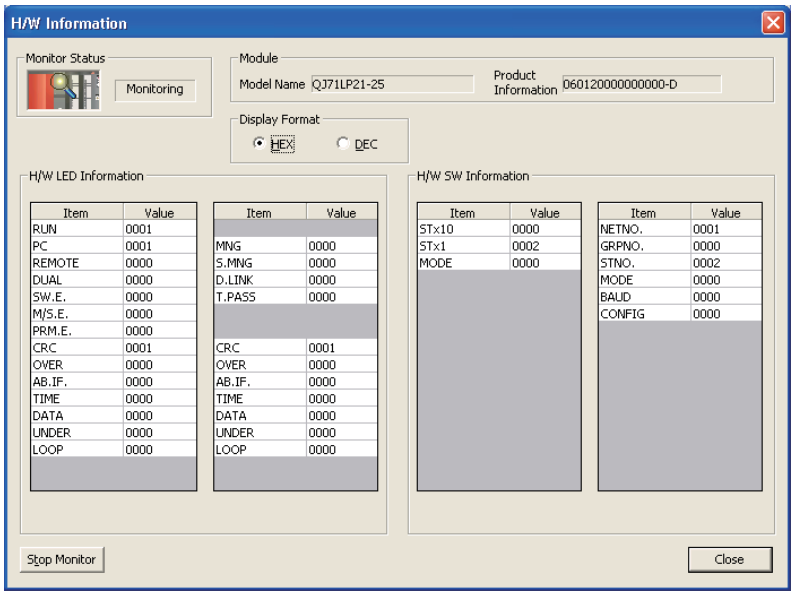
● Detailed Information

Displays the module information of the selected module.
The following is an example of the Module's Detailed Information screen when QJ71LP21-25 is selected.
(☞ Section 18.8.1)



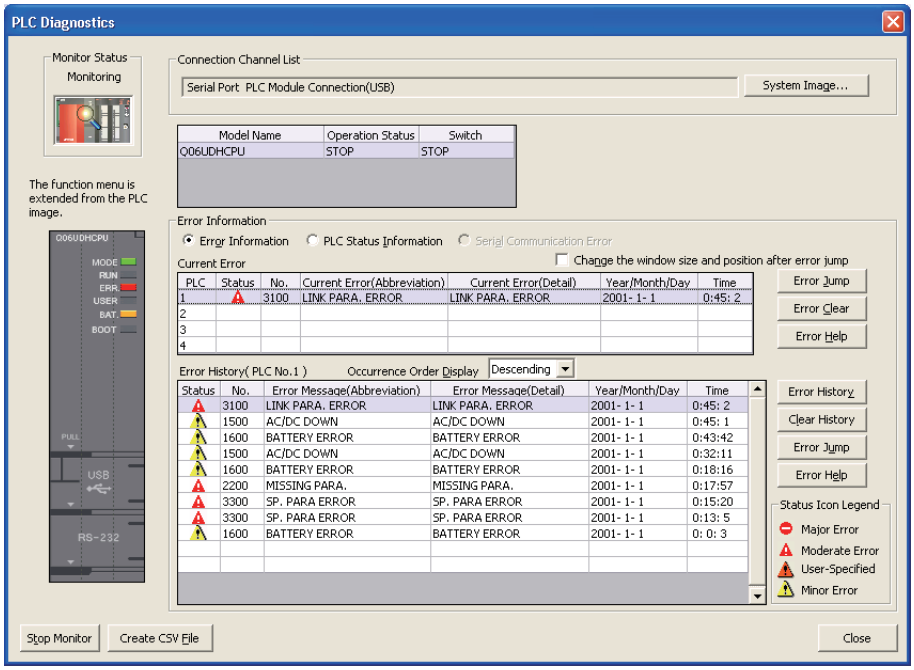
● H/W Information

Displays the hardware LED information and the hardware switch information.
The display contents of the H/W Information differ according to module version.
For details, refer to the User's Manual of each module.



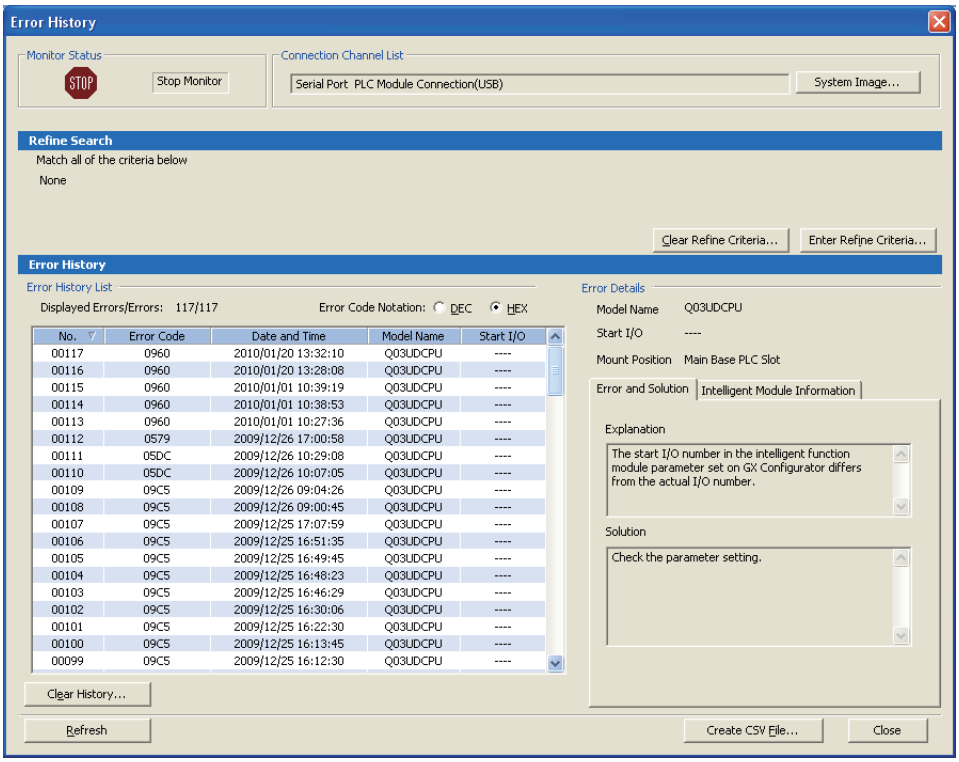
● Diagnostics

Displays the diagnostic information of the selected module.
The following is an example of the PLC Diagnostics screen when the programmable controller CPU module is selected.
(☞ Section 18.1)



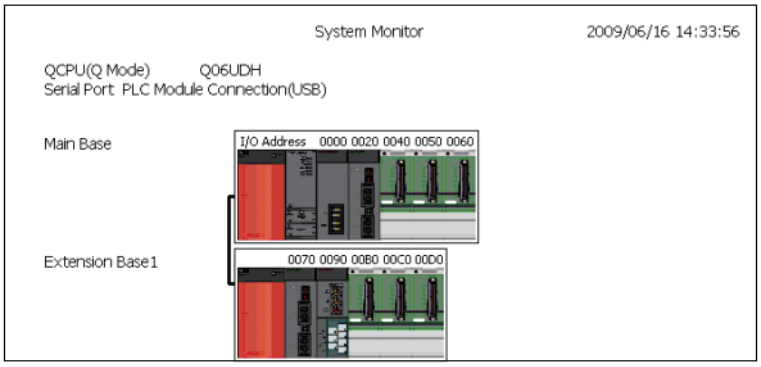
● Error History Detail

Displays error history logs of the module selected on the System Monitor screen.
This button is available when GX Works2 is connected to the programmable controller CPU that supports the module error history collection function.
(☞ Section 18.8.2)



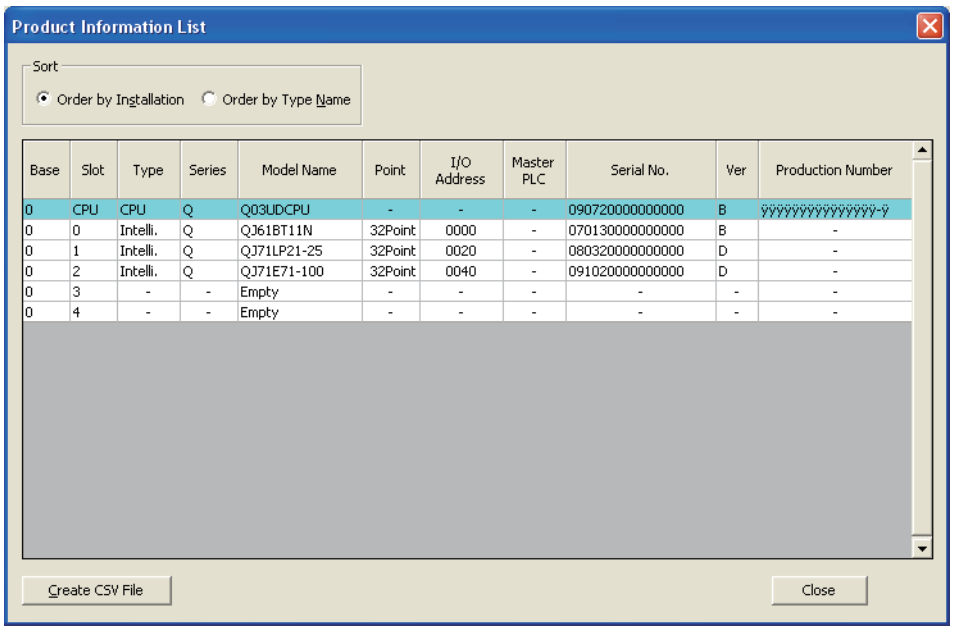
● Print

Prints the figure of the system configuration.



● Product information List...

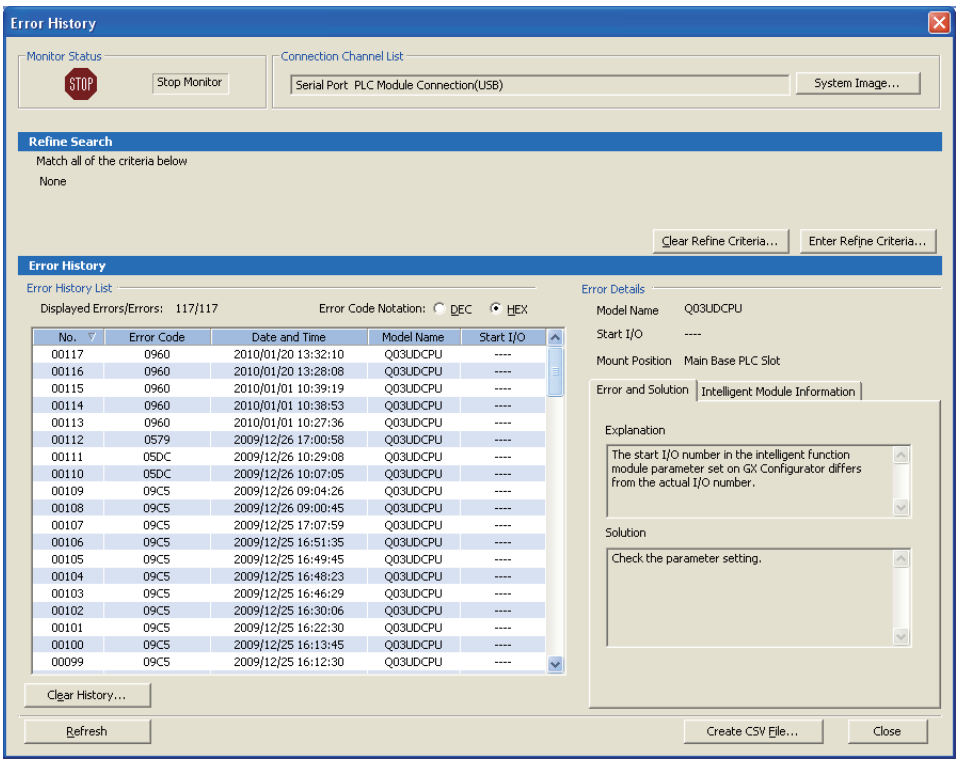
Displays the product information of each module mounted to the base unit/block.



- Clicking the Create CSV File button saves the product information data in CSV file format.

● System Error History

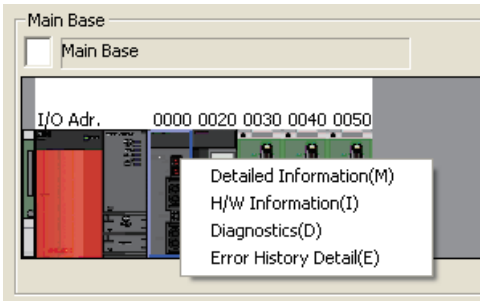
Displays all error history logs of the programmable controller and modules.
This button is available when GX Works2 is connected to the programmable controller CPU that supports the module error history collection function.
(☞ Section 18.8.2)



Point

● Operation to selected module

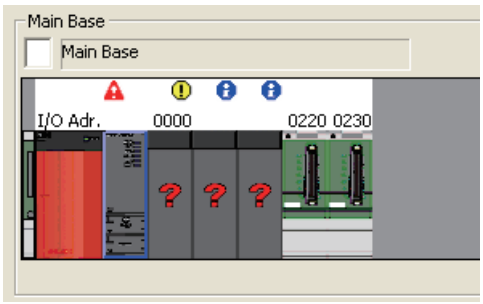
The functions of "Operation to Selected Module" can also be executed from the shortcut menu by selecting modules from "Main Base" or "Extension Base" ("Main Block" or "Extension Block" for LCPU).



● Displaying module status

The following screen is displayed if the mounting status of the module cannot be obtained due to the incorrect parameter settings.

Execute the system monitor function again after adjusting the parameter to the mounting status.



■ Error icons

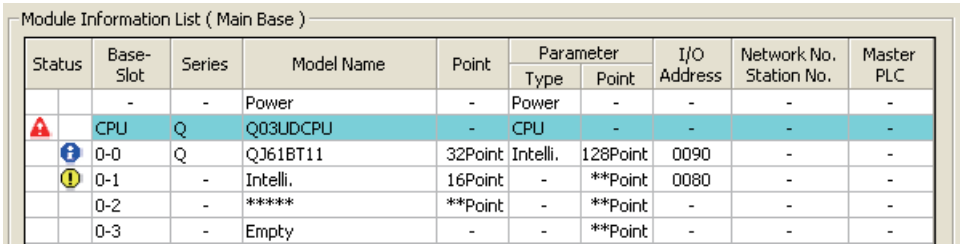
The following table shows the details of the error status icons of the programmable controller CPU and the modules.

Module	Icon	Error	Programmable controller CPU status
Programmable controller CPU	Serious error	MAIN CPU down	RESET and others
	Moderate error	Stop error	STOP due to error in parameter or instruction codes
	Minor error	Error allowing operation	Errors that allow RUN status such as battery low and annunciator ON
	Assignment error	Assignment error	Assignment errors such as multiple CPU setting is not set.
Module	Error	H/W error	H/W errors in the base or the power supply
	Serious error*1	Module system error	H/W errors in modules
	Moderate error	Module error	No appropriate environment for executing the functions of modules
	Minor error*1	Module warning	Impropriety in programs or user's operations
	Assignment error	Assignment error	The assigning status of the module is different with the mounting status of the module. (The status that the module type and points cannot be obtained.)
	Illegal assignment	Illegal assignment	The assigning status of the module is different with the mounting status of the module. (The status that the module type and points can be obtained.)

*1 : This item is not displayed for remote I/O module.

■ Display when mounted modules do not match with the I/O assignment setting on PLC parameter

The following shows "Module Information List" on the System monitor function according to the I/O assignment on PLC parameter. If module mounting status does not match with the I/O assignment, change "I/O Assignment" of the I/O assignment setting to match with the mounting status. "*****", "-", and "**" are displayed if the module is not mounted, or the parameter is different with the mounting status.


Module Information List (Main Base)

Status	Base-Slot	Series	Model Name	Point	Parameter Type	Parameter Point	I/O Address	Network No. Station No.	Master PLC
	-	-	Power	-	Power	-	-	-	-
	CPU	Q	Q03UDCPU	-	CPU	-	-	-	-
	0-0	Q	QJ61BT11	32Point	Intelli.	128Point	0090	-	-
	0-1	-	Intelli.	16Point	-	**Point	0080	-	-
	0-2	-	*****	**Point	-	**Point	-	-	-
	0-3	-	Empty	-	-	**Point	-	-	-

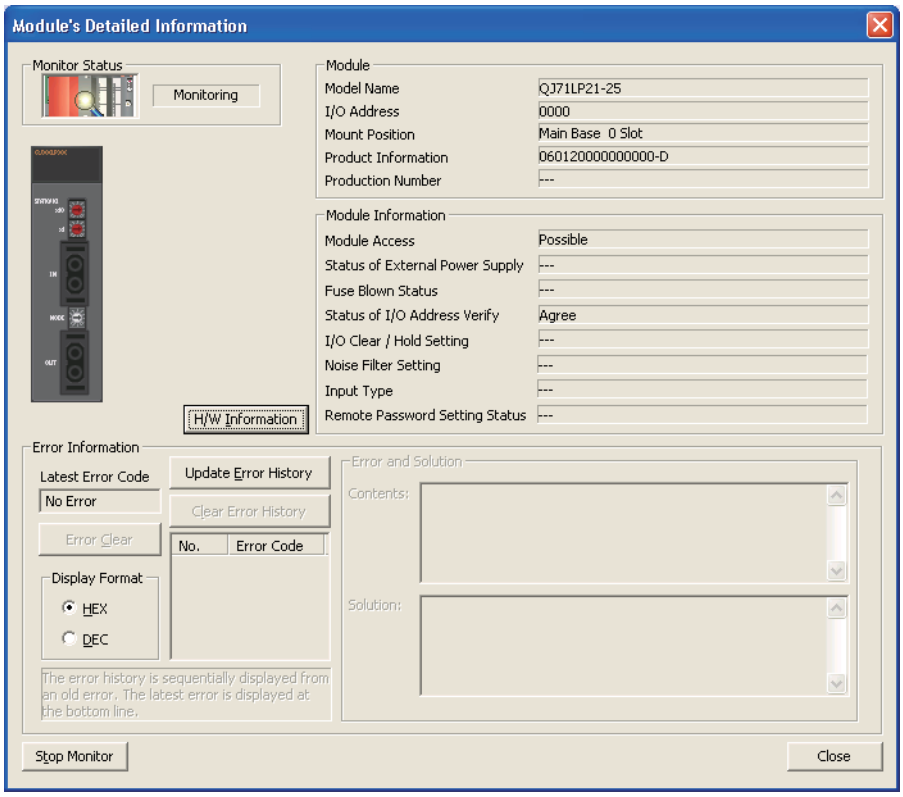
18.8.1 Checking module's detailed information

Display the module information of the selected module.

■ Modules of QCPU (Q mode)/LCPU

Screen display

Select a module on the System Monitor screen and click the Detailed Information button.
The following is an example of the Module's Detailed Information screen when QJ71LP21-25 is selected.



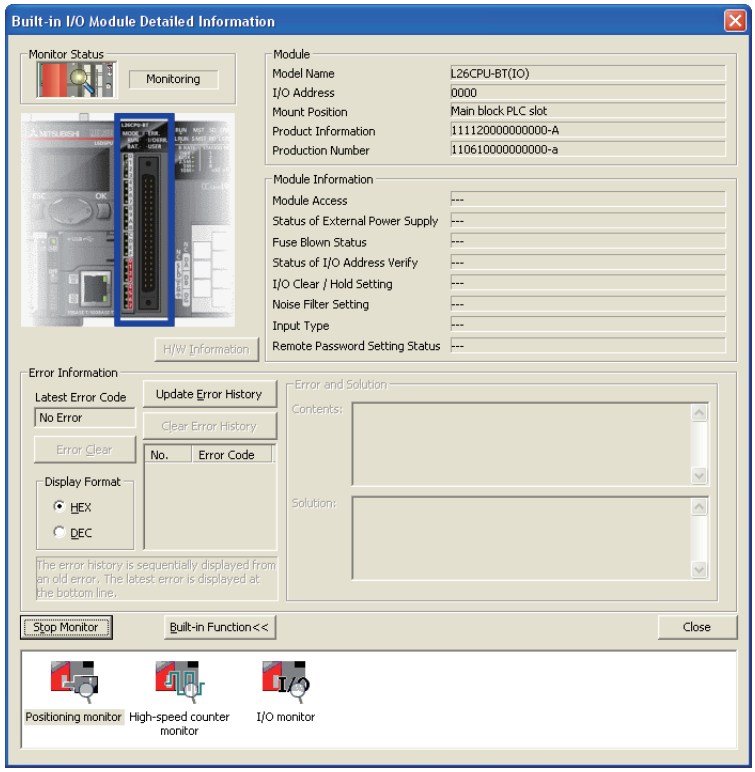
Screen button

- H/W Information
  Displays the hardware LED information and the hardware switch information. (☞ Section 18.8)
- Update Error History
  Updates the error history of the module.
- Clear Error History **(Supported by LCPU only)**
  Deletes the error history of the module.
- Error Clear
  Clears the error displayed in "Latest Error Code".

■ Built-in I/O module

Screen display

Select a built-in I/O module on the System Monitor screen and click the Detailed Information button.



Screen button

For the buttons on the screen, refer to ■ Modules of QCPU (Q mode)/LCPU.

● Built-in Function<< / Built-in Function>>

Displays/hides the built-in function buttons.

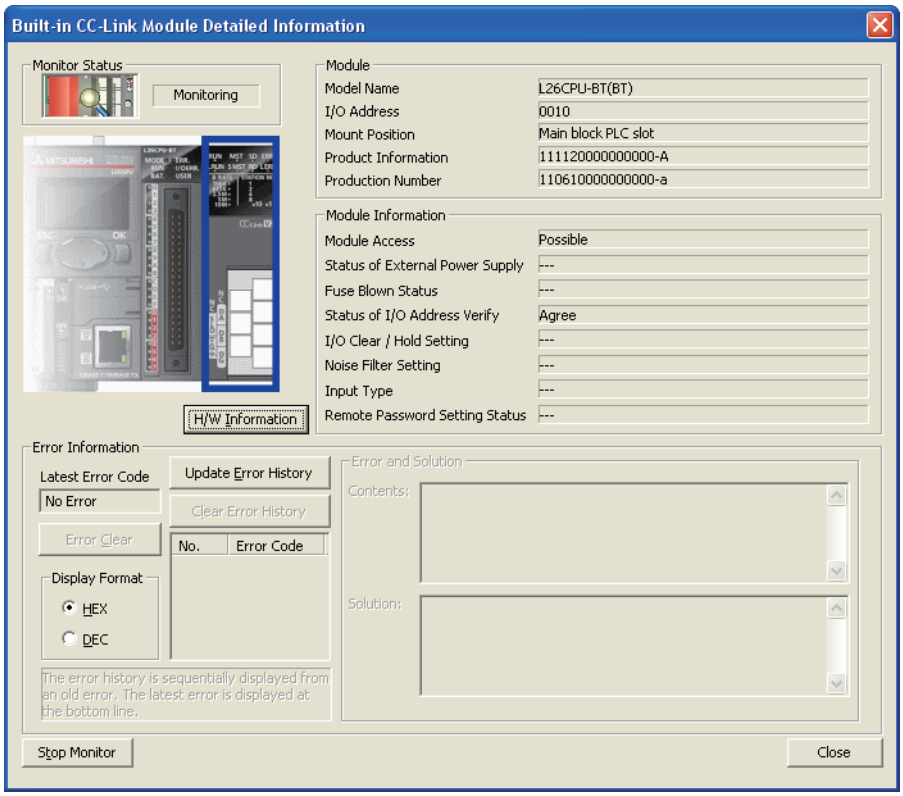
For details of the built-in function buttons, refer to the following sections.

- Positioning monitor ☞ Section 18.10.1
- High-speed counter monitor ☞ Section 18.10.2
- I/O monitor ☞ Section 18.10.3

■ Built-in CC-Link module

Screen display

Select a built-in CC-Link module on the System Monitor screen and click the Detailed Information button.



Screen button

For the buttons on the screen, refer to ■ Modules of QCPU (Q mode)/LCPU.

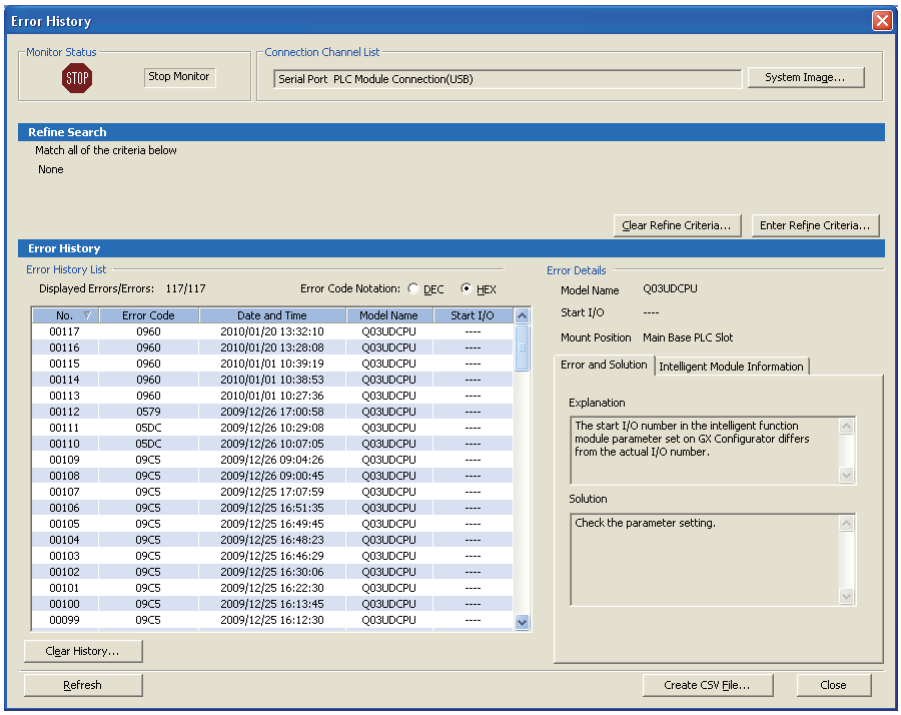
18.8.2 Checking details of error history

Check error history of the programmable controller CPU and modules.
Error history of a specified module can be displayed by using the refine search function.

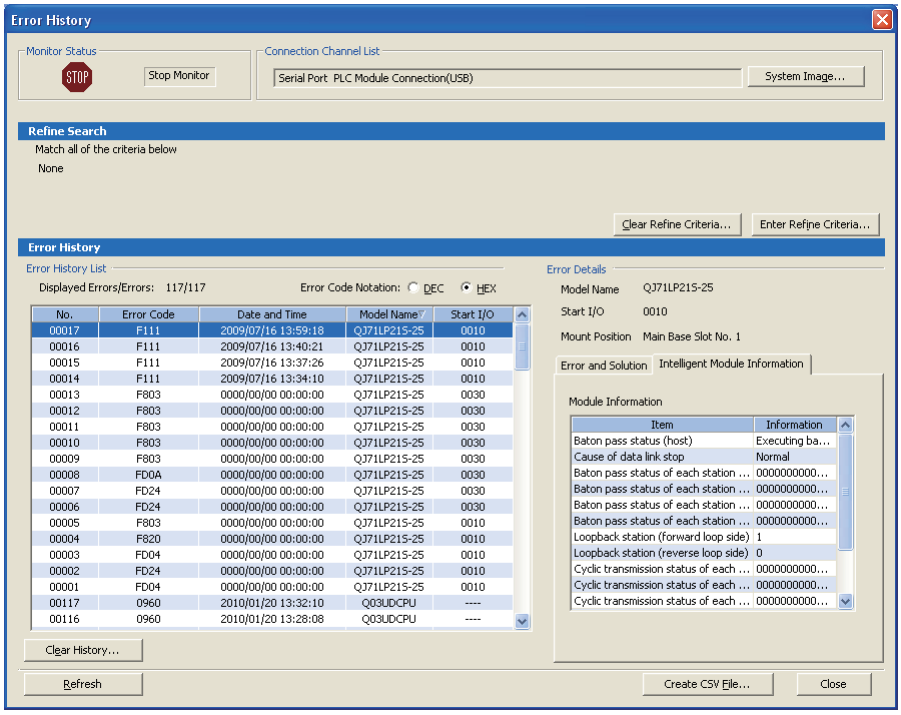
Screen display

Select [Diagnostics] ⇒ [System Monitor] ⇒ Error History Detail / System Error History **.**

<Error history (when programmable controller CPU is selected>



<System error history>



Display contents

Item		Description
Monitor Status		Display the current monitor status.
Connection Channel List		Display the information of the connection destination setting.
Refine Search		Display the refinement criteria for the error history list. Not displayed when no refinement criterion is specified.
Error History List		–
	Error Code Notation	Select the display format of error codes (DEC/HEX).
	No.	Display the error history number. Errors are numbered in order of occurring.
	Error Code	Display the error code that indicates details of the error.
	Date and Time	Display date and time of the error occurrence.
	Model Name	Display the model name of the module on which the error occurs.
	Start I/O	Display the start I/O number of the module on which the error occurs.
Error Details		–
	Model Name	Display the model name of the module selected in the error history list.
	Start I/O	Display the start I/O number of the module selected in the error history list. For the module that uses multiple slots, the starting slot is only displayed.
	Mount Position	Display the mount position of the module selected in the error history list.
	<<Error and Solution>>	Display the explanation and solution of the error on the module being selected in the error history list.
	<<Intelligent Module Information>>	Display the module information at the error occurrence of the intelligent function module being selected in the error history list.

Screen button

For the buttons on the screen, refer to Section 18.8.

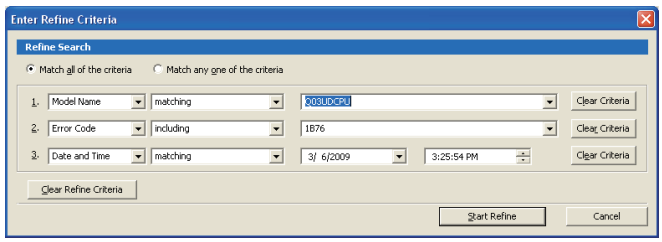
- Clear Refine Criteria...

  Clears all refinement criteria.

- Enter Refine Criteria...

  Displays the Enter Refine Criteria screen.

  To start refining the search, click the Start Refine button.



- Clear History...

  Clears the error history saved on the programmable controller CPU.

- Refresh

  Updates information displayed in the error history list.

- Create CSV File...

  Exports information displayed in the error history list to a file in CSV format.

Point

- **Programmable controller CPUs and modules that support the function to display detailed error history**

  Detailed error history can be displayed when a programmable controller CPU and intelligent function module that support the module error history collection function are used.

  For versions of modules that support the function, refer to the User's Manual of each module.

18.9 Changing Modules Online

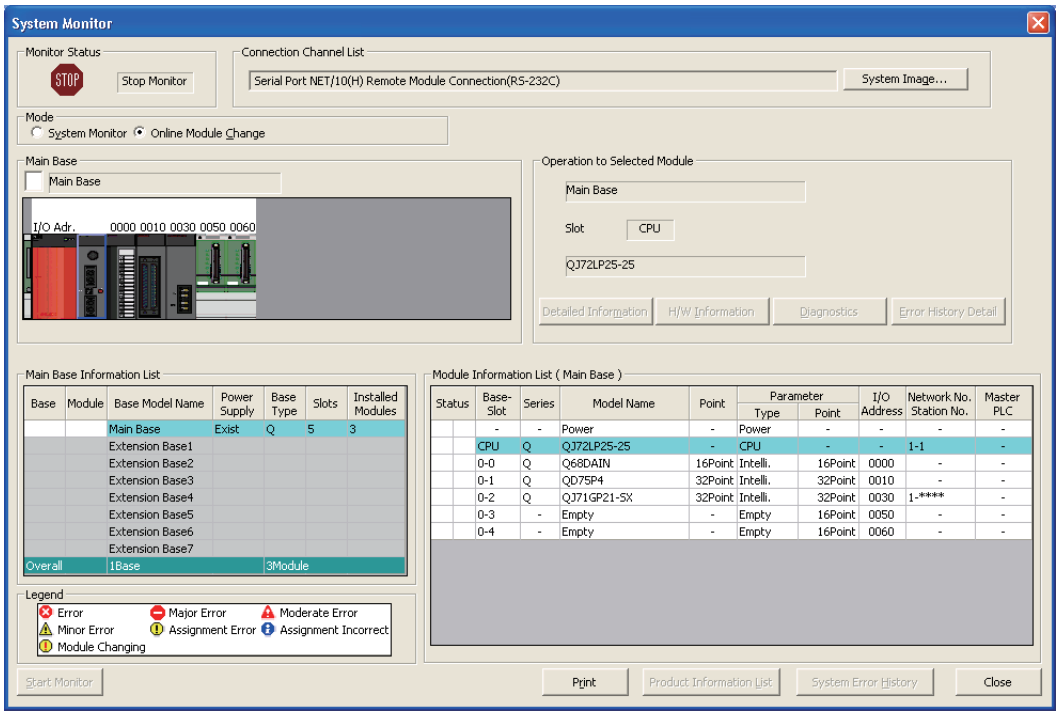
Q CPU *1 | L CPU (×) | Remote | Head (×) | FX (×)

*1 : Process CPU and Redundant CPU only

This section explains how to change modules online.

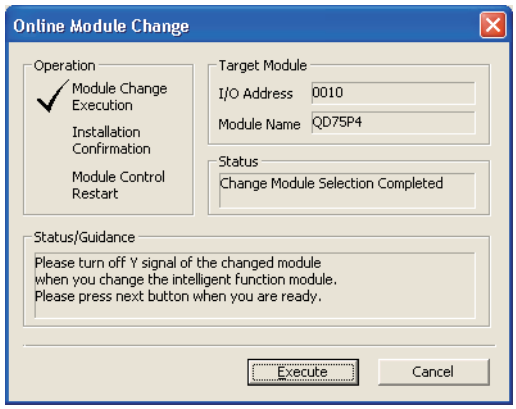
Screen display

Select [Diagnostics] ⇒ [Online Module Change].
<Remote I/O module>



Operating procedure

1. **Double-click the module to be exchanged on the System Monitor screen.**
   The Online Module Change screen is displayed.



2. **Change the module by following the instruction of "Status/Guidance".**

Point

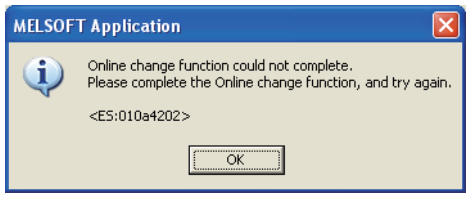
● **Remote I/O module versions compatible with Online module change**
Use the function version D or later to perform the Online module change function on a remote I/O module.
For the method for checking the function version, refer to the following manual.
☞ Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)

● **Canceling Online module change**

- Online module change can be suspended by clicking the Cancel button during the process of Online module change to check the system status with monitoring or current value change.
- Online module change can be continued from the suspended status by selecting [Diagnostics] ⇒ [Online Module Change].
- Online module change can also be continued when GX Works2 is terminated during the process of Online module change by restarting GX Works2 and performing the same operation above.

● **Executing Online module change on a single programmable controller CPU from two personal computers**
The authority to execute Online module change can be transferred to the personal computer which executed the function later.

● **Online module change during monitoring**
Stop monitoring before executing Online module change.
Online module change can be executed without stopping the monitoring, however, the following message will be displayed.



Restrictions

● **Restrictions on Online module change**

- Online module change cannot be performed to multiple modules simultaneously.
- Online module change cannot be continued when the programmable controller CPU is reset, or the power is turned OFF during the process of Online module change.
- Online module change cannot be performed when a Process CPU or Redundant CPU is in the following state.
  - The RESET/L.CLR switch of the programmable controller CPU is reset.
  - A stop error occurred and the programmable controller CPU is stopped.

18.10 Built-in I/O Module Tools

Q CPU | L CPU | Remote | Head | FX

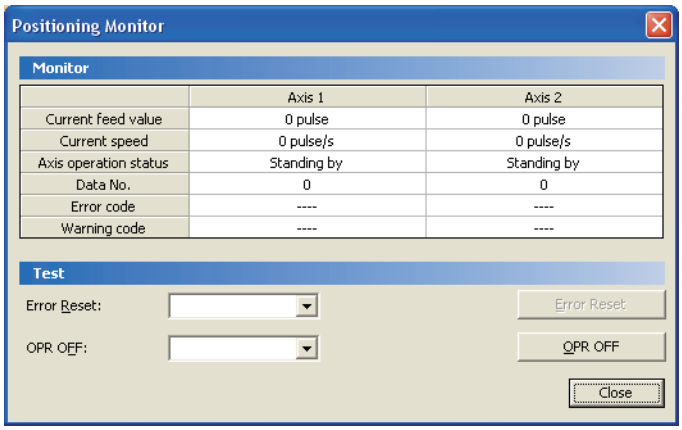
This section explains how to monitor the operating status of the positioning function, high-speed counter function, and I/O signals using the built-in I/O module tools.
For the monitoring items and setting values, refer to MELSEC-L CPU Module User's Manual (Built-in I/O Function).

18.10.1 Positioning monitor

Monitor the operating status of the positioning function.
The methods for executing the error reset and OPR OFF are also explained.

Screen display

Select [Tool] ⇒ [Built-In I/O Module Tool] ⇒ [Positioning Monitor].



Display contents

Item		Description
Monitor		Display the current status.
Test		–
	Error Reset	Click ▼ to select an axis to execute the error reset.
	OPR OFF	Click ▼ to select an axis to execute the OPR OFF.

Screen button

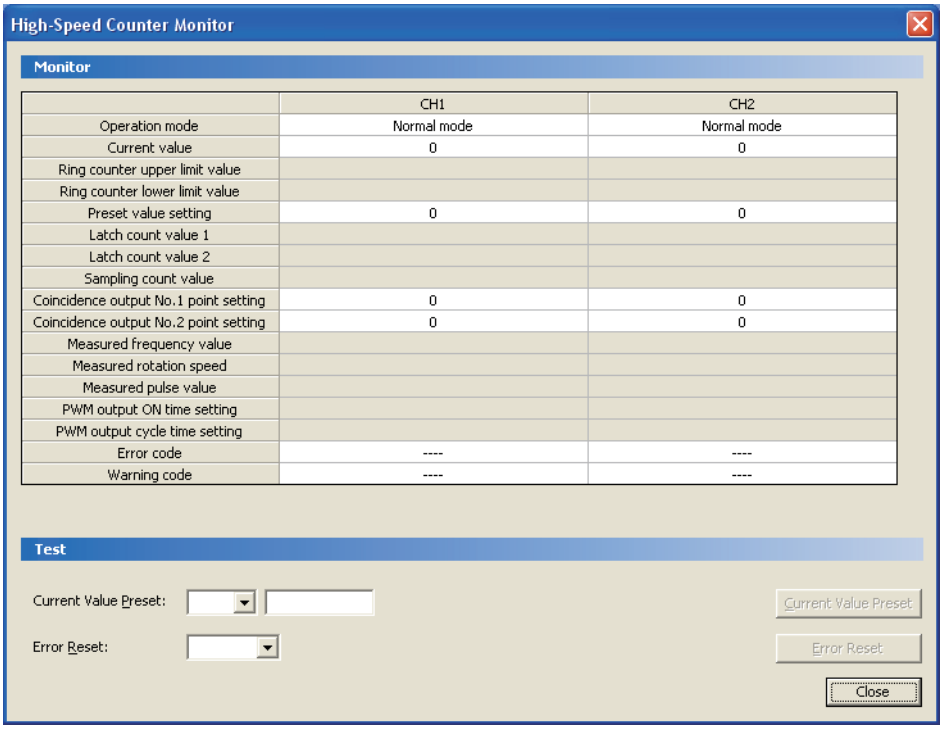
- Error Reset
  Executes the error reset of the selected axis.
- OPR OFF
  Executes the OPR OFF of the selected axis.

18.10.2 High-speed counter monitor

Monitor the operating status of the high-speed counter function.
The methods for executing the current value preset and error reset are also explained.

Screen display

Select [Tool] ⇒ [Built-In I/O Module Tool] ⇒ [High-Speed Counter Monitor].



Display contents

Item		Description
Monitor		Display the current status.
Test		–
	Current Value Preset	Click ▼ to select a channel. After selecting the channel, enter the preset value.
	Error Reset	Click ▼ to select a channel to execute the error reset.

Screen button

- Current Value Preset

  Applies the preset value of the selected channel to the programmable controller CPU.

- Error Reset

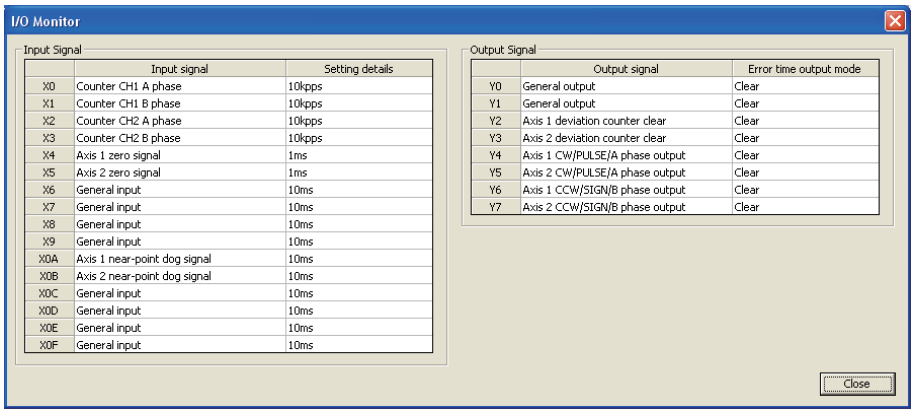
  Executes the error reset of the selected channel.

18.10.3 I/O monitor

Monitor the I/O signals.

Screen display

Select [Tool] ⇒ [Built-In I/O Module Tool] ⇒ [I/O Monitor].



Display contents

Item	Description
Input Signal	Display the status of each input signal.
Output Signal	Display the status of each output signal.

19 SIMULATING OPERATIONS OF EXTERNAL DEVICES

This chapter explains debugging operations using the I/O system setting function.

19.1 I/O System Setting Function

Q CPU L CPU Remote Head FX

The I/O system setting function simulates operations of external devices.
Using the I/O system setting function, operations of external devices can be simulated without a special debugging sequence program. Since input devices (X) can also be turned ON/OFF, devices in programs do not need to be rewritten during the simulation.

19.1.1 Differences between conventional debugging and debugging with I/O system setting function

This section explains differences between conventional debugging and debugging with the I/O system setting function.

■ Conventional debugging

1) Devices need to be rewritten
As input devices (X) can be turned ON/OFF only with an external device connected to the I/O module, the program needs to be modified by changing X0 → M0, X1 → M1, etc. to conduct debugging without an external device.

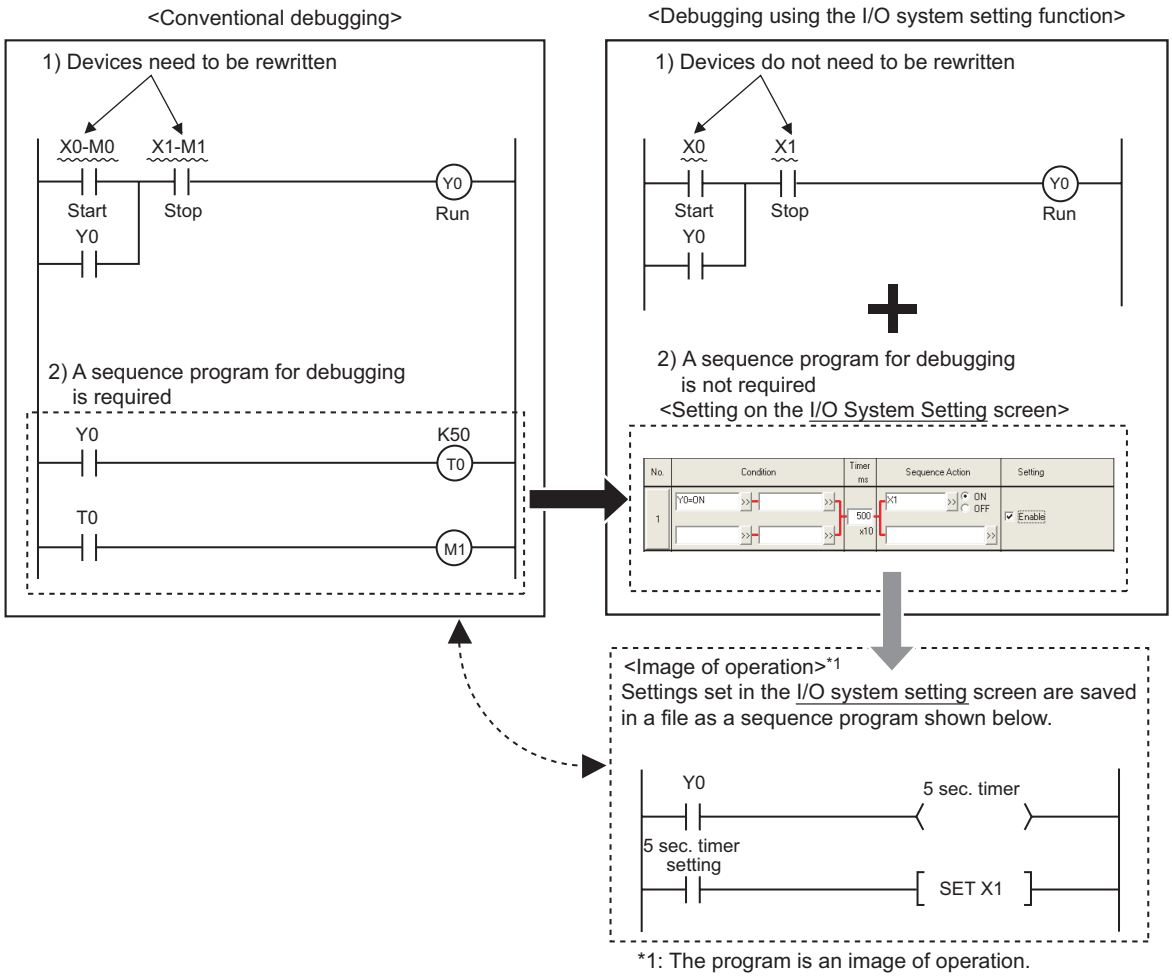
2) A sequence program for debugging is required
A debugging sequence program needs to be added to simulate operations of external devices.

■ Debugging with the I/O system setting function

1) Devices do not need to be rewritten
It is not necessary to rewrite devices (X0 → M0) as input devices (X) can be turned ON/OFF with the I/O system setting function.

2) A sequence program for debugging is not required
For sequence actions for debugging can be set/changed easily from the setting screen, a sequence program for debugging is not required.

Example: Simulating operations of program when Y0 is turned ON, and 5 seconds later X1 is turned ON to stop running

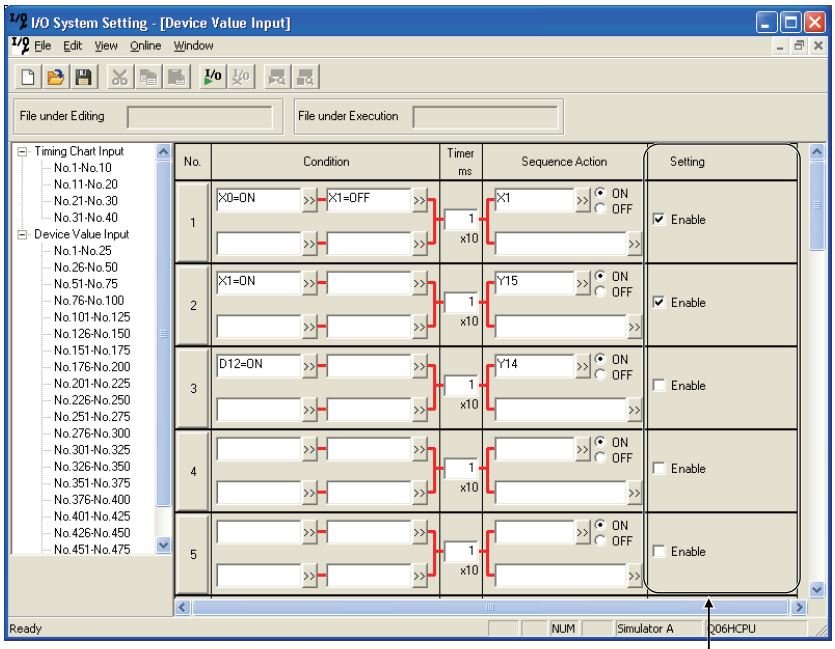


*1: The program is an image of operation.

19.1.2 Conditions and sequence actions for simulation

The I/O system setting function simulates operations of external devices according to specified conditions and sequence actions for debugging.
In "Condition", set a condition for starting up a sequence action for debugging. For settings of conditions, refer to Table 19.1.2-1.
In "Sequence Action", set devices of which values are to be changed or a timing chart which is to be started up at timing when the condition is true, using either of two kinds of setting methods: device value input and timing chat input. For details, refer to Section 19.1.3.
Sequence actions for debugging can be switched easily by selecting/clearing "Enable" on the I/O system setting screen.

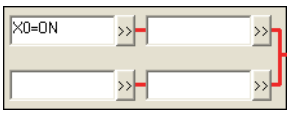
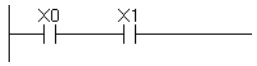
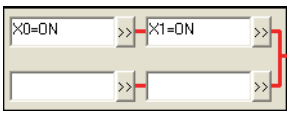
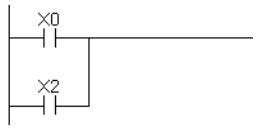
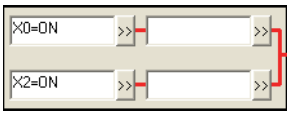
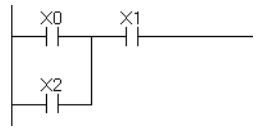
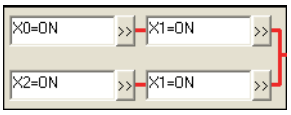
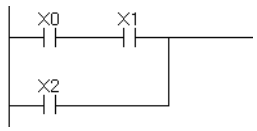
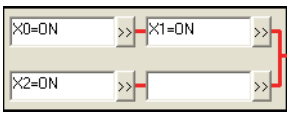
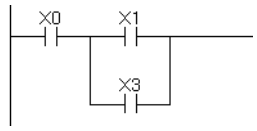
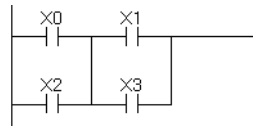
Example) Settings on the I/O system setting screen using the device value input



By selecting/clearing "Enable", sequence actions for debugging can be switched easily.

● **Combinations of conditions and examples of settings on the I/O system setting screen**

Table 19.1.2-1 Combination of conditions and setting examples

	Combination of conditions	Condition setting on the I/O system setting screen
1		
2		
3		
4		
5		
6		
7		

19.1.3 Timing chart input and device value input

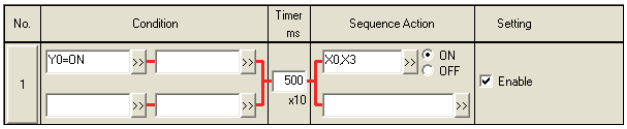
There are two methods to set sequence actions in the I/O system setting function: one is the device value input to change value of a desired device after a specified amount of time has elapsed when a condition has been satisfied; the other is the time chart input to execute a timing chart when a condition has been satisfied.

● **Device value input**

A value of a specified device can be changed after the specified condition is satisfied and the time specified for the timer is elapsed.
This enables actions such as the following.

Example: "When Y0 is turned ON, 5 seconds later X0 and X3 are turned ON"
Condition / Timer / Sequence action

<Setting of device value input>



Point

● **Sequence action after timer activation**

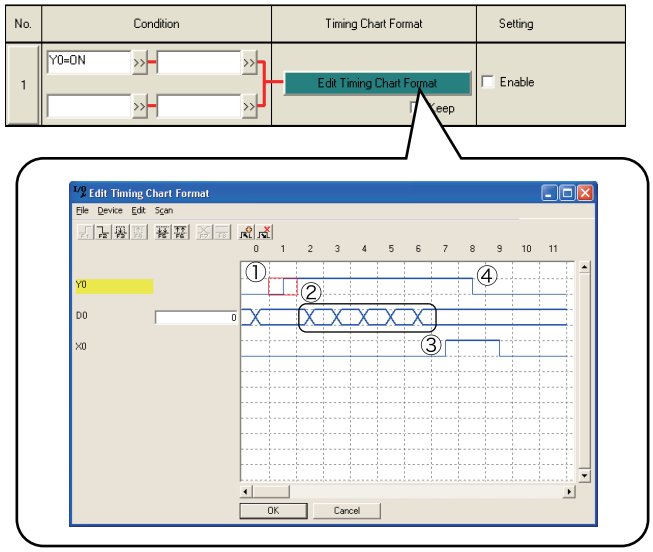
After the timer is activated, the timer will not be suspended even when the condition changes to unsatisfied status, and the sequence action is performed to change the value of the specified device.

● **Timing chart input**

When a specified condition has been satisfied, device variation defined in timing chart format can be performed.
This enables complicated actions such as the following.

Example: "When Y0 is turned ON, D0 is counted up, Y0 is turned OFF when X0 is turned ON"
① Condition / ② ④ Timing chart format / ③

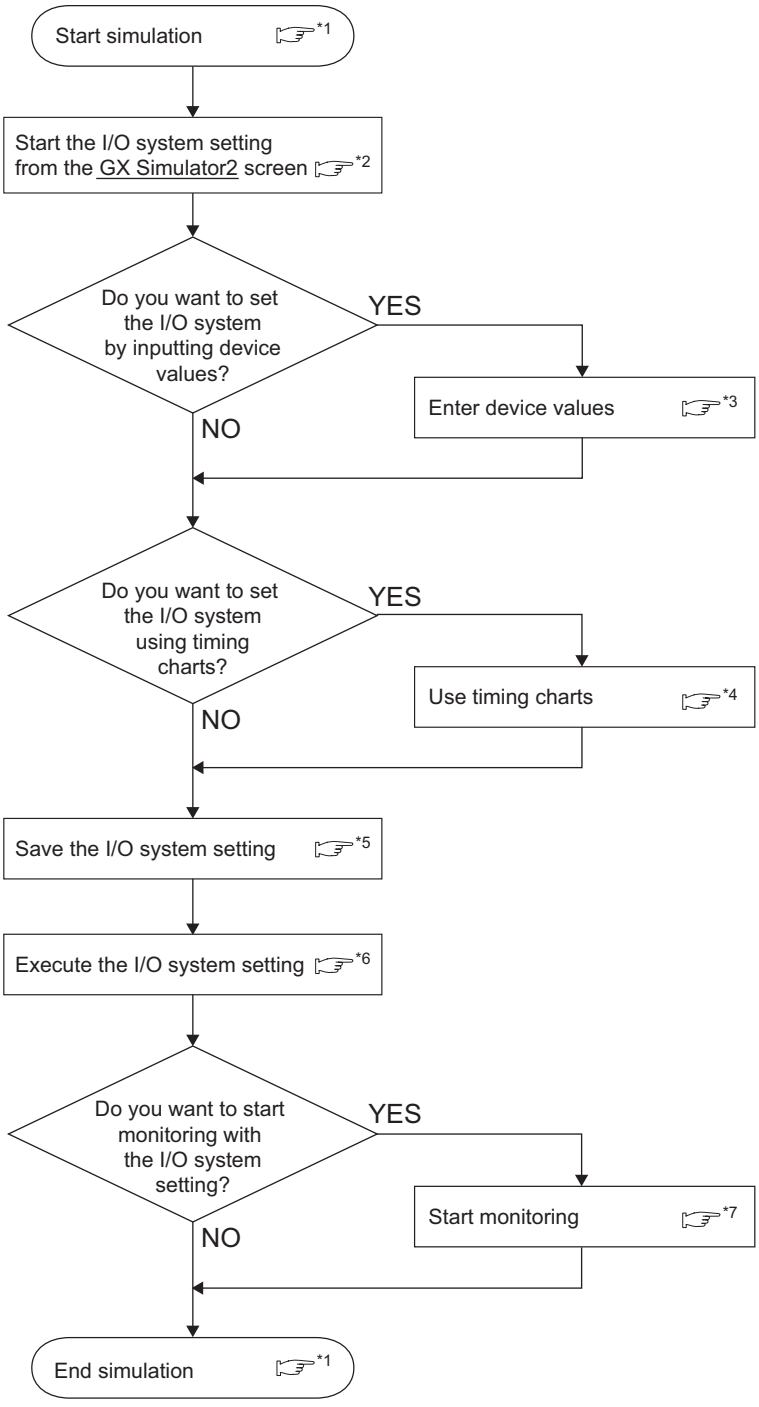
<Setting of timing chart input>



19.2 Operating Procedure of I/O System Setting Function

Q CPU L CPU ~~Remote~~ ~~Head~~ FX

The following shows the operating procedure of the I/O system setting function.



*1 : ☞ Section 15.2
*2 : ☞ Section 19.3
*3 : ☞ Section 19.4
*4 : ☞ Section 19.5
*5 : ☞ Section 19.8.3
*6 : ☞ Section 19.6
*7 : ☞ Section 19.7

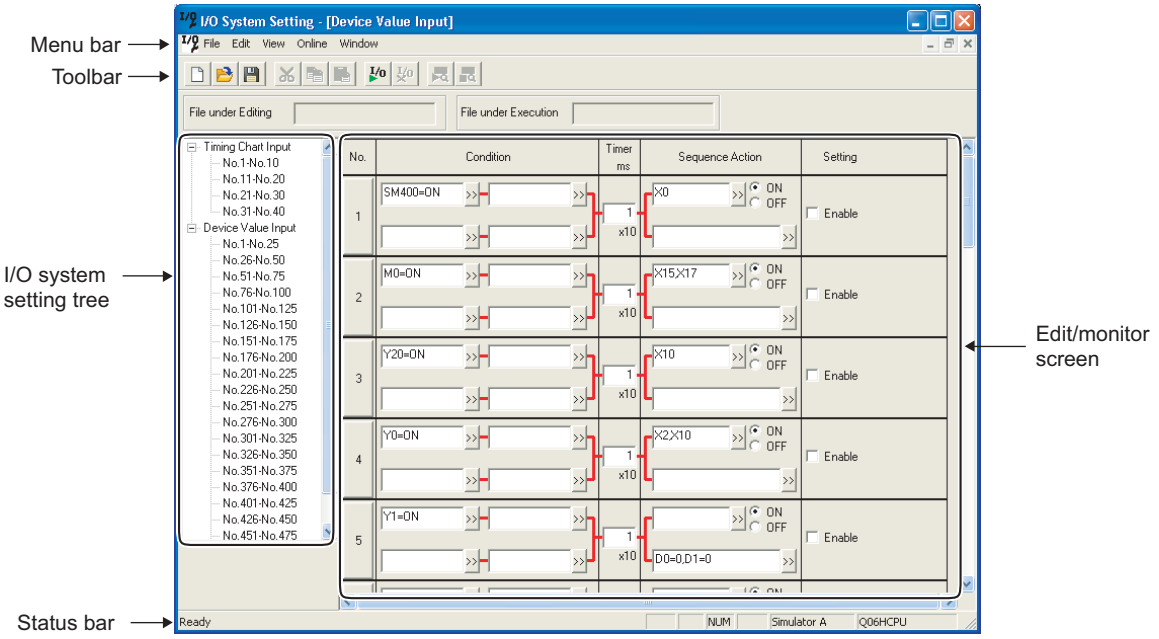
19.3 Screen Configuration of I/O System Setting Function

Q CPU L CPU Remote Head FX

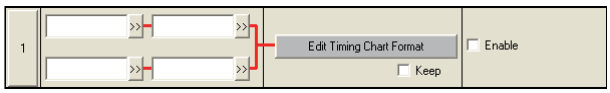
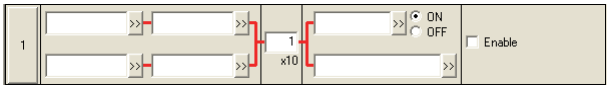
This section explains the screen configuration of the I/O system setting function.

Screen display

Select the GX Simulator2 screen ⇒ [Tool] ⇒ [I/O System Setting].



Display contents

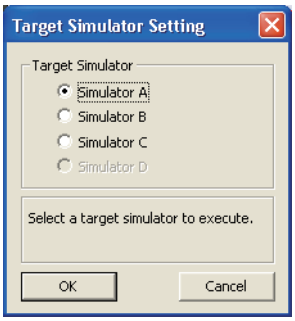
Item	Description	Reference
Menu bar	Display menu options for executing each function.	Section 1.3.12
Toolbar	Display tool buttons for executing each function.	Appendix 1.8
File under Editing	Display the name of a file being edited.	–
File under Execution	Display the name of a file being executed.	–
I/O system setting tree	Select a setting method for the I/O system setting. ● **Timing Chart Input** To set the I/O system setting in timing chart format, double-click the number to be set. ● **Device Value Input** To set the I/O system setting by setting device values, double-click the number to be set.*1	Section 19.4 Section 19.5
Edit/monitor screen	Edit/monitor the I/O system setting. ● **At timing chart input**  ● **At device value input** 	Section 19.4 Section 19.5
Status bar	Display information about a project being edited.	–

*1 : For FXCPU, the setting range is No. 1 to No. 100.

Point

● **Target Simulator Setting screen (QCPU (Q mode)/LCPU)**

If simulation has been started from multiple projects at startup of the I/O system setting function, the Target Simulator Setting screen is displayed to specify a simulator (virtual programmable controller) on which the I/O system setting is performed.



Restrictions

● **Startup of the I/O system setting**

The I/O system setting of GX Simulator Version 7 and the I/O system setting of GX Works2 cannot be started up simultaneously.

Startup the I/O system setting of GX Works2 after disabling the I/O system setting of GX Simulator Version 7.

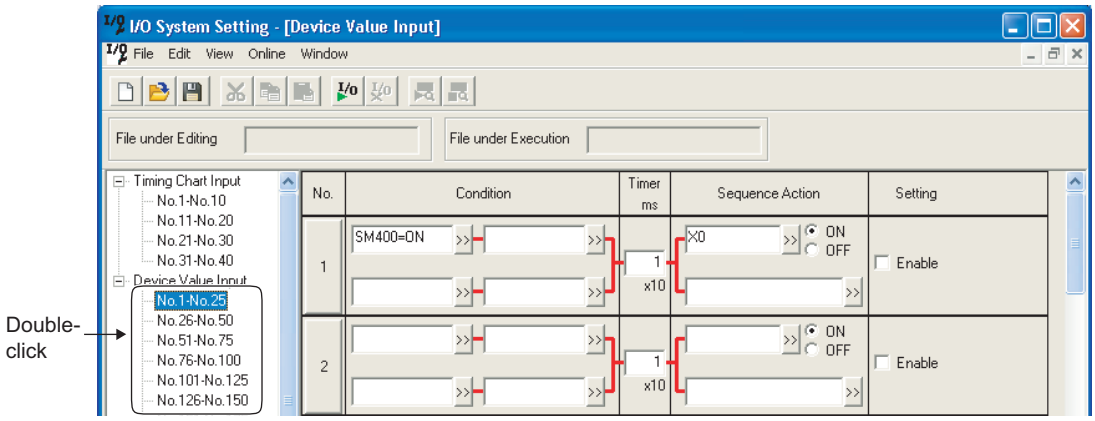
19.4 Setting by Inputting Device Values

Q CPU | L CPU | Remote | Head | FX

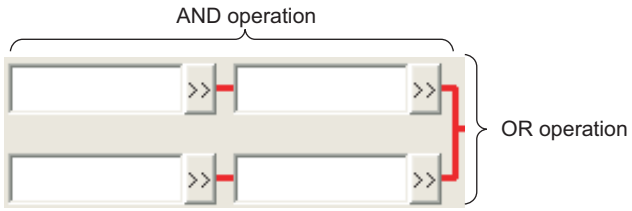
This section explains how to configure the I/O system setting by inputting device values.

Operating procedure

1. **Double-click a desired setting number from "Device Value Input" in the I/O system setting tree.**



2. **Set the items on the screen.**

Item	Description
No.	Setting number in the I/O System Setting screen.
Condition	Specify the input condition from the virtual programmable controller. The Device Specification screen is displayed by clicking >>. (☞ Section 19.4.1) Bit devices and word devices can be specified for the input condition. Labels cannot be specified. For a bit device, ON/OFF can be set in a designated condition; for a word device, comparison (=,<>,<,>,<=,>=) with a constant or another word device can be set in a designated condition. In addition, a relational condition can be set by specifying AND/OR operation.  With an And operation, the condition is satisfied if both designated conditions on the left and right are achieved. Otherwise, the condition is not satisfied. With an OR operation, the condition is satisfied if either or both of designated conditions in upper and lower columns are achieved.
Timer ms	Set a period of time from when the specified condition is satisfied until the sequence action is issued. The setting range is 1 to 1000 (10 to 10000ms).
Sequence Action	Set a bit device to be turned ON/OFF or a word device of which the value is to be changed after the specified condition is satisfied. Labels cannot be set.
Setting	Set whether each setting is to be enabled/disabled. Select this to enable the setting.

19.4.1 Setting conditions

Conditions can be entered directly, or set on the Device Specification screen.
For devices that can be entered for conditions, refer to Appendix 2.2.
Note that there are devices which are not supported by the I/O system setting. For unsupported devices, refer to Restrictions in this section.

● **Data entry method (direct data entry)**

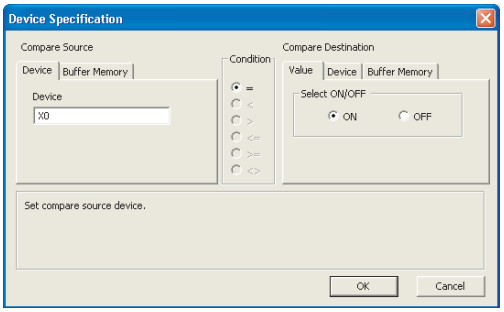
Operation

- **Enter conditional expressions directly.**

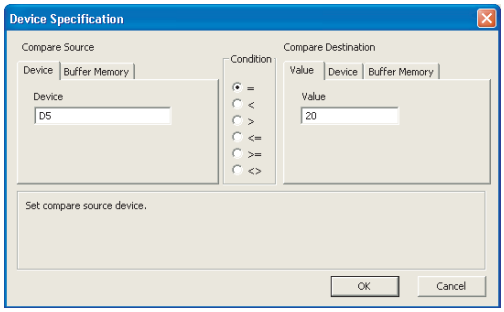
  Example) For bit devices: X0=ON, M10=OFF
  For word devices: D0=20, D5<20, D15<>5, D25>=10, D0=D50

● **Data entry method (set on the Device Specification screen)**

<When a bit device is selected>



<When a word device is selected>



Operation

- **Set the items on the screen.**

Item			Description
Compare Source			–
	<<Device>>		–
		Device	Set a device.
	<<Buffer Memory>>*1		–
		Module Start (HEX)	Enter a start I/O number of the intelligent function module in hexadecimal.
		Address	Enter a buffer memory address in decimal/hexadecimal.
		Decimal/Hexadecimal	Select an input form (decimal/hexadecimal) of the buffer memory address.
Condition			Select a comparison condition when the compare source is other than a bit device.
Compare Destination			–
	<<Value>>		–
		Select ON/OFF	Specify ON/OFF when the compare source is a bit device.
		Value	Enter a value when the compare source is a word device.
	<<Device>>		–
		Device	Set a device.
	<<Buffer Memory>>*1		–
		Module Start (HEX)	Enter a start I/O number of the intelligent function module in hexadecimal.
		Address	Enter a buffer memory address in decimal/hexadecimal.
		Decimal/Hexadecimal	Select an input form (decimal/hexadecimal) of the buffer memory address.

*1 : For FXCPU, these items are supported by FX3U and FX3UC only.

Restrictions

● **Unsupported devices**

The following special relays are not supported by the I/O system setting.
Use other supported devices to set conditions.

- SM402 (After RUN, ON for only 1 scan)
- SM403 (After RUN, OFF for only 1 scan)
- SM404 (Low speed execution type program After RUN, ON for 1 scan only)
- SM405 (Low speed execution type program After RUN, OFF for 1 scan only)
- SM1038 (After RUN, ON for only 1 scan)
- SM1039 (After RUN, OFF for only 1 scan)

19.4.2 Setting sequence actions

Sequence actions can be entered directly, or set on the Bit Device Setting screen or the Word Device Setting screen.
For devices that can be entered for conditions, refer to the following section.
(☞ Appendix 2.2)

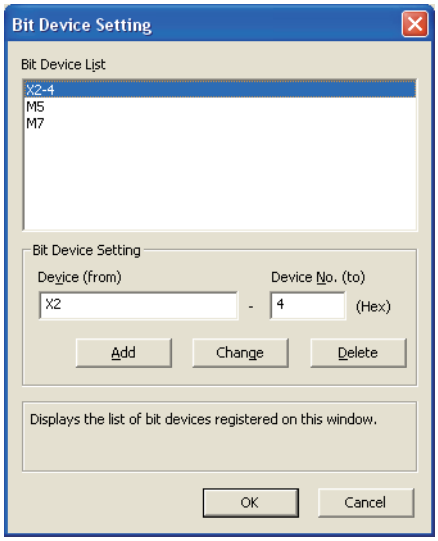
● **Data entry method (direct data entry)**

Operation

- **Enter devices directly.**

  Example) For bit devices: X2-4, M5, M7
  For word devices: D12=234, D20=10

● **Data entry method (set on the Bit Device Setting screen)**

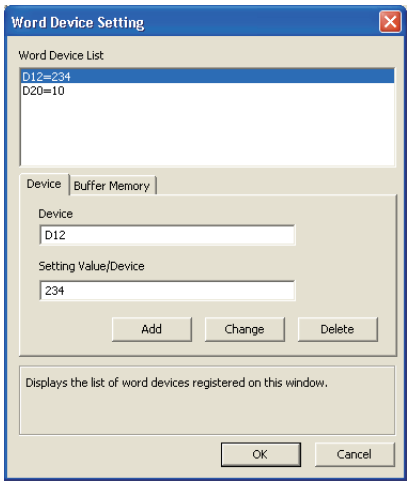


Operation

- **Set the items on the screen.**

Item		Description
Bit Device List		Display the list of bit devices being set.
Bit Device Setting		–
	Device (from)	Set a bit device.
	Device No. (to)	Set an end bit device number for the range specification.

● **Data entry method (set on the Word Device Setting screen)**



Operation

- **Set the items on the screen.**

Item		Description
Word Device List		Display the list of word devices being set.
<<Device>>		–
	Device	Set a word device.
	Setting Value/Device	Set a device value or device.
<<Buffer memory>>*1		–
	Module Start (HEX)	Enter a start number of the module in hexadecimal.
	Address	Enter a buffer memory address in decimal/hexadecimal.
	Decimal/Hexadecimal	Select an input form (decimal/hexadecimal) of the buffer memory address.

*1 : For FXCPU, these items are supported by FX3U and FX3UC only.

■ Data entry method for direct data entry

Enter a device of which a value is to be changed when the specified condition is satisfied.

For setting multiple devices, separate each device with ",".
For setting consecutive devices, connect the start device number and end device number with "-".

Example) X0, X2, M10-20
D0=100, W0=100

Point

● **Number of device points that can be executed simultaneously**
Up to 25000 device points can be executed simultaneously in the device input of the I/O system setting.

● **Setting conditions and sequence operation**
- Index settings (Example: D0Z0), bit-specified word device (Example: D0.0), and digit-specified bit device (Example: K4X0) cannot be set in the conditions and sequence operation.
- The I/O system setting does not support local devices. When local devices are set, the I/O system setting may not perform properly.

● **Cutting/copying/pasting I/O system setting by unit of setting number**
The I/O system setting can be cut/copied/pasted by unit of setting number.
To cut/copy/paste the I/O system setting, click a setting number of the I/O system setting and select [Edit] ⇒ [Cut]/[Copy]/[Paste].

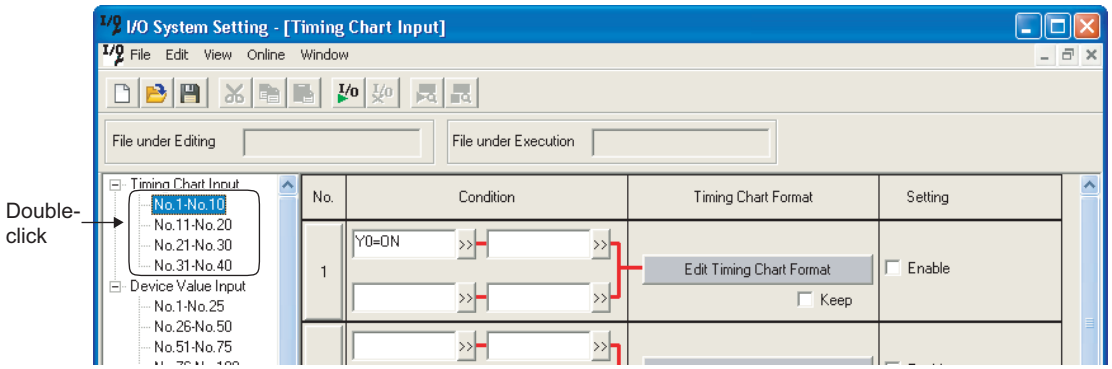
19.5 Setting Using Timing Charts

Q CPU | L CPU | Remote | Head | FX

This section explains how to set the I/O system setting using timing charts.

Operating procedure

1. **Double-click a desired setting number from "Timing Chart Input" in the I/O system setting tree.**



2. **Set the items on the screen.**

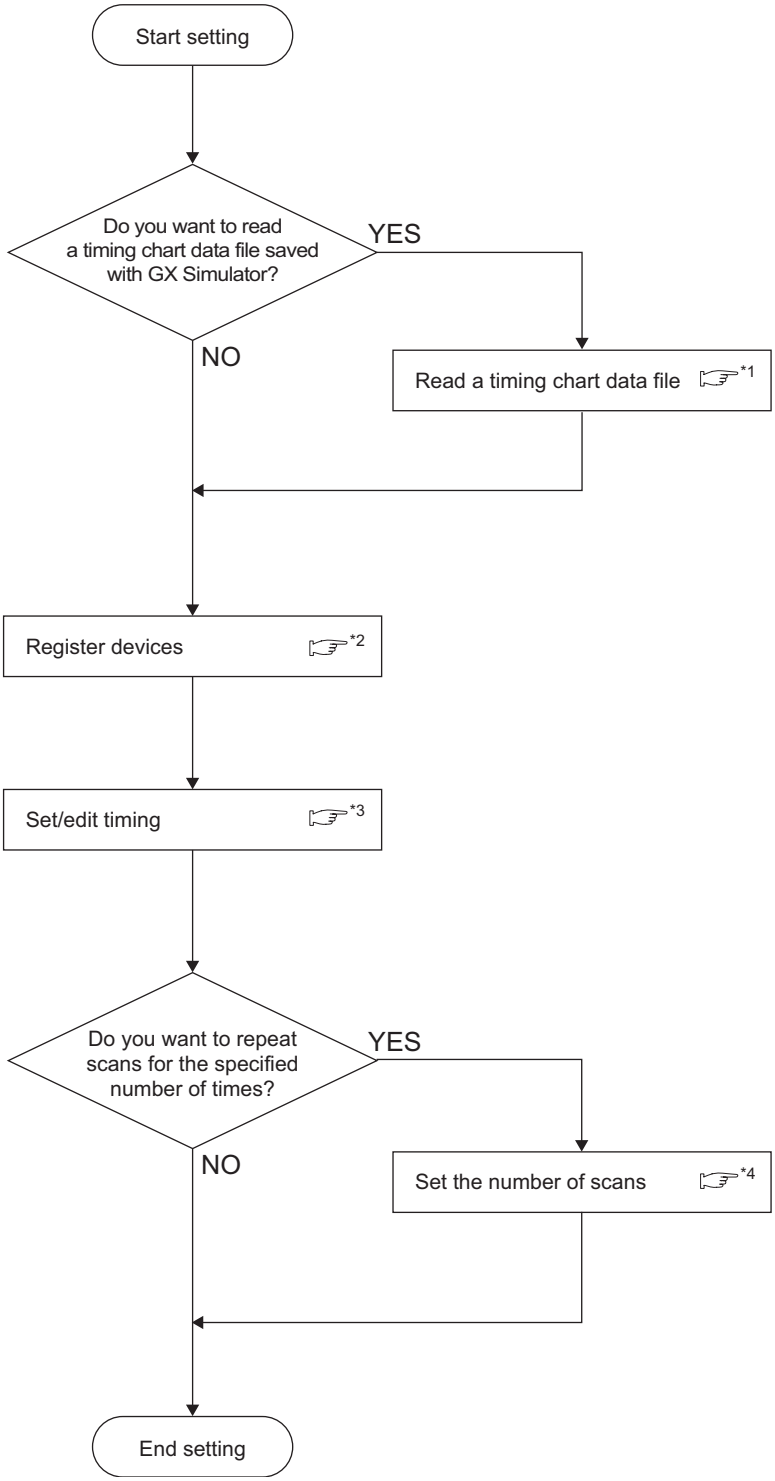
Item		Description
No.		Setting number in the I/O System Setting screen.
Condition		Specify the input condition from the simulation. (☞ Section 19.4.1)
Timing Chart Format		The Edit Timing Chart Format screen is displayed by clicking the [Edit Timing Chart Format] button.
	Keep	Select this to execute the timing specified in the timing chart repeatedly.
Setting		Set whether each setting is to be enabled/disabled. Select this to enable the setting.

Point

● **Cutting/copying/pasting I/O system setting by unit of setting number**
The I/O system setting can be cut/copied/pasted by unit of setting number.
To cut/copy/paste the I/O system setting, click a setting number of the I/O system setting and select [Edit] ⇒ [Cut]/[Copy]/[Paste].

19.5.1 Setting in timing chart format

The following shows the setting procedure on the Edit Timing Chart Format screen.



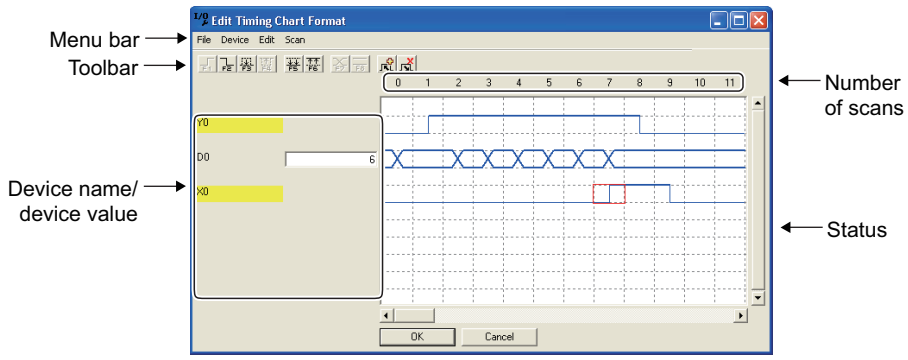
*1 : ☞ Section 19.5.6
*2 : ☞ Section 19.5.3
*3 : ☞ Section 19.5.4
*4 : ☞ Section 19.5.5

19.5.2 Screen configuration of Edit Timing Chart Format screen

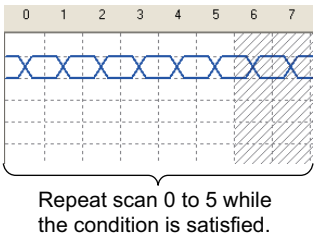
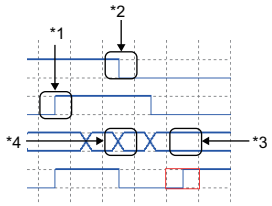
The following explains the screen configuration of the Edit Timing Chart Format screen.

Screen display

Select the Timing Chart Input screen ⇒ Edit Timing Chart Format **.**



Display contents

Item	Description	Reference
Menu bar	Display menu options for executing each function.	–
Toolbar	Display tool buttons for executing each function.	–
Device name/device value	Display devices specified in the Enter Device screen. ● **Bit device** The device name is displayed in yellow when the device is ON at the timing of the cursor position. ● **Word device** The device value at timing of the cursor position is displayed in a text box on the right of the device name. When a word device is specified as 32-bit integer, (D) is added at the end of the device name, and when a word device is specified as single precision real number, (E) is added at the end of the device name. Example) D0(D), W6(D), D10(E), W60(E)	–
Number of scans	Display the number of scans at the timing. To repeat a scan for the specified number of times, set the number of scans. (☞ Section 19.5.5) When "Keep" below the Edit Timing Chart Format button is selected, enabled scans can be repeated while the condition is satisfied. (Example: Keep scanning for 6 scans, which is the specified number of scans)  6 scans of from scan 0 to 5 are only enabled. Repeat scan 0 to 5 while the condition is satisfied.	–
Status	Display status of the timing chart being set.  *1: The target device is turned OFF →ON. *2: The target device is turned ON →OFF. *3: There is no change in the device value. *4: There is a change in the device value.	–

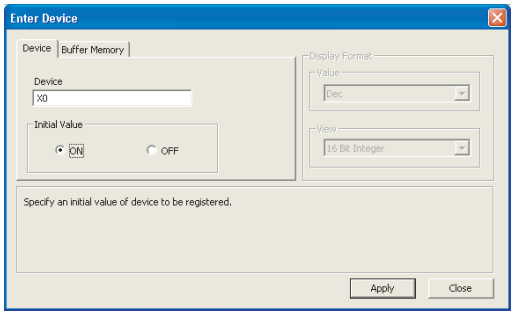
19.5.3 Registering devices

Register devices for setting timing.

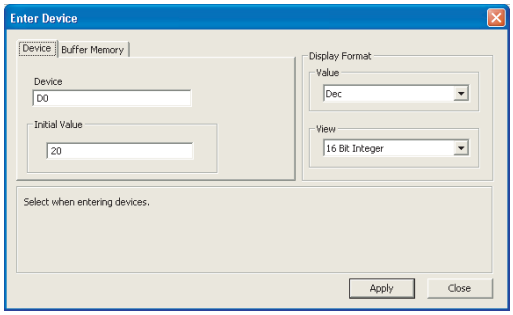
Operating procedure

1. **Select [Device] ⇒ [Enter Device] from the Edit Timing Chart Format screen.**

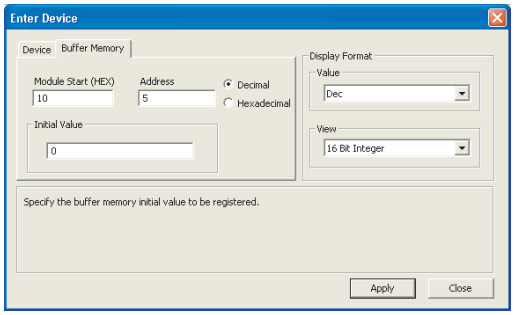
<Bit device>



<Word device>



<Buffer memory>



2. **Set the items on the screen.**

Item			Description
<<Device>>			Select this tab to register devices.
	Device		Set a device to be registered.
	Initial Value		Set the initial value of the device. For a bit device, select ON/OFF of the bit. For a word device, set the initial value.
<<Buffer Memory>>*1			Select this tab to register buffer memory.
	Module Start (HEX)		Set a start address of a module to be registered.
	Address		Set the address of the buffer memory to be registered.
	Decimal/Hexadecimal		Select the input form of the buffer memory address.
	Initial Value		Set the initial value of the buffer memory to be registered.
	Display Format		–
		Value	Select the display format of the value.
		View	Select the display format of the device.

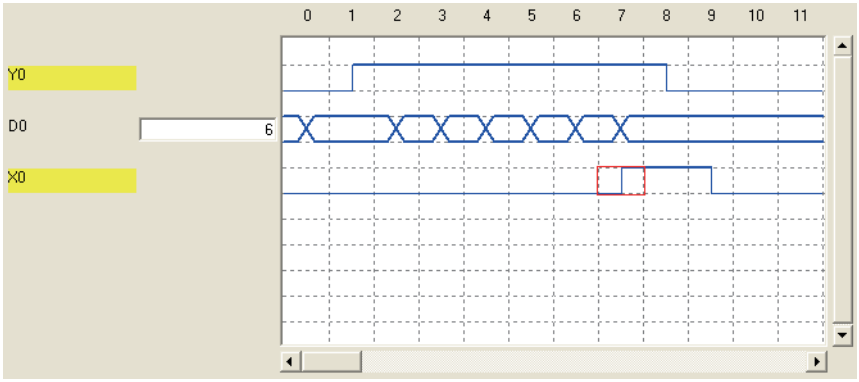
*1 : For FXCPU, this item is supported by FX3U and FX3UC only.

Point

● **Deleting registered devices**
To delete a registered device, select the device displayed in device name/device value on the Edit Timing Chart Format screen, and select [Device] ⇒ [Delete Device].

19.5.4 Setting timing

Set/edit the timing.
Move the cursor to the timing to be set, and perform an operation using any of tool buttons, menus, and shortcut keys.



Operation	Toolbar	Menu	Shortcut key
Device ON		• Select [Edit] ⇒ [Bit Device] ⇒ [Device ON]. • Right-click and select [Device ON] from the shortcut menu. • Double-click at the cursor position	F1
Device OFF		• Select [Edit] ⇒ [Bit Device] ⇒ [Device OFF]. • Right-click and select [Device OFF] from the shortcut menu. • Double-click at the cursor position.	F2
Progressive OFF		• Select [Edit] ⇒ [Bit Device] ⇒ [Progressive OFF]. • Right-click and select [Progressive OFF] from the shortcut menu.	F3
Progressive ON		• Select [Edit] ⇒ [Bit Device] ⇒ [Progressive ON]. • Right-click and select [Progressive ON] from the shortcut menu.	F4
All OFF		• Select [Edit] ⇒ [Bit Device] ⇒ [All OFF]. • Right-click and select [All OFF] from the shortcut menu.	F5
All ON		• Select [Edit] ⇒ [Bit Device] ⇒ [All ON]. • Right-click and select [All ON] from the shortcut menu.	F6
Change		• Select [Edit] ⇒ [Word Device] ⇒ [Change]. • Right-click and select [Change] from the shortcut menu. • Double-click the cursor position.	F7
No Change		• Select [Edit] ⇒ [Word Device] ⇒ [No Change]. • Right-click and select [No Change] from the shortcut menu.	F8
Insert		• Select [Edit] ⇒ [Insert]. • Right-click and select [Insert] from the shortcut menu.	Insert
Delete		• Select [Edit] ⇒ [Delete]. • Right-click and select [Delete] from the shortcut menu.	Delete

■ Setting timing of bit devices

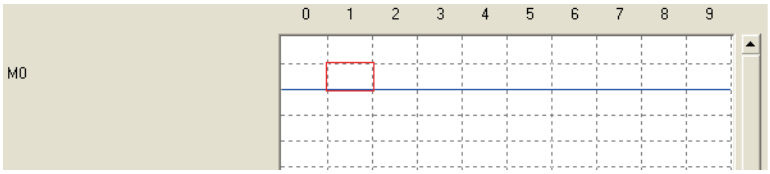
● Setting the ON/OFF cycle

Set continuous ON/OFF repeated for the specified period after the specified timing.

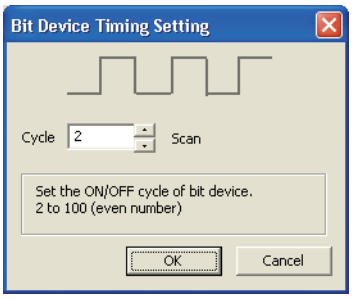
Example) Set the following value to scan 1 (cursor position).
Cycle: 2

Operation

1. Select a cell corresponding to a scan of a bit device to be changed.

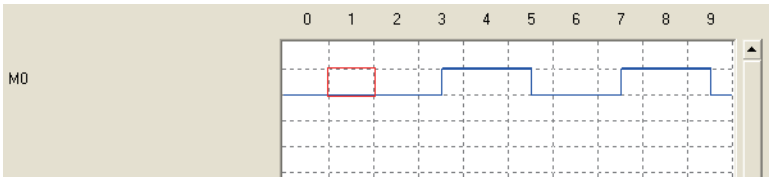


2. Select [Edit] ⇒ [Timing Setting].



3. Set an ON/OFF cycle of the bit device.

4. Click the OK button.
ON/OFF of the bit device is cyclically set.

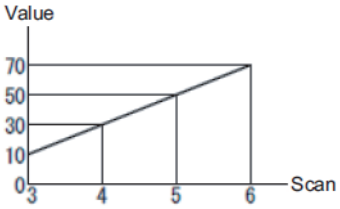


■ Setting timing of word devices

● Changing the value at the specified timing

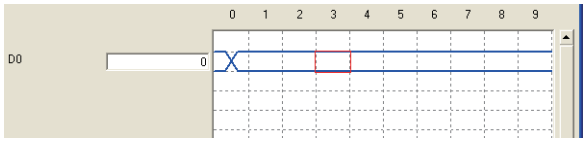
Change the value of the specified device at the specified timing.

Example) Set the following value to scan 3 (cursor position).
Setting Value: 10, Continue, Number of Scans: 4, Increase and Decrease: Increase, Increase and Decrease Value: 20

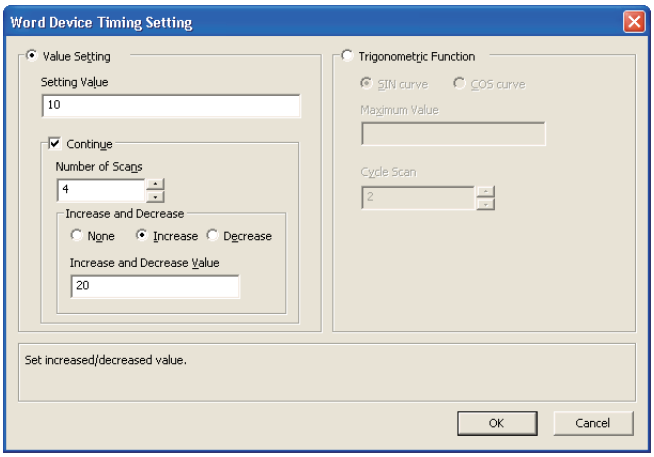


Operation

1. Select a cell corresponding to a word device to be changed.



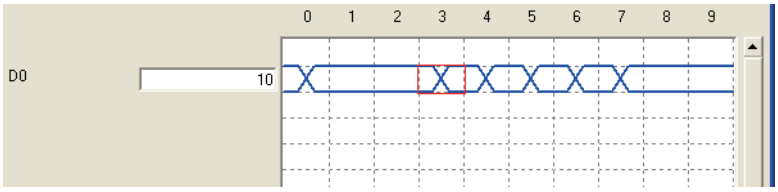
2. Select [Edit] ⇒ [Word Device] ⇒ [Change] (F7).



3. Set the items on the screen.

Item			Description
Value Setting			Select this to set a value.
	Setting Value		Enter a setting value for the word device.
	Continue		Select this to set the setting value continuously.
		Number of Scans	Enter the number of scans to be continued.
		Increase and Decrease	Set this to increase/decrease the value.
		Increase and Decrease Value	Set the increase/decrease value.
Trigonometric Function			Select this to change the value using trigonometric functions.
	SIN curve		Select this to change the value with a SIN curve.
	COS curve		Select this to change the value with a COS curve.
	Maximum Value		Enter the maximum value.
	Cycle Scan		Select the number of scans corresponding to one period of SIN/COS curves.

4. **Click the** OK **button.**
The value of the word device is set.

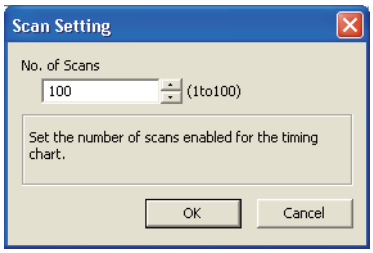


19.5.5 Setting number of scans of timing chart

Set the number of scans of a timing chart input from an external device.

Screen display

Select the Edit Timing Chart Format screen ⇒ [Scan] ⇒ [Scan Setting].



Operating procedure

1. **Enter the value for "No. of Scans".**

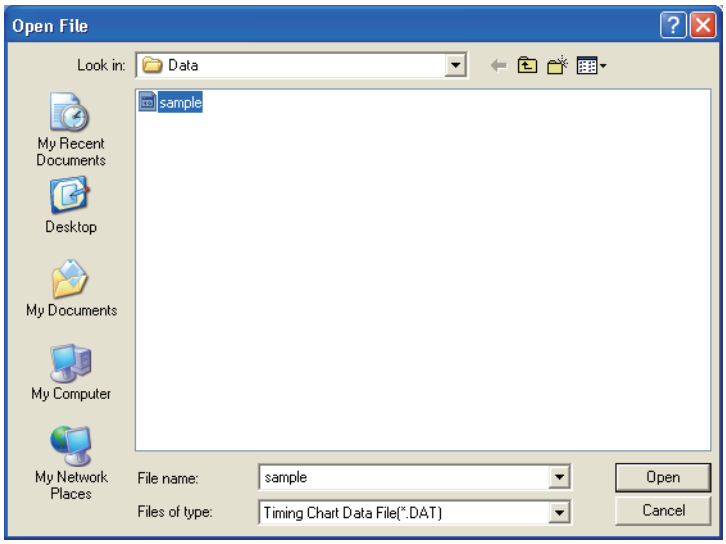
2. **Click the** OK **button.**
Columns of disabled scans are shaded on the timing chart.

19.5.6 Utilizing timing chart data of existing applications

Read and utilize a timing chart data file (*.DAT) saved with the timing chart of GX Simulator.
Since devices and timing are automatically registered after reading, there is no need to register them again.

Screen display

Select the Edit Timing Chart Format screen ⇒ [File] ⇒ [Open File].



Restrictions

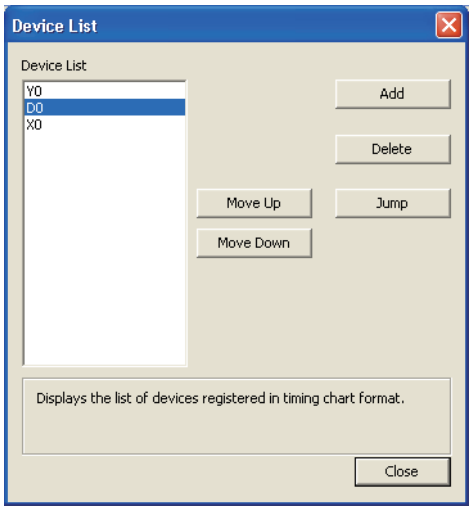
- **Number of device points that can be read from a timing chart data file**
  Timing chart data for 16 device points from the top in the screen can only be saved with the timing chart function. Therefore, move necessary devices to within 16 points from the top in the screen and save the data when creating a timing chart data file.
- **Number of scans that can be read from a timing chart data file**
  Scan 0 to 99 are available in the Edit Time Chart Format screen of the I/O system setting function.
  When a timing chart data file includes scan 100 and later, they are discarded.
- **When a double-precision real number is used in a timing chart data file**
  When a double-precision real number is contained in a timing chart data file created with GX Simulator, the file cannot be read.

19.5.7 Displaying list of registered devices

Display a list of registered devices.

Screen display

Select the Edit Timing Chart Format screen ⇒ [Device] ⇒ [Device List].



Display contents

Item	Description
Device List	Display devices registered on the Edit Timing Chart Format screen.

Screen button

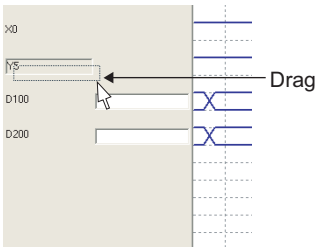
- Add
  Displays the Enter Device screen, and adds a device to the Edit Timing Chart Format screen.
- Delete
  Deletes the device being selected from the Edit Timing Chart Format screen.
- Jump
  Displays the device being selected on the Edit Timing Chart Format screen.
- Move Up / Move Down
  Moves the display position of a device being selected up/down on the Edit Timing Chart Format screen.

19.5.8 Exchanging display positions of devices

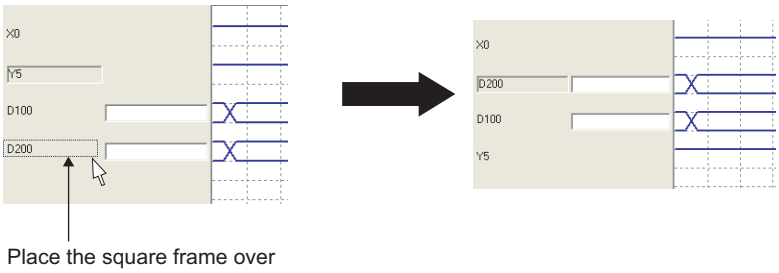
Exchange the display positions of devices by dragging and dropping a device name.

Operating procedure

1. **Drag a device name on the Edit Timing Chart Format screen.**



2. **Place the square frame over a device to be exchanged.**

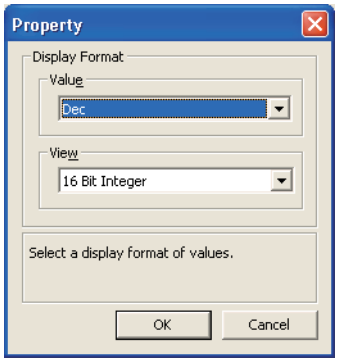


19.5.9 Changing display format of devices

Change the display format of devices registered in the Edit Timing Chart Format screen.
This function is not applicable to bit devices.

Operating procedure

1. **Select the Edit Timing Chart Format screen ⇒ [Device] ⇒ [Property].**



2. **Set the items on the screen.**

Item		Description
Display Format		–
	Value	Select the display format of values.
	View	Select the display format of devices.

3. **Click the** OK **button.**

19.6 Performing I/O System Setting Function

Q CPU L CPU Remote Head FX

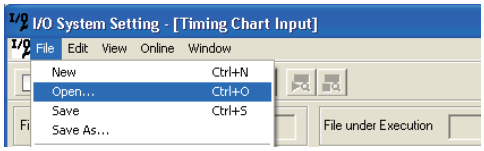
This section explains the operations of simulation using the I/O system setting function.

19.6.1 Executing simulation

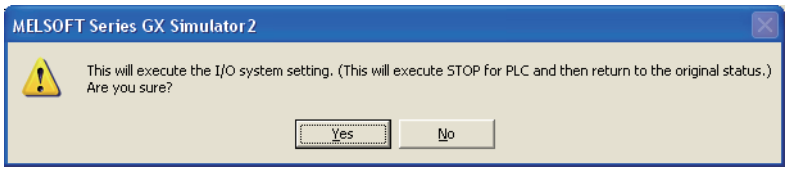
Execute simulation with settings configured using the I/O system setting function.

Operating procedure

1. **Select the I/O System Setting screen ⇒ [File] ⇒ [Open] ( ), and open an I/O system setting file (*.IOS).**



2. **Select the I/O System Setting screen ⇒ [File] ⇒ [Execute I/O System Setting] ( ).**
   The confirmation message is displayed.



3. **Click the Yes button.**

Point

- **I/O system setting files**
  When the I/O system setting function is executed after an I/O system setting file is changed, the changes are automatically overwritten to the file.
- **Simulation with the I/O system setting**
  Make sure that the simulator (virtual programmable controller) specified as execution target is in the RUN status at "LED" on the GX Simulator2 screen.
  When it is in the STOP status, sequence actions and timing charts are not performed even though conditions of the device value input or timing chart input are satisfied.

19.6.2 Disabling simulation

Stop simulation of the I/O system setting being executed by disabling the I/O system setting.

Operating procedure

- **Select the I/O System Setting screen ⇒ [File] ⇒ [Disable I/O System Setting] ( ).**

19.7 Monitoring I/O System Setting

Q CPU L CPU Remote Head FX

**This section explains how to monitor devices on the I/O System Setting screen.
Using this function, status of registered conditions can be confirmed, and values of devices registered in conditions can be changed.**

19.7.1 Starting/stopping monitoring

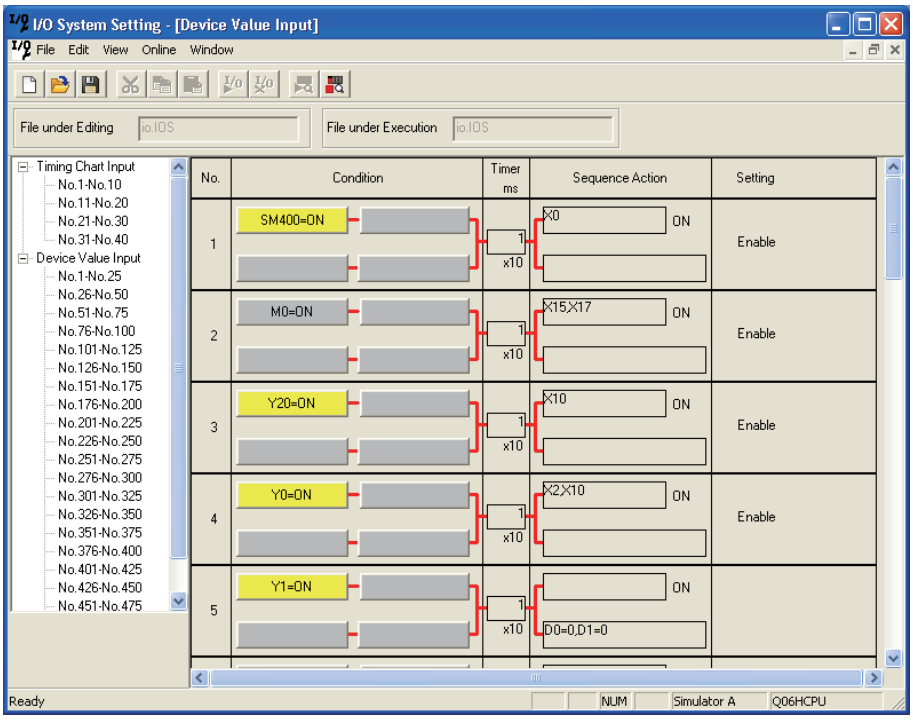
Start/stop monitoring on the I/O System Setting screen.

■ Start monitoring

Start monitoring on the I/O System Setting screen.

Operating procedure

- **Select [Online] ⇒ [Start Monitoring] ( ) on the I/O System Setting screen.**
  Monitoring starts.



■ Stop monitoring

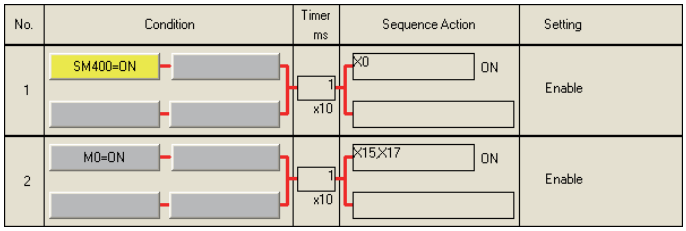
Stop monitoring on the I/O System Setting screen.

Operating procedure

- **Select [Online] ⇒ [Stop Monitoring] ( ) on the I/O System Setting screen.**

■ Screen display during monitoring

When monitoring starts, the I/O System Setting screen is displayed as shown below.
Conditions that are satisfied are displayed in yellow.



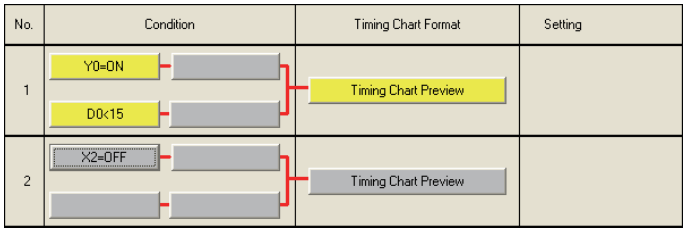
Screen button

● Timing Chart Preview

Displays the Edit Timing Chart Format screen to confirm the monitoring status.

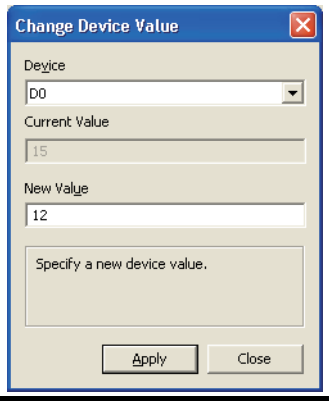
19.7.2 Changing current value of devices

Change current device value during monitoring.



Operating procedure

- **Set the items on the screen.**

Item	Description
For a bit device	Click a bit device to invert its status.
For a word device	Click a word device to display the Change Device Value screen below and change its value. 

Screen button

For the button on the screen, refer to Section 19.7.1.

19.8 Operating I/O System Setting Files

Q CPU L CPU Remote Head FX

This section explains how to operate an I/O system setting file (*.IOS).

19.8.1 Creating I/O system setting files

Create a new I/O system setting file.

Operating procedure

- **Select [File] ⇒ [New] ( ).**

19.8.2 Opening existing I/O system setting files

Open a saved I/O system setting file.

Operating procedure

1. **Select [File] ⇒ [Open] ( ).**
2. **Select a file to be opened and click the Open button.**

Point

● **Supported existing applications**
I/O system setting files created with GX Simulator Version 6 or later can also be opened.

Restrictions

● **'Push Button'/'Always ON' set with existing GX Simulator**
When an I/O system setting file in which a `Push Button'/'Always ON' is set with GX simulator is read with GX Works2, a 'Push Button' is converted to a '(blank)' and a 'Always ON' is converted to a 'SM400=ON' by QCPU (Q mode). A 'Push Button' is converted to a '(blank)' and an 'Always ON' is converted to an 'M8000=ON' by FXCPU.

19.8.3 Saving I/O system setting files

Save an I/O system setting file being open under a specified name.

Operating procedure

1. **Select [File] ⇒ [Save As].**
2. **Enter a name of the file to be saved and click the Save button.**

20 PRINTING

This chapter explains how to print data such as sequence programs and devices created with GX Works2.

20.1 Print Function

Q CPU L CPU Remote Head FX

This section explains the overview of print function and printable data.

■ Batch print and print window functions

The print functions are batch print function and print window function.

● **Batch print function**

A function to batch print multiple data in a project.

● **Print window function**

A function to print data displayed on the active window.

■ Printable and non-printable data

The following table shows the printable and non-printable data.

○: Printable ×: Non-printable

Data	Batch print	Print window
Cover	○	×
PLC parameter	○	○
Redundant parameter	○	○
Network parameter	○	○
Intelligent function module*1	×	○
Program setting*2	○	○
Ladder	○	○
SFC (MELSAP3)	○	○
SFC (MELSAP-L)*1	○	○
ST*3	○	○
Structured Ladder/FBD*3	○	○
Function/Function block program*3	○	○
Label*3	○	○
Device comment	○	○
Device memory	○	○
Device initial value*1	○	○
Change TC Setting	○	×
Device list	○	○
Cross reference	○	○
Statement/Note	○	×
Project content list	○	×
User library content list	○	×
Product information list	○	×
System monitor*1	×	○
Verification result	×	○

*1 : Not supported by FXCPU.
*2 : For FXCPU, this function is supported by Structured project only.
*3 : User library data can be printed.

Point

● **Print items on the batch print screen**
Data supported by the batch print function are displayed on the batch print screen in the order shown in the table on the previous page, and changed data are saved in the project. Therefore, when a project created in the old version of GX Works2 is opened in the new version, the listed order of the print items may be changed.
Change the order of the print items with "Set Print Order".

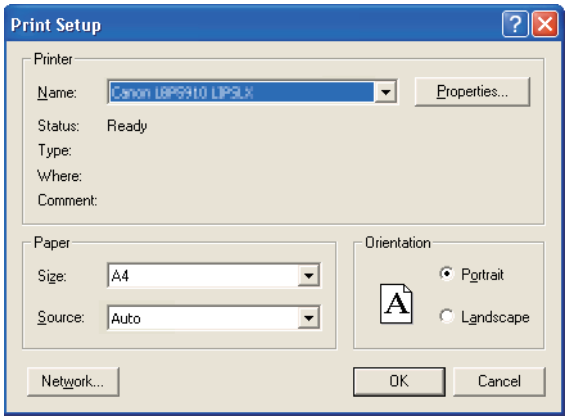
20.2 Setting Printer

Q CPU L CPU Remote Head FX

This section explains how to set a printer.
Print job output can be selected on the Printer Setup screen for batch print. For details, refer to Section 20.3.1.

Screen display

Select [Project] ⇒ [Printer Setup].



Operating procedure

1. **Set the items on the screen.**

Item		Description
Name		Select the printer to be used.
Paper		Set the paper size and paper feed method of the printer.
	Size	Select the size of paper.
	Source	Select the paper feed method.
Orientation		Set the page orientation.
	Portrait	Select this to print the page in portrait mode.
	Landscape	Select this to print the page in landscape mode.

2. **Click the** OK **button.**

Point

● **Printer settings**
Printer settings changed in GX Works2 are not saved.

Restrictions

● **Printing data using equipment such as other companies' PDF printers**
Some lines of a table may not be printed correctly.

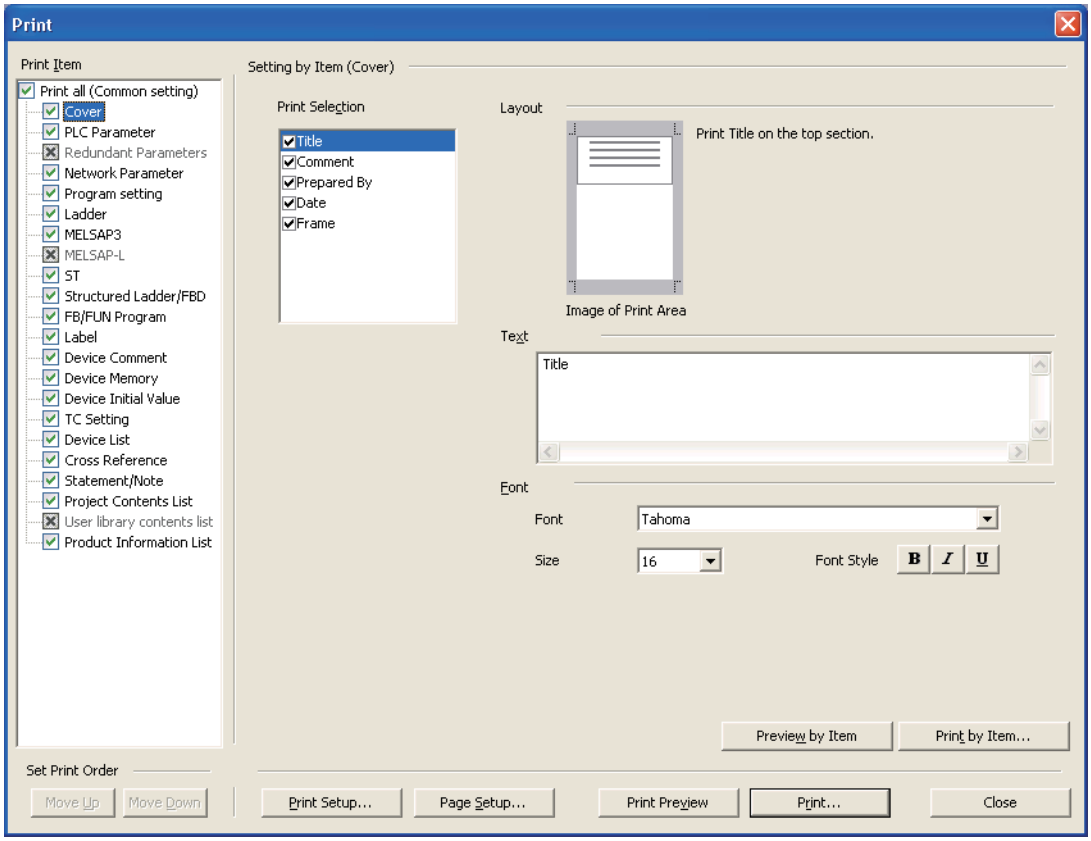
20.3 Batch Printing Project Data

Q CPU | L CPU | Remote | Head | FX

This section explains how to batch print project data.
A print preview can be displayed before printing data. For displaying a print preview, refer to Section 20.6.

Screen display

Select [Project] ⇒ [Print].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Print Item	Select the data to be printed. ☒ is displayed for items without data to be printed or items whose data is read-protected by the security setting. 🔒 is displayed for print items to which read-protected is set in the security setting.
Setting by Item	Set details of print settings for each data. (☞ Section 20.5)

2. **Click the** Print... **button.**

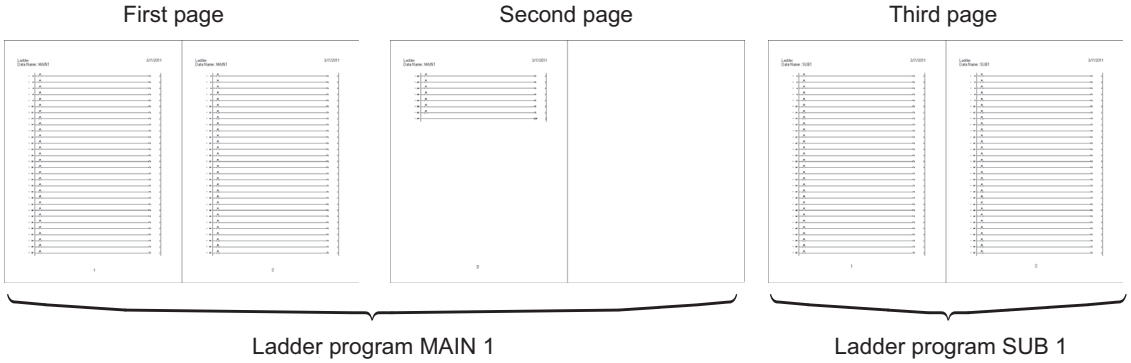
Data of items selected under "Print Item" are printed in the order from the top.

Screen button

- Move Up / Move Down
  Moves the selected item up/down under "Print Item".
- Print Setup...
  Displays the Print Setup screen. (☞ Section 20.3.1)
- Page Setup...
  Displays the Page Setup screen. (☞ Section 20.4)
  Set a header/footer of the paper on which data is printed.
- Print Preview
  Displays a print preview of the item selected under "Print Item". (☞ Section 20.6)

Point

- **Using a function to print multiple pages on a single page**
  When using the function to print multiple pages on a single page, data are printed in a group of print item.
  When data ends in the middle of the page, the next data will not be printed on the same page but will be printed on the new page.
  The following figure shows the example of printing two pages on a single page.

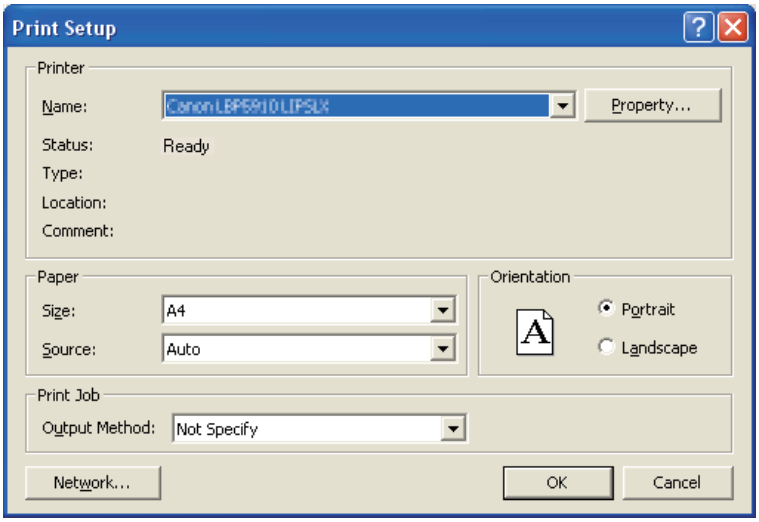


20.3.1 Setting printer for batch print

For batch print, the printer can also be set on the Print screen.
Print job output can be selected in the printer setting for batch print.
For notes and restrictions on printer setting, refer to Section 20.2.

Screen display

Select the [Print Setup...] button on the Print screen.



Operating procedure

1. **Set the items on the screen.**

Item		Description
Name		Select the printer to be used.
Paper		Set the paper size and paper feed method of the printer.
	Size	Select the size of paper.
	Source	Select the paper feed method.
Orientation		Set the page orientation.
	Portrait	Select this to print the page in portrait mode.
	Landscape	Select this to print the page in landscape mode.
Print Job		Select a method for print job output.
	Output Method	Select whether to print all print items as one print job or to print each print item separately.

2. **Click the [OK] button.**

Point

● **Printing with a PDF output printer**
For a PDF output printer which outputs print results to files, files are created for each print job. The size of the files to be created is depending on the printer driver.

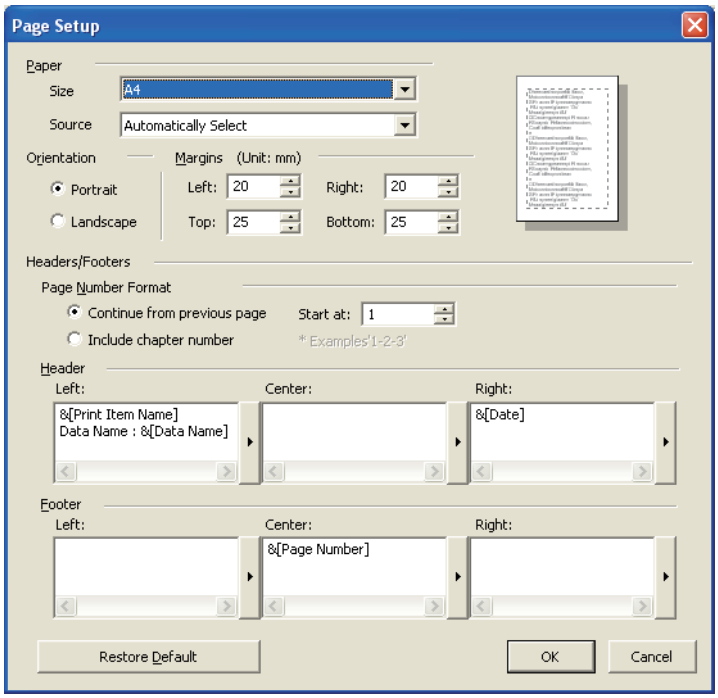
20.4 Page Set Up for Batch Print

Q CPU L CPU Remote Head FX

This section explains how to set the page setup for batch print.

Screen display

Select the Print Screen ⇒ Page Setup... **.**



Operating procedure

1. **Set the items on the screen.**

Item			Description
Paper			–
	Size		Select the paper size.
	Source		Select the paper feed method.
Orientation			Set the page orientation.
Margins (Unit: mm)			Set spaces for top/bottom/right/left of the paper.
Headers/Footers			–
	Page Number Format		Select "Continue from previous page" or "Include chapter number" for the page numbers printed in header/footer.
		Start at:	Set a page number for the first page to be printed when "Continue from Previous Page" is selected.
	Header		Enter character strings to be printed in header or footer. Up to 512 characters including string patterns and line feeds can be entered in the header/footer. Note that a line feed is handled as two characters. Click ▸ to display a list of string pattern. Selected string pattern is entered at the cursor position.
	Footer		

2. **Click the** OK **button.**

Screen button

● Restore Default

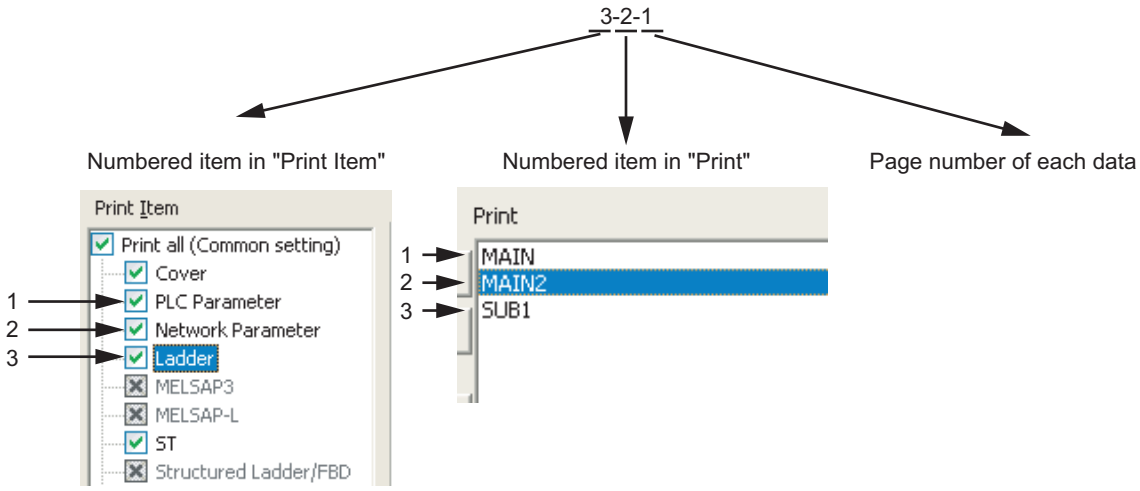
Restores the default setting of header/footer.

Point

● **Printing chapter numbers**

By selecting "Include chapter number", page numbers are displayed with: the numbered item in "Print Item", the numbered item in "Print", and the page number of each data. Even when there is no actual data to be printed in "Print Item" or "Print", the numbers with the chapter number format will be assigned in order.

The following figure shows an example of page number assignment with the chapter number format.



● **When characters which exceed the maximum number of characters are entered to header/footer**

When the project is opened in GX Works2 with a language different from the opened project data, characters which exceed 512 characters may be displayed.

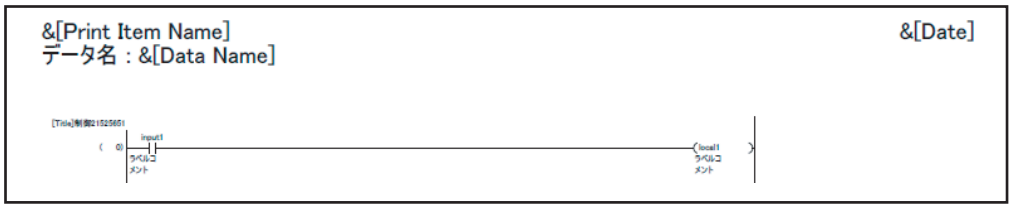
When characters which exceed 512 characters are entered to the header/footer, characters cannot be entered or pasted; however, they can be deleted or cut.

● **Header and footer**

String patterns of header/footer may not function when a project created in GX Works2 in other language is opened, or a project created in GX Works2 Version 1.64S or later is opened in GX Works2 Version 1.62Q or earlier.

When the string pattern of header and footer do not function, set the setting again.

<When a project created in GX Works2 Version 1.64S or later is opened in GX Works2 Version 1.62Q or earlier>



20.5 Setting Details of Batch Print

Q CPU L CPU Remote Head FX

This section explains how to set items for the batch print function.

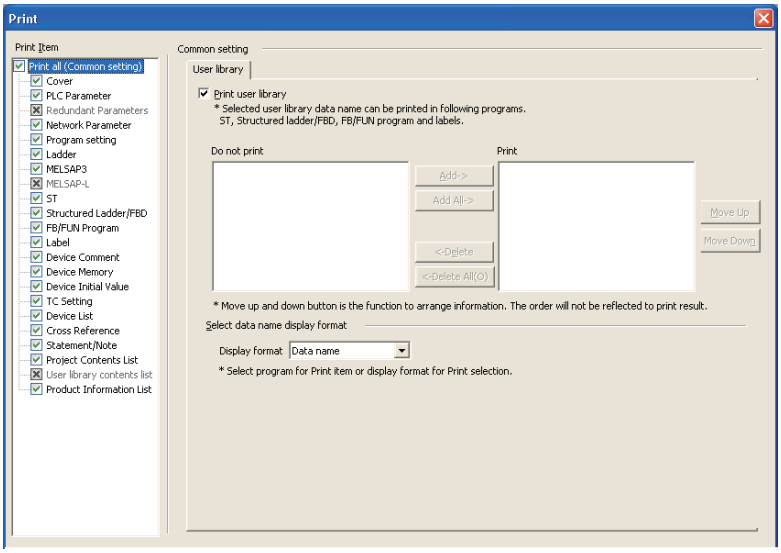
20.5.1 Setting common items (batch-print setting for user library data)

Set items to print user library data.
Selected user library data names can be printed under the following print items.

- ST
- Structured Ladder/FBD
- FB/FUN program
- Label

Screen display

Select "Print all (Common setting)" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item	Description
User library	–
Print user library*1	Select this to print user library data.
Do not print	Display data names which will not be printed
Print	Display data names to be printed. Data are printed in the order from the top.
Select data name display format	–
Display format	Select a display format of data name when ST, Structured Ladder/FBD, FB/FUN program, or label is selected.

*1 : This item cannot be selected for Simple project.

Screen button

- Add->
  Moves data selected in "Do not print" to "Print".
- Add All->
  Moves all data in "Do not print" to "Print".
- <-Delete
  Moves data selected in "Print" to "Do not print".
- <-Delete All(O)
  Moves all data in "Print" to "Do not print".
- Move Up / Move Down
  Moves data selected in "Print" up/down.

Point

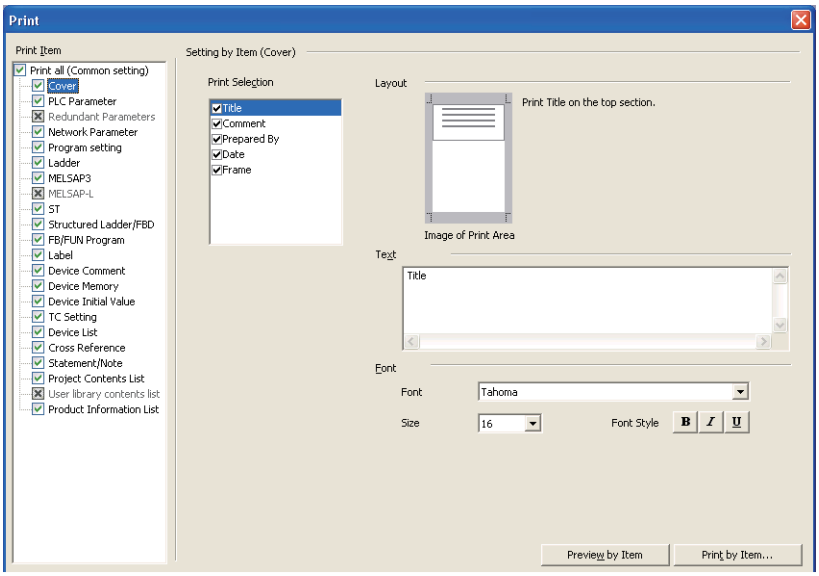
- **Printing read protected data**
  When printing read protected data displayed on the field of "Do not print", enable the editing status of the user library for editing.
  For details of editing user library, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Structured Project)

20.5.2 Setting batch print for cover

Set items to print a cover.

Screen display

Select "Cover" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Print Selection		Select the item(s) to be printed.
Layout		Display print area of the item(s) selected for "Print Selection".
Text		Enter text for each item to be printed. Text can be entered when "Title", "Comment", "Prepared By", and/or "Date" are selected for "Print Selection". A maximum of 200 characters can be set for each item. Note that a line feed is handled as two characters. The numbers of characters and lines that can be printed differ according to the size or font setting of print paper. Check the print image with the print preview function.
Font		Set fonts for each item to be printed. Fonts can be set when "Title", "Comment", "Prepared By", and/or "Date" are selected for "Print Selection".
	Font	Select a font.
	Size	Select a font size.
	Font Style	Select a font style.

Screen button

- Print by Item...

  Prints items selected in "Print Item".

- Preview by Item

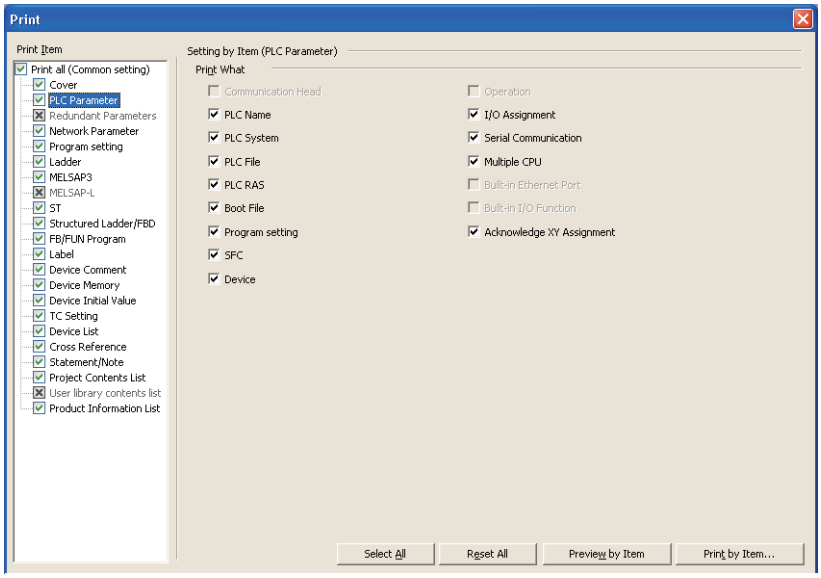
  Displays a print preview of items selected in "Print Item".

20.5.3 Setting batch print for PLC parameter

Set items to print PLC parameter.

Screen display

Select "PLC Parameter" in "Print Item" on the Print screen.
The following is an example of setting screen when QCPU (Q mode) is selected.



Operating procedure

- **Set the item on the screen.**

Item	Description
Print What	Select the item(s) of PLC parameter to be printed.

Screen button

For the screen buttons, refer to Section 20.5.2.

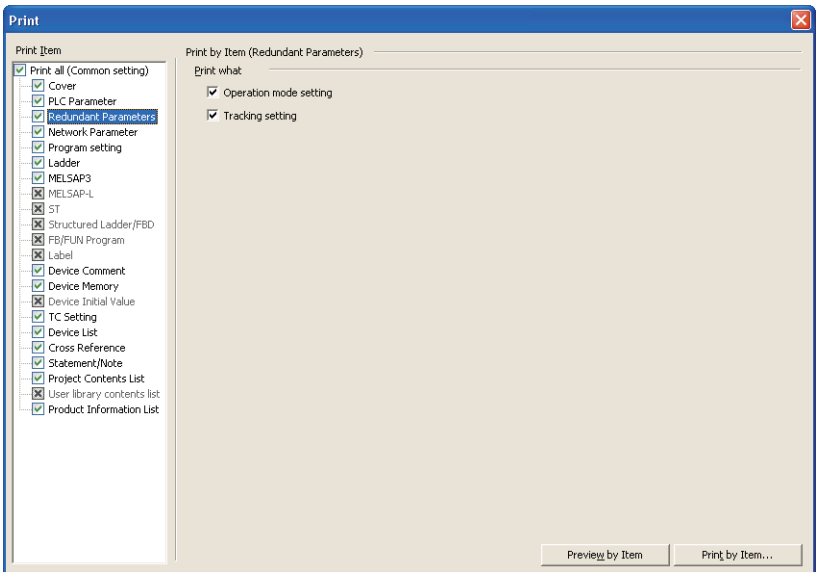
- Select All
  Selects all items.
- Reset All
  Clears the selection of all items.

20.5.4 Setting batch print for redundant parameters

Set items to print redundant parameters.

Screen display

Select "Redundant Parameter" in "Print Item" on the Print screen.



Operating procedure

- **Set the item on the screen.**

Item	Description
Print what	Select the item(s) of redundant parameters to be printed.

Screen button

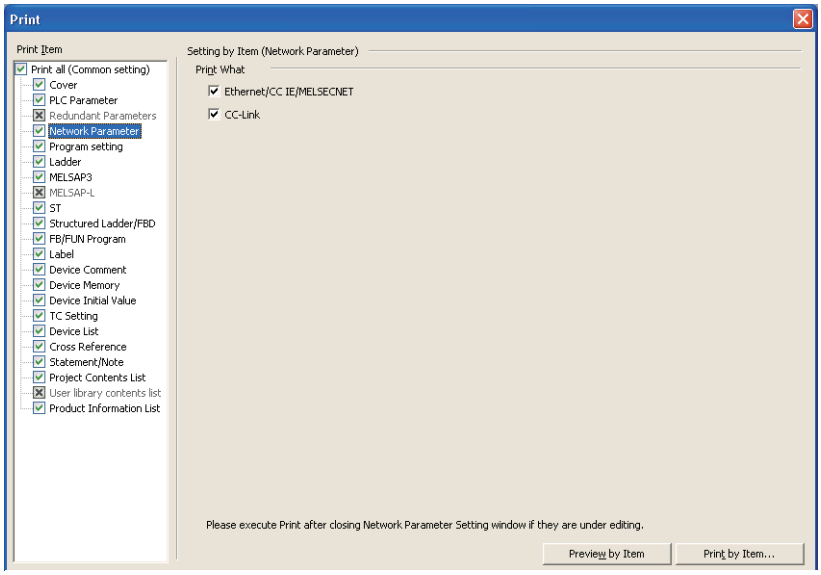
For the screen buttons, refer to Section 20.5.2.

20.5.5 Setting batch print for network parameter

Set items to print the network parameter.

Screen display

Select "Network Parameter" in "Print Item" on the Print screen.
The following is an example of setting screen when QCPU (Q mode) is selected.



Operating procedure

- **Set the item on the screen.**

Item	Description
Print What	Select the item(s) of network parameter to be printed.

Screen button

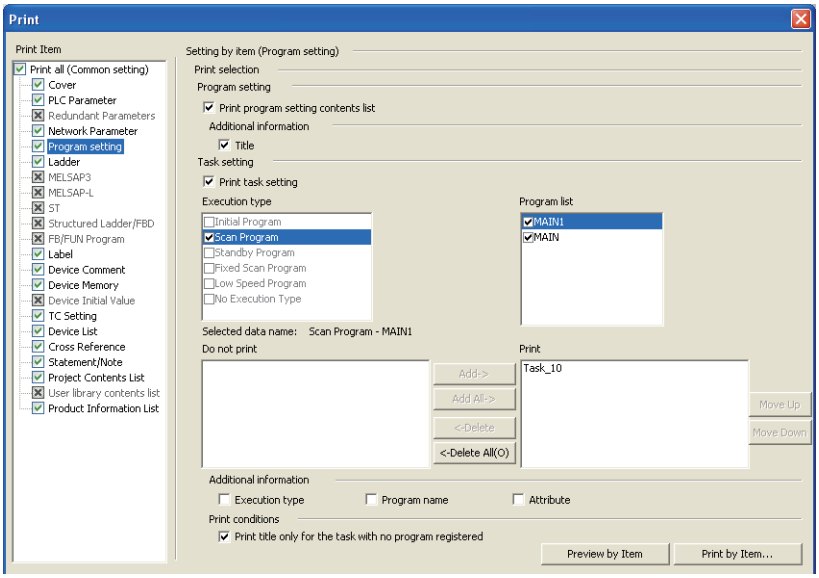
For the screen buttons, refer to Section 20.5.2.

20.5.6 Setting batch print for program settings

Set items to print program settings on the Navigation window.
For FXCPU, this function is supported by Structured project only.

Screen display

Select "Program setting" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item			Description
Print selection			–
	Program setting		Select this to print the list of program setting content.
		Additional information	Select this to print the titles of the list of program setting content.
	Task setting*1		Select this to print tasks registered in the program setting.
		Execution type	Select the execution types to be printed. Data are printed in the order from the top.
		Program list	Select the programs to be printed. Data are printed in the order from the top.
		Select data name	Items selected for "Execution type" and "Program list" are displayed.
		Do not print	Display data names which will not be printed
		Print	Display data names to be printed. Data are printed in the order from the top.
		Additional information	Append selected items to the task setting.
		Print conditions	Set the conditions for printing.
			Print title only for the task with no program registered	Select this to print only titles even when programs are not registered to the task. When this item is selected, only header, footer, and/or title are printed for each data on one page.

*1 : This item cannot be selected for Simple project.

Screen button

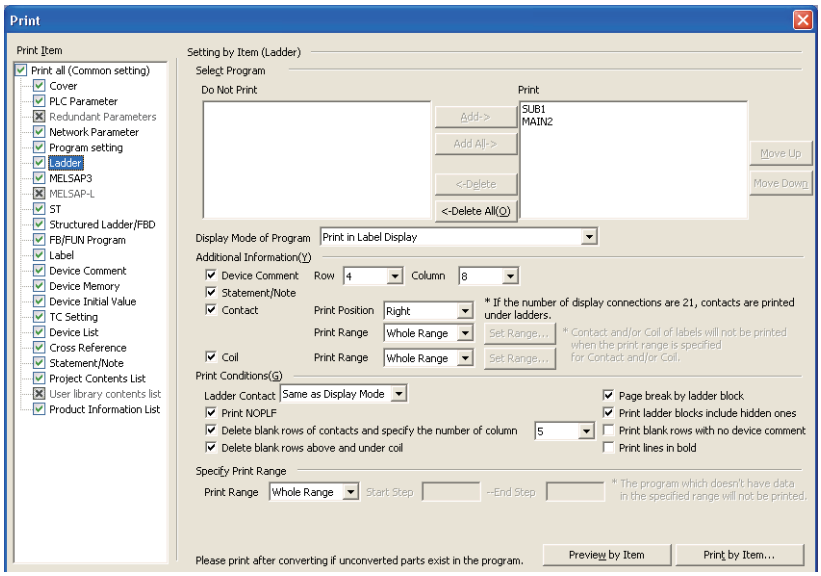
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.7 Setting batch print for ladder programs

Set items to print ladder programs.

Screen display

Select "Ladder" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Select Program		Display all data names of ladder program.
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Display Mode of Program*1		Select whether to print data in label display or device display.
Additional Information		Append selected items to the ladder program.
	Device Comment	Select this to append device comments. For labels, label comments are appended. Set the number of comment rows and columns to be printed.
	Statement/Note	Select this to append statements and notes.
	Contact	Select this to append contact usage destination. Set the print position and print range. To specify the print range, click the Set Range... button, and set the device range on the Device Range Setting (Contact) screen.
	Coil	Select this to append coil usage destination. Set a print range. To specify the print range, click the Set Range... button, and set the device range on the Device Range Setting (Coil) screen.

Item		Description
Print Conditions		Set the conditions for printing ladder programs.
	Ladder Contact	Set the number of contacts to be printed.
	Print NOPLF*2	Select this to print the NOPLF instructions. (Data will be printed on the new page at the NOPLF instruction in the program with or without this item is selected.)
	Delete blank rows of contacts and specify the number of column	Select this to print programs with blank rows of contact usage destination closed up. When this item is selected, the number of columns of contact usage destination can be selected.
	Delete blank rows above and under coil	Select this to print programs with blank rows of coil usage destination closed up.
	Page break by ladder block	Select this to print data on the new page in ladder block unit. When this item is cleared, data is printed on the new page in ladder row unit.
	Print ladder blocks include hidden ones*3	Select this to print hidden ladder blocks.
	Print blank rows with no device comment	Select this to print blank rows which do not contain device comments.
	Print lines in bold	Select this to print programs with bold lines.
Specify Print Range		–
	Print Range	Set the ladder program print range. To specify the print range, select "Specify Range" and set a start step and an end step.

*1 : For FXCPU Simple projects (with labels), when a block password with the validated setting for "Read-protect the execution program" exists, Preview by Item, Print by Item..., Print Preview, and Print... cannot be used with the device display.

*2 : Not supported by FXCPU.

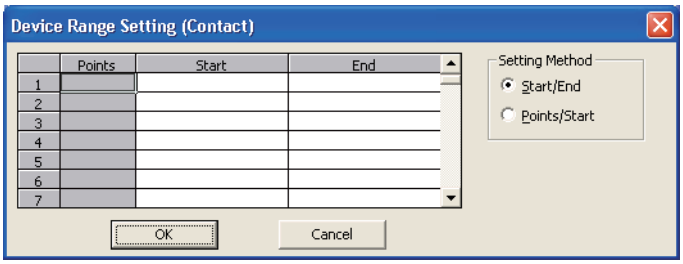
*3 : For projects with labels, this item can be selected only when "Print in Label Display" is selected for "Display Mode of Program".

Screen button

For the screen For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

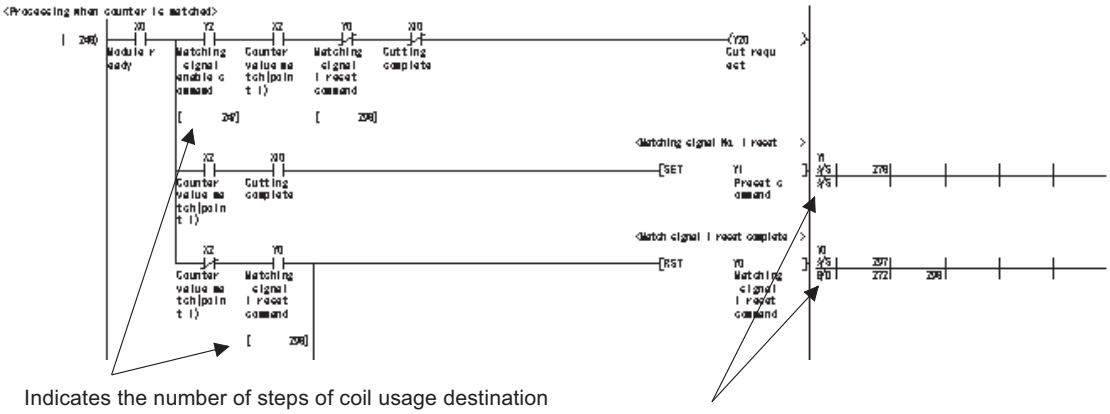
● Set Range...

Displays the Device Range Setting screen.



■ Contact/coil usage destination

Contact usage destination and coil usage destination are output as shown below.

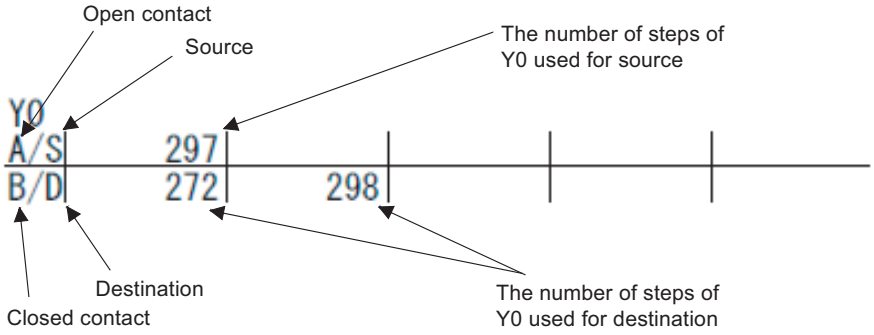


Indicates the number of steps of coil usage destination

Indicates the number of steps of contact usage destination

The following shows an example of contact usage destination.

Example) Contact usage destination of Y0



● Printing examples with a setting of "Delete blank rows of contacts and specify the number of column"

The following examples show the difference of printing contact usage destination according to the setting of "Delete blank rows of contacts and specify the number of column".

< Without the item selected (5 columns) >

M1					
A/S	4	5	6	7	8
B/D	10	11	12	13	14
M1					
A/S	16	17	18	19	20
B/D	22	23	24	25	26

< With the item selected (5 columns) >

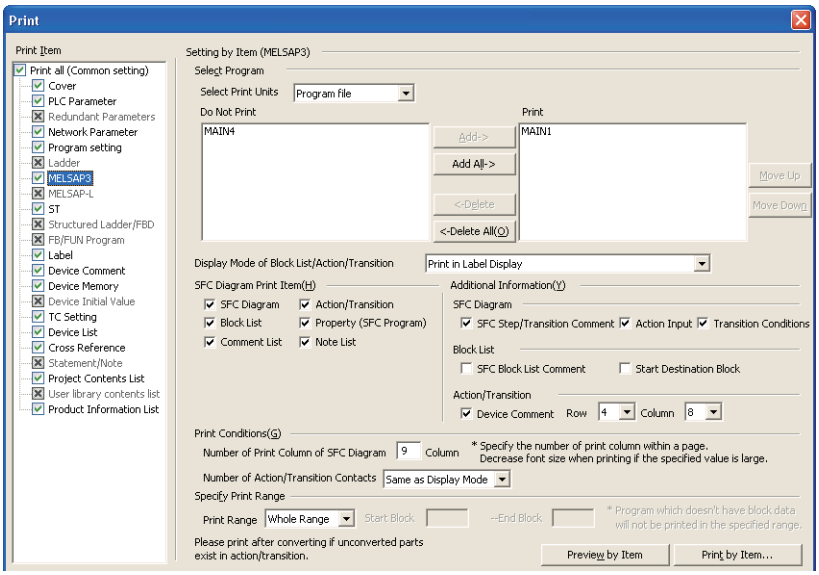
M1					
A/S	4	5	6	7	8
	16	17	18	19	20
B/D	10	11	12	13	14
	22	23	24	25	26

20.5.8 Setting batch print for MELSAP3 programs

Set items to print SFC (MELSAP3) programs.

Screen display

Select "MELSAP3" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Select Program		Display data names of SFC (MELSAP3) program.
	Select print units*1	Select either "Program block" or "Program file".
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Display Mode of Block List/ Action/Transition*2		Select whether to print data in label display or device display. This item can be selected only when "Block List" or "Action/Transition" is selected in "SFC Diagram Print Item".
SFC Diagram Print Item		Select the item(s) to be printed in SFC diagram.
	SFC Diagram	Select the item(s) to be printed.
	Block List*3	
	Comment List	
	Action/Transition	
	Property (SFC Program)*3,*4	
	Note List	

Item			Description
Additional Information			Append selected item(s) to "SFC Diagram Print Item".
	SFC Diagram		–
		SFC Step/Transition Comment	Select this to append SFC steps/transition comments to the SFC diagram.
		Action	Select this to append operation outputs to the SFC diagram.
		Transition	Select this to append transition conditions to the SFC diagram.
	Block List*4		–
		SFC Block List Comment	Select this to append SFC block list comments to the block list.
		Start Destination Block	Select this to append start destination block to the block list.
	Action/Transition		–
		Device Comment	Select this to append device comments to Action/Transition. For labels, label comments are appended. Set the numbers of rows and columns for comments to be printed.
Print Conditions			Set conditions for printing programs.
	Number of Print Column of SFC Diagram		Specify the number of columns of SFC diagram to be printed on a single page. The program is printed with reducing the size to fit the specified number of columns on a single page.
	Number of Action/Transition Contacts		Set the number of contacts to be printed.
Specify Print Range			–
	Print Range*3		Set the SFC (MELSAP3) program print range. To specify the print range, select "Specify Range" and set a start block and an end block.

*1 : This item cannot be selected for Simple project.
*2 : For Simple projects (without labels), this item is fixed to "Print in Device Display".
*3 : For Structured projects, this item cannot be selected when "Program block" is selected for "Select print units".
*4 : Not supported by FXCPU.

Screen button

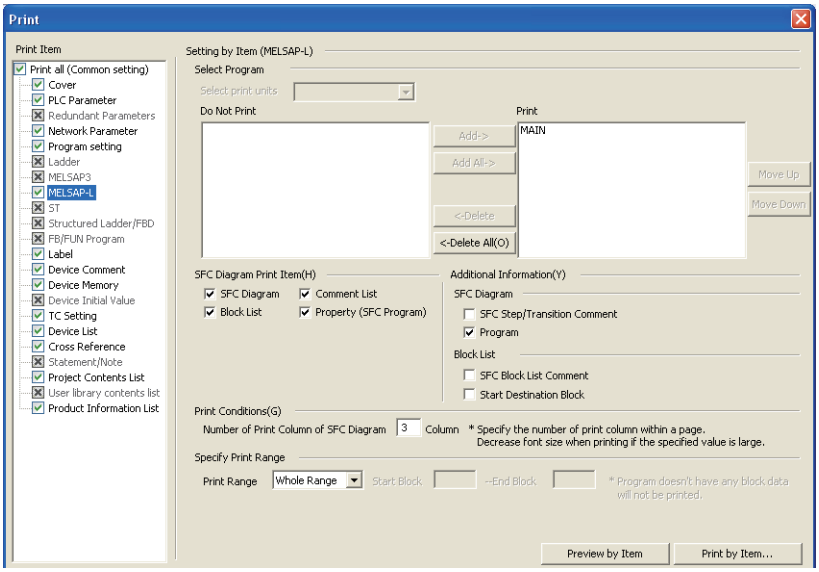
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.9 Setting batch print for MELSAP-L programs

Set items to print SFC (MELSAP-L) programs.
This setting is not supported by FXCPU.

Screen display

Select "MELSAP-L" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item			Description
Select Program			Display all data names of SFC (MELSAP-L) program.
	Select print units*1		Select either "Program block" or "Program file".
	Do Not Print		Display data names which will not be printed.
	Print		Display data names to be printed. Data are printed in the order from the top.
SFC Diagram Print Item			Select the item(s) to be printed in SFC diagram.
	SFC Diagram		Select the item(s) to be printed.
	Block List		
	Comment List		
	Property (SFC Program)		
Additional Information			Append selected item(s) to "SFC Diagram Print Item".
	SFC Diagram		–
		SFC Step/Transition Comment	Select this to append SFC steps/transition comments to the SFC diagram.
		Program	Select this to append programs to the SFC diagram.
	Block List		–
		SFC Block List Comment	Select this to append SFC block list comments to the block list.
		Start Destination Block	Select this to append start destination block to the block list.
Print Conditions			Set conditions for printing programs.
	Number of Print Column of SFC Diagram		Specify the number of columns of SFC diagram to be printed on a single page. The program is printed with reducing the size to fit the specified number of columns on a single page.
Specify Print Range			–
	Print Range		Set the SFC (MELSAP-L) program print range. To specify the print range, select "Specify Range" and set a start step and an end step.

*1 : This item cannot be selected for Simple project.

Screen button

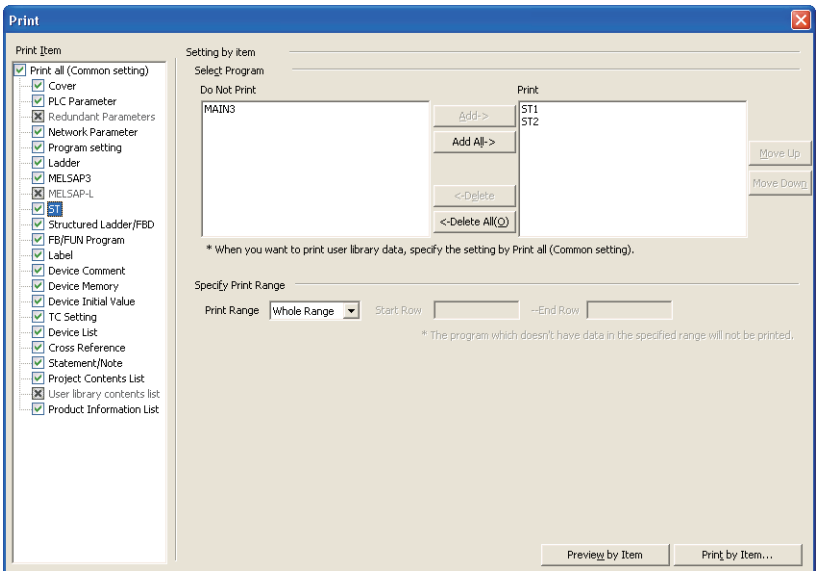
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.10 Setting batch print for ST programs

Set items to print ST programs.

Screen display

Select "ST" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Select Program		Display all data names of ST program.
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Specify Print Range		–
	Print Range	Set the ST program print range. To specify the print range, select "Specify Range" and set a start line and an end line.

Screen button

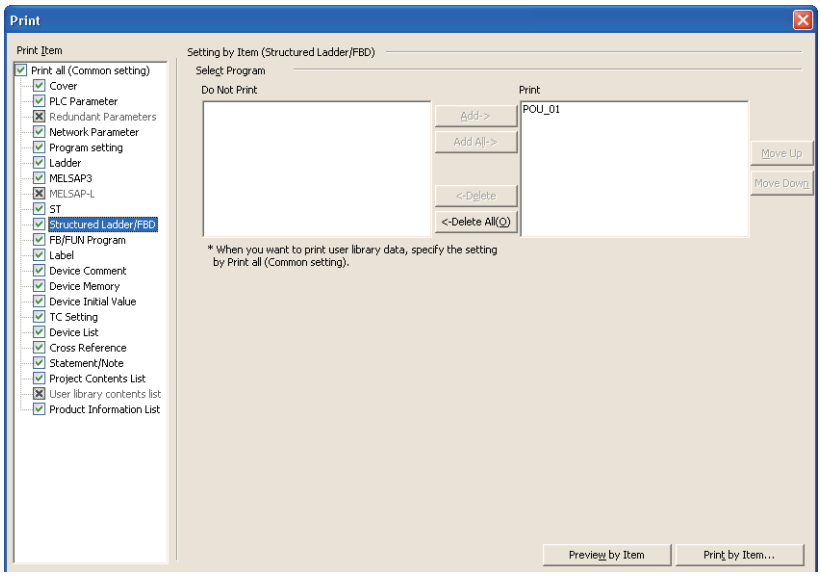
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.11 Setting batch print for Structured Ladder/FBD programs

Set items to print Structured Ladder/FBD programs.

Screen display

Select "Structured Ladder/FBD" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Select Program		Display all data names of Structured Ladder/FBD program.
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.

Screen button

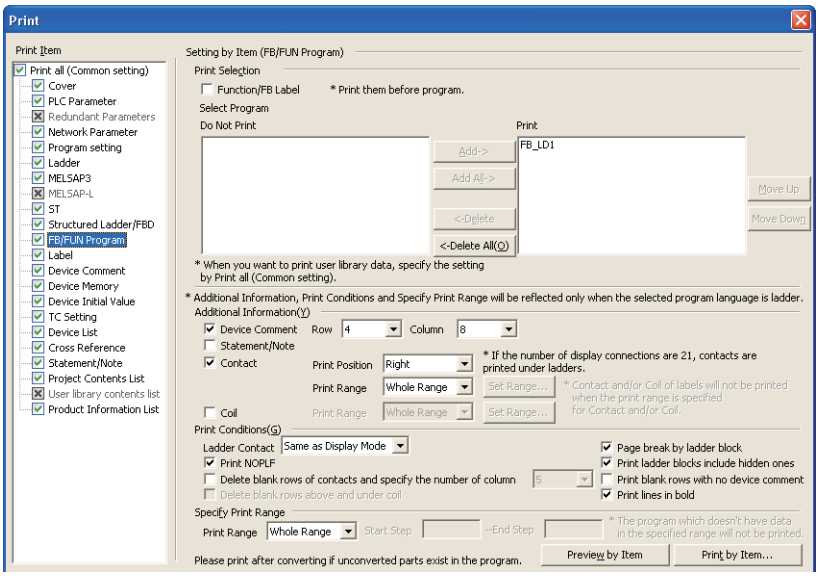
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.12 Setting batch print for FB/FUN programs

Set items to print function and function block programs.

Screen display

Select "FB/FUN Program" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item			Description
Print Selection			–
	Function/FB Label		Select this to print function/function block labels.
	Select Program		Display all data names of function/function block program.
		Do Not Print	Display data names which will not be printed.
		Print	Display data names to be printed. Data are printed in the order from the top.
Additional Information			Append selected items to the ladder program.
	Device comment		Select this to append device comments. For labels, label comments are appended. Set the number of comment rows and columns to be printed.
	Statement/Note		Select this to append statements and notes.
	Contact		Select this to append contact usage destination. Set the print position and print range. To specify the print range, click the [Set Range...] button, and set the device range on the Device Range Setting (Contact) screen.
	Coil		Select this to append coil usage destination. Set a print range. To specify the print range, click the [Set Range...] button, and set the device range on the Device Range Setting (Coil) screen.

Item		Description
Print Conditions		Set the conditions for printing ladder programs.
	Ladder Contact	Set the number of contacts to be printed.
	Print NOPLF*1	Select this to print the NOPLF instructions. (Data will be printed on the new page at the NOPLF instruction in the program with or without this item is selected.)
	Delete blank rows of contacts and specify the number of column	Select this to print programs with blank rows of contact usage destination closed up. When this item is selected, the number of columns to be printed can be selected.
	Delete blank rows above and under coil	Select this to print programs with blank rows of coil usage destination closed up.
	Page break by ladder block	Select this to print data on the new page in ladder block unit. When this item is cleared, data is printed on the new page in ladder row unit.
	Print ladder blocks include hidden ones*2	Select this to print hidden ladder blocks.
	Print blank rows with no device comment	Select this to print blank rows which do not contain device comments.
	Print lines in bold	Select this to print programs with bold lines.
Specify Print Range		–
	Print Range	Set the ladder program print range. To specify the print range, select "Specify Range" and set a start step and an end step.

*1 : Not supported by FXCPU.

*2 : For projects with labels, this item can be selected only when "Print in Label Display" is selected for "Display Mode of Program".

Screen button

For the screen buttons, refer to Section 20.5.1, Section 20.5.2, and Section 20.5.7.

Point

● **Data to be printed in FB/FUN programs**

Data to be printed in FB/FUN programs are function blocks created in ladder programs and functions/function blocks created in ST programs or Structured Ladder/FBD programs.

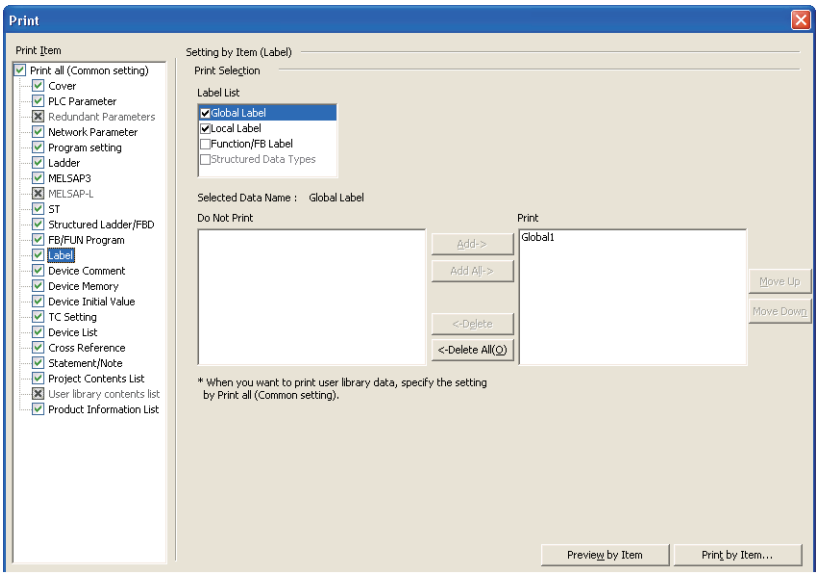
Display-prohibited programs are not displayed in "Select Program".

20.5.13 Setting batch print for labels

Set items to print label data.

Screen display

Select "Label" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Print Selection		Display all data names of label.
	Label List	Select the label type(s) to be printed. Data are printed in the order from the top. The item is displayed in gray when data to be printed do not exist.
	Select Data Name	Display items selected in "Label List".
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.

Screen button

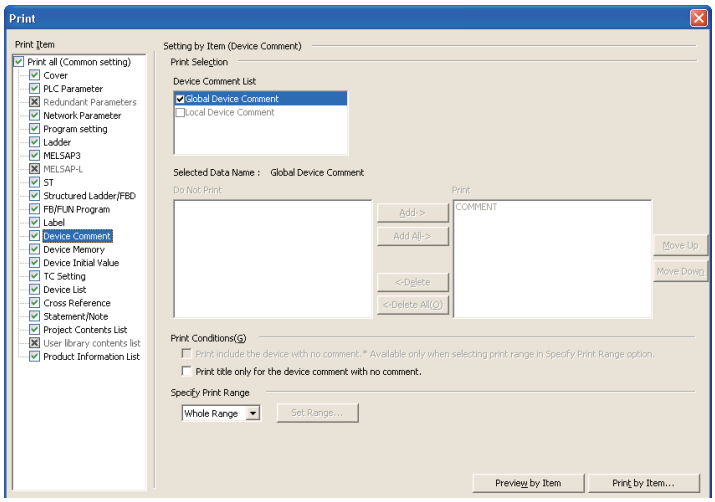
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.14 Setting batch print for device comments

Set items to print device comment data.

Screen display

Select "Device Comment" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Print Selection		Display all data names of device comment.
	Device Comment List	Select the device comment to be printed. Data are printed in the order from the top. The item is displayed in gray when data to be printed do not exist, or all data are read protected.
	Select Data Name	Display items selected in "Device Comment List".
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Print Conditions		–
	Print include the device with no comment. *Available only when selecting print range in Specify Print Range option.	Select this to print data including devices to which device comments are not registered.
	Print title only for the device comment with no comment.	Select this to print only titles of data to which device comments are not registered. When this item is selected, only header, footer, and/or title are printed for each data on one page.
Specify Print Range		Set the device comment print range. To specify the print range, select "Specify Range" and set the device range by clicking the Set Range... button. Since direct inputs (DX) and direct outputs (DY) are device comments as same as inputs (X) and outputs (Y), they are not printed when "Whole Range" is selected. When printing direct inputs (DX) or direct outputs (DY), select "Specify Print Range", and set the device range.

Screen button

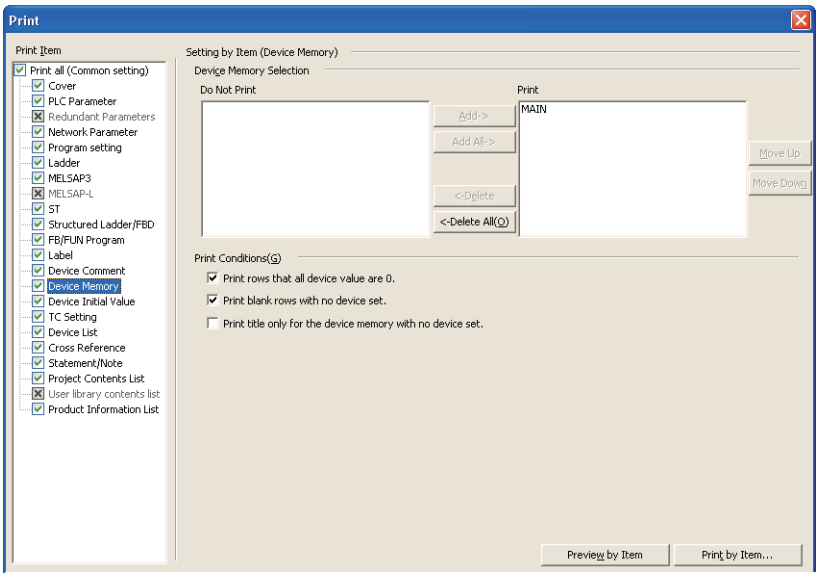
For the screen buttons, refer to Section 20.5.1, Section 20.5.2, and Section 20.5.7.

20.5.15 Setting batch print for device memory data

Set items to print device memory data.

Screen display

Select "Device Memory" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Device Memory Selection		Display all data names of device memory.
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Print Conditions		–
	Print rows that all device value are 0.	Select this to print rows in which device values are all 0.
	Print blank rows with no device set.	Select this to print rows in which devices are not set.
	Print title only for the device memory with no device set.	Select this to print only titles of device memory data in which devices to be printed are not set. When this item is selected, only header/footer/titles are printed on a single page per data.

Screen button

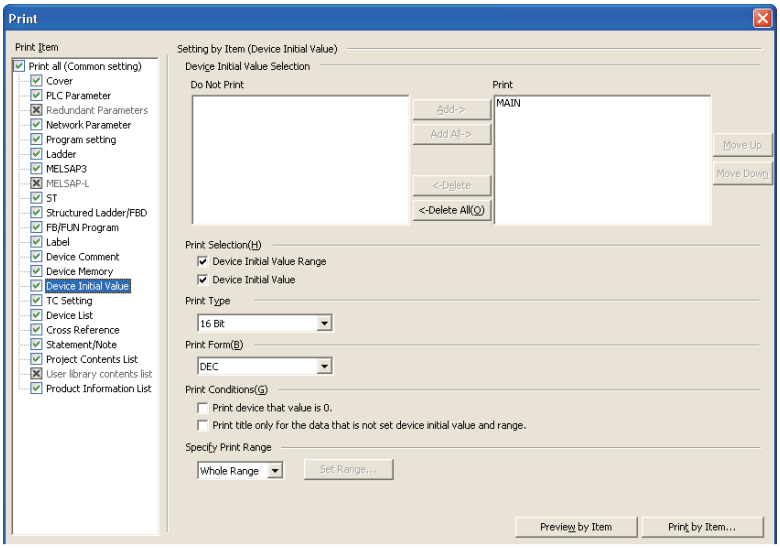
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.16 Setting batch print for device initial values

Set items to print device initial values.
This setting is not supported by FXCPU.

Screen display

Select "Device Initial Value" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Device Initial Value Selection		Display all data names of device initial values.
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Print Selection		–
	Device Initial Value Range	Select this to print specified range of device initial values.
	Device Initial Value	Select this to print device initial values (device values).
Print Type		Select a bit unit for handling device initial values for printing.
Print Form		Select a data format of device initial value for printing.
Print Conditions		–
	Print device that value is 0.	Select this to print devices whose value is 0.
	Print title only for the data that is not set device initial value and range.	Select this to print only titles of data to which the device initial value range is not set, or data which do not contain devices to be printed. When this item is selected, only header/footer/titles are printed on a single page per data.
Specify Print Range		Set the device initial value print range. To specify the print range, select "Specify Range" and set the device range by clicking the Set Range... button.

Screen button

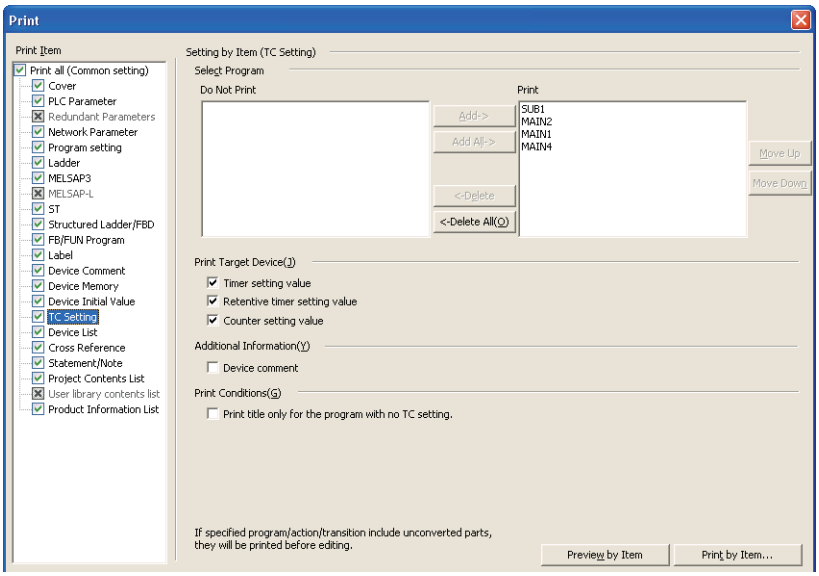
For the screen buttons, refer to Section 20.5.1, Section 20.5.2, and Section 20.5.7.

20.5.17 Setting batch print for TC setting values

Set items to print TC setting values.

Screen display

Select "TC Setting" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Select Program		Display all data names of ladder/MELSAP3/MELSAP-L programs.
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Print Target Device		Select the item to be printed.
	Timer setting value	Select this to print timer setting values. Labels to which timer is set as a data type are also printed.
	Retentive timer setting value*1	Select this to print retentive timer setting values. Labels to which retentive timer is set as a data type are also printed.
	Counter setting value	Select this to print counter setting values. Labels to which counter is set as a data type are also printed.
Additional Information		Append the selected item to the devices to be printed.
	Device comment	Select this to append device comments. For labels, label comments are appended.
Print Conditions		–
	Print title only for the program with no TC setting.	Select this to print only titles of programs which do not contain TC setting values. When this item is selected, only header/footer/titles are printed on a single page per data.

*1 : Not supported by FXCPU.

Screen button

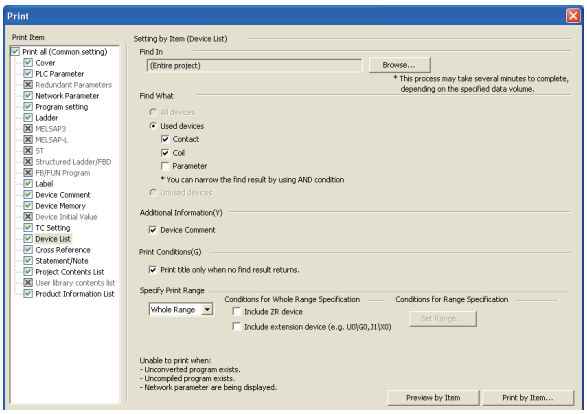
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.18 Setting batch print for device list

Set items to print the device list.

Screen display

Select "Device List" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item			Description
Find In			Set a search location of data to be printed. Click the Browse... button to select a search location. A search location cannot be entered directly.
Find What			Set a search target for devices to be printed.
	All devices		Select this to search all devices.
	Used devices		Select this to search devices used for contacts, coils, and parameters. Selected items are searched.
	Unused devices		Select this to search devices which are not used.
Additional Information			Append the selected item(s) to the device list.
	Device Comment		Select this to append device comments.
Print Conditions			–
	Print title only when no find result returns.		Select this to print only titles even when the program does not contain any devices. When this item is selected, only header/footer/titles are printed on a single page.
Specify Print Range			Set the device comment print range. To specify the print range, select "Specify Range" and set the device range for "Conditions for Range Specification".
	Conditions for Whole Range Specification		–
		Include ZR device	Select this to include ZR devices in the print target when "Whole Range" is specified for "Specify Print Range".
		Include extension device (e.g. U0\G0, J1\X0)	Select this to include extended devices in the print target when "Whole Range" is specified for "Specify Print Range". (BLm\Sn and BLm\TRn devices are printed with or without this item is selected.)
	Conditions for Range Specification		Set a range of devices to be printed.

Screen button

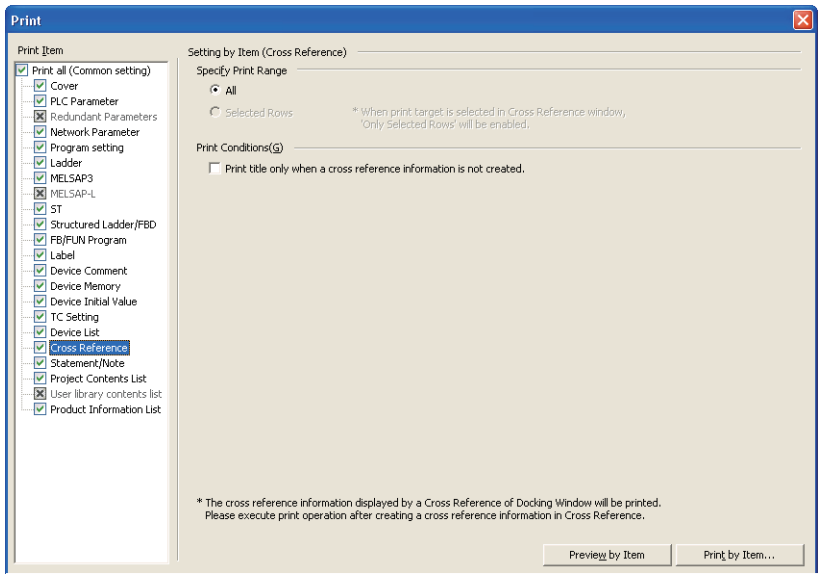
For the screen buttons, refer to Section 20.5.1, Section 20.5.2, and Section 20.5.7.

20.5.19 Setting batch print for cross reference information

Set items to print cross reference information created on the Cross Reference window.

Screen display

Select "Cross Reference" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Specify Print Range		–
	All	Select this to print all rows.
	Selected Rows	Select this to print selected row(s). Select the row(s) to be printed on the Cross Reference window in advance.
Print Conditions		–
	Print title only when a cross reference information is not created.	Select this to print only titles when the cross reference information is not created. When this item is selected, only header/footer/table titles are printed on a single page.

Screen button

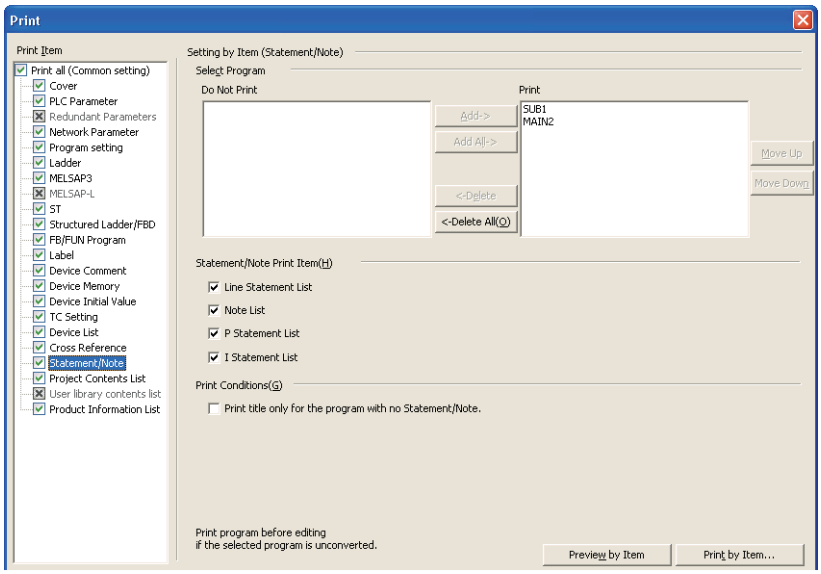
For the screen buttons, refer to Section 20.5.2.

20.5.20 Setting batch print for statements/notes

Set items to print statement/note data.

Screen display

Select "Statement/Note" in "Print Item" on the Print screen.



Operating procedure

- **Set the items on the screen.**

Item		Description
Select Program		Display all program names of ladder program.
	Do Not Print	Display data names which will not be printed.
	Print	Display data names to be printed. Data are printed in the order from the top.
Statement/Note Print Item		Selected items are printed.
	Line Statement List	Select the item(s) to be printed.
	Note List	
	P Statement List	
	I Statement List	
Print Conditions		–
	Print title only for the program with no Statement/Note.	Select this to print only titles of data in which statements/notes do not exist. When this item is selected, only header, footer, and/or title are printed for each data on one page.

Screen button

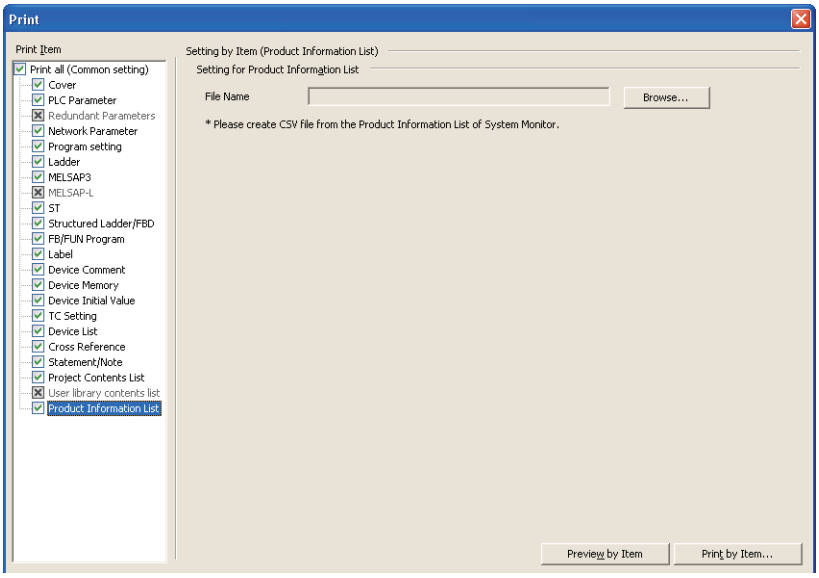
For the screen buttons, refer to Section 20.5.1 and Section 20.5.2.

20.5.21 Setting batch print for product information list

Set items to print the product information list created on the System Monitor screen.
This setting is not supported by FXCPU.

Screen display

Select "Product Information List" in "Print Item" on the Print screen.



Operating procedure

- **Set the item on the screen.**

Item		Description
Setting for Product Information List		–
	File Name	Set a product information list file to be printed. Click the Browse... button to select a product information list file. A product information list file cannot be entered directly.

Screen button

For the screen buttons, refer to Section 20.5.2.

Point

● **Printable product information list files**
Only the product information list files created on the System Monitor screen in GX Works2 can be printed.
Product information list files created in GX Developer cannot be printed.

20.6 Displaying Batch Print Preview

Q CPU | L CPU | Remote | Head | FX

This section explains how to check the print image of each data.

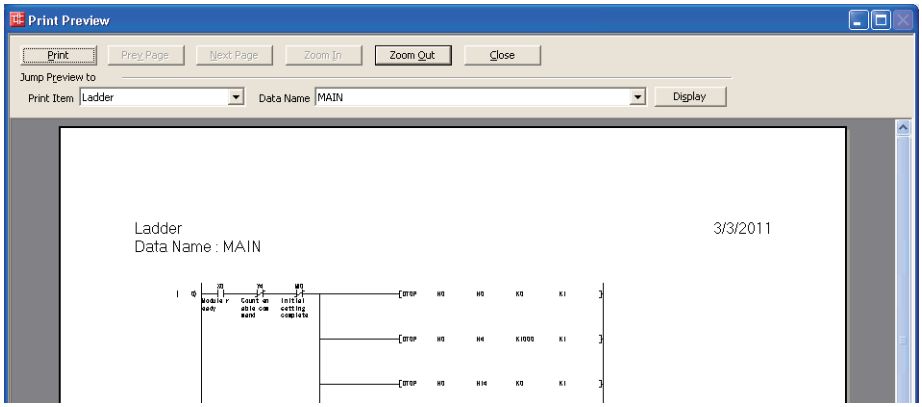
Operating procedure

1. **Select [Project] ⇒ [Print Preview].**

   The Print screen is displayed. (☞ Section 20.3)

2. **Click the** Print Preview **button.**

   The Print Preview screen is displayed.



3. **Select items in "Print Item" and "Data Name" to change the data and check the print image.**

4. **Click the** Print Preview **button.**

   The print image of the selected data is displayed.

Screen button

- Print...

  Prints data.

- Prev Page / Next Page

  Displays the previous page/next page.

- Zoom In / Zoom Out

  Changes the display size of print image.

Point

- **Displaying previous/next page in print preview**

  The range in which previous/next pages can be displayed by clicking the Prev Page / Next Page button is within one data.
  Use the "Jump Preview to" function to switch from the displayed preview data to another data.

- **Page numbers displayed in footer**

  When "Continue form previous page" is selected in the page setting, "[Insert page number here]" is displayed at the position where a page number is to be printed in the print preview.

20.7 Printing Data Displayed on Screen

Q CPU L CPU Remote Head FX

This section explains how to print data displayed on the screen.
The print image can be checked prior to the printing. For checking print images, refer to Section 20.9.

Screen display

Select [Project] ⇒ [Print Window].

The Print Window function cannot be executed from the menu for the following data.
Execute the Print Window function as described below for each data.

- **Parameters**

  Click the Print Window... button on the PLC parameter setting screen or the network parameter setting screen.

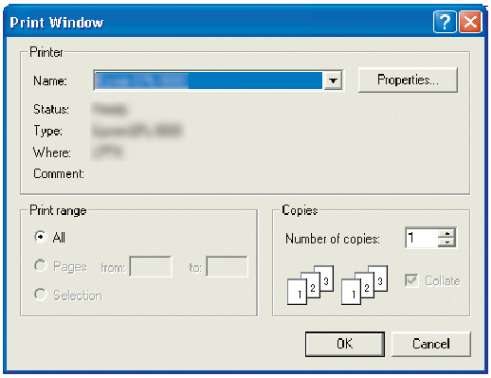
- **Device initial value**

  Click the Print... button on the Device Initial Value screen.

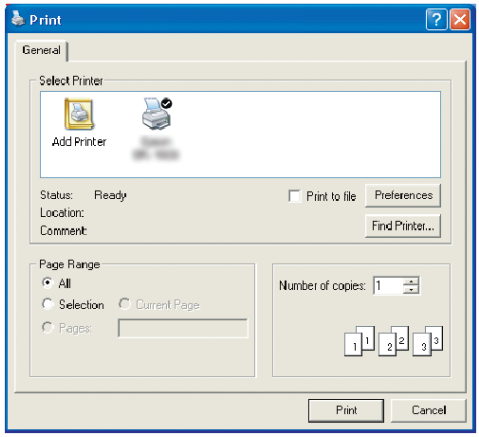
- **Device list or cross reference**

  Select rows to be printed, and click the Print... button on each screen.

<Data other than intelligent function module>



<Intelligent function module>



Operating procedure

1. **Set the items on the screen.**

2. **Click the OK / Print... button.**

   Printing starts.

Point

- **Printer settings**

  Click the Properties... or Preferences button to make detailed settings for the printer.

- **Printing ladder program screens**

  When printing a ladder program screen, the Print Window (Ladder) screen is displayed. For SFC (Zoom) programs, the Print Window (Ladder) screen is not displayed.
  For details, refer to Section 20.8.1.

20.8 Setting Print Details for Data Displayed on Screen

Q CPU | L CPU | Remote | Head | FX

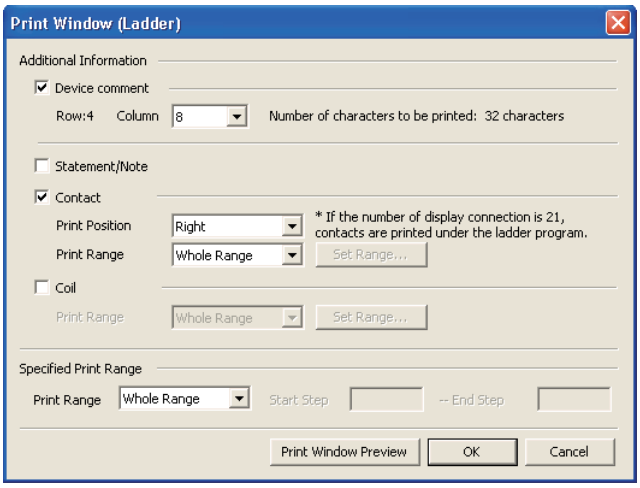
This section explains how to set print details.
Print details can be set using ladder program and device initial setting.

20.8.1 Setting print details for ladder programs

Set print details such as print range and additional information of ladder program.

Screen display

Select [Project] ⇒ [Print Window]/[Print Window Preview].
The following explains a setting operation for the Print Window function. Apply the same operation for the Print Window Preview function.
<Option setting screen for Print Window>



Operating procedure

1. **Set the items on the screen.**

Item		Description
Additional Information		Append selected items to the ladder program.
	Device comment	Select this to append device comments. Set the number of comment columns to be printed. The number of comment rows is fixed.
	Statement/Note	Select this to append statements and notes.
	Contact	Select this to append contact usage destination. Set the print position and print range. To specify the print range, click the Set Range... button, and set the device range on the Device Range Setting (Contact) screen.
	Coil	Select this to append coil usage destination. Set the print range. To specify the print range, click the Set Range... button, and set the device range on the Device Range Setting (Coil) screen.
Specified Print Range		–
	Print Range	Set the print range of ladder program. To specify the print range, select "Specified Range" and set a start step and an end step.

2. **Click the [OK] button.**

For the Print Window function, the Print Window screen is displayed. (☞ Section 20.7)
For the Print Window Preview function, the Print Window Preview screen is displayed. (☞ Section 20.9)

Screen button

For the screen buttons, refer to Section 20.5.7.

- [Print Window Preview]
  Displays a print preview.

■ Contact/coil usage destination

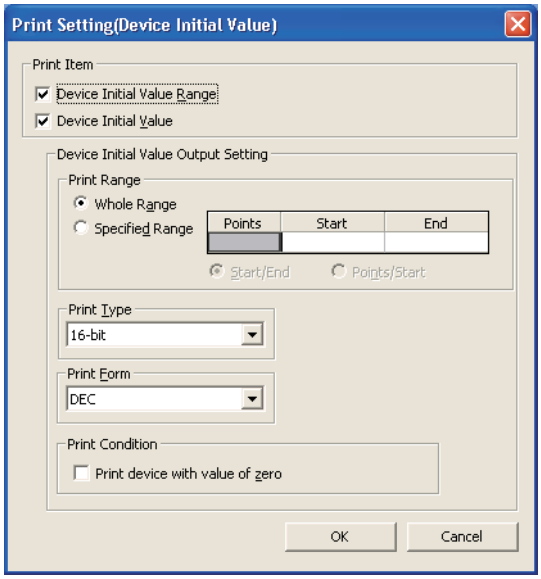
For details of contact/coil usage destination, refer to Section 20.5.7.

20.8.2 Setting print details for device initial values

Set print details such as print items and print range of device initial values.

Screen display

Click the Print Setting... button on the Device Initial Value screen.



Operating procedure

1. **Set the items on the screen.**

Item			Description
Print Item			–
	Device Initial Value Range		Select this to print specified range of device initial values.
	Device Initial Value		Select this to print device initial values (device values).
Device Initial Value Output Setting			Set the items to print device initial values (device values).
	Print Range		–
		Whole Range	Select this to print all devices registered as device values
		Specified Range	Select this to specify a the print range. The method to specify a range is the same as that of device initial value setting. (☞ Section 8.2)
	Print Type		Select a bit unit for handling device initial values at printing.
	Print Form		Select a data format of device initial value at printing.
	Print Condition		–
		Print device with value of zero	Select this to print devices whose value is 0.

2. **Click OK the button.**

20.9 Previewing Print Images

Q CPU L CPU Remote Head FX

This section explains how to check print images of data displayed on the screen.

Screen display

Select [Project] ⇒ [Print Window Preview].

The Print Window Preview function cannot be executed from the menu for the following data. Execute the Print Window Preview function as described below for each data.

- **Parameters**

  Click the Print Preview... button on the PLC parameter setting screen or the network parameter setting screen.

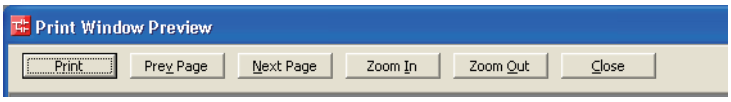
- **Device initial value**

  Click the Print Preview... button on the Device Initial Value screen.

- **Device list or cross reference**

  Select rows to be printed, and click the Print Preview... button on each screen.

  <For Structured Ladder/FBD>

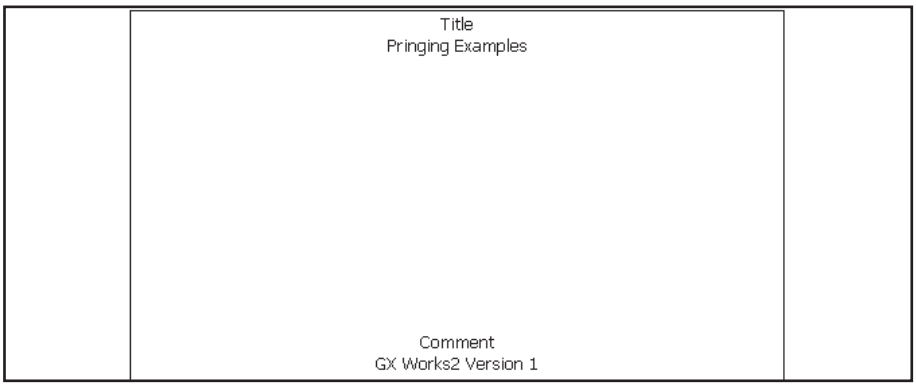


20.10 Printing Examples

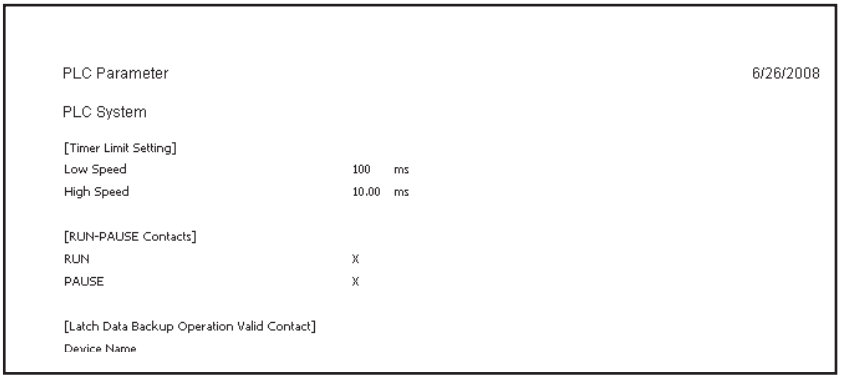
Q CPU L CPU Remote Head FX

The following shows examples of printing.

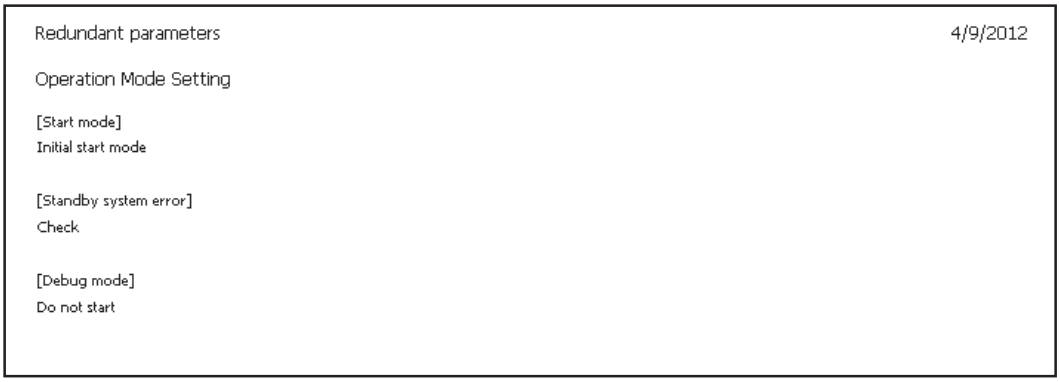
■ Cover



■ PLC parameters



■ Redundant parameters



■ Network parameters

Network Parameter 1/28/2013

Ethernet/CC IE/MELSECNET

[Ethernet/CC IE/MELSECNET]

	Module 1	Module 2	Module 3	Module 4
Network Type	CC IE Control(Control Station)	CC IE Control(Normal Station)	Ethernet	CC IE Control(Normal Station)
Start I/O No.	0000	0020	0040	0060
Network No.	1	1	2	3
Total Stations	4	-	-	-
Group No.	0	0	0	0
Station No.	1	2	3	4
Mode	Online	Online	Online	Online
	Network Range Assignment Exist	-	Operation Setting Exist	-
	Network Operation Settings None	-	Initial Setting None	-
	Refresh Parameters Exist	Refresh Parameters Exist	Open Setting None	Refresh Parameters Exist
	Interrupt Settings None	Interrupt Settings None	Router Relay Parameter None	Interrupt Settings None
	Specify Station No. by Parameter	Specify Station No. by Parameter	Station No.<->IP Information None	Specify Station No. by Parameter
	-	-	FTP Parameters None	-
	-	-	E-mail Setting None	-
	-	-	Interrupt Settings None	-
	-	-	-	-

■ Intelligent function modules

Intelligent Function Module 6/26/2008
Start I/O:0030 Q64AD Analog Module
Parameter

Item	CH1	CH2	CH3	CH4
Basic setting	Set the A/D conversion system.			
A/D conversion enable/disable setting	0:Enable	0:Enable	0:Enable	0:Enable
Sampling/Averaging process setting	0:Sampling Processing	0:Sampling Processing	0:Sampling Processing	0:Sampling Processing
Average time/Average number of times specification	0:Count Average	0:Count Average	0:Count Average	0:Count Average
Average time/average number of times	0 Times	0 Times	0 Times	0 Times

■ Program setting

● Program setting

Program setting 4/26/2012
Data Name : Program setting

● Task setting

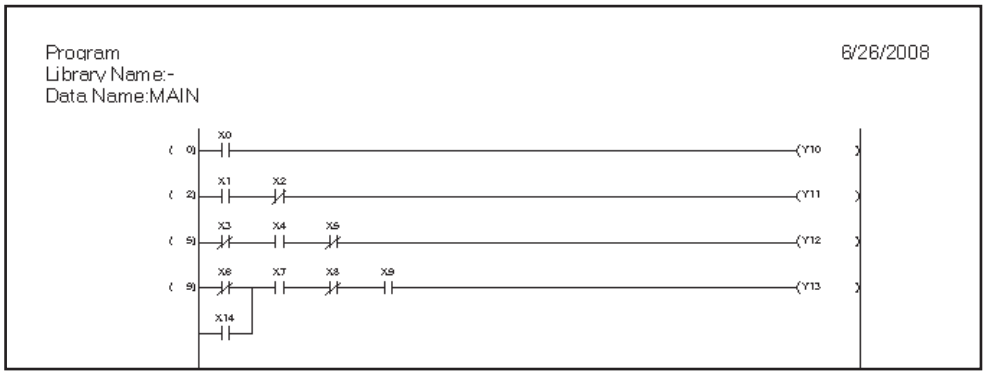
Program setting 4/27/2012
Data Name : Task_01

Task Setting
Execution type: Scan Program
Program file name: MAIN
Attribute: [No setting]

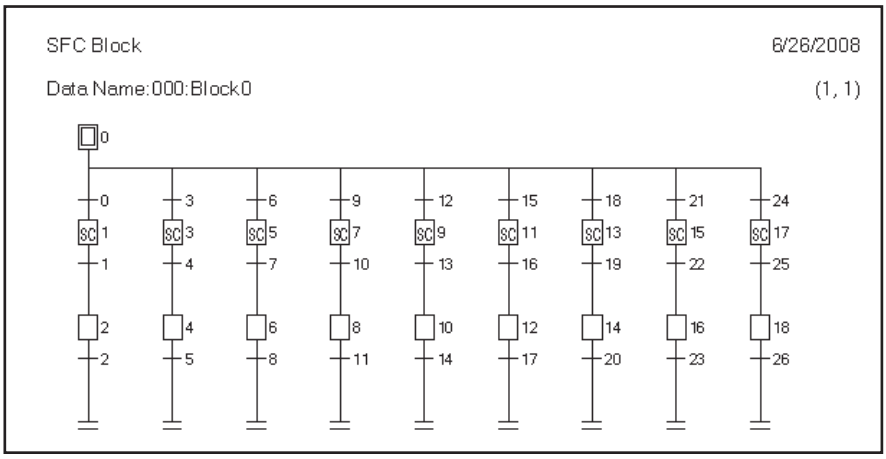
	Program Name	Comment
1	pou_01	
2	pou_02	
3	pou_03	

■ Programs

● Ladder



● SFC diagram (MELSAP3)



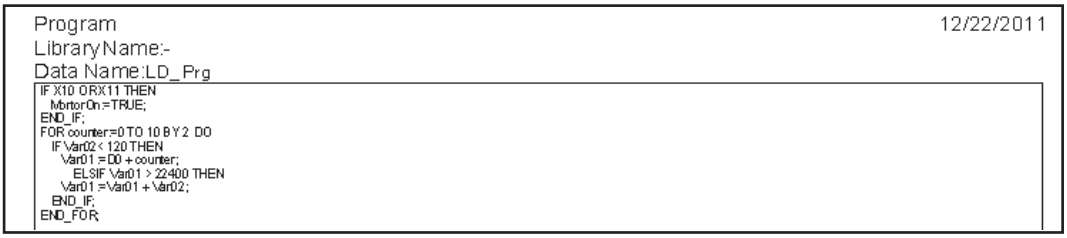
● SFC block list

SFC Block List 12/22/2011

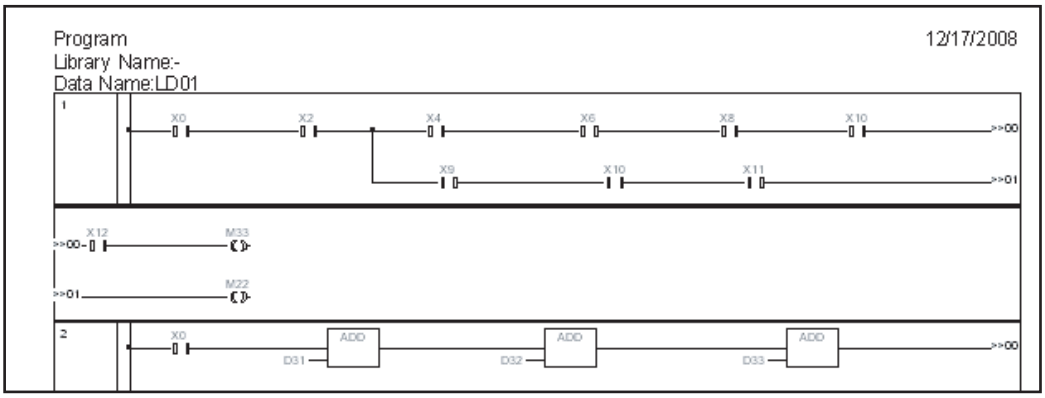
Data Name:MAIN

No.	Data Name	Title	Conversion Status	Block Start	Step Transition	Block PAUSE/RESTART	Pause Mode	Number of Active Steps	Continuous Transition Bit
0	Block	First Process	*	M0	M1	M2	M3	D0	M4
1	Block1	Second Process	*	M10	M11	M12	M13	D10	M14
2	Block2	Third Process	*	M20	M21	M22	M23	D20	M24
3	Block3	In Process; DO NOT USE	*						

● ST

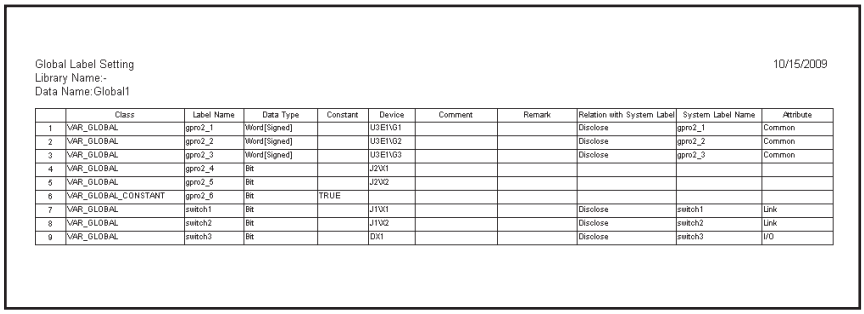


● Structured Ladder/FBD



■ Labels

● Global labels

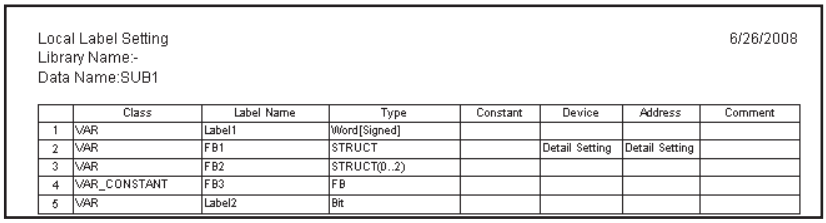


Global Label Setting
Library Name:-
Data Name:Global1

10/15/2009

	Class	Label Name	Data Type	Constant	Device	Comment	Remark	Relation with System Label	System Label Name	Attribute
1	VAR_GLOBAL	gpro2_1	Word[Signed]		U3E1\G1			Disclose	gpro2_1	Common
2	VAR_GLOBAL	gpro2_2	Word[Signed]		U3E1\G2			Disclose	gpro2_2	Common
3	VAR_GLOBAL	gpro2_3	Word[Signed]		U3E1\G3			Disclose	gpro2_3	Common
4	VAR_GLOBAL	gpro2_4	Bit		J2\X1					
5	VAR_GLOBAL	gpro2_5	Bit		J2\X2					
6	VAR_GLOBAL_CONSTANT	gpro2_6	Bit	TRUE						
7	VAR_GLOBAL	switch1	Bit		J1\X1			Disclose	switch1	Link
8	VAR_GLOBAL	switch2	Bit		J1\X2			Disclose	switch2	Link
9	VAR_GLOBAL	switch3	Bit		DX1			Disclose	switch3	I/O

● Local labels

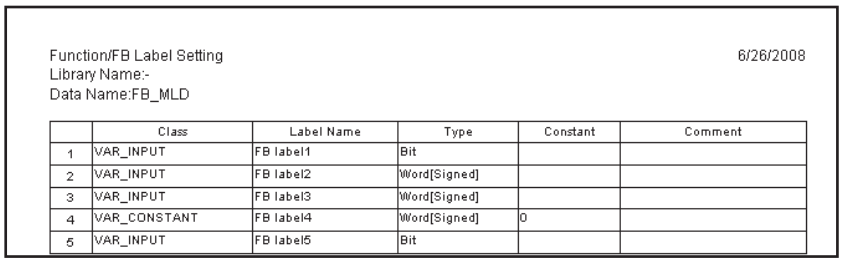


Local Label Setting
Library Name:-
Data Name:SUB1

6/26/2008

	Class	Label Name	Type	Constant	Device	Address	Comment
1	VAR	Label1	Word[Signed]				
2	VAR	FB1	STRUCT		Detail Setting	Detail Setting	
3	VAR	FB2	STRUCT(0..2)				
4	VAR_CONSTANT	FB3	FB				
5	VAR	Label2	Bit				

● Function/function block labels



Function/FB Label Setting
Library Name:-
Data Name:FB_MLD

6/26/2008

	Class	Label Name	Type	Constant	Comment
1	VAR_INPUT	FB label1	Bit		
2	VAR_INPUT	FB label2	Word[Signed]		
3	VAR_INPUT	FB label3	Word[Signed]		
4	VAR_CONSTANT	FB label4	Word[Signed]	0	
5	VAR_INPUT	FB label5	Bit		

● **Structures**

Structure Setting 12/22/2011
Library Name:-
Data Name:Structured

	Label Name	Data Type	Constant	Comment
1	Element1	Bit		
2	Element2	Word[Signed]		
3	Element3	Double Word[Signed]		
4	Element4	Word[Signed](0..9)		
5	Element5	String(32)		

■ Structure devices

● **Structure devices**

(Devices are printed automatically after printing labels.)

Structured Data Device Setting 6/26/2008
Library Name:-
Data Name:Global1

	Label Name	Structured Data Type Name	Data Name	Type	Device
1	Fb1	Fb1	Inst1	Bit	
			Inst2	Bit(0..3)	
			Inst3	Bit(0..2)	
			Inst4	Bit	
			Inst5	Bit	
			Inst6	Bit	
			Inst7	Bit(0..2)	
			Inst8	Bit(0..1)	
			Inst9	Bit	
			Inst10	Bit	
			Inst11	Bit	
			Inst12	Bit	

■ Device comments

Device Comment 6/26/2008

Data Name:COMMENT

Device Name	Comment
X0	Internal Relay1
X1	Internal Relay2
X2	Special Relay1
X3	Special Relay2

■ Device memory data

Device Memory 6/26/2008

Data Name:MAIN

Device Name	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
X0	0b	0b	0b	0b	0b					
D0	0d	4d	0d	0d	0d	0d	1d			
SW0	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h
W0	0h	1h	2h	3h	4h	5h				
SD0	"##"	"##"	"##"	"##"	"##"	"##"	"##"	"##"	"##"	"##"

■ Device initial values

● Device initial value ranges

Device Initial Value Range 6/11/2009

Data Name:MAIN

No.	Points	Start Device	End Device	Comment
1	5	D0	D4	Data register
2	7	D10	D16	
3	2	D18	D19	
4	16	W0A	W19	Link register
5	3	W1A	W1C	

● Device initial values

Device Initial Value 12/22/2011

Data Name:MAIN Device Type:16Bit Form:DEC

Device	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10(A)	+11(B)	+12(C)	+13(D)	+14(E)	+15(F)
D0	1	2	3	4	5											
D10	77	85	73	78	32	32	45									
D18	80	85														
W0A	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597	597
W1A	597	597	597													

■ TC setting values

TC Setting 6/27/2011
Data Name : MAIN

Position	Device/Label	Setting Value
(1)	C10	K10
(8)	T1	K100
(19)	T3	D10

■ Device list

Device List 3/17/2011

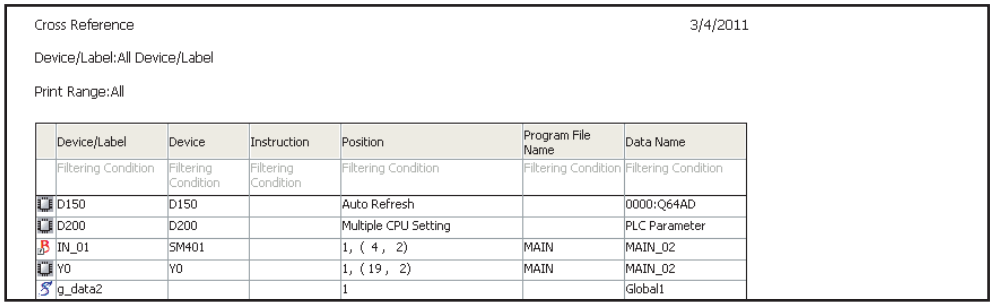
Find Range:Y0 to Y1FFF
Find In:Project1
Display Option:All devices

Print Range:All

*: in use, (counts): the number of coil uses

Device	Contact	Coil (counts)	Parameter	Comment
Y0				
Y1		*(2)		Preset command
Y2	*	*(1)		Coincidence signal enable
Y3				Down count command
Y4	*	*(1)		Count enable command
Y5				External preset detection reset
Y6				Counter function selection start
Y7		*(4)		Coincidence signal No.2 reset

■ Cross reference



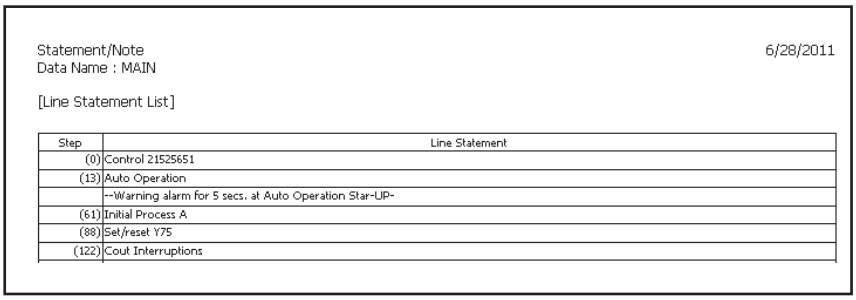
Cross Reference 3/4/2011

Device/Label:All Device/Label

Print Range:All

	Device/Label	Device	Instruction	Position	Program File Name	Data Name
	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition
	D150	D150		Auto Refresh		0000:Q64AD
	D200	D200		Multiple CPU Setting		PLC Parameter
	IN_01	SM401		1, (4, 2)	MAIN	MAIN_02
	Y0	Y0		1, (19, 2)	MAIN	MAIN_02
	g_data2			1		Global1

■ Statements/Notes

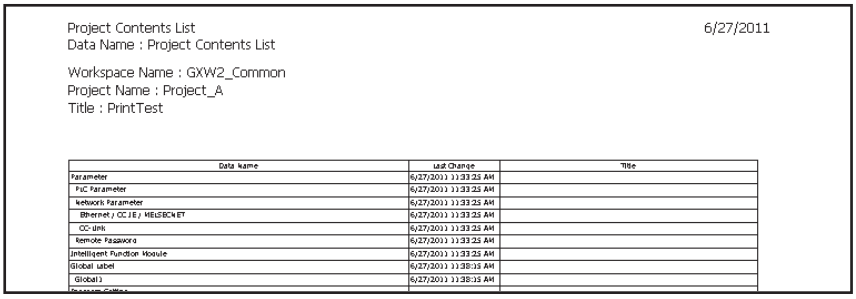


Statement/Note 6/28/2011
Data Name : MAIN

[Line Statement List]

Step	Line Statement
(0)	Control 21525651
(13)	Auto Operation
	--Warning alarm for 5 secs. at Auto Operation Star-UP-
(61)	Initial Process A
(88)	Set/reset Y75
(122)	Cout Interruptions

■ Project content list

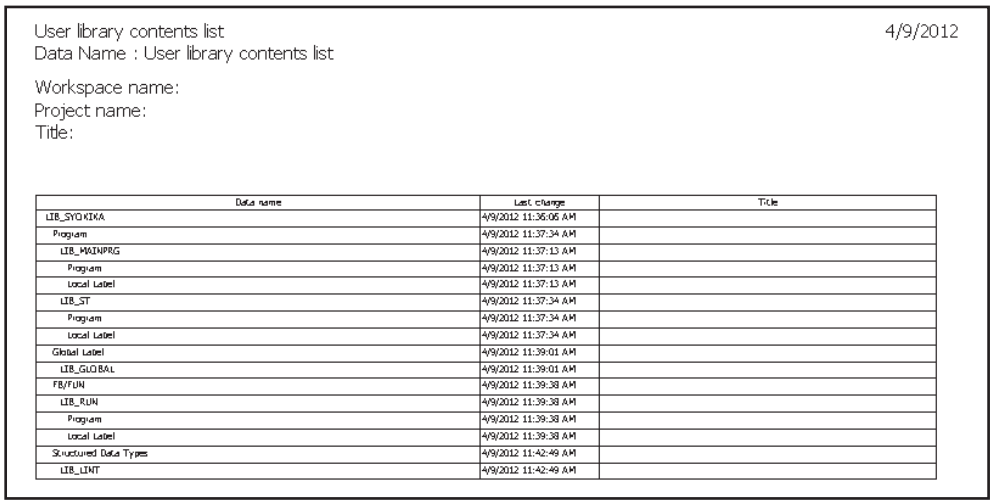


Project Contents List 6/27/2011
Data Name : Project Contents List

Workspace Name : GXW2_Common
Project Name : Project_A
Title : PrintTest

Data name	Last Change	Title
Parameter	6/27/2011 11:33:25 AM	
PLC Parameter	6/27/2011 11:33:25 AM	
Network Parameter	6/27/2011 11:33:25 AM	
Ethernet / CC IE / MELSECNET	6/27/2011 11:33:25 AM	
CC-Link	6/27/2011 11:33:25 AM	
Remote Password	6/27/2011 11:33:25 AM	
Intelligent Function Module	6/27/2011 11:33:25 AM	
Global Label	6/27/2011 11:38:16 AM	
Global1	6/27/2011 11:38:16 AM	

■ User library content list



User library contents list 4/9/2012
Data Name : User library contents list

Workspace name:
Project name:
Title:

Data name	Last change	Title
LIB_SYOKIKA	4/9/2012 11:36:06 AM	
Program	4/9/2012 11:37:34 AM	
LIB_MAINPRG	4/9/2012 11:37:13 AM	
Program	4/9/2012 11:37:13 AM	
Local Label	4/9/2012 11:37:13 AM	
LIB_ST	4/9/2012 11:37:34 AM	
Program	4/9/2012 11:37:34 AM	
Local Label	4/9/2012 11:37:34 AM	
Global Label	4/9/2012 11:39:01 AM	
LIB_GLOBAL	4/9/2012 11:39:01 AM	
FB/FUN	4/9/2012 11:39:38 AM	
LIB_RUN	4/9/2012 11:39:38 AM	
Program	4/9/2012 11:39:38 AM	
Local Label	4/9/2012 11:39:38 AM	
Structured Data Types	4/9/2012 11:42:49 AM	
LIB_LINT	4/9/2012 11:42:49 AM	

■ Product information list

Product Information List 6/27/2011
Data Name : Product Information List

Product Information List

Base	Slot	Type	Series	Model Name	Point	I/O Address	Master PLC	Serial No.	Ver	Production Number
0	CPU	CPU	Q	Q100UDEHCP	-	-	-	H1127A000000000	B	-
0	0	Intelli.	Q	QD81DL96	32Point	0000	-	120520000000000	B	-
0	1	-	-	Empty	-	-	-	-	-	-
0	2	Input	Q	QX40(-TS)	16Point	0030	-	-	-	-
0	3	-	-	Empty	-	-	-	-	-	-
0	4	-	-	Empty	-	-	-	-	-	-
0	5	-	-	Empty	-	-	-	-	-	-
0	6	-	-	Empty	-	-	-	-	-	-
0	7	-	-	Empty	-	-	-	-	-	-

■ Verification result

● Verify result list

Verify Result[PLC Verify] 6/27/2011

Verify Source:Project_A
Verify Destination:in Q100UDEH PLC
Hierarchy:Verify Result List
Verify Result:There were 7 parts not matched.

No.	Object Type	Data(Verify Source)	Data(Verify Destination)	Verify Result
1	Program File	MAIN	MAIN	Mismatch
2	Program File	MAIN1	MAIN1	Match
3	Program File	MAIN2	MAIN2	Match
4	Program File	MAIN4		Source Only
5	Program File		MAIN3	Dest. Only
6	Program File		MAIN5	Dest. Only
7	Program File		MAIN6	Dest. Only
8	Program File		MAIN7	Dest. Only
9	Parameter	PLC/Network	PLC/Network	Mismatch

● Detailed verify result

Verify Result[PLC Verify] Program File 6/27/2011

Verify Source:Project_A
-> MAIN
Verify Destination:in Q100UDEH PLC
-> MAIN
Hierarchy:Verify Resul... List -> [1]Program File
Verify Result:There were 2 parts not matched.

Line	Step	Verify Source	Step	Verify Destination	Verify Result
1	0	LD X0	0	LD X0	Match
2	1	OUT C10 K10	1	OUT C10 K10	Match
3	5	LD C10	5	LD C10	Match
4	6	OUT Y30	6	OUT Y31	Mismatch
5	7	LD Y30	7	LD Y31	Mismatch
6	8	OUT T1 K100	8	OUT T1 K100	Match
7	12	LD T1	12	LD T1	Match

20.11 Considerations for Printing

Q CPU L CPU Remote Head FX

The following explains the considerations for printing.

■ Common considerations of Batch Print and Print Window functions

● Displaying print previews and printing data

Print preview display and printing cannot be executed in the following situations.

- The print target data do not exist.
- The print target screen is being monitored.
  (Start printing after stopping the monitoring.)

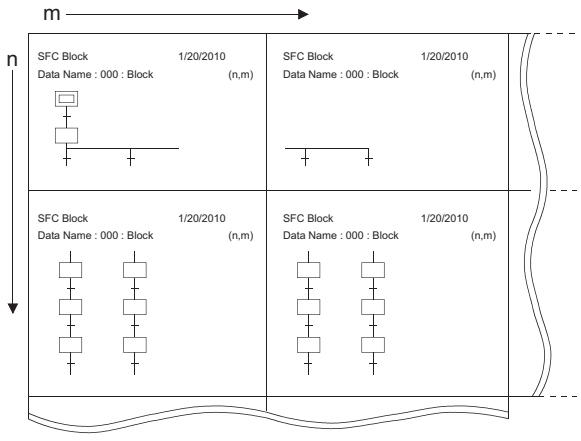
● Considerations of printing large volume data

Large volume data may not be printed at all or printed half way due to the limitations of printer driver or Windows® print spooler.
In this case, print data by following the instructions described below.

- Separate the data by setting a print range with "Specify Print Range".
- Select [start] ⇒ [Control Panel] ⇒ [Printers and Faxes], open the property of the printer being used, and select "Print directly to the printer" in the Advanced tab on the property screen.
- Set "Output by Item" for the print job output on the Print Setup screen (☞ Section 20.3.1). (For batch print only)
- Set "Output by Item" for the print job output on the Print screen displayed by clicking the Print... button or the Print by Item... button. (For batch print only)

● Printing SFC diagrams

When an SFC diagram is printed, the printout may be divided into multiple pages depending on the number of the branches and couplings, and the number of steps. A number that indicates the position is printed at top right of each page.



● Printing hierarchically-displayed cross reference information

Cross reference information is printed as shown below when "Display hierarchically" is selected on the <<Condition Setting>> tab.

- "+" and "-" are not printed.
- Each hierarchy of device/label is displayed with indentation.
- When only the lower hierarchy of device/label is selected, the hierarchy above the selected hierarchy is also printed.
- Data in the collapsed rows are not printed.

<Cross reference information displayed on screen>

Device/Label	Label Data T...	Device	Address	Instruction	Position	Program...	Task	Data Type	Data Name	Comment
Filtering C...	Filtering Con...	Filterin...	Filtering C...	Filtering ...	Filtering Condition	Filtering ...	Filte...	Filtering ...	Filtering Con...	Filtering Condi...
D150		D150	%MW0.150		Auto Refresh			Intellige...	0000:Q64AD	
D200		D200	%MW0.200		Multiple CPU Setting			Parameter	PLC Parameter	
[Start]		D200	%MW0.200							
[End]		D229	%MW0.229							
IN_01	Bit	SM401	%MX10.401		1, (4, 2)	MAIN	Task...	Program	MAIN_02	
Y0	Bit	Y0	%QX0		1, (19, 2)	MAIN	Task...	Program	MAIN_02	
g_data2	Struct1(0..3)				1			Global L...	Global1	Array of Struct1
[0]	Struct1									
AAA	Bit	M8176	%MX0.8176		1			Structure	Struct1	Member1
DDD	Double Word...	D12280	%MD0.12...		2			Structure	Struct1	Member2
CCC	Bit(0..2)				3			Structure	Struct1	Member3
[1]	Struct1									

<Printed cross reference information>

Cross Reference 3/16/2011

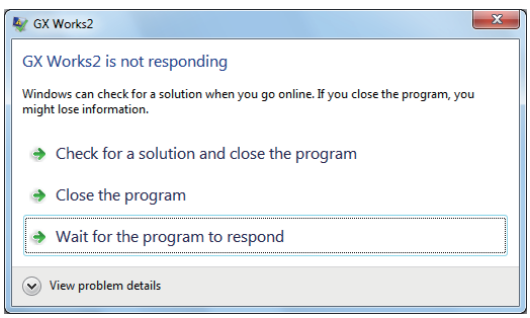
Device/Label:All Device/Label

Print Range:All

Device/Label	Label Data Type	Device	Address	Instruction	Position	Program File Name	Task	Data Type	Data Name	Comment
Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition	Filtering Condition
D150		D150	%MW0.150		Auto Refresh			Intelligent Function Module Parameter	0000:Q64AD	
D200		D200	%MW0.200		Multiple CPU Setting			Parameter	PLC Parameter	
[Start]		D200	%MW0.200							
[End]		D229	%MW0.229							
IN_01	Bit	SM401	%MX10.401		1, (4, 2)	MAIN	Task_01	Program	MAIN_02	
Y0		Y0	%QX0		1, (19, 2)	MAIN	Task_01	Program	MAIN_02	
g_data2	Struct1(0..3)				1			Global Label	Global1	Array of Struct1
[0]	Struct1									
AAA	Bit	M8176	%MX0.8176		1			Structure	Struct1	Member1
DDD	Double Word[Unsigned]/Bit String[32-bit]	D12280	%MD0.12280		2			Structure	Struct1	Member2
CCC	Bit(0..2)				3			Structure	Struct1	Member3
[1]	Struct1									

● Considerations for using the print function with 64-bit edition Windows® operating system

- When the print result is output with the Print or Print Window function, the Save As screen may not be displayed in the foreground.
  Use Alt + Tab keys or Alt + Esc keys to bring the screen in the foreground.
- GX Works2 does not respond when the GX Works2 operation is performed while the Save As screen is displayed.
  When the following screen is displayed, select "Wait for the program to respond".
  Do not select "Close the program". Unsaved data will be lost.



■ Considerations of Batch Print function

● Uncompiled programs

Uncompiled program are not printed or applied to the print preview.
Print data or display the print preview after converting the program.

● NOPLF instruction

The NOPLF instruction is not supported by SFC (Zoom) programs.

● Changing setting of "Ladder Contact"

When the setting of "Ladder Contact", which is set for "Ladder" and "FB/FUN" selected in "Print Item", is changed to the amount less than the one set at the program creation, the program may not be displayed normally, the same phenomenon as when changing the setting of "Display Connection of Ladder Diagram" in the option setting.
For details, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Simple Project)

● Number of printable rows

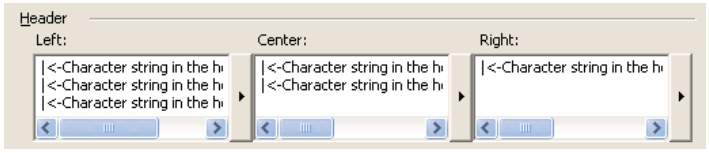
The number of printable rows is limited for the following data. The rows that exceeded the limitation will not be printed.

- For device comments and device list, 100,000 rows can be printed per data.
- For device memory data and device initial values, 20,000 rows can be printed per data.
- For TC setting values, 20,480 rows can be printed per data.

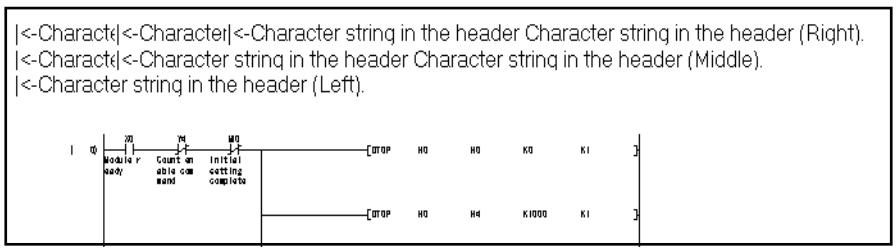
● When character strings in header/footer overlap

Overlapped character strings in header/footer are printed on top of each other in order of priority: right, center, left. The overlapped character string is overwritten by the character string which is given the priority.
The following shows an example of overlapped character strings.

<Setting example of overlapped character strings in header>



<Printing example of overlapped character strings in header>



● Specifying device comment print range for FXCPU

For FXCPU, an error occurs when the Device Range Setting screen is opened in GX Works2 Version 1.64S or later with a project created in GX Works2 Version 1.62Q or earlier, in which nesting (N)/index register (V)/index register (Z) is specified for device comment print range.
In this case, delete the device range setting for nesting (N)/index register (V)/index register (Z).

■ Considerations of Print Window function

● Uncompiled programs

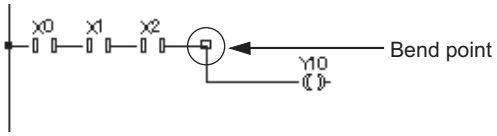
Uncompiled program are not printed or reflected to the print preview.
Print data or display the print preview after converting the program.

● NOPLF instruction

The NOPLF instruction is not supported.

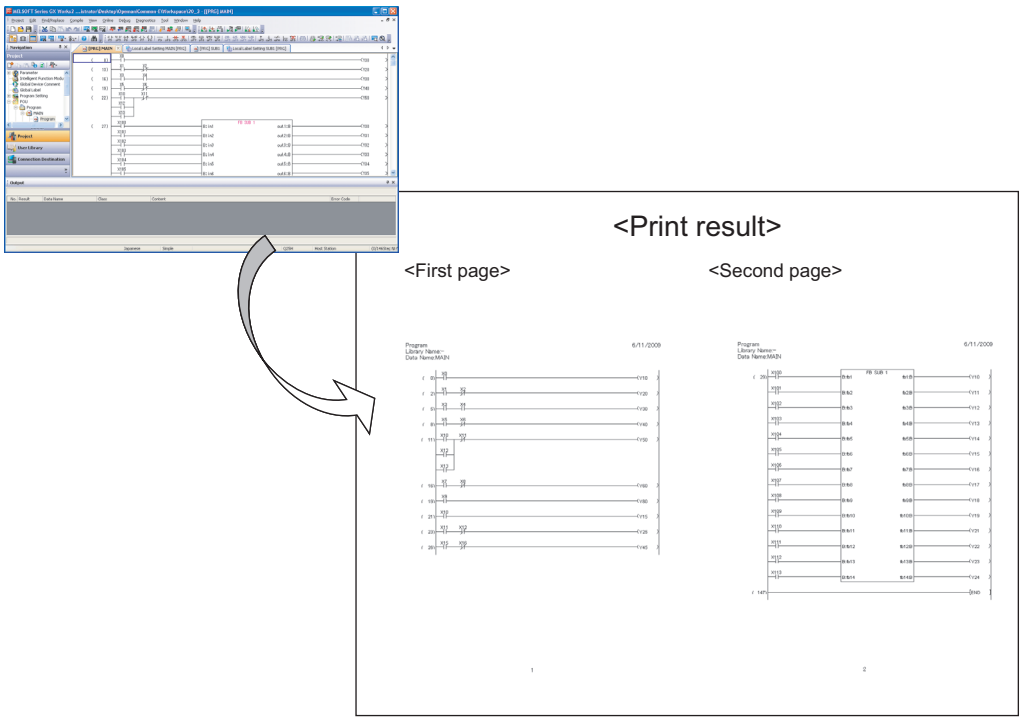
● Structured Ladder/FBD

If a bend point is created in a Structured Ladder/FBD program, it will be printed as shown below. If the bend point is unnecessary to be printed, delete it on the Structured Ladder/FBD editor.
For details of bend points ☞ GX Works2 Version 1 Operating Manual (Structured Project)



● Page feed in ladder program

If a ladder block or function block does not fit in one page, the page is automatically fed and the ladder block or function block is printed from the top of the next page.



● Printing structure/label setting editor

Since the screen width is adjusted automatically to fit the page size when the structure/label setting editor is printed, the printing may be difficult to read depending on the column width of the screen. In order to improve the printing quality, adjust the column width of the structure/label setting editor. The visibility of the printing is increased by adjusting the column width to narrow. However, if the words input into the Remark/Comment column are too long, or one cell is divided into multiple pages, the content in that cell cannot be printed completely.

● Printing intelligent function module data

When the print function is performed on the Print Window Preview screen while the positioning data of intelligent function module are displayed, the font size and the display position of the header may be different from the normal display. Perform the print function on the Print Window screen.

21 SETTING OPTIONS

Option settings such as screen display format setting and detailed operation settings of each function are available.

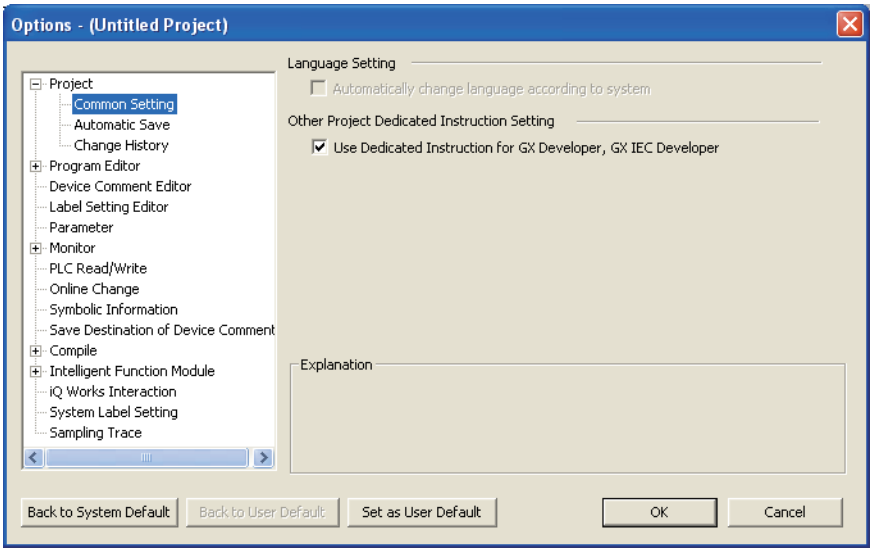
21.1 Basic Operations

Q CPU L CPU Remote Head FX

This section explains how to set options.

Screen display

Select [Tool] ⇒ [Options].



Operating procedure

- **Set the items on the screen.**

  When the cursor is placed on a setting item, an explanation of the item is displayed on the "Explanation" field.

Screen button

● Back to System Default

Restores the initial settings.

● Back to User Default

Restores the user default settings.

● Set as User Default

Stores the current settings as the user default and applies them to a new project.

Point

● **Considerations when changing option settings**

All programs need to be compiled when the following option settings are changed.

- "Default Length of String Data Type" in "Label Setting Editor"
- Settings in "Compile"

Compiling all programs changes the device assignment to labels. Therefore, device values set before the program change remain on the device-assigned labels.

Perform the following operations for a precautionary measure.

- For QCPU (Q mode)/LCPU
  After writing data to the programmable controller CPU, reset the programmable controller CPU, clear all device memories including latches, clear all file registers, and switch the programmable controller CPU to RUN.
- For FXCPU
  After writing data to the programmable controller CPU, clear device memory using the PLC memory clear function, and switch the programmable controller CPU to RUN.

(☞ Section 17.4)

For the considerations for compiling all programs, refer to the following manuals.

☞ GX Works2 Version 1 Operating Manual (Simple Project)/(Structured Project)

21.2 Option Setting List

Q CPU L CPU Remote Head FX

The following table shows the option setting items.
For (Simple), (Structured) and (Intelligent) indicated in the Reference column, refer to the following manuals respectively.

(Simple) … GX Works2 Version 1 Operating Manual (Simple Project)
(FB) … GX Works2 Version 1 Operating Manual (Simple Project, Function Block)
(Structured) … GX Works2 Version 1 Operating Manual (Structured Project)
(Intelligent) … GX Works2 Version 1 Operating Manual (Intelligent Function Module)

Tree item		Item	Explanation	Default	Reference
Project	Common Setting	Automatically change language according to system[*1]	Language setting will be automatically changed according to system when edit Ladder/SFC program (Statement and Note) or device comment.	Selected	–
		Use Dedicated Instruction for GX Developer, GX IEC Developer	Dedicated Instruction for GX Developer, GX IEC Developer (Instructions that their name ends with '_M' and '_MD') can be used in the projects using the following function. Open Other Project, Read from PLC or PLC Type change.	Selected	Section 4.7.1
	Automatic Save	Save project after writing to PLC	Select whether to save the project automatically after writing to the programmable controller CPU.	Cleared	Section 12.1
		Save project after online change	Select whether to save the project automatically after completing online change to the programmable controller CPU.	Cleared	Section 12.9.1
		Save project after changes in TC setting values are written to PLC	Select whether to save the project automatically after changes in TC setting values have been written to the programmable controller CPU.	Cleared	(Simple)
	Change History	Revision is not Registered when Save Project	Select whether to register the revision after saving a project.	Selected	Section 4.2.3
		Revision is registered when Save Project		Cleared	
		Display confirmation message showing whether to register history	Select whether to display a confirmation message of the revision registration after saving a project.	Cleared	
		Automatically set revision titles	Select whether to automatically set revision titles at revision registration after saving a project. Automatically-set titles can be changed on the Revision List window.	Cleared	

Tree item			Item	Explanation	Default	Reference
Program Editor	All Editors	Device Comment	Program/Program File Name	Set a reference/reflection target of device comments for each program/program file.	MAIN	Section 9.1.1
			Specify the reference/ reflection	Set a reference/reflection target according to the local device range of PLC parameter when set to "PLC parameter setting". Within the local device range: local device comment Outside the local device range: global device comment	Global	
			Reference/reflect the other, when device comment is not set.	When it is checked, the behavior of each device will be the one as follows: 1) Refer the comment (Global/Local) specified in device comment field. 2) If device comment does not exist, the behavior will be the one as follows: • When specified to Global Comment: Refer Local Comment. • When specified to Local Comment: Refer Global Comment.	Cleared	
			Apply to all programs	Apply the current setting of reference/ reflection target for device comment to all programs/program files.	–	
			Global	Set all reference/reflection target to 'global' for device comment of selected program/program file name.	–	
			Local	Set a all reference/reflection target to 'local' for device comment of selected program/program file name.	–	
			PLC Parameter Setting	Set all reference/reflection targets for device comment of target device of the selected program/program file name to "PLC parameter setting". Target Device: Device can be specified within the local device range in the device setting of PLC parameter	–	
	Structured Ladder/ FBD/ST	Tool Hint	Monitored Value	Select display item in tool hint when mouse cursor is placed over label/device name.	Selected	(Structured)
			Class		Cleared	
			Device		Selected	
			Address		Cleared	
			Device Comment		Selected	
			Data Type		Cleared	
			Constant Value		Cleared	
			Label Comment		Selected	
			Remark		Cleared	
			Tool Hint Display Format	Select display lines on tool hint.	Multi Line	

Tree item			Item	Explanation	Default	Reference
Program Editor	Structured Ladder/ FBD	Label	Display label name/ comment of contact or coil in multiline	Set display lines and characters per line.	Cleared	(Structured)
			Display labels and devices	Select whether to display labels and devices which are assigned to the labels, when 'Label' is selected from View mode. * Users can neither edit the displayed devices nor set them to the Find/Replace target.	Cleared	
			Declare new label name	Select whether to display the label registration/selection dialog when entering new labels.	Selected	
	Structured Ladder/ FBD	FB/FUN	Wrap instance name for function block	Select whether to wrap function block instance name at the function block width.	Cleared	
			Specify the number of enable characters for label name/comment	Specify the number of display characters of function or function block label.	Cleared	
			Automatic input/output labels	Select whether to add input/output label when function block or function is pasted.	Selected	
			Automatic ENO labels	Select whether to add ENO output label when function block or function is pasted.	Cleared	
			Pin overwrites	Select whether to overwrite I/O label with a grid line when ruling a grid line over function or function block.	Selected	
			Double clicking opens header	Select whether a label editor is displayed when function or function block is double clicked.	Selected	
			Double clicking opens body	Select whether a program editor is displayed when function or function block is double clicked.	Cleared	
		Guided	Ladder Wrapping	Select whether to wrap ladder. The edited ladder shall be object after changing the setting.	Selected	
			Return Contacts		8	
			Open Structured Ladder/ FBD Editor in guided mode	Set guided mode as default when open Structured Ladder/FBD editor.	Cleared	
			Allow hotkey repeater	Select whether to display grid line ruling dialog at drawing lines.	Cleared	
			Enter label names after contacts and coils	Select whether to input label names or devices after entering contacts and coils.	Selected	
			Auto Comment Block Width	Set the width of comment to be added in ladder block with grid numbers when adding ladder block.	8	
	ST		Auto Indention	Select whether to use the automatic indent when beginning a new line after entering ST control syntax such as IF or FOR, and when displaying template of inline structured text.	Selected	
			Instruction/label name prediction	Select whether to display listed label names starting with the input character when a character is input. (Structured text: label name, inline structured text: instruction and label name)	Selected	
			Tabulator Length in ST	Set tabulator length. It is not available with inline structured text.	4	

Tree item			Item	Explanation	Default	Reference
Program Editor	Ladder/ SFC	Enter ladder	Check duplicated coil	Select whether to check duplicated coils when entering instruction. Unconverted ladder is not the object for duplicated coil check.	Cleared	(Simple)
			Enter label comment and device comment	Select whether to enter label comment or device comment continuously after entering instructions.	Cleared	
			Do not display note in ladder input window when edit coil instructions.	Select whether to display note in ladder input window when edit coil instructions.	Cleared	
			Check special relay/ special register compatible with A-PLC	When A-PLC Compatible Setting of PLC Parameter setting has not be enabled at the time of instruction inputting, check whether to display a confirming message to input special relay/special register compatible with A-PLC. MELSAP-L is an exception.	Cleared	
			Display available instruction tool hints in entering instruction	Select whether to automatically display tool hint of instruction in entering instruction.	Selected	
			Display available instructions in entering instruction	Select whether to automatically display available instructions in entering instruction.	Selected	
			Display available labels in entering instruction	Select whether to automatically display available defined labels in entering instruction.	Selected	
		Tool hint	Monitored Value	Select display item in tool hint when mouse cursor is placed over label name. * Options for simple project (with label) or label program of structured project. * As for function block, devices are excluded from display target in tool hint.	Selected	
			Class		Cleared	
			Device		Selected	
			Device Comment		Selected	
			Data Type		Cleared	
			Constant Value		Cleared	
			Label Comment		Cleared	
			Remark		Cleared	
			Tool hint display format	Select the number of display lines in tool hint. * Will be wrapped in 64 single-byte characters or 32 double-byte characters.	Multiple lines	

Tree item			Item	Explanation	Default	Reference
Program Editor	Ladder	Comment	Device Comment	Select whether to display the label comment or the device comment at ladder editor.	Cleared	(Simple)
			Note	Select whether to display the note comment at ladder editor.	Cleared	
			Statement	Select whether to display the statement comment at ladder editor.	Cleared	
			Device Comment Display Format	Set the display rows and columns for label comment or device comment.	Row: 4 Column: 8	
			Copy device comment in copying ladder	Select whether to copy device comment in copying ladder. * Pasting device comments will be executed based on the setting of Reference/Reflection target for device comment. * Pasting device comments will not be executed between different PLC types. * Copying or pasting will not be executed for read-protected device comments.	Cleared	
	Ladder	Ladder Diagram	Display Connection of Ladder Diagram	Set the number of contacts. ([Program Editor] ⇒ [SFC] ⇒ [Zoom])	11 Contacts	
			Use the Switching Ladder Edit Mode (Read, Write, Monitor, Monitor (Write))	Select whether to switch Ladder Edit Mode (Read, Write, Monitor and Monitor (Write)). Will be the same operation as the ladder edit mode of GX Developer. *Unable to set when security setting is enabled.	Selected	
			Display labels and devices	Select whether to display labels, and devices assigned to label. (Exclude function block.) * Devices are excluded from Find/ Replace target. * Options for simple project (with label) or label program of structured project.	Cleared	
			Display STL instruction in contact format *Only applies to the FXCPU	Select whether to display STL instruction in contact format. This is valid for simple projects (Not using labels) only. Contact format ladder block display for STL instruction is not wrap displayed.	Cleared	
			Display Instruction Help at symbol error occurrence	Select whether to automatically display Instruction Help when symbol errors occur.	Selected	
			Open Undefined Label Registration dialog at ladder entry	Select whether to open Undefined Label Registration dialog when labels used at ladder entry are undefined.	Selected	
			Set initial value to '1' for Enter HLine/Delete HLine dialogue.	Select whether to set initial value to '1' when Enter HLine/Delete HLine dialog is opened.	Cleared	
			Stop at the connection points (Instruction/Vertical Line) when enter or delete horizontal line.	Select whether to edit line by connection point (Instruction/Vertical Line) when Enter HLine/Delete HLine is executed.	Cleared	

Tree item			Item	Explanation	Default	Reference
Program Editor	SFC	Comment	Block List	Display device comment on SFC block list.	Cleared	(Simple)
			Step/Transition	Display step/transition comment on SFC editor.	Cleared	
		SFC 1	SFC Edit Area	Set SFC edit area when create SFC. Please change by "SFC Row Setting" after creating a SFC.	Col Number: 10 Line Number: 306	
			Tile SFC and Zoom vertically	Select whether to tile Zoom windows at the cursor position on SFC when creating SFC diagram. Checking this option changes the [Open Zoom with New Window] option into unchecked.	Selected	
			Arrange	Select the type of tile for SFC and ZOOM window.	Tile Vertically	
			SFC Display Window Ratio	Select window display ratio for SFC when Tile Vertically is selected.	30%	
			MELSAP-L Label/Device Display Format	Set display lines for MELSAP-L program.	4	
			Jump to start destination block	Set whether to jump to start destination block when cursor is moved to block start step.	Cleared	
		SFC 2	Leave comment or step No. selected	Select whether to leave comment or step No. selected in Enter SFC Symbol screen when changing SFC symbol in MELSAP3. Block or symbol must be left selected in Enter SFC Symbol screen when newly entering SFC symbol.	Cleared	
		Zoom	Open Zoom with New Window	Select whether to open a new window for each Zoom or to change the display in the fixed window when opening Zoom. Checking this option changes the "Tile SFC and Zoom vertically" option into unchecked.	Cleared	
			Number of Action/ Transition Contacts	Set the number of contacts.	Same as the "Ladder Diagram" setting	

Tree item	Item	Explanation	Default	Reference
Device Comment Editor	Number of Device Comment Edit/Display Characters	Set the number of input and display characters for device comment.	32	Section 9.2.1
	Extended Setting	• When "Standard mode" is selected. Device comment up to 32K points per device can be registered. In total, up to 1024K points per file can be registered. • When "Extended mode" is selected. Device comment up to 192K points per device can be registered. In total, up to 2048K points per file can be registered.	Standard mode	Section 9.4
Label Setting Editor	Automatic copy and increment when inserting a row	Select whether to copy the texts in the upper row after incrementing it when inserting a row.	Selected	(Simple) (Structured)
	Copy data type/comment items	Select if the data type, comment, and remark shall be object for auto copy.	Selected	
	Default Length of String Data Type	Set the default string length for string data type.	32	
	Display last blank row	Select whether to display last blank row. This setting is valid for global label and local label except the local label of function block, function and structured data type.	Cleared	
Parameter	Use user defined parameter *Only applies to the QCPU and LCPU	Display the User Defined Parameter Setting button and able to set it. Once the user set parameter is set, it will remain even after checking off the selection box.	Cleared	–
	Display number of columns for CC-Link list setting *Only applies to the QCPU and LCPU	Select 4 columns or 2 columns to display number of columns in CC-Link list setting of network parameter. Please reopen the CC-Link list setting window to reflect changes.	4 Columns	Section 6.3
	Display number of rows for CC-Link station information	Select 16 rows or 8 rows to display number of rows in CC-Link list setting of network parameter. Please reopen the CC-Link list setting window to reflect changes.	16 Rows	Section 6.3.1

Tree item		Item	Explanation	Default	Reference
Monitor	Structured Ladder/FBD/ST	Display Format of Monitoring Value	Select whether to display monitored value in Decimal or Hexadecimal.	Decimal	(Structured)
		Monitor buffer memory and link memory *Only applies to the QCPU, LCPU, FX3U(C)	Select whether to monitor buffer memory and link memory during monitoring. Scan time of PLC will be lengthened depending on the setting.	Cleared	
		Significant Characters	Set the number of displayable characters to monitor character-string data.	16	
		Verify with PLC setting before starting monitoring	• When "Always Verify with PLC" is selected. Verify with PLC before starting monitoring. However, do not verify if simulator is running, selecting uncompiled program's POU, or unchanged POU. (Last verification status is held while editor is open.) • When "Not Always Verify with PLC" is selected. Start monitoring without verifying with PLC. • When "Confirm whether to Verify with PLC" is selected. Show a confirmation box whether to verify with PLC before starting monitoring. However, the confirmation box will not be displayed and do not verify if simulator is running, selecting uncompiled program's POU, or unchanged POU. (Last verification status is held while editor is open.)	Confirm whether to Verify with PLC	
	Ladder/SFC	Set automatic registration destination	Label and device of ladder block (Ladder) in cursor, action/transition step (SFC) will be registered to watch window while monitoring watch window. (Caution1: Cursor move will be slow when setting is enabled. 2: Select FB instance for function block.)	Not Specified	Section 14.6.2

Tree item		Item	Explanation	Default	Reference
Monitor	Ladder	Display Format of Monitoring Value	Select the display format of the monitored value in decimal or hexadecimal.	Decimal	(Simple)
		Monitor buffer memory and link memory *Only applies to the QCPU, LCPU, FX3U(C)	Select whether to monitor buffer memory and link memory during Ladder-monitoring. Scan time of PLC will be lengthened depending on the setting.	Cleared	
		FXGP format Ladder monitor *Only applies to the FXCPU	PLS/PLF instruction is displayed in GP(DOS) and FXGP(WIN) formats. If it is not checked, it is displayed in GX Developer form.	Cleared	
		Display monitored value by device/label name of contact/coil instruction.	In monitoring ladder, select whether to highlight contact/coil instruction based on the monitored value displayed by device/label name.	Cleared	
		Display lines for monitoring current value	Select whether to display rows of the current value monitor during Ladder-monitoring.	Show Always	
	SFC*2	Watch Step Not Transferring within Watching Time	Select whether to display a warning dialog when detect a step that does not transfer even if specified time passes while monitoring.	Cleared	(Simple)
		Program/Program File Name	Select watch target program/program file.	(SFC program name)	
		Target All Blocks	Specify watch target block.	Selected	
		Specify the Block Detailed Setting	Specify watch target block.	Cleared	
		Stop Transition Watch Monitor when Detected	Select whether to detect other step that does not transfer while displaying warning dialog.	Selected	
		Monitor block start with new window	Select whether to open a corresponding SFC window to monitor when the active step transfers to a block start step.	Cleared	
PLC Read/Write		Keep last file selection for PLC read/write dialog	Select whether to store file selection status to PLC read/write dialog.	Selected	Section 12.1
		Turn PLC to STOP at time of PLC write after executing Rebuild All and do not execute remote RUN	Select whether to turn the PLC to STOP at the time of PLC write and not execute remote RUN because executing "Rebuild All" from the menu or icon changes the device assignment. PLC write cannot be executed in RUN with this option checked.	Cleared	
		When writing to PLC after a Rebuild All operation, clear the device ranges set in the Device/Label Auto-Assign setting to 0. *Recommended setting: checked*3,*4 *Unnecessary for simple projects (Do not use label)	After executing a Rebuild All, when labels are reassigned to new devices, values from the previous program will remain in the previously assigned devices. This setting automatically clears the device ranges in the Device/Label Automatic-Assign Setting.	Selected	Section 12.1.7 (Simple) (Structured)
		Check program cache memory when writing to PLC *Only applies to Universal Model QCPU (Except for High-speed Universal model QCPU), QCPU, or LCPU	Select whether to execute automatically check program cache memory when writing to program memory. Automatic recovery is enabled in Write to PLC, Online program change, TC setting change, Write title, and Password/Keyword.	Cleared	Manual of programmable controller CPU

Tree item	Item	Explanation	Default	Reference
Online Change	Execute fall instruction *Only applies to the QCPU and LCPU	Select whether to execute fall instruction (LDF, LDFI, ANDF, ANDFI, ORF, ORFI, MEF, PLF, FCALLP, EFCALLP) at online change.	Cleared	Section 12.9
	Transfer program cache memory to program memory *Only applies to the QCPU and LCPU	Select whether to transfer the program cache memory to program memory when online change completed. * Message will be shown to confirm whether to transfer to or not if it is unchecked.	Selected	
	Execute online change based on relative step No. *Ladder Only *Only applies to the QCPU and LCPU	Select whether to execute online change based on relative step No. from pointer. Even if real step No. is different, online change is available as long as relative step No. from the pointer is corresponding.	Cleared	
	Execute online change by Compile *Enabled when 'Switch the Ladder Edit Mode' is set	Select whether to execute Online Program Change when ladder program or SFC program is edited and compiled. Will be enabled when 'Switch Ladder Edit Mode' is checked. ([Options] ⇒ [Program Editor] ⇒ [Ladder] ⇒ [Ladder Diagram])	Cleared	
	Under booting, reflect changes to boot source during online program change * Except for Q00UJ/Q00U/Q01UCPU, basic model QCPU and FXCPU	Select whether to reflect the changes to boot source after online program change.	Cleared	
Symbolic Information	Setting for Writing Symbolic Information to PLC	Set the writing format for symbolic information. The capacity will be optimized by high speed mode support version but be read only by 1.45X or later. The capacity will not be optimized by compatible mode but be read by 1.44W or previous. FXCPU support only high-speed mode.	High Speed Mode	Section 12.9.1
	Setting for Save Destination of Symbolic Information to PLC	Set a PLC drive to store symbolic information. This setting can be changed when you connect to PLC. Program Memory/Device Memory will be selected in simulation mode if an unusable storage is specified.	Program Memory/ Device Memory	
Save Destination of Device Comment	Set save destination of device comment to the target memory of PLC data	Under device comment selected status, select whether to change the target memory of PLC data to the one specified by Save Destination of Device Comment.	Cleared	Section 12.1.6
	Save Destination of Device Comment	Set the target memory for device comment save destination. Able to change it later. In simulation mode, program/device memory will be selected if invalid destination is specified. * This setting will not be saved by 'Set as User Default' setting.	Program Memory/ Device Memory	

Tree item		Item	Explanation	Default	Reference
Compile	Basic Setting	Function Block Call	Enable calling function block from ladder to ST or vice versa, from ladder to Structured Ladder/FBD or vice versa, using inline ST in ladder, reducing steps when using function block. * Input label for VAR_IN_OUT remains equal to output label.	Selected	(Structured)
		Program Check	Check when program check is not needed after Build or Online Program Change. It can reduce the compile time depending on the setting.	Selected	(Simple) (Structured)
		Operational Setting	Select whether to use the same label name in global label and local label. When the same label is selected, local label will be given priority.	Cleared	
		Create Cross Reference Information	Creating cross reference information after compiling enables to reduce find time. The information can be found in uncompiled project. Specified find condition is treated as filter condition. The setting will be canceled if find mode is 'Fast Find'.	Cleared	Section 10.1.1
	Output Result	Stop Build	Set the number of error and warning to stop the compile.	Error: 25 Warning: 100	(Simple) (Structured)
		Disable Warning and Notification Message	Register warning codes to invalidate. The registered warning codes shall not be displayed in output window.	(No setting)	
		Display the Use Status Notification of Automatic-Assign Device in Output Result	The use status of device automatic-assign is displayed in output window.	Selected	–

Tree item			Item	Explanation	Default	Reference
Compile	Ladder/ SFC	Compile Condition	Make sure that the instruction is not used beyond the device range assigned by the label[*2]	Select whether to display warnings or not when ladder/SFC program instruction is using devices out of device range assigned by the labels in instruction. Able to detect instructions that may use devices out of range and may overwrite other label's value.	Cleared	(Simple)
	Structured Ladder/ FBD/ST	Compile Condition 1	Use lower-case device names as labels[*5]	Select whether to use device names typed with lower case characters as labels. Only the device name outside device range is valid for Inline Structured Text.	Cleared	(Structured)
			Function Output Setting	Select whether to connect directly from the objective function output to other input.	Selected	
			Allow VAR_OUTPUT at FB call (ST)	Select whether to allow VAR_OUTPUT at FB call. Check: Able to specify VAR_OUTPUT as FB argument. (e.g. FBInst(FBVarOUT:= Variable);) Uncheck: Compile error C8015 returns if VAR_OUTPUT is specified as FB argument.	Selected	
			Add temporary variables as arguments to use macrocode	For the ST or structure ladder FB call from structured ladder, set whether to add temporary variables as input argument, I/O argument, and output argument to use macrocode.	Cleared	
		Compile Condition 2	(D)INT_TO_BOOL_E, (D)WORD_TO_BOOL_E, TIME_TO_BOOL_E	Check the box to generate code that holds the output (SET). When unchecked, the instruction word output will be treated as a coil (OUT).	Selected	
			NOT_E		Selected	
			LIMITAION_E, MAXIMUM_E, MINIMUM_E		Selected	
			EQ_E, NE_E, GT_E, GE_E, LT_E, LE_E		Selected	
			AND_E, OR_E, XOR_E		Selected	
			User Defined Function with EN/ENO	Select whether to generate a code which keeps bit type output of the target function. (Codes keeping bit type are generated if output is in bit type array or in structure array, regardless of option setting.)	Selected	
			User Defined Function Block with EN/ENO	Select whether to generate a code which keeps bit type output of the target function block. (Codes keeping bit type are generated if output is in bit type array or in structure array, regardless of option setting.)	Cleared	
		Compile Condition 3	Automatically assign each system device to output of functions that use EN/ ENO	Select whether to assign each system device to output functions of EN/ENO. Only functions enabled. (Function block is disabled.) Only checked functions at [Generate Code That Holds the Output of the Following] are enabled when the output is bit type.	Selected	

Tree item		Item	Explanation	Default	Reference
Intelligent Function Module*2	QD75/LD75 Type Positioning	Display Specification of Positioning Data	Set the range of positioning data to be displayed.	Data No.1 to 100	(Intelligent)
		Confirm PLC operation status when writing a Data	Select whether to check an operation status of programmable controller CPU and allow to be written in the status of STOP.	Selected	Section 12.1.4
		Display a confirmation message when writing to flash ROM	Select to display a confirmation message when writing to flash ROM.	Selected	
	Guidance	Display intelligent function module guidance	Select whether to automatically display intelligent function module guidance.	Selected	(Intelligent)
iQ Works Interaction*2,*6		Enable an editing of parameters set in MELSOFT Navigator	Select whether enabling or not editing parameters set by MELSOFT Navigator.	Selected	Section 6.1
System Label Setting*6,*7		Use MELSOFT Navigator Option Information	Checking this option enables use of the option setting of MELSOFT Navigator. The option setting specified in MELSOFT Navigator at the time of opening this project is used.	Cleared	(Simple) Structured)
		System Label Name Setting	Set how to name system labels. When system labels are entered, system label names are determined based on this setting at the time of project save.	Use global names directly	
Sampling Trace		Display a message to confirm operation contents at the start of trace.	Display a confirming message to start of trace.	Selected	–
		Display a message to confirm discard of the trace result at the start of trace.	Display a message to confirm discard of the trace result at the start of trace.	Selected	
		Display a caution message in saving data as GX LogViewer format CSV file.	Display a caution message about data changes in saving data as GX LogViewer format CSV file.	Selected	

*1 : Supported by Japanese version of GX Works2 only.
*2 : Not supported by FXCPU.
*3 : This setting is not required when the following operations are performed, and the programmable controller CPU is switched to RUN for writing programs to programmable controller CPU after compiling programs.
• For QCPU (Q mode)/LCPU: reset the programmable controller CPU, clear all device memories including latches, clear all file registers.
• For FXCPU: perform the PLC memory clear function.
*4 : 0 clear process may take a couple of minutes when a large amount of devices to be cleared exists.
*5 : Not supported by Simple project.
*6 : Not supported by High-speed Universal model QCPU.
*7 : For FXCPU, this item is supported by FX3G, FX3GC, FX3U, and FX3UConly.

Point

● **Options supported by communication head module and remote I/O module**
The following option items are supported by projects for communication head module and remote I/O module.
- Project
- Parameter
- PLC Read/Write
- Intelligent Function Module

22 USING LIBRARIES

This chapter explains the overview of library function in GX Works2.

22.1 Libraries

FB library and user library are the libraries of GX Works2.
Work hours for creating programs can be reduced by using functions of library.
This section explains the overview of libraries.

The following table shows the applicability of libraries according to the project type.

○: Applicable ×: Not applicable

Project type	Library	
	FB library	User library
Simple project (without labels)	×	×
Simple project (with labels)	○ ☞ Section 22.1.1	×
Structured project	○ ☞ Section 22.1.1	○ ☞ Section 22.1.2

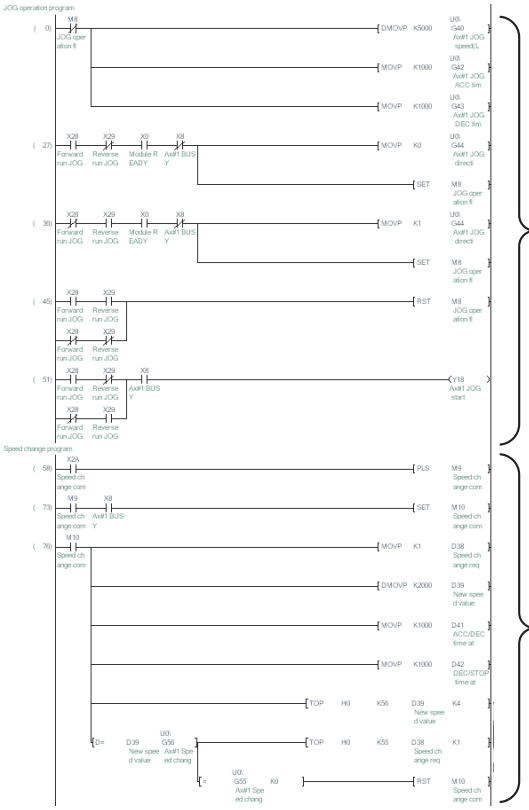
22.1.1 FB libraries

Q CPU L CPU Remote Head FX

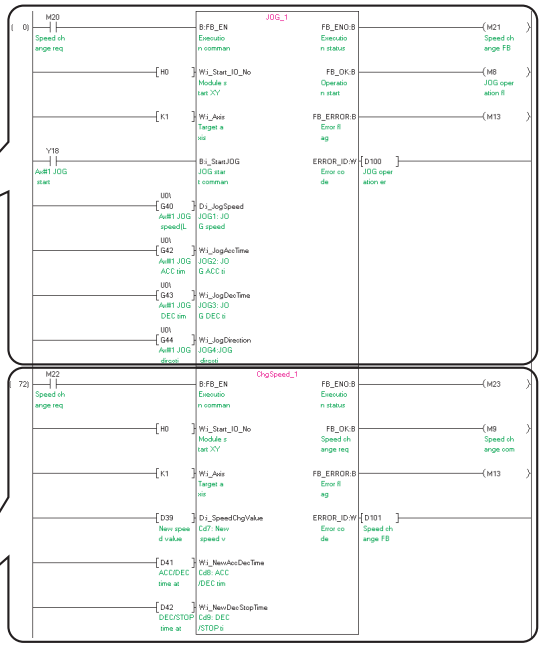
FB libraries are the collection of function blocks prepared as MELSOFT Library and they can be used in projects with labels.
Contact your local Mitsubishi representative to obtain MELSOFT Library.
To use the FB library in a Structured project, import the library to a Simple project (with labels), and change the project type to a Structured project by selecting [Project] ⇒ [Change Project Type].

Programs can be created efficiently by using the FB libraries.
The following shows an example of using the FB library of QD70 positioning module (QD70P4).

< Without FB libraries >



< With FB libraries >



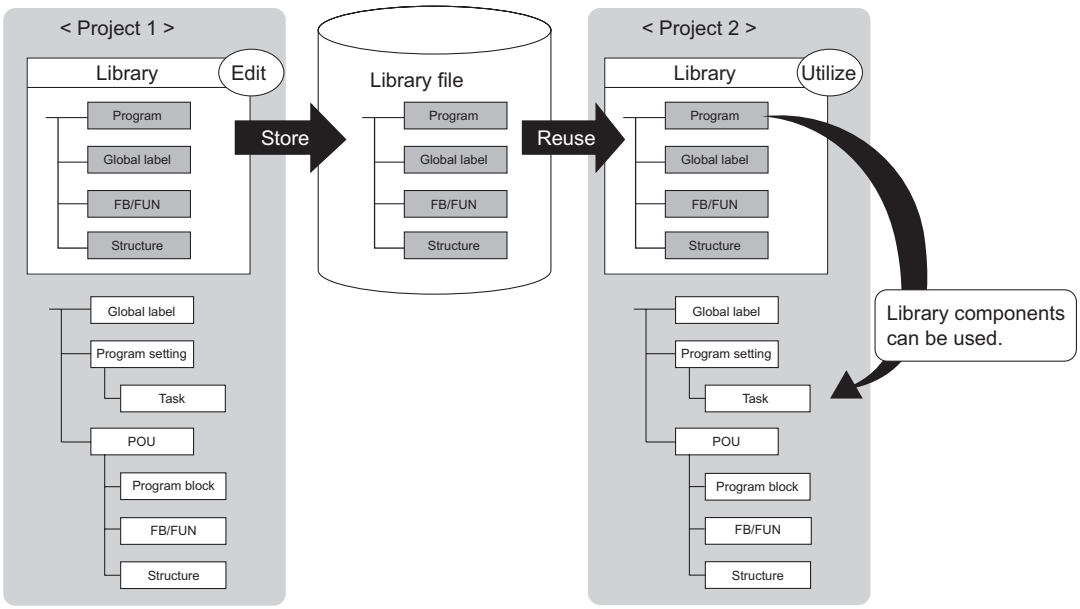
For details of using the FB libraries, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

22.1.2 User libraries

Q CPU L CPU Remote Head FX

User libraries are components which can be shared between multiple projects and they can be used in a Structured project only.
User libraries are created by a user.

Frequently-used components are stored and reused for programming efficiency.



The following data can be registered to user libraries.

- Global labels
- Structures
- POUs (program blocks, functions, function blocks)

For details of using user libraries, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Structured Project)

MELSOFT

APPENDIX

Appendix 1 List of Toolbars and Shortcut Keys

Q CPU L CPU Remote Head FX

This section shows the list of toolbars and shortcut keys that can be used for GX Works2.

For (Simple), (FB), (Structured), and (Intelligent) indicated in the Reference column, refer to the following manuals respectively:

(Simple) … GX Works2 Version 1 Operating Manual (Simple Project)
(FB) … GX Works2 Version 1 Operating Manual (Simple Project, Function Block)
(Structured) … GX Works2 Version 1 Operating Manual (Structured Project)
(Intelligent) … GX Works2 Version 1 Operating Manual (Intelligent Function Module)

Appendix 1.1 Common toolbars and shortcut keys

The following explains the toolbars that are available regardless of the editing target and the corresponding shortcut keys.

■ "Standard" toolbar icons

The following table shows the "Standard" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Create a new project.	Section 4.2.1
	Ctrl + O	Open	Open an existing project.	Section 4.2.2
	Ctrl + S	Save	Save the project.	Section 4.2.3
	Ctrl + P	Print	Print data such as sequence programs and devices.	Chapter 20
	F1	GX Works2 Help	Display the GX Works2 Help screen.	Section 3.4.1
-	-	Find Help for GX Works2	Search for help items with an entered keyword on the GX Works2 Help screen.	

■ "Program Common" toolbar icons

The following table shows the "Program Common" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + X	Cut	Cut the selected data.	–
	Ctrl + C	Copy	Copy the selected data.	–
	Ctrl + V	Paste	Paste the cut/copied data at the cursor position.	–
	Ctrl + Z	Undo	Cancel the previous operation.	–
	Ctrl + Y	Redo	Perform the operation canceled by [Undo].	–
	Ctrl + F	Find Device	Search for a device.	Section 10.3.1
	–	Find Instruction	Search for an instruction.	Section 10.3.2
	Ctrl + Alt + F7	Find Contact or Coil	Search for a contact or coil corresponding to a specified device.	
	–	Write to PLC	Write data to the programmable controller CPU.	Section 12.1
	–	Read from PLC	Read data from the programmable controller CPU.	
	–	Start Monitoring (All Windows)	Start monitoring all windows being opened.	Section 14.2
	–	Stop Monitoring (All Windows)	Stop monitoring all windows being opened.	
	F3	Start Monitoring	Start monitoring the window being operated.	
	Alt + F3	Stop Monitoring	Stop monitoring the window being operated.	
	–	Device/Buffer Memory Batch Monitor	Batch monitor device/buffer memories.	Section 14.3
	Shift + Enter	Modify Value	For ladder and SFC (Zoom) programs, change the ON/OFF and value of a device/label used in a program.	Section 16.1
	F4	Build	Compile/convert a program being edited.	Section 5.4
	Shift + F4	Online Program Change	Compile/convert a program and write it to the programmable controller CPU.	
	Shift + Alt + F4	Rebuild All	Compile/convert all programs in a project.	
	–	Start/Stop Simulation	Start/stop simulation.	Section 15.2

■ "Docking Window/Switch Project Data" toolbar icons

The following table shows the "Docking Window/Switch Project Data" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	–	Select data type	Select a data type and data name to be displayed.	Section 3.2.2
–	–	Select data name		
	–	Display	Display the editing screen of the selected data type and data name.	
	–	Navigation	Display/hide the Navigation window.	Section 3.2.5
	–	Selection	Display/hide the Function Block Selection window.	(FB) (Structured)
	–	Output	Display/hide the Output window.	(Simple) (Structured)
	–	Cross Reference	Display/hide the Cross Reference window.	Section 10.1
	–	Device List	Display/hide the Device List window.	Section 10.2
	–	CC-Link Device Reference Window	Display/hide the CC-Link Device Reference window.	Section 6.3.5
	–	Watch	Display/hide the Watch window.	Section 14.6
	–	Intelligent Function Module Monitor	Display/hide the Intelligent Function Module Monitor window.	(Intelligent)
	–	Intelligent Function Module Guidance	Display/hide the Intelligent Function Module Guidance window.	
	–	Find/Replace	Display/hide the Find/Replace window.	Section 10.3

■ "Intelligent Function Module" toolbar icons

The following table shows the "Intelligent Function Module" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	QD75/LD75 Positioning Module Wave Trace	Execute a wave trace of the QD75/LD75 positioning module.	(Intelligent)
	–	QD75/LD75 Positioning Module Location Trace	Execute a location trace of the QD75/LD75 positioning module.	
	–	Serial Communication Module Circuit Trace	Execute a circuit trace of the serial communication module.	
	–	QD75/LD75 Positioning Module Test Monitor	Execute a positioning monitor of the QD75/LD75 positioning module.	
	–	QD75/LD75 Positioning Module Test	Execute a positioning test of the QD75/LD75 positioning module.	
	–	Offset/Gain Setting of Temperature Input Module	Execute offset/gain setting of the temperature input module.	
	–	Offset/Gain Setting of Analog Module	Execute offset/gain setting of the analog module.	

■ "Debug Function" toolbar icons

The following table shows the "Debug Function" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Stop	Stop the step execution.	Section 16.6.9
	–	Cancel	Cancel the step execution.	Section 16.6.7
	–	Break Execution	Execute the break execution.	Section 16.6.6
	–	Step Execution	Execute the step execution.	Section 16.6.5
	–	Execution Option	Display the Execution Option screen of the step execution.	Section 16.6.8
	–	Set/Cancel Break Point	Set a break point at the cursor position, or cancel the set break point.	Section 16.6.2
	–	Enable/Disable Break Point	Enable/disable the break point at the cursor position.	
	–	Cancel All Break Points	Cancel all break points.	
	–	Break Point	Display the Break Point window.	
	–	Cancel All Break Devices	Cancel all break devices.	Section 16.6.3
	–	Break Device	Display the Break Device window.	
	–	Set/Cancel Skip Range	Set a skip range, or cancel the set skip range.	Section 16.6.4
	–	Enable/Disable Skip Range	Enable/disable the skip range at the cursor position.	
	–	Cancel All Skip Ranges	Cancel all skip ranges.	
	–	Skip Range	Display the Skip Range window.	

■ Other shortcut keys

The following table shows other shortcut keys that are available regardless of the editing target.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	F2	Rename	Change the name of the selected data or library on the Navigation window.	Section 4.3.3
		Rename (Library)		(Structured)
–	Delete	Delete	Delete the selected data.	Section 4.3.4
–	Ctrl + Shift + C	Copy	Copy data in the project.	Section 4.3.2
–	Ctrl + Shift + V	Paste	Paste the copied data to a folder.	
–	Ctrl + Shift + E	Add New Module	Add the intelligent function module data to the project being edited.	(Intelligent)
–	Alt + F4	Exit	Close the project being edited and exits GX Works2.	Section 3.1
–	Ctrl + E	Cross Reference	Create the cross reference information.	Section 10.1
–	Ctrl + D	Device List	Display the device list.	Section 10.2
–	F11 / Ctrl + .	–	After creating cross reference information, move to the next cross reference information.	Section 10.1
–	Shift + F11 / Ctrl + Shift + .	–	After creating cross reference information, move to the previous cross reference information.	
–	F12 / Ctrl + ,	–	After creating cross reference information, move focus between the Cross Reference window and work windows.	
–	Ctrl + F	Find Device	Search for a device/label in the program.	Section 10.3.1
–	Ctrl + Shift + F	Find String	Search for a string.	Section 10.3.3

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Ctrl + H	Replace Device	Replace a device/label in the program.	Section 10.3.1
–	Ctrl + Shift + H	Replace String	Replace a string.	Section 10.3.3
–	Ctrl + Alt + ↓	–	After performing the search/replace function once, search for an item in the downward direction.	Section 10.3
–	Ctrl + Alt + ↑	–	After performing the search/replace function once, search for an item in the upward direction.	
–	Shift + F3	Start Watching	Start monitoring the current values of registered devices/labels and intelligent function module.	Section 14.6
–	Shift + Alt + F3	Stop Watching	Stop monitoring the current values of registered devices/labels and intelligent function module.	
–	Ctrl + Enter	Register Device Test with Execution Condition	Register the device test with execution condition.	Section 16.3
–	Ctrl + F4	–	Close the window displayed on the uppermost position.	–
–	Ctrl + F6	–	Move to the next uppermost window.	–

Appendix 1.2 "Navigation Window" toolbar icons

The following table shows the "Navigation Window" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Add New Data	Add data to the project.	Section 4.3.1
	–	Copy	Copy selected data.	Section 4.3.2
	–	Paste	Paste copied data.	
	–	Property	Display a property of the selected data.	Section 4.3.6
	–	Refresh	Update the display content of the Navigation window.	–
	–	Project Property	Display a property of the open project.	–
		Expand All Uncompiled Data	Expand all uncompiled data in the tree on the Project view and the User Library view.	Section 3.2.5
		Collapse All	Collapse all data in the tree on the Project view and the User Library view.	

Appendix 1.3 Toolbar icons and shortcut keys for setting labels

The following explains the toolbar icons and the corresponding shortcut keys for setting labels.

■ "Label" toolbar icons

The following table shows the "Label" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Shift + Insert	New Declaration (Before)	Add a row above the cursor position.	(Simple) (Structured)
	–	New Declaration (After)	Add a row below the cursor position.	
	Shift + Delete	Delete Row	Delete the row at the cursor position.	
	–	Read from CSV File	Read label settings from the CSV file.	
	–	Write to CSV File	Write label settings to the CSV file.	
	–	Confirm Update of System Label Database	Apply system label information changed in another project to global labels.	
	–	Import System Label	Import system label information and apply it to global labels.	
	–	Reservation to Register System Label	Reserve the selected global label for registration as a system label.	
	–	Reservation to Release System Label	Reserve the selected global label for deregistration of system label.	

■ Other shortcut keys

The following table shows other shortcut keys for setting labels.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Ctrl + A	Select All	Select all rows.	(Simple) (Structured)
–	Ctrl + + / Ctrl + Num + *1	–	Display all lines of comment and remark of the selected line.	
–	Ctrl + - / Ctrl + Num - *1	–	Display only the first line of comment and remark of the selected line.	

*1 : 'Num' indicates keys in the numeric keypad.

Appendix 1.4 Toolbar icons and shortcut keys for setting device memory

The following explains the toolbar icons and the corresponding shortcut keys for setting device memory.

■ "Device Memory" toolbar icons

The following table shows the "Device Memory" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Display Mode/Binary	Display data in binary.	Section 7.2.5
	–	Display Mode/Octal	Display data in octal.	
	–	Display Mode/Decimal	Display data in decimal.	
	–	Display Mode/ Hexadecimal	Display data in hexadecimal.	
	–	Display Mode/Float	Display data in real number.	
	–	Display Mode/String	Display data in character string.	
	–	Display Mode/String (ASCII only)	Display data in ASCII string.	
	–	Register/16-bit	Display data in units of words.	
	–	Register/32-bit	Display data in units of double words.	
	–	Register/64-bit	Display data in units of 64 bits.	
	Ctrl + I	Input Device	Enter a device.	Section 7.2.2
	–	FILL	Set the same value to continuous devices.	Section 7.2.4
	–	Read Device Memory from PLC	Read data in device memory from a programmable controller CPU.	Section 7.4.1
	–	Write Device Memory to PLC	Write data in device memory to a programmable controller CPU.	
	–	Read from Excel File	Read data from an Excel file.	Section 7.4.2
	–	Write to Excel File	Write data to an Excel file.	

■ Other shortcut key

The following table shows other shortcut key for setting device memory.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Insert	Insert Row	Insert a row at the cursor position.	Section 7.2

Appendix 1.5 Toolbar icons and shortcut keys for verification result

The following table shows the toolbar icons and the corresponding shortcut keys for the verification result.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Alt + ↓	Next Unmatch	Move to the next mismatched data.	Section 4.2.7 Section 12.2
	Alt + ↑	Previous Unmatch	Move to the previous mismatched data.	
	Alt + Back space	Return to Result List	Display the <<Verify Result List>>tab.	
	Ctrl + Delete	Close Detail Result	Close the <<Detail Verify Result>>tab being displayed.	
	Ctrl + Shift + Delete	Close All Detail Result	Close all <<Detail Verify Result>>tab.	
	–	Write to CSV File	Write verification result to a CSV file.	

Appendix 1.6 Toolbar icons and shortcut keys for executing sampling trace

The following explains the toolbar icons and the shortcut keys for executing sampling trace.

■ Toolbar icons for executing sampling trace

The following table shows the toolbar icons for executing sampling trace.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	Trace Setting	Display the Trace Setting screen.	Section 16.4.2
	–	Start Trace	Start sampling trace. To start sampling trace, the trace ready signal (SM800) must be ON.	Section 16.4.4
	–	Stop Trace	Stop sampling trace.	
	–	Display Trace Buffer Condition	Display the Trace Data Storage Status screen.	
	–	–	Display the current sampling trace status	–
	–	Buffer Status	Displayed when the trace data have been acquired up to the specified total number of samplings.	
	–	Trigger Occurrence	Displayed when a trigger is generated during sampling trace.	
	–	Zoom Out Timing Chart	Zoom the scale of timing chart	Section 16.4.4
	–	Zoom In Timing Chart		
	–	Zoom Out Trend Graph	Zoom the scale of trend graph	
	–	Zoom In Trend Graph		
	–	Switch Chart/Detail	Switch the trace result display on the Sampling Trace screen between the timing chart (graph) and the detailed data (value).	

■ Other shortcut keys

The following table shows the other shortcut keys for executing sampling trace.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Shift + Alt + ←	–	Move the vertical axis information line 10 columns to the left.	Section 16.4.4
–	Shift + Alt + →	–	Move the vertical axis information line 10 columns to the right.	
–	Ctrl + ←	–	Move the vertical axis information line 100 columns to the left.	
–	Ctrl + →	–	Move the vertical axis information line 100 columns to the right.	
–	Alt + ←	–	Move the vertical axis information line toward the left from the vertical axis information line to the columns of first data change.	
–	Alt + →	–	Move the vertical axis information line toward the right from the vertical axis information line to the columns of first data change.	

Appendix 1.7 Toolbar icons and shortcut keys for program editors

The following explains the toolbar icons and the corresponding shortcut keys for program editors.

■ "Ladder" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the ladder editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
F5	F5	Open Contact	Insert an open contact at the cursor position.	(Simple)
sF5	Shift + F5	Open Branch	Insert an open contact branch at the cursor position.	
F6	F6	Close Contact	Insert a closed contact at the cursor position.	
sF6	Shift + F6	Close Branch	Insert a closed contact branch at the cursor position.	
F7	F7	Coil	Insert a coil at the cursor position.	
F8	F8	Application Instruction	Insert an application instruction at the cursor position.	
F9	F9	Horizontal Line	Insert a horizontal line at the cursor position.	
sF9	Shift + F9	Vertical Line	Insert a vertical line at the cursor position.	
cF9	Ctrl + F9	Delete Horizontal Line	Delete the horizontal line at the cursor position.	
cF10	Ctrl + F10	Delete Vertical Line	Delete the vertical line at the cursor position.	
sF7	Shift + F7	Rising Pulse	Insert a rising pulse at the cursor position.	
sF8	Shift + F8	Falling Pulse	Insert a falling pulse at the cursor position.	
aF7	Alt + F7	Rising Pulse Branch	Insert a rising pulse branch at the cursor position.	
aF8	Alt + F8	Falling Pulse Branch	Insert a falling pulse branch at the cursor position.	
saF5	Shift + Alt + F5	Rising Pulse Close	Insert a rising pulse close at the cursor position.	
saF6	Shift + Alt + F6	Falling Pulse Close	Insert a falling pulse close at the cursor position.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Shift + Alt + F7	Rising Pulse Close Branch	Insert a rising pulse close branch at the cursor position.	(Simple)
	Shift + Alt + F8	Falling Pulse Close Branch	Insert a falling pulse close branch at the cursor position.	
	Alt + F5	Operation Result Rising Pulse	Insert an operation result rising pulse at the cursor position.	
	Ctrl + Alt + F5	Operation Result Falling Pulse	Insert an operation result falling pulse at the cursor position.	
	Ctrl + Alt + F10	Invert Operation Results	Insert an operation result inversion at the cursor position.	
	F10	Edit Line	Input a line at the cursor position.	
	Alt + F9	Delete Line	Delete the line at the cursor position.	
	Ctrl + B	Insert Inline Structured Text Box	Insert an inline structured text box.	
	–	Device Comment	Edit device comments.	Section 9.2.2
	–	Statement	Edit statements.	(Simple)
	–	Note	Edit notes.	
	–	Statement/Note Batch Edit	Batch-edit statements/notes.	
	Ctrl + L	Line Statement List	Display the list of line statements used in the program.	
	Ctrl + Alt + F1	Display Template	Insert a template corresponds to the instruction/ function/control syntax.	(Structured)
	Alt + ←	Mark Template (Left)	Set an argument of the template in the selected status from the left by selecting the menu each time.	
	Alt + →	Mark Template (Right)	Set an argument of the template in the selected status from the right by selecting the menu each time.	
	Shift + F2	Read Mode	Switch the mode of the open window to "Read Mode".	(Simple)
	F2	Write Mode	Switch the mode of the open window to "Write Mode".	
	F3	Monitor Mode	Switch the mode of the open window to "Monitor Mode" during monitoring.	
	Shift + F3	Monitor (Write Mode)	Switch the mode of the open window to "Monitor (Write Mode)" during monitoring.	
	Ctrl + Alt + F6	Device Display	Display devices assigned by compilation.	
	–	Zoom	Change the display magnification ratio of the ladder program.	
–	Ctrl + Alt + V	Continuous Paste	Increment the device number of device in the cut/ copied ladder block and paste it consecutively.	
–	Shift + Insert	Insert Row	Insert a row at the cursor position.	
–	Shift + Delete	Delete Row	Delete the row at the cursor position.	
–	Ctrl + Insert	Insert Column	Insert a column at the cursor position.	
–	Ctrl + Delete	Delete Column	Delete the column at the cursor position.	
–	Ctrl + Shift + →	Connect Line to Right-Side Symbol	Connect a horizontal line to the element at the right of the cursor position.	
–	Ctrl + Shift + ←	Connect Line to Left-Side Symbol	Connect a horizontal line to the element at the left of the cursor position.	
–	Ctrl + →	Enter/Delete HLine Rightward	Enter/delete a line at the right of the cursor position.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Ctrl + ←	Enter/Delete HLine Leftward	Enter/delete a line at the left of the cursor position.	
–	Ctrl + ↓	Enter/Delete VLine Downward	Enter/delete a line at the downward of the cursor position.	
–	Ctrl + ↑	Enter/Delete VLine Upward	Enter/delete a line at the upward of the cursor position.	
–	Ctrl + /	Switch Open/Close Contact	Switch a open contact to closed contact, and vice versa.	
–	Ctrl + :	Switch Statement/ Note Type	Change the type of a statement/note.	
–	Ctrl + Alt + Enter	Instruction Partial Edit	Open the Enter Symbol screen in which the first argument is in the selected status.	
–	Alt + → / ←	–	Select a device/label on the Enter Symbol screen. Switch the device/label to be selected using the → / ← button.	
–	Alt + ↑ / ↓	–	Increment/decrement a device/label on the Enter Symbol screen.	
–	Ctrl + Space	–	Display options of instruction/label on the Enter Symbol screen.	
–	Ctrl + ↑ / ↓ / → / ←	–	Move the cursor on the editing screen while the Enter Symbol screen is displayed.	
–	Ctrl + G	Jump	Display the specified row.	
–	Ctrl + Alt + PgDown	Jump to Next Ladder Block Start	Move the cursor from the current position to the start of the next ladder block.	(Simple)
–	Ctrl + Alt + PgUp	Jump to Previous Ladder Block Start	Move the cursor from the current position to the start of the previous ladder block.	
–	Ctrl + Alt + E	Next Device	Move the cursor to the same device as the one at the cursor position.	
–	Ctrl + Alt + D	Next Contact	Move the cursor to the contact where the same device as the one at the cursor position is used.	
–	Ctrl + Alt + F	Next Coil	Move the cursor to the coil where the same device as the one at the cursor position is used.	
–	Ctrl + Alt + R	Back	Return the cursor to the previous position before the [Next Device]/[Next Contact]/[Next Coil] function execution.	
–	Ctrl + F5	Comment	Display device comments.	
–	Ctrl + F7	Statement	Display statements.	
–	Ctrl + F8	Note	Display notes.	
–	Ctrl + - / Ctrl + Num - *1	Non-Display Ladder Block	Hide a ladder block.	
–	Ctrl + + / Ctrl + Num + *1	Display Ladder Block	Display hidden a ladder block.	
–	Ctrl + turn mouse scroll wheel upward	Bigger	Change the display size of text larger on the editing screen.	
–	Ctrl + turn mouse scroll wheel downward	Smaller	Change the display size of text smaller on the editing screen.	
–	Ctrl + Shift + Enter	Tile FB Horizontally	Tile the ladder editor and the function block program editor horizontally.	(FB)
–	Ctrl + R	Back to Zoom SFC Block	Open the SFC diagram corresponds to the program on the Zoom editor window.	(Simple)
–	Shift + Alt + ↑ / ↓ / ← / →	Moves up/down/left/ right	Move the cursor toward up/down/left/right of the SFC diagram.	
–	Ctrl + F1	Open Instruction Help	Display the Instruction Help screen.	
–	Space	–	Display the Find screen.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	F1	Instruction Help	Display details of instructions.	Section 3.4.1
–	Ctrl + Shift + =	–	Enter an assignment operator (:=) when editing the inline structured text program.	(Structured)

*1 : 'Num' indicates keys in the numeric keypad.

■ "ST" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the ST editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	F2	List Operands	Display the Label Registration/Selection screen.	(Structured)
	Ctrl + F1	Display Template	Insert a template corresponds to the instruction/function/control syntax.	
	Ctrl + Alt + ←	Mark Template (Left)	Set an argument of the template in the selected status from the left by selecting the menu each time.	
	Ctrl + Alt + →	Mark Template (Right)	Set an argument of the template in the selected status from the right by selecting the menu each time.	
	Ctrl + F7	Toggle Bookmark	Set a bookmark at the cursor line. If a bookmark has already been set, delete the set bookmark.	
	–	Bookmark List	Jump to the specified bookmark from the bookmark list.	
	F7	Next Bookmark	Display the next bookmark position.	
	Shift + F7	Previous Bookmark	Display the previous bookmark position.	
	Ctrl + Shift + F7	Delete All Bookmarks	Delete all bookmarks.	
	Ctrl + Num + *1	Increase Zoom	Zoom in the screen one level.	
	Ctrl + Num - *1	Decrease Zoom	Zoom out the screen one level.	
–	Ctrl + G	Jump	Jump to the specified line.	
–	Shift + F2	Zoom Header/Body Header	Open the label setting editor of the selected POU.	
–	Ctrl + Insert	Copy	Copy the selected data.	
–	Shift + Delete	Cut	Cut the selected data.	
–	Shift + Insert	Paste	Paste the cut/copied data at the cursor position.	
–	F1	Instruction Help	Display details of instructions.	Section 3.4.1
–	Ctrl + Shift + =	–	Enter an assignment operator (:=) when editing the inline structured text program.	(Structured)

*1 : 'Num' indicates keys in the numeric keypad.

■ "Structured Ladder/FBD" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the Structured Ladder/FBD editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + Q	Select Mode	Change the input mode for positioning contacts/coils.	(Structured)
	Ctrl + T	Interconnect Mode	Change the input mode for drawing lines.	
	Ctrl + Shift + Q	Guided Mode/Guided Editing	Change the input mode for entry with keyboard.	
	Ctrl + Shift + A	Guided Mode/Auto Comment	Add a comment entry field at the start of the ladder block added in Guided editing.	
	Ctrl + B	Auto Connect	Connect the start and end points to draw a line automatically.	
	Ctrl + W	Insert Row	Insert a row into the ladder program being edited.	
	Ctrl + U	Insert Column	Insert a column into the ladder program being edited.	
	Ctrl + Alt + B	New Ladder Block Before	Insert a new ladder block in front of the ladder block being edited.	
	Ctrl + Alt + A	New Ladder Block After	Insert a new ladder block after the ladder block being edited.	
	–	Input Instruction	Open the Input Instruction screen.	
	–	Left Power Rail	Display/hide the left power rail.	
	1	Open Contact	Insert an open contact at the cursor position.	
	2	Close Contact	Insert a closed contact at the cursor position.	
	3	Open Branch	Insert an open contact branch at the cursor position.	
	4	Close Branch	Insert a closed contact branch at the cursor position.	
	5	Vertical Line Segment	Insert a vertical line at the cursor position.	
	6	Horizontal Line Segment	Insert a horizontal line at the cursor position	
	7	Coil	Insert a coil at the cursor position.	
	8	Selection	Display the Function Block Selection window.	
	9	Input Label	Insert an input variable at the cursor position.	
	0	Output Label	Insert an output variable at the cursor position.	
	–	Rising Pulse	Insert a rising pulse at the cursor position.	
	–	Falling Pulse	Insert a falling pulse at the cursor position.	
	–	Rising Pulse Close	Insert a rising pulse close at the cursor position.	
	–	Falling Pulse Close	Insert a falling pulse close at the cursor position.	
	Ctrl + J	Jump	Insert a jump at the cursor position.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + R	Return	Insert a return at the cursor position.	(Structured)
	Ctrl + M	Comment	Insert a comment entry field.	
	Ctrl + Shift + L	Ladder Block Label	Display the Ladder Block screen.	
	F2	List Operands	Display the Label Registration/Selection screen.	
	+	Increment Pins	Increment the number of arguments of functions and function blocks.	
	-	Delete Pins	Delete the number of arguments of functions and function blocks.	
	Ctrl + Num + *1	Increase Zoom	Zoom in the screen one level.	
	Ctrl + Num - *1	Decrease Zoom	Zoom out the screen one level.	
–	Alt + ↑/↓	–	Narrow and widen the width of ladder block in the Guided mode.	
–	Ctrl + Alt + S	Signal Configuration/ Configure	Set the type of contact and coil.	
–	Ctrl + Alt + C	Signal Configuration/ Toggle	Change the type of contact and coil in the order shown below: • Contact: Open Contact → Close Contact • Coil: Normal → Negation → Set → Reset	
–	Ctrl + G	Jump	Jump to the specified ladder block number.	
–	Ctrl + Shift + M	Change Label-Device-Address Mode	Switch the display format in order (label, device, address).	
–	Ctrl + Shift + K	Change Label-Comment Mode	Switch the display between label and comment.	
–	Shift + F2	Zoom Header/Body/ Header	Open the label setting editor screen for the selected POU.	
–	Ctrl + Insert	Copy	Copy the selected data.	
–	Shift + Delete	Cut	Cut the selected data.	
–	Shift + Insert	Paste	Paste the cut/copied data at the cursor position.	
–	Insert	Guided Mode/ Overwrite, Insert Mode	Switch the input mode between Overwrite/ Insert in the Guided mode.	
–	Ctrl + L	Guided Mode/Line Mode	Change the input mode for drawing lines in Guided editing.	
–	Ctrl + PgUp	–	Scroll a ladder block to the right.	
–	Ctrl + PgDown	–	Scroll a ladder block to the left.	
–	F1	Instruction Help	Display details of instructions.	Section 3.4.1

*1 : 'Num' indicates keys in the numeric keypad.

■ "SFC" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the SFC editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	F5	[STEP] New Step	Insert  at the cursor position.	(Simple)
	F6	[B] Block Start Step (with END check)	Insert  at the cursor position.	
	Shift + F6	[BS] Block Start Step (without END check)	Insert  at the cursor position.	
	F8	[JUMP] Jump	Insert  at the cursor position.	
	F7	[END] END Step	Insert  at the cursor position.	
	Shift + F5	[DUMMY] Dummy Step	Insert  at the cursor position.	
	F5	[TR] Transition	Insert  at the cursor position.	
	F6	[--D] Selection Divergence	Insert a selection divergence.	
	F7	[==D] Simultaneous Divergence	Insert a simultaneous divergence.	
	F8	[--C] Selection Convergence	Insert a selection convergence.	
	F9	[==C] Simultaneous Convergence	Insert a simultaneous convergence.	
	Shift + F9	[|] Vertical Line	Insert a vertical line.	
	Ctrl + 1	No Attribute	Set the step attribute to No Attribute.	
	Ctrl + 2	Stored Coil	Set the step attribute to Stored Coil.	
	Ctrl + 3	Stored Operation (without Transition Check)	Set the step attribute to Stored Operation (SE).	
	Ctrl + 4	Stored Operation (with Transition Check)	Set the step attribute to Stored Operation (ST).	
	Ctrl + 5	Reset	Reset the step attribute.	
	Alt + F5	Vertical Line (Draw Line)	Insert  at the cursor position.	
	Alt + F7	Selection Divergence (Draw Line)	Insert  at the cursor position.	
	Alt + F8	Simultaneous Divergence (Draw Line)	Insert  at the cursor position.	
	Alt + F9	Selection Convergence (Draw Line)	Insert  at the cursor position.	
	Alt + F10	Simultaneous Convergence (Draw Line)	Insert  at the cursor position.	
	Ctrl + F9	Delete Line	Delete the line at the cursor position.	
	–	SFC Step/Transition Comment	Edit the SFC step/transition comments.	
	–	Sort SFC Step No.	Sort the SFC block step numbers.	
	–	SFC All Block Batch Monitoring	Batch monitor all blocks in the SFC program.	
	–	SFC Auto Scroll	Scroll the screen to display active steps automatically when they are out of the screen during monitoring.	
	Shift + F2	Read Mode	Switch the mode of the open window to "Read Mode".	
	F2	Write Mode	Switch the mode of the open window to "Write Mode".	
	F3	Monitor Mode	Switch the mode of the open window to "Monitor Mode" during monitoring.	
	Shift + F3	Monitor (Write Mode)	Switch the mode of the open window to "Monitor (Write Mode)" during monitoring.	
	–	Zoom	Change the display magnification ratio of the SFC diagram.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Ctrl + turn mouse scroll wheel upward	Bigger	Enlarge the text display size on the editing screen.	(Simple)
–	Ctrl + turn mouse scroll wheel downward	Smaller	Reduce the text display size on the editing screen.	
–	Shift + Insert	Insert Row	Insert a row at the cursor position.	
–	Shift + Delete	Delete Row	Delete the row at the cursor position.	
–	Ctrl + Insert	Insert Column	Insert a column at the cursor position.	
–	Ctrl + Delete	Delete Column	Delete the column at the cursor position.	
–	Ctrl + G	Jump	Move the cursor to the SFC step number/ transition number in the specified block	
–	Ctrl + M	Find Jump Step	Move the cursor to the step of the jump source.	
–	Numeric key	–	Move the cursor to the SFC step number/ transition number.	
–	Ctrl + Alt + F4	Convert Block	Convert a single block only.	
–	Ctrl + F5	SFC Step/Transition Comment	Display the SFC step/transition comments.	
–	Ctrl + L / Ctrl + double-click	Open Zoom/Start Destination Block	Display the Zoom editor window or the start destination block.	
–	Space	–	Display the start destination block.	
–	Ctrl + R	Back to Start SFC Block	Display the start source block.	
–	Ctrl + Alt + F8	Program Display	Display programs on the SFC diagram when editing in MELSAP-L.	

■ SFC block list shortcut keys

The following table shows the shortcut keys for the SFC block list.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	Ctrl + G	Jump	Jump to the specified block number/data name.	(Simple)
–	Numeric key	–	Jump to the selected block number.	
–	Ctrl + F5	SFC Block List Comment	Display comments of the SFC block list.	

■ Other shortcut keys

The following table shows other shortcut keys for program editors.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
–	↑/↓/→/←	–	Move the cursor in the arrow direction.	(Structured)
–	PgUp	–	Scroll up the screen.	
–	PgDown	–	Scroll down the screen.	
–	Ctrl + PgUp	–	Scroll the screen to the left.	
–	Ctrl + PgDown	–	Scroll the screen to the right.	
–	Home	–	Move the cursor to its leftmost position in the row.	
–	End	–	Move the cursor to its rightmost position in the row.	
–	Ctrl + Home	–	Move the cursor to the start of the program.	
–	Ctrl + End	–	Move the cursor to the end of the program.	
–	Shift + ↑/↓/→/←	–	Set a range.	
–	Ctrl + Shift + Home	–	Select the range from the current position up to the start of the program.	
–	Ctrl + Shift + End	–	Select the range from the current position down to the end of the program.	
–	Delete	–	Delete the selected target.	

Appendix 1.8 Toolbar icons and shortcut keys for I/O system setting function

The following table shows the toolbar icons and the corresponding shortcut keys for the I/O system setting function.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Create a new I/O system setting.	Section 19.8.1
	Ctrl + O	Open	Open an existing I/O system setting.	Section 19.8.2
	Ctrl + S	Save	Save the I/O system setting.	–
	Ctrl + X	Cut	Cut the selected data.	Section 19.4.2
	Ctrl + C	Copy	Copy the selected data.	
	Ctrl + V	Paste	Paste the cut/copied data at the cursor position.	
	–	Execute I/O System Setting	Execute the I/O system setting function and starts simulation.	Section 19.6.1
	–	Disable I/O System Setting	Disable the execution of the I/O system setting function.	Section 19.6.2
	–	Start Monitoring	Start monitoring the I/O System Setting screen.	Section 19.7.1
	–	Stop Monitoring	Stop monitoring the I/O System Setting screen.	
–	Alt + F4	Exit I/O System Settings	Exit the I/O system setting.	–

Appendix 1.9 Shortcut keys for operating intelligent function module

The following explains the toolbar icons and the corresponding shortcut keys for editing intelligent function module data.

■ Toolbar icons for positioning monitor function

The following table shows the toolbar icons for the positioning monitor function.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	–	–	Monitor the operating status of positioning module.	(Intelligent)
	–	–	Monitor the start history.	
	–	–	Monitor the error history.	
	–	–	Monitor the warning history.	
	F3	–	Start the positioning monitor.	
	Alt + F3	–	Stop the positioning monitor.	

■ Toolbar icons and shortcut keys for predefined protocol support function

The following table shows the toolbar icons and the corresponding shortcut keys for the predefined protocol support function.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Create a new communication protocol.	(Intelligent)
	Ctrl + O	Open	Open an existing communication protocol.	
	Ctrl + S	Save	Save the protocol information.	
	Ctrl + C	Copy	Copy the selected data.	
	Ctrl + V	Paste	Paste the cut/copied data at the cursor position.	
	–	Print	Print the protocol information.	
	–	Write to Module	Write data to the module.	
	–	Read from Module	Read data from the module.	

Appendix 2 Simulation Function

Q CPU L CPU Remote Head FX

The simulation function debugs sequence programs on the virtual programmable controller on the personal computer.
The created sequence programs can be debugged without connecting the personal computer to the programmable controller CPU.

This section explains the simulation function and the restrictions.

Appendix 2.1 Supported CPU functions

This section explains the programmable controller CPU functions that are supported by GX Works2 simulation function.
The following tables show the functions that are supported by the simulation function.

○: Supported △: Supported with restrictions ×: Not supported

Function name		Function detail	Supported/ Not supported	Remarks
Programming				
	Memory	Program memory	○	–
		Program cache memory	×	–
		Memory card (RAM)	○	–
		Memory card (ROM)	×	–
		Standard RAM	○	–
		Standard ROM	○	–
	I/O number	I/O number assignment (automatic)	○	–
		I/O number assignment (specified)	○	–
		Number of points occupied by empty slots	○	–
		Number of base slots	△	QCPU (Q mode) only
	Interrupt program	–	×	–
	Multiple program execution	Program executing order setting	○	–
		Initial execution type	○	–
		Scan execution type	○	–
		Standby type	○	–
		Fixed scan execution type	○	–
		Change (Set) by parameter	○	–
		Change by instruction	○	–
	Boot operation	–	○	–
	Programming language	Ladder Diagram	○	–
		List	×	–
		Sequential Function Chart (MELSAP3, MELSAP-L)	△*1	–
		Structured Text	○	–
	Communication with intelligent function module	–	×	–

Function name	Function detail	Supported/ Not supported	Remarks
Programmable controller CPU function			
Constant scan	–	△	No operation is performed in actual time.
Watch dog timer (WDT)	–	△	30,000,000 instructions per scan
Latch function	–	△	Supported by device backup function.
Device initial value	–	○	–
Service processing setting	–	×	–
Output mode setting at STOP to RUN	–	○	–
Input response time selection	–	×	–
Error time output mode setting	–	×	–
CPU operation mode at hardware error	–	×	–
Switch setting of intelligent function module	–	×	–
Monitor function	–	○	–
Monitor condition setting	–	×	–
Monitoring/testing local devices	–	○	–
Remote password	–	×	–
CPU module system display	–	×	–
LED display	–	○	–
Interrupt from intelligent function module	–	×	–
Serial communication function	–	×	–
Remote RUN/STOP	–	○	–
Remote PAUSE	–	×	–
Remote RESET	–	○	–
Remote latch clear	–	○	–
Scan time measurement	–	×	–
Program list monitoring	–	△	No operation is performed in actual time.
Interrupt program list monitoring	–	×	–
Monitoring/testing devices	–	○	–
Forced ON/OFF of external I/O	–	○	–
Device test with execution condition	–	○	–
Sampling trace	–	○	–
Online program change	–	△	SFC file batch online program change is not supported.
Debugging by multiple programming tools	–	×	–
Self-diagnostic function	–	○	–
Error history	–	○	–
System protection	–	×	–
Password registration	–	×	–
Error reset	–	○	–
LED control function	–	○	–
Module error history collection function	–	×	–
Local device batch read function	–	×	–
Backing up latch data to standard ROM	–	×	–

Function name		Function detail	Supported/ Not supported	Remarks
Programmable controller CPU function				
	Writing/Reading device data to standard ROM	–	△	Supported by device backup function.
	Reading module name	–	×	–
	Clock function	–	△	Clock setting is not supported. Extended clock setting (1/1000 seconds) is not supported.
	Battery long-life operation	–	×	–
	Memory check function	–	×	–
	LCPU data logging function	–	△	Only trigger logging is supported by sampling trace function.
	LCPU built-in I/O function	–	×	–
	LCPU built-in Ethernet function	–	×	–
	LCPU built-in CC-Link function	–	×	–
	QCPU multiple CPU system	–	×	–
	QCPU network	–	×	–
Device, Constant				
	A series CPU compatibility setting (Special relay, special register)	–	×	–
	Device indexing	16-bit indexing	○	–
		32-bit indexing	○	–
	Pointer	Local/Common pointer	○	–
	Local device	–	○	–
	Floating point arithmetic processing (Internal precision)	–	△	Rounding error occurs.
	Device setting	–	○	–
	Indirect specification	–	○	–
	File register setting	–	○	–
	Extended data register, extended link register (Use file registers)	–	○	–
	Extension of bit device points	–	○	–

*1 : The following functions are not supported.
· Periodic execution program setting
· Operation mode at block/step concurrent start
· Step transition monitoring timer
· Control SFC type program
· Step/Transition comment read (instruction)

Appendix 2.2 Supported devices

This section explains the devices supported by the simulation function.
However, some devices may be restricted or not supported. No processing is performed for unsupported devices (NOP processing).
Unsupported devices used in a program and their used locations can be checked by selecting [Debug] ⇒ [Instructions Unsupported by Simulation]. (☞ Section 15.3)

● **Device list (QCPU (Q mode)/LCPU)**

Devices SM/SD1000 and later are not supported by the simulation function.

○: Supported ×: Not supported –: Irrelevant

Category	Type	Device name	Range set by parameter	Support	Remarks
Internal user device	Bit device	Input (X)	Applicable (within 29k words)	○	Actual inputs are invalid.
		Output (Y)		○	Actual outputs are invalid.
		Internal relay (M)*1		○	–
		Latch relay (L)		○	–
		Annunciator (F)		○	–
		Edge relay (V)*1		○	–
		Step relay (S)		○	–
		Link special relay (SB)		○	–
		Link relay (B)		○	–
	Word device	Timer (T)*1, *2		○	No operation is performed in actual time. The high-speed timer can be set in units of 0.1ms (by parameter). (For Universal model QCPU and LCPU, in units of 0.01ms)
		Retentive timer (ST)*2		○	No operation is performed in actual time. The high-speed retentive timer can be set in units of 0.1ms (by parameter). (For Universal model QCPU and LCPU, in units of 0.01ms)
		Counter (C)*2		○	–
		Data register (D)*1		○	–
		Link register (W)		○	–
		Link special register (SW)		○	–
Internal system device	Bit device	Function input (FX)	Not applicable	○	–
		Function output (FY)		○	–
		Special relay (SM)		○	For the supported special relays, refer to the Special relay list.
	Word device	Function register (FD)		○	–
		Special register (SD)		○	For the supported special registers, refer to the Special register list.
Link direct device	Bit device	Link input (Jn\X)	Not applicable	×	–
		Link output (Jn\Y)		×	–
		Link relay (Jn\B)		×	–
		Link special relay (Jn\SB)		×	–
	Word device	Link register (Jn\W)		×	–
		Link special register (Jn\SW)		×	–
Intelligent function module device	Word device	Intelligent function module device (Un\G)	Not applicable	○	I/O assignment setting in PLC parameter is required.
Index register	Word device	Index register (Z)	Not applicable	○	–

Category	Type	Device name	Range set by parameter	Support	Remarks
File register	Word device	File register (ZR)	0 to 1017k points (in units of 1k)	○	File register setting in PLC parameter is required. For Universal model QCPU and LCPU, 0 to 4086k points
Nesting	–	Nesting (N)	Not applicable	○	–
Pointer	–	Pointer (P)	Not applicable	○	–
		Interrupt pointer (I)		×	–
Others	Bit device	SFC block device (BL)	Not applicable	○	–
		SFC transition device (TR)		×	–
	–	Network number specified device (J)		×	–
		I/O number specified device (U)		×	–
		Macro instruction argument device (VD)		○	–
		CPU shared memory (Un\G)		○	Memory for reading/writing data among CPU modules in a multiple CPU system. Enabled only when multiple CPU settings are made. Not supported by LCPU.
Constant	–	Decimal constant	K-2147483648 to 2147483647	○	–
		Hexadecimal constant	H0 to FFFFFFFF	○	–
		Real constant	E±1.17550-38 to E±3.40282+38	○	–
			E±2.22507-308 to E±1.79770+308	×	–
		String constant	"ABC", "123"	○	Up to 32 characters per instruction

*1 : Devices that can be used for local devices
*2 : Timer/Retentive timer/Counter: Contact and coil are bit devices and current value is a word device.

● Device list (FXCPU)

○: Supported ×: Not supported –: Irrelevant

Category	Type	Device name	Purpose	Support	Remarks
Internal user device	Bit device	Input (X)	–	○	Octal number. Actual inputs are invalid.
		Output (Y)	–	○	Octal number. Actual outputs are invalid.
		Auxiliary relay (M)	General type*1 (changeable)	○	–
			Latched type*2 (changeable)	○	–
			General type (fixed)	○	–
			Latched type*3 (fixed)	○	–
			Special type	○	–
		State (S)	Initial state*1	○	–
			Initial state (latched)	○	–
			General type*1	○	–
			Latched type*2	○	–
			Annunciator type*3	○	–
			Latched type*3	○	–
	Word device	Timer (T)	100ms	○	–
			10ms	○	–
			100ms/10ms	○	–
			Retentive type for 1ms*3	○	–
			Retentive type for 100ms*3	○	–
			1ms*3	○	–
		Counter (C)	16-bit up-counter*1	○	–
			16-bit up-counter*2	○	–
			32-bit bidirectional counter*1	○	–
			32-bit bidirectional counter*2	○	–
			High-speed counter	×	–
		Data register (D) (32 bits when used in pairs)	16-bit general type*1	○	–
			16-bit latched type*2	○	–
			16-bit latched type*3	○	–
			16-bit special type	○	–
			File type*1	○	–
			RAM file type	○	–
			16-bit latched type (extension register [R])	○	–
			16-bit latched type (extension file register [ER])	×	–
			Buffer memory	○	–
			16-bit index type	○	–

Category	Type	Device name	Purpose	Support	Remarks
Nesting (N)			Master control	○	–
Pointer		Pointer (P)	JUMP or CALL branch	○	–
		Interrupt pointer (I)	Interruption	×	–
Decimal constant			16 bits	○	–
			32 bits	○	–
Hexadecimal constant			16 bits	○	–
			32 bits	○	–
Real number constant				○	–
Character string constant				○	–

*1 : Non-latched area. It can be changed to the latched area by parameter setting.
*2 : Latched area. It can be changed to the non-latched area by parameter setting.
*3 : Fixed latched area. The characteristics of latch cannot be changed.

● **Special relay list (QCPU (Q mode)/LCPU)**

For details of special relays
☞ User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used

No.	Name	Description
SM0	Diagnostic error	OFF : No error ON : Error
SM1	Self-diagnostic error	OFF : No self-diagnostic error ON : Self-diagnostic error
SM5	Error common information	OFF : No error common information ON : Error common information
SM16	Error individual information	OFF : No error individual information ON : Error individual information
SM50	Error reset	OFF→ON: Error reset
SM56	Operation error	OFF : Normal ON : Operation error
SM62	Annunciator detection	OFF : Not detected ON : Detected
SM165	Program memory batch transfer execution status	OFF : Completed ON : Not being executed or not completed
SM202	LED OFF command	OFF→ON: LED OFF
SM203	STOP contact	STOP status
SM204	PAUSE contact	PAUSE status
SM206	PAUSE enable coil	OFF : PAUSE disabled ON : PAUSE enabled
SM213	Clock data read request	OFF : Ignored ON : Read request
SM250	Max. loaded I/O read	OFF : Ignored ON : Read
SM320	Presence/absence of SFC program	OFF : SFC program absent ON : SFC program present
SM321	Start/stop SFC program	OFF : SFC program not executed (stop) ON : SFC program executed (start)
SM322	SFC program start status	OFF : Initial start ON : Resume start
SM323	Presence/absence of continuous transition for entire block	OFF : Continuous transition not effective ON : Continuous transition effective
SM324	Continuous transition prevention flag	OFF : When transition is executed ON : When no transition
SM325	Output mode at block stop	OFF : OFF ON : Preserves
SM326	SFC device clear mode	OFF : Clear device ON : Preserves device

No.	Name	Description
SM327	Output during end step execution	OFF : Hold step output turned OFF (cleared) ON : Hold step output held
SM328	Clear processing mode when end step is reached	OFF : Clear processing is performed. ON : Clear processing is not performed.
SM400	Always ON	ON OFF
SM401	Always OFF	ON OFF
SM402	After RUN, ON for only 1 scan	ON OFF 1 scan
SM403	After RUN, OFF for only 1 scan	ON OFF 1 scan
SM405	Low speed execution type program After RUN, OFF for 1 scan only	ON OFF 1 scan
SM409*1	0.01 second clock	0.005 sec 0.005 sec
SM410*1	0.1 second clock	0.05 sec 0.05 sec
SM411*1	0.2 second clock	0.1 sec 0.1 sec
SM412*1	1 second clock	0.5 sec 0.5 sec
SM413*1	2 second clock	1 sec 1 sec
SM414*1	2n second clock	n sec n sec
SM415*1	2n (ms) clock	n (ms) n (ms)
SM420	User timing clock No. 0	n2 scan, n1 scan, n2 scan
SM421	User timing clock No. 1	
SM422	User timing clock No. 2	
SM423	User timing clock No. 3	
SM424	User timing clock No. 4	
SM430	User timing clock No. 5	
SM431	User timing clock No. 6	
SM432	User timing clock No. 7	
SM433	User timing clock No. 8	
SM434	User timing clock No. 9	
SM510	Low speed program execution flag	OFF : Completed or not executed ON : Execution under way
SM600	Memory card usable flags	OFF : Unusable ON : Use enabled
SM602	Drive 1 flag	OFF : No drive 1 ON : Drive 1 present

No.	Name	Description
SM603	Drive 2 flag	OFF : No drive 2 ON : Drive 2 present
SM604	Memory card in-use flag	OFF : Not used ON : In use
SM620	Drive 3/4 usable flags	OFF : Unusable ON : Use enabled
SM621	Drive 3/4 protect flag	OFF : Not protected ON : Protected
SM622	Drive 3 flag	OFF : No drive 3 ON : Drive 3 present
SM623	Drive 4 flag	OFF : No drive 4 ON : Drive 4 present
SM624	Drive 3/4 in-use flag	OFF : Not used ON : In use
SM640	File register use	OFF : File register not used ON : File register in use
SM650	Comment use	OFF : Comment not used ON : Comment in use
SM672	Memory card file register access range flag	OFF : Within access range ON : Outside access range
SM680	Program memory write error	OFF : Write not executed/ normal ON : Write error
SM681	Program memory writing flag	OFF : Write not executed ON : During writing
SM700	Carry flag	OFF : Carry OFF ON : Carry ON
SM703	Sort order	OFF : Ascending order ON : Descending order
SM704	Block comparison	OFF : Non-match found ON : All match
SM722	BIN/DBIN instruction error disabling flag	OFF : Error detection performed ON : Error detection not performed
SM776	Enable/disable local device at CALL	OFF : Local device disabled ON : Local device enabled
SM777	Enable/disable setting for local devices in interrupt program	OFF : Local device disabled ON : Local device enabled
SM800	Trace preparation	OFF : Not ready ON : Ready
SM801	Trace start	OFF : Suspend ON : Start
SM802	Trace execution in progress	OFF : Suspend ON : Start
SM803	Trace trigger	OFF → ON: Start
SM804	After trace trigger	OFF : Not after trigger ON : After trigger
SM805	Trace completed	OFF : Not completed ON : End
SM826	Trance error	OFF : Normal ON : Error
SM829	Forced registration specification of trace setting	OFF : Forced registration disabled ON : Forced registration enabled
SM1500*2	Process control instruction S.IN hold mode	OFF : No-hold ON : Hold
SM1501*2	Process control instruction S.OUT hold mode	OFF : No-hold ON : Hold
SM1510*3	Operation mode	(Fixed to 'OFF') OFF : Backup mode, debug mode ON : Separate mode
SM1511*3	System A identification flag	(Fixed to 'ON' (System A))*4
SM1512*3	System B identification flag	(Fixed to 'OFF' (System A))*4
SM1513*3	Debug mode status flag	(Fixed to 'ON') OFF : Not in debug mode ON : Debug mode
SM1515*3	Operation system status	(Fixed to 'ON' (Control system))*5
SM1516*3		(Fixed to 'OFF' (Control system))*5

*1 : When the setting value of the constant scan is equal to the integral multiple of the clock time, the value of the special relay is OFF every scan. For the setting to turn the clock of the special relay ON/OFF, refer to Point in the next page.

*2 : These devices are for the process control instruction, and supported by Process CPU and Redundant CPU only.
When the program with the process control instruction is written to the programmable controller CPU other than Process CPU and Redundant CPU, a stop error occurs on the CPU from INSTRCT.CODE ERR (error code 4002).

*3 : Applicable for operations on Redundant CPU only. Fixed to the status in the parentheses.

*4 : The following shows the correspondences for the system A and the system B of Redundant system.
System A: When SM1511 is ON, or SM1512 is OFF.
System B: When SM1511 is OFF, or SM1512 is ON.
Unspecified system: When both SM1511 and SM1512 are OFF.

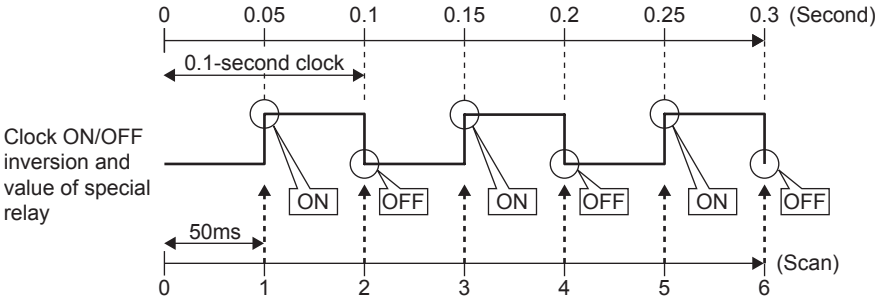
*5 : The following shows the correspondences for the operating status of CPU module.
Control system: When SM1515 is ON, or SM1516 is OFF.
Standby system: When SM1515 is OFF, or SM1516 is ON.
Unspecified system: When both SM1515 and SM1516 are OFF.

Point

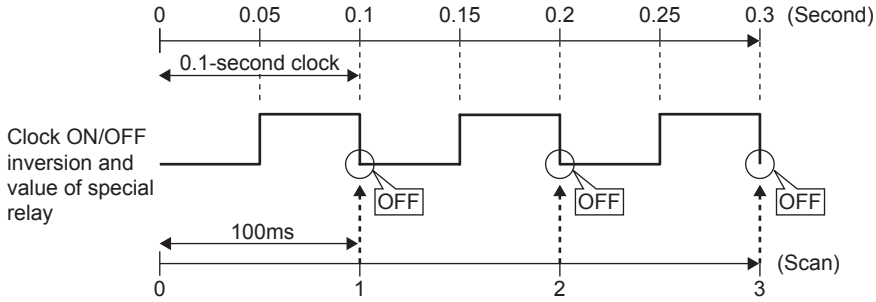
● **Turning clock of special relay ON/OFF**

To turn the clock of the special relay ON/OFF, set the constant scan setting value avoiding the integral multiple of the clock time, as described by the following example “Not equal to integral multiple” shown below.

• Example: Not equal to integral multiple
The following figure shows the behavior of the 0.1-second clock when the constant scan is 50ms.
The special relay repeats ON/OFF.



• Example: Equal to integral multiple
The following figure shows the behavior of the 0.1-second clock when the constant scan is 100ms (default).
The value of the special relay is OFF every scan.

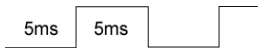
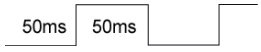
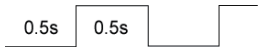
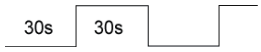


● **Contact scan setting**

To set the constant scan setting value, select [PLC Parameter] ⇒ <<PLC RAS>> and set it.

● Special relay list (FXCPU)

For details of special relays
☞ FXCPU Structured Programming Manual [Device & Common]

No.	Name	Description
M8000	RUN monitor NO contact	OFF : STOP ON : RUN
M8001	RUN monitor NC contact	OFF : RUN ON : STOP
M8002	Initial pulse NO contact	ON for only 1 scan after RUN
M8003	Initial pulse NC contact	OFF for only 1 scan after RUN
M8004	Error occurrence	ON while either one among M8060 to M8067 is ON
M8011	10ms clock	
M8012	100ms clock	
M8013	1 sec. clock	
M8014	1 min. clock	
M8018	Installation detection for real-time clock	Always ON
M8020	Zero	ON when the addition or subtraction result is 0
M8021	Borrow	ON when the subtraction result is less than the maximum negative value
M8022	Carry	ON when "carry" occurs in the addition result
M8023	Floating-point calculation command	ON : Carry out floating-point calculation
M8024	BMOV instruction execution direction	ON : Write OFF : Read
M8026	RAMP mode	ON : Hold output value OFF : Reset value at output
M8028	Timer switch command	OFF : 100ms timer ON : 10ms timer
M8029	Instruction execution complete	OFF : During executing ON : Execution completed
M8031	Non-latched memory all clear	OFF : Hold ON : Clear
M8032	Latched memory all clear	OFF : Hold ON : Clear
M8033	Memory holding against STOP mode	OFF : Clear ON : Hold
M8034	All output disable	OFF : Enable output ON : Disable output
M8038	RAM file clear command	OFF : Hold ON : Clear
M8039	Constant scan mode	OFF : Normal scan ON : Constant mode

No.	Name	Description
M8040	Transfer disable	OFF : Enable transfer ON : Disable transfer
M8041	Transfer start (for IST instruction)	OFF : Stop transfer ON : Start transfer
M8042	Start pulse (for IST instruction)	ON : IST instruction start command
M8043	Zero point return complete (for IST instruction)	ON : IST instruction zero point return complete command
M8044	Zero point condition (for IST instruction)	ON : Zero point OFF : Zero point return is undetermined
M8045	All output reset disable (for IST instruction)	ON : Disable reset OFF : Enable reset
M8046	STL state ON	ON : ON while either one among S0 to S899 is ON
M8047	STL monitoring enable	ON : Enable D8040 to D8047
M8048	Annunciator ON	ON while either one among S900 to S999 is ON
M8049	Annunciator enable	ON : Enable D8049 OFF : Disable D8049
M8067	Operation error	ON : Operation error OFF : No operation error
M8068	Operation error latch	Hold occurrence of M8067
M8074	RAM file register setting	ON : Use setting OFF : Not use setting
M8090	BKCMP instruction: Block comparison signal	ON : Comparison result matches OFF : Comparison result does not match
M8091	Output character quantity selector signal	ON : Change nothing OFF : Write 00H (NULL)
M8160	XCH instruction: SWAP function	ON : 8-bit conversion OFF : Normal mode
M8161	8-bit processing mode	Processing mode in the ASC, ASCI, and HEX instructions
M8164	FROM and TO instructions: Transfer points variable mode	Transfer points switch command
M8168	SMOV instruction: Hexadecimal data handling function	Data shift in 4-bit units
M8200	Counter counting direction	ON : C200 is down-counting OFF : C200 is up-counting

No.	Name	Description
M8201	Counter counting direction	ON : C201 is down-counting OFF: C201 is up-counting
M8202	Counter counting direction	ON : C202 is down-counting OFF: C202 is up-counting
M8203	Counter counting direction	ON : C203 is down-counting OFF: C203 is up-counting
M8204	Counter counting direction	ON : C204 is down-counting OFF: C204 is up-counting
M8205	Counter counting direction	ON : C205 is down-counting OFF: C205 is up-counting
M8206	Counter counting direction	ON : C206 is down-counting OFF: C206 is up-counting
M8207	Counter counting direction	ON : C207 is down-counting OFF: C207 is up-counting
M8208	Counter counting direction	ON : C208 is down-counting OFF: C208 is up-counting
M8209	Counter counting direction	ON : C209 is down-counting OFF: C209 is up-counting
M8210	Counter counting direction	ON : C210 is down-counting OFF: C210 is up-counting
M8211	Counter counting direction	ON : C211 is down-counting OFF: C211 is up-counting
M8212	Counter counting direction	ON : C212 is down-counting OFF: C212 is up-counting
M8213	Counter counting direction	ON : C213 is down-counting OFF: C213 is up-counting
M8214	Counter counting direction	ON : C214 is down-counting OFF: C214 is up-counting
M8215	Counter counting direction	ON : C215 is down-counting OFF: C215 is up-counting
M8216	Counter counting direction	ON : C216 is down-counting OFF: C216 is up-counting
M8217	Counter counting direction	ON : C217 is down-counting OFF: C217 is up-counting
M8218	Counter counting direction	ON : C218 is down-counting OFF: C218 is up-counting

No.	Name	Description
M8219	Counter counting direction	ON : C219 is down-counting OFF: C219 is up-counting
M8220	Counter counting direction	ON : C220 is down-counting OFF: C220 is up-counting
M8221	Counter counting direction	ON : C221 is down-counting OFF: C221 is up-counting
M8222	Counter counting direction	ON : C222 is down-counting OFF: C222 is up-counting
M8223	Counter counting direction	ON : C223 is down-counting OFF: C223 is up-counting
M8224	Counter counting direction	ON : C224 is down-counting OFF: C224 is up-counting
M8225	Counter counting direction	ON : C225 is down-counting OFF: C225 is up-counting
M8226	Counter counting direction	ON : C226 is down-counting OFF: C226 is up-counting
M8227	Counter counting direction	ON : C227 is down-counting OFF: C227 is up-counting
M8228	Counter counting direction	ON : C228 is down-counting OFF: C228 is up-counting
M8229	Counter counting direction	ON : C229 is down-counting OFF: C229 is up-counting
M8230	Counter counting direction	ON : C230 is down-counting OFF: C230 is up-counting
M8231	Counter counting direction	ON : C231 is down-counting OFF: C231 is up-counting
M8232	Counter counting direction	ON : C232 is down-counting OFF: C232 is up-counting
M8233	Counter counting direction	ON : C233 is down-counting OFF: C233 is up-counting
M8234	Counter counting direction	ON : C234 is down-counting OFF: C234 is up-counting

● **Special register list (QCPU (Q mode)/LCPU)**

For details of special registers
☞ User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used

No.	Name	Description
SD0	Diagnostic error	Diagnostic error code
SD1	Clock time for diagnosis error occurrence	Clock time for diagnosis error occurrence
SD2		
SD3		
SD4	Error information categories	Error information category code
SD5	Error common information	Error common information
SD6		
SD7		
SD8		
SD9		
SD10		
SD11		
SD12		
SD13		
SD14		
SD15		
SD16	Error individual information	Error individual information
SD17		
SD18		
SD19		
SD20		
SD21		
SD22		
SD23		
SD24		
SD25		
SD26		
SD50	Error reset	Error code to be reset
SD62	Annunciator number	Annunciator number
SD63	Number of annunciators	Number of annunciators
SD64	Table of detected annunciator numbers	Annunciator detection number
SD65		
SD66		
SD67		
SD68		
SD69		
SD70		
SD71		
SD72		
SD73		
SD74		
SD75		

No.	Name	Description
SD76	Table of detected annunciator numbers	Annunciator detection number
SD77		
SD78		
SD79		
SD200	Status of switch	Status of CPU switch
SD201	LED status	Status of CPU-LED
SD202	LED OFF command	Bit pattern of LED that is turned OFF
SD203	Operating status of CPU	Operating status of CPU[*1]
SD204	LED display color	CPU-LED display color
SD207	LED display priority ranking	Priorities 1 to 4
SD208		Priorities 5 to 8
SD209		Priorities 9 to 11
SD210	Clock data	Clock data (year, month)
SD211	Clock data	Clock data (day, hour)
SD212	Clock data	Clock data (minute, second)
SD213	Clock data	Clock data (higher digits of year, day of week)
SD220	LED display data	LED display data
SD221		
SD222		
SD223		
SD224		
SD225		
SD226		
SD227		
SD240	Base mode	0: Automatic mode 1: Detail mode
SD241	Extension stage number	0: Main base only 1 to 7: Extension stage number
SD242	A/Q base differentiation	0 : QA**B is installed (A mode) 1 : Q**B is installed (Q mode)
SD243	No. of base slots (Operation status)	Number of base slots
SD244		
SD250	Loaded maximum I/O	Loaded maximum I/O number
SD286	Device assignment	Number of points assigned for M (for extension)
SD287		
SD288		Number of points assigned for B (for extension)
SD289		
SD290		Number of points assigned for X
SD291		Number of points assigned for Y
SD292		Number of points assigned for M
SD293		Number of points assigned for L

No.	Name	Description
SD294	Device assignment	Number of points assigned for B
SD295		Number of points assigned for F
SD296		Number of points assigned for SB
SD297		Number of points assigned for V
SD298		Number of points assigned for S
SD299		Number of points assigned for T
SD300		Number of points assigned for ST
SD301		Number of points assigned for C
SD302		Number of points assigned for D
SD303		Number of points assigned for W
SD304		Number of points assigned for SW
SD305	Device assignment (Index register)	16-bit modification Number of points assigned for Z
SD306	Device assignment (Same as parameter contents)	Number of points assigned for ZR (for extension)
SD307		
SD308	Device assignment (Assignment including the number of points set to the extended data register and extended link register setting)	Number of points assigned for D (for inside + for extension)
SD309		
SD310		Number of points assigned for W (for inside + for extension)
SD311		
SD395	Multiple CPU system information	Multiple CPU number
SD396		No. 1 CPU operation status
SD412*2	1 second counter	Number of counts in 1-second units
SD414*2	2n second clock setting	2n second clock units
SD415*2	2n millisecond clock setting	2n millisecond clock units
SD420	Scan counter	Number of counts in each scan
SD430	Low speed scan counter	Number of counts in each scan
SD500	Execution program No.	Program number in execution
SD520*3	Current scan time	Current scan time (ms value)
SD521*3		Current scan time (μs value)
SD522*3	Initial scan time	Initial scan time (ms value)
SD523*3		Initial scan time (μs value)
SD524*3	Minimum scan time	Minimum scan time (ms value)
SD525*3		Minimum scan time (μs value)
SD526	Maximum scan time	Maximum scan time (ms value)
SD527		Maximum scan time (μs value)
SD528	Current scan time for low speed execution type programs	Current scan time (ms value)
SD529		Current scan time (μs value)
SD532	Minimum scan time for low speed execution type programs	Minimum scan time (ms value)
SD533		Minimum scan time (μs value)
SD534	Maximum scan time for low speed execution type programs	Maximum scan time (ms value)
SD535		Maximum scan time (μs value)

No.	Name	Description
SD600	Memory card type	Memory card type
SD602	Drive 1 (Memory card RAM) capacity	Drive 1 capacity
SD603	Drive 2 (Memory card ROM) capacity	Drive 2 capacity
SD604	Memory card use conditions	Memory card use conditions
SD620	Drive 3/4 type	Drive 3/4 type
SD622	Drive 3 (Standard RAM) capacity	Drive 3 capacity
SD623	Drive 4 (Standard ROM) capacity	Drive 4 capacity
SD624	Drive 3/4 use conditions	Drive 3/4 use conditions
SD640	File register drive	Drive number
SD641 to SD646	File register file name	File register file name
SD647	File register capacity	File register capacity
SD648	File register block number	File register block number
SD650	Comment drive	Comment drive number
SD651 to SD656	Comment file name	Comment file name
SD670	Parameter enable drive information	Parameter enable drive number
SD681	Program memory write (transfer) status	Write (transfer) status display (percentage)
SD840	Debug function usage	Debug function usage
SD1500 *4	Process control instruction Basic period	Basic period for process control instruction
SD1501 *4		
SD1502 *4	Process control instruction Detail error code	Detailed error code for process control instruction
SD1503 *4	Process control instruction Generated error location	Generated error location for process control instruction
SD1506 *4	Dummy devices	Dummy devices
SD1507 *4		
SD1508 *4	Process control instruction Function availability selection	b0 Bumpless function availability setting for the S.PIDP instruction 0: Enabled 1: Disabled (Default: 0)

*1 : SD203 supports the operating status of CPU only. STOP/ PAUSE cause is fixed to 0.

*2 : Values are derived from the constant scan setting value and the number of scans.

*3 : All values are equal to the constant scan setting value.

*4 : These devices are for the process control instruction, and supported by Process CPU and Redundant CPU only. When the program with the process control instruction is written to the programmable controller CPU other than Process CPU and Redundant CPU, a stop error occurs on the CPU from INSTRCT.CODE ERR (error code 4002).

● **Special register list (FXCPU)**

For details of special registers
☞ FXCPU Structured Programming Manual [Device & Common]

No.	Name	Description
D8000	Watchdog timer	200ms*1
D8001	PLC type and system version	*2
D8002	Memory capacity	Maximum capacity based on the programmable controller type
D8004	Error M number	M8060 to M8068
D8006	Low battery voltage detection level	30 (Unit: 0.1 V)
D8010	Current scan time	*3
D8011	Minimum scan time	*3
D8012	Maximum scan time	*3
D8013	Second data	Operate as 1-second timer
D8014	Minute data	Time data
D8015	Hour data	Time data
D8016	Day data	Time data
D8017	Month data	Time data
D8018	Year data	Time data
D8019	Day-of-the-week data	Time data
D8028	Value of register Z	Value of register Z
D8029	Value of register V	Value of register V
D8030	Variable analog potentiometer VR1	*4
D8031	Variable analog potentiometer VR2	*4
D8039	Constant scan time	Initial value: 100ms (Unit: 1ms)*5
D8040	ON state relay number 1	Value of STL monitor
D8041	ON state relay number 2	Value of STL monitor
D8042	ON state relay number 3	Value of STL monitor
D8043	ON state relay number 4	Value of STL monitor
D8044	ON state relay number 5	Value of STL monitor
D8045	ON state relay number 6	Value of STL monitor
D8046	ON state relay number 7	Value of STL monitor
D8047	ON state relay number 8	Value of STL monitor
D8049	Smallest active state relay number	Value of STL monitor
D8067	Error code for operation error	Error code number
D8068	Latched step number where operation error has occurred	Hold step number where operation error has occurred
D8069	Step number where error has occurred	Step number where error has occurred
D8101	PLC type and system version	*6
D8102	Memory capacity	Maximum capacity based on the programmable controller type
D8164	FROM and TO instructions: Transfer points quantity specification	Write transfer points
D8182	Value of register Z1	Value of register Z1
D8183	Value of register V1	Value of register V1
D8184	Value of register Z2	Value of register Z2
D8185	Value of register V2	Value of register V2
D8186	Value of register Z3	Value of register Z3
D8187	Value of register V3	Value of register V3
D8188	Value of register Z4	Value of register Z4
D8189	Value of register V4	Value of register V4
D8190	Value of register Z5	Value of register Z5
D8191	Value of register V5	Value of register V5
D8192	Value of register Z6	Value of register Z6
D8193	Value of register V6	Value of register V6
D8194	Value of register Z7	Value of register Z7
D8195	Value of register V7	Value of register V7
D8312	Latched step number where operation error has occurred	Lower
D8313		Upper
D8314	Step number where error has occurred 32 bits	Lower
D8315		Upper

*1 : Initialized to 200ms on every programmable controller type. The watchdog timer time can be changed, but the WDT check is never performed.

*2 : The value of D8001 differs according to the programmable controller type.

Programmable controller CPU	Value
FX0, FX0S	20000
FX0N	20000
FX1	21000
FXU, FX2C	20000
FX1S	22000
FX1N, FX1NC	26000
FX2N, FX2NC	24000
FX3G, FX3GC	26000
FX3U, FX3UC	24000

*3 : The value is always set to 100ms.

*4 : Operates as a general data register. Write a value between 0 and 255 and test the operation using functions such as the Modify Value function of GX Works2.

*5 : The value can be changed, but a single scan is always executed in 100ms.

*6 : The value of D8101 differs according to the programmable controller type.

Programmable controller CPU	Value '***' indicates a version.
FX0, FX0S	0
FX0N	
FX1	
FXU, FX2C	
FX1S	
FX1N, FX1NC	
FX2N, FX2NC	
FX3G, FX3GC	26***
FX3U, FX3UC	16***

■ Devices supported by the I/O system setting function

The following table shows the list of devices which can be used for conditions, the device value input, and timing chart input in the I/O system setting function.

● Device list (QCPU (Q mode)/LCPU)

○: Supported ×: Not supported

Category	Device name		Symbol	QCPU (Q mode)/LCPU
Internal user device	Input		X	○
	Output		Y	○
	Internal relay		M	○
	Latch relay		L	○
	Annunciator		F	○
	Edge relay		V	×
	Step relay		S	×
	Link relay		B	○
	Link special relay		SB	○
	Timer	Current value	TN	○
		Contact	TS	○
		Coil	TC	×
	Counter	Current value	CN	○
		Contact	CS	○
		Coil	CC	×
	Retentive timer	Current value	STN(SN)	○
		Contact	STS(SS)	○
		Coil	STC(SC)	×
	Data register		D	○
	Link register		W	○
	Link special register		SW	○
	Direct input		DX	×
	Direct output		DY	×
Internal system device	Function input		FX	○
	Function output		FY	○
	Special relay		SM	○
	Function register		FD	○
	Special register		SD	○
Link direct device	Link input		J□\X□	×
	Link output		J□\Y□	×
	Link register		J□\W□	×
	Link special register		J□\SW□	×
	Link relay		J□\B□	×
	Link special relay		J□\SB□	×
Intelligent function module device	Intelligent function module device		U□\G□	○
Index register	Index register		Z	○
File register	File register		R	○
			ZR	○
Nesting	Nesting		N	×
Pointer	Pointer		P	×
	Interrupt pointer		I	×

Category	Device name	Symbol	QCPU (Q mode)/LCPU
Others	SFC block device	BL	×
	SFC transition device	TR	×
Constant	Decimal constant	K	○
	Hexadecimal constant	H	○
	Real constant	E	×

● Device list (FXCPU)

○: Supported ×: Not supported

Category	Device name		Symbol	FXCPU
Device	Input		X	○
	Output		Y	○
	Auxiliary relay		M	○
	State		S	○
	Timer	Current value	TN	○
		Contact	TS	○
		Coil	TC	×
	Counter	Current value	CN	○
		Contact	CS	○
		Coil	CC	×
	Data register		D	○
Direct specification of buffer memory			U□\G□	○*1
Index register	Index register		V	○
			Z	○
Extension register	Extension register		R	○*2
Nesting	Nesting		N	×
Pointer	JUMP or CALL branch		P	×
	Interrupt pointer		I	×
Constant	Decimal constant		K	○
	Hexadecimal constant		H	○
	Real number constant		E	×

*1 : Supported by FX3U and FX3UC only.
*2 : Supported by FX3U, FX3UC, FX3G, and FX3GC only.

Appendix 2.3 Supported instructions

This section explains the instructions supported by the simulation function.
Instructions/functions used in Structured projects can also be simulated.
However, some instructions may be restricted or not supported. No processing is performed for unsupported instructions (NOP processing).

When an unsupported instruction is used,  is displayed in the monitor status display. (☞ Section 14.1.2)
Unsupported devices used in a program and their used locations can be checked by selecting [Debug] ⇒ [Instructions Unsupported by Simulation]. (☞ Section 15.3)

■ QCPU (Q mode)/LCPU

● Sequence instructions

Category	Symbol	Restrictions
Contact instruction	LD, LDI, AND, ANI, OR, ORI, LDP, LDF, ANDP, ANDF, ORP, ORF, LDPI, LDFI, ANDPI, ANDFI, ORPI, and ORFI	–
Bond instruction	ANB, ORB, MPS, MRD, MPP, INV, MEP, MEF, EGP, and EGF	–
Output instruction	OUT, OUT T, OUT C, OUT F, OUTH T, SET, RST, SET F, RST F, PLS, PLF, and FF	–
Shift instruction	SFT(P)	–
Master control instruction	MC and MCR	–
End instruction	FEND and END	–
Other instruction	STOP, NOP, NOPLF, and PAGE	–

● Basic instructions

Category	Symbol	Restrictions
Comparison operation instruction	=, <>, >, <=, <, >=, D=, D<>, D>, D<=, D<, D>=, E=, E<>, E>, E<=, E<, E>=, and BKCMP□(P)	–
	$=, $<>, $>, $<=, $<, and $>=	Not supported by Basic model QCPU.
Arithmetic operation instruction	+(P), –(P), D+(P), D–(P), *(P), /(P), D*(P), D/(P), B+(P), B–(P), DB+(P), DB–(P), B*(P), B/(P), DB*(P), DB/(P), E+(P), E–(P), E*(P), E/(P), BK+(P), BK–(P), INC(P), DEC(P), DINC(P), and DDEC(P)	–
	$+(P)	Not supported by Basic model QCPU.
Data conversion instruction	BCD(P), DBCD(P), BIN(P), DBIN(P), INT(P), DINT(P), FLT(P), DFLT(P), DBL(P), WORD(P), GRY(P), DGRY(P), GBIN(P), DGBIN(P), NEG(P), DNEG(P), ENEG(P), BKBCD(P), and BKBIN(P)	–
Data transfer instruction	MOV(P), DMOV(P), EMOV(P), $MOV(P), CML(P), DCML(P), BMOV(P), FMOV(P), XCH(P), DXCH(P), BXCH(P), and SWAP(P)	–
Program branch instruction	CJ, SCJ, JMP, and GOEND	–
Other convenient instruction	MTR	Not supported by Basic model QCPU.

● Application instructions

Category	Symbol	Restrictions
Logical operation instruction	WAND(P), DAND(P), BKAND(P), WOR(P), DOR(P), BKOR(P), WXOR(P), DXOR(P), BKXOR(P), WXNR(P), DXNR(P), and BKNXR(P)	–
Rotation instruction	ROR(P), RCR(P), ROL(P), RCL(P), DROR(P), DRCR(P), DROL(P), and DRCL(P)	–
Shift instruction	SFR(P), SFL(P), BSFR(P), BSFL(P), DSFR(P), and DSFL(P)	–
Bit processing instruction	BSET(P), BRST(P), TEST(P), DTEST(P), and BKRST(P)	–
Data processing instruction	SER(P), DSER(P), SUM(P), DSUM(P), DECO(P), ENCO(P), SEG(P), DIS(P), UNI(P), NDIS(P), NUNI(P), WTOB(P), BTOW(P), MAX(P), MIN(P), DMAX(P), DMIN(P), SORT, DSORT, WSUM(P), and DWSUM(P)	The SORT and DSORT instructions are executed in one scan.
Structured instruction	FOR, NEXT, BREAK(P), CALL(P), RET, FCALL(P), and XCALL	–
	ECALL(P) and EFCALL(P)	–
Data table operation instruction	FIFW(P), FIFR(P), FPOP(P), FINS(P), and FDEL(P)	–
Buffer memory access instruction	FROM(P), DFRO(P), TO(P), and DTO(P)	–
String processing instruction	STR(P), DSTR(P), VAL(P), DVAL(P), ESTR(P), and EVAL(P)	–
	BINDA(P), DBINDA(P), BINHA(P), DBINHA(P), BCDDA(P), DBCDDA(P), DABIN(P), DDABIN(P), HABIN(P), DHABIN(P), DABCD(P), DDABCD(P), LEN(P), ASC(P), HEX(P), RIGHT(P), LEFT(P), MIDR(P), MIDW(P), INSTR(P), EMOD(P), and EREXP(P)	Not supported by Basic model QCPU.
Special function instruction	SIN(P), COS(P), TAN(P), RAD(P), DEG(P), SQR(P), EXP(P), LOG(P), RND(P), and SRND(P)	–
	ASIN(P), ACOS(P), ATAN(P), BSQR(P), BDSQR(P), BSIN(P), BCOS(P), BTAN(P), BASIN(P), BACOS(P), and BATAN(P)	Not supported by Basic model QCPU.
Data control instruction	LIMIT(P), DLIMIT(P), BAND(P), DBAND(P), ZONE(P), and DZONE(P)	–
Switch instruction	RSET(P) and QDRSET(P)	The QDRSET(P) instruction is not supported by Basic model QCPU/ LCPU.
Clock instruction	DATERD(P), DATE+(P), DATE−(P), SECOND(P), and HOUR(P)	The DATERD(P) instruction reads the personal computer clock data.
Program control instruction	PSTOP(P), POFF(P), and PSCAN(P)	Not supported by Basic model QCPU.
Display instruction	LEDR	–
Process control instruction	S.IN, S.OUT1, S.PID, S.PHPL, S.LLAG, S.I, S.D, S.DED, S.FG, S.IFG, S.FLT, S.ENG, S.IENG, S.ABS, S.OUT2, S.MOUT, S.R, S.PIDP, S.SPI, S.IPD, S.BPI, S.HS, S.LS, S.MID, S.AVE, S.LIMT, S.VLMT1, S.VLMT2, S.ONF2, S.ONF3, S.DBND, S.PGS, S.SEL, S.BUMP, S.AMR, S.SUM, S.TPC, S.ADD, S.SUB, S.MUL, S.DIV, S.SQR, S.>, S.<, S.=, S.>=, S.<=, S.DUTY, S.BC, S.2PID, S.PSUM, S.AT1	Supported by Process CPU and Redundant CPU only.*1
Other instruction	DUTY, ZRRDB(P), ZRWRB(P), ADRSET(P), ZPUSH(P), ZPOP(P), TIMCHK, WDT(P), TRACE, TRACER, and RBMOV(P)	• The RBMOV instruction operates as the BMOV instruction. • The TRACE, TRACER, and RBMOV(P) are not supported by Basic model QCPU. • The RBMOV(P) instruction is not supported by LCPU.

*1 : When the program is written to the programmable controller CPU other than Process CPU and Redundant CPU, a stop error occurs on the CPU from INSTRCT.CODE ERR (error code 4002).

● SFC control instructions

Category	Symbol	Restrictions
Step operation status check instruction	LD, LDI, AND, ANI, OR, ORI	–
Block operation status check instruction		–
Active step batch readout instruction	MOV(P), DMOV(P), BMOV(P)	–
Block START instruction	SET	–
Block END instruction	RST	–
Block STOP instruction	PAUSE	–
Block restart instruction	START	–
Step START instruction	SET	–
Step END instruction	RST	–

● Multiple CPU dedicated instructions

Category	Symbol	Restrictions
CPU shared memory access instruction	FROM(P), DFRO(P), S(P), TO, TO(P), and DTO(P)	Not supported by LCPU.

■ FXCPU

For details of the instructions, refer to the following manual.
☞ FXCPU Structured Programming Manual [Basic & Applied Instruction]

● Sequence instructions

Category	Symbol	Restrictions
Contact instruction	LD, LDI, AND, ANI, OR, ORI, LDP, LDF, ANDP, ANDF, ORP, and ORF	–
Bond instruction	ANB, ORB, MPS, MPP, and INV	–
	MEP and MEF	–
Output instruction	OUT, SET, RST, PLS, and PLF	–
Master control instruction	MC and MCR	–
Step ladder instruction	STL and RET	–
Other instruction	END and NOP	–

● Application instructions

○: Supported, –: Not supported

Category	Symbol	32-bit instruction	Pulse instruction execution
Program flow	CJ	–	○
	CALL	–	○
	SRET	–	–
	FEND	–	–
	FOR	–	–
	NEXT	–	–
Move and compare	CMP	○	○
	ZCP	○	○
	MOV	○	○
	SMOV	–	○
	CML	○	○
	BMOV	–	○
	FMOV	○	○
	XCH	○	○
	BCD	○	○
	BIN	○	○
Arithmetic and logical operation	ADD	○	○
	SUB	○	○
	MUL	○	○
	DIV	○	○
	INC	○	○
	DEC	○	○
	WAND	○	○
	WOR	○	○
	WXOR	○	○
	NEG	○	○

Category	Symbol	32-bit instruction	Pulse instruction execution
Rotation and shift operation	ROR	○	○
	ROL	○	○
	RCR	○	○
	RCL	○	○
	SFTR	–	○
	SFTL	–	○
	WSFR	–	○
	WSFL	–	○
	SFWR	–	○
	SFRD	–	○
Data operation	ZRST	–	○
	DECO	–	○
	ENCO	–	○
	SUM	○	○
	BON	○	○
	MEAN	○	○
	ANS	–	–
	ANR	–	○
	SQR	○	○
	FLT	○	○
Handy instruction	IST	–	–
	SER	○	○
	ABSD	○	–
	INCD	–	–
	TTMR	–	–
	STMR	–	–
	ALT	–	–
	RAMP	–	–
	SORT	–	–
External FX I/O device	ASC	–	–
	FROM	○	○
	TO	○	○
External Device (optional device)	ASCI	–	○
	HEX	–	○
Data transfer 2	ZPUSH	–	○
	ZPOP	–	○

Category	Symbol	32-bit instruction	Pulse instruction execution
Floating point	ECMP	○	○
	EZCP	○	○
	EMOV	○	○
	ESTR	○	○
	EVAL	○	○
	EBCD	○	○
	EBIN	○	○
	EADD	○	○
	ESUB	○	○
	EMUL	○	○
	EDIV	○	○
	EXP	○	○
	LOGE	○	○
	LOG10	○	○
	ESQR	○	○
	ENEG	○	○
	INT	○	○
	SIN	○	○
	COS	○	○
	TAN	○	○
	ASIN	○	○
	ACOS	○	○
	ATAN	○	○
	RAD	○	○
	DEG	○	○
	WSUM	○	○
	WTOB	–	○
	BTOW	–	○
	UNI	–	○
	DIS	–	○
	SWAP	○	○
Real time clock control	TCMP	–	○
	TZCP	–	○
	TADD	–	○
	TSUB	–	○
	HTOS	○	○
	STOH	○	○
	TRD	–	○
	HOUR	○	–
External device	GRY	○	○
	GBIN	○	○
Block data operation	BK+	○	○
	BK-	○	○
	BKCMP=	○	○
	BKCMP>	○	○
	BKCMP<	○	○
	BKCMP<>	○	○
	BKCMP<=	○	○
	BKCMP>=	○	○

Category	Symbol	32-bit instruction	Pulse instruction execution
Character string control	STR	○	○
	VAL	○	○
	$+	–	○
	LEN	–	○
	RIGHT	–	○
	LEFT	–	○
	MIDR	–	○
	MIDW	–	○
	INSTR	–	○
	$MOV	–	○
Data operation 3	FDEL	–	○
	FINS	–	○
	POP	–	○
	SFR	–	○
	SFL	–	○
Data comparison	LD=	○	–
	LD>	○	–
	LD<	○	–
	LD<>	○	–
	LD<=	○	–
	LD>=	○	–
	AND=	○	–
	AND>	○	–
	AND<	○	–
	AND<>	○	–
	AND<=	○	–
	AND>=	○	–
	OR=	○	–
	OR>	○	–
	OR<	○	–
	OR<>	○	–
	OR<=	○	–
	OR>=	○	–
Data table operation	LIMIT	○	○
	BAND	○	○
	ZONE	○	○
	DABIN	○	○
	BINDA	○	○
Data transfer 3	RBFM	–	–
	WBFM	–	–

Appendix 2.4 Enable/disable setting of parameter items

Some parameter setting items of GX Works2 are not applicable to the simulation function.
The following table shows the parameter setting items applicable to the simulation function.
The remote password is not supported.

■ QCPU (Q mode)/LCPU

● PLC parameter setting applicability

○: Applicable ×: Not applicable

Parameter	Item	Applicability
PLC Name	Label	×
	Comment	×
PLC System	Timer Limit Setting	○
	RUN-PAUSE Contacts	○
	Latch Data Backup Operation Valid Contact	×
	Remote Reset	Fixed to 'Allow'
	Output Mode at STOP to RUN	○
	Floating Point Arithmetic Processing	Fixed to 'Perform internal arithmetic operations in double precision*1
	Intelligent Function Module Setting (Interrupt Pointer Setting)	×
	Module Synchronization	×
	Built-in CC-Link Setting	×
	Common Pointer No.	○
	Points Occupied by Empty Slot	○
	System Interrupt Settings	×
	High Speed Interrupt Settings	×
	Interrupt Program/Fixed Scan Program Setting	×
	A-PLC Compatibility Setting	×
	Service Processing Setting	Fixed to 'Execute it while waiting for contact scan setting'
	PLC Module Change Setting	×
PLC File	File Register	○
	Transfer to Standard ROM at Latch data backup operation	×
	Comment File Used in a Command	○
	Initial Device Value	○
	File for Local Device	○
	File used for SP.DEVST/S.DEVLD Instruction	×
PLC RAS	WDT (Watchdog Timer) Setting	WDT error occurs if 30,000,000 or more instructions are executed during one scan.
	Error Check	×
	Operating Mode When There is an Error	○*2
	Constant Scanning	○
	Error History	○
	Low Speed Program Execution Time	×
	Module Error History Collection	×

Parameter	Item		Applicability
Boot File	Boot Option		×
	Boot File Setting		×
Program	Program		○*3
SFC	SFC Program Start Mode		○
	Start Conditions		○
	Output Mode When the Block is Stopped		○
Device	Device Points		○
	Latch Start/End (possible to clear with latch clear)		×
	Latch Start/End (disabled to clear with latch clear)		×
	Local Device Start/End		○
	Extended Device Latch Start/End (possible to clear with latch clear)		×
	Extended Device Latch Start/End (disabled to clear with latch clear)		×
I/O Assignment Setting	I/O Assignment		○*4
	Base Setting		○*5
	Switch Setting		×
	Detailed Setting	Error Time Output Mode	×
		PLC Operation Mode at H/W Error	×
		I/O Response Time	×
		Control PLC	×
Multiple CPU Setting	No. of PLC		○
	Host Station		×
	Operation Mode		×
	Multiple CPU Synchronous Startup Setting		×
	Online Module Change		×
	I/O Sharing When Using Multiple CPUs		×
	Communication Area Setting (Refresh Setting)		×
	Multiple CPU High Speed Transmission Area Setting		○
	Auto Refresh Setting		×
Built-in Ethernet Port Setting	IP Address Setting		×
	Communication Data Code		×
	Open Setting		×
	FTP Setting		×
	Time Setting		×
Built-in I/O Function Setting	Positioning		×
	High-speed Counter		×
	Input Signal		×
	Output Signal		×
Serial Communication	Transmission Speed		×
	Sum Check		×
	Transmission Wait Time		×
	Online Change		×
Acknowledge XY Assignment			×

*1 : Internal operations are performed with double precision. However, the processing speed does not change.
*2 : Supports "Computation Error" and "Intelligent Module Program Execution Error".
*3 : There are restrictions for "Low Speed" and "Fixed Scan" type programs. (☞ Appendix 2.5)
*4 : Not supported by the "Branch Module" setting for LCPU.
*5 : Slots are assigned with a maximum number of slots when "Auto" is selected for "Base Mode".

● Network parameter setting applicability

○: Applicable ×: Not applicable

Parameter	Item	Applicability
Network Parameter	Ethernet/CC IE/MELSECNET	×
	CC-Link	×

■ FXCPU

● PLC parameter setting applicability

○: Applicable ×: Not applicable

Parameter	Item	Applicability
Memory Capacity	Memory Capacity	○
	Comments Capacity	○
	File Register Capacity	○
	Program Capacity	○
	Special Function Memory Capacity	○
Device	Device	○
PLC Name	Title	×
PLC System (1)	Battery Less Mode	×
	MODEM Initialized	×
	RUN Terminal Input	×
PLC System (2)	Channel Setting	×
	Operate Communication Setting	×
	Protocol	×
	Data Length	×
	Parity	×
	Stop Bit	×
	Transmission Speed	×
	Header	×
	Terminator	×
	Control Line	×
	H/W Type	×
	Control Mode	×
	Sum Check	×
	Transmission Control Procedure	×
	Station Number Setting	×
	Time Out Judge Time	×
Special Function Block (Built-in CC-Link/LT Setting)	Unit Name	×
	Address	×
	Value	×
	Size/Type	×
	Check the identification code before initializing	×
	Identification Code	×
	Transmission Speed	×
	Point Mode	×
	Station Type	×
	I/O Points	×
	Specify Reserved Station	×

Parameter	Item	Applicability
Positioning	Bias Speed [Hz]	×
	Max. Speed [Hz]	×
	Creep Speed [Hz]	×
	Zero Return Speed [Hz]	×
	Acceleration Time [ms]	×
	Deceleration Time [ms]	×
	Interruption Input of DVIT Instruction	×
	Rotation Direction Signal	×
	Head Address	×
	Positioning Instruction	×
	Pulse [pls]	×
	Frequency [Hz]	×
	Positioning table settings will not be initialized when the PLC is powered ON	×
Ethernet Port Setting	Channel	×
	IP Address Setting	×
	Communication Data Code	×
	Disable direct connection to MELSOFT	×
	Do not respond to search for CPU on network	×
	Open Setting	×
	Time Setting	×
	Log Record Setting	×

● Network parameter setting applicability

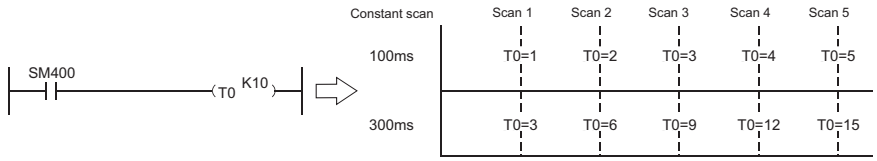
○: Applicable ×: Not applicable

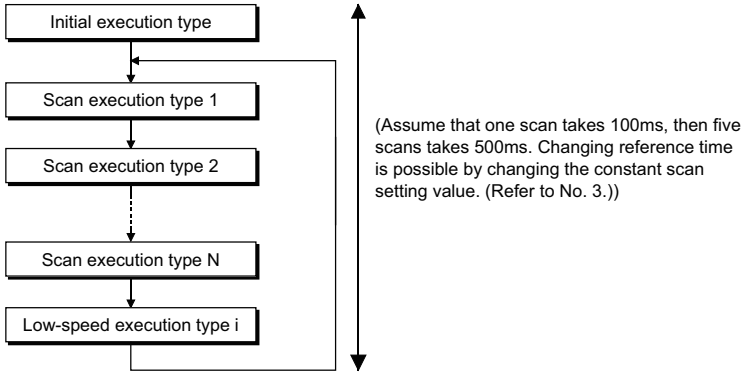
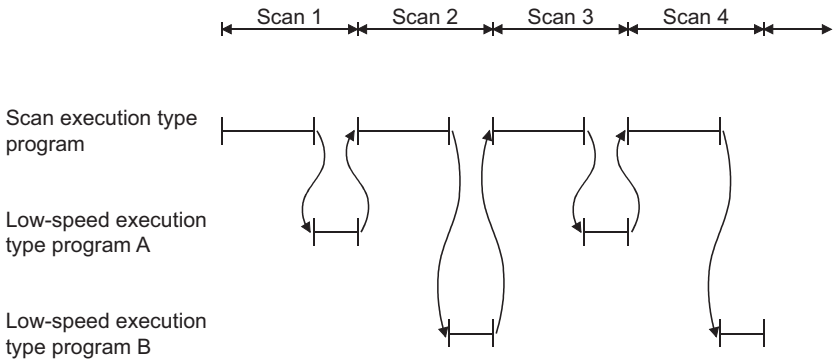
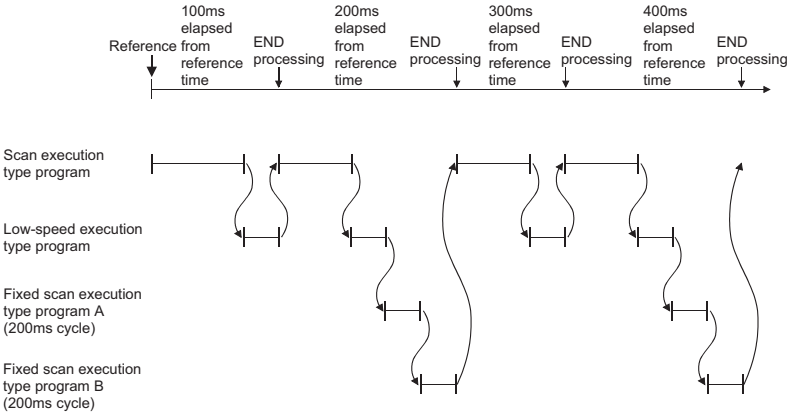
Parameter	Item	Applicability
Network Parameter	CC-Link	×

Appendix 2.5 Restrictions and considerations

This section explains the restrictions and considerations on debugging programs using the simulation function.

● **QCPU (Q mode)/LCPU**

No.	Item	Debugging using the simulation function
1	Time processing	Time processing of the timer instruction/function is performed by assuming that the scan time is 100ms. If the constant scan time is set in parameter, the set constant scan time is used as the scan time.
2	Supported instructions	Some instructions including the data refresh instruction are not supported by the simulation function. Unsupported instructions are processed as NOP. (Supported instructions ☞ Appendix 2.3)
3	Process control instructions	NSTRCT. CODE ERR (error code 4004) occurs when a device which cannot be used for instruction argument is specified. For programmable controller CPU, this error occurs at the timing of CPU power ON/reset, switching from STOP to RUN, or instruction execution. For the simulation function, however, this error occurs only at the timing of instruction execution. Therefore, the error will not occur for the simulation function if the instruction with an inapplicable device is not executed, however, when that program is written to the programmable controller CPU, an error occurs even if the instruction is not executed.
4	Processing time	The time set for constant scan is used for updating the timer current value.  In the virtual programmable controller, the number of counts per scan of the timer instruction changes depending on the constant scan setting. When the constant scan time is set to 100ms, the count of the 100ms timer is +1 per scan. The count of the same timer is +3 per scan when the constant scan time is set to 300ms.
5	Monitoring	• If [Local device not executed] is selected in the GX Works2 local device monitoring, the simulation function monitors the devices of the program executed at the end of each scan. However, the function may monitor the devices of the low-speed execution type or fixed scan execution type programs processed at the end of each scan if these types of program are included in the programs for simulation. For details, refer to 5 and 6 in this table. • If a program for local device monitoring is specified in the GX Works2 local device monitoring, the simulation function monitors the local devices in the specified program regardless of the existence of a scan execution type program.

No.	Item	Debugging using the simulation function
6	Operation of low-speed execution type programs	In the virtual programmable controller, one low-speed execution type program is always executed after the execution of scan execution type programs. This execution is not affected by the constant scan time and the program execution time set for low-speed execution type programs. The following shows the operation procedure of programs. (The procedure does not change in step operation.)  All scan execution type programs are executed in each scan, whereas one low-speed execution type program is executed. Therefore, when N number of low-speed execution type programs are set, the execution of all programs completes in N scans.  • Since a low-speed execution type program is always executed within one scan in the virtual programmable controller, the monitor value of SM510 remains OFF
7	Operation of fixed scan execution type programs	The simulation function measures the time at the end of scan execution type and low-speed execution type programs and judges whether to execute fixed scan execution type programs. The following shows the processing timing of the simulation function when the scan time is set to 100ms and the timing of fixed scan execution type programs is set to 200ms. 
8	Automatic write at the start of simulation	At the start of simulation, PLC parameters and programs registered in the program setting of PLC parameter are written to the virtual programmable controller. The file register specified in "Use the following file" on the <<PLC File>> tab of PLC parameter is automatically created.
9	Interrupt programs	Not supported by the simulation function. Even created, an interrupt program is not processed.

<table>
<tr><th>No.</th><th>Item</th><th>Debugging using the simulation function</th></tr>
<tr><td>10</td><td>Floating point numbers</td><td>Since a rounding error always occurs in the operation result of an instruction using floating point numbers, the result does not match with the result of the operation executed on the programmable controller CPU.</td></tr>
<tr><td>11</td><td>Using memory card</td><td>The simulation is performed in the following capacity according to the programmable controller type.
High Performance model QCPU : 2M
Universal model QCPU : 8M
For LCPU, a memory card cannot be used.</td></tr>
<tr><td>12</td><td>I/O module</td><td>Not supported by the simulation function.</td></tr>
<tr><td>13</td><td>Network</td><td>Not supported by the simulation function.</td></tr>
<tr><td>14</td><td>Intelligent function module (Intelligent parameters)</td><td>The virtual programmable controller has a buffer memory area of 64k points for 64 modules to be used for accessing intelligent function modules. This buffer memory can be used for saving and reading data.
To use intelligent function modules in the simulation function, the I/O assignment must be set on the <<I/O Assignment>> tab of PLC parameter.</td></tr>
<tr><td>15</td><td>Double-precision operation for the floating-point arithmetic processing</td><td>The double-precision operation of the simulation function performs the internal operation with double precision and converts the final result to the single precision.
The processing speed is not changed even if the double-precision operation is set not to be performed on the <<PLC System>> tab of PLC parameter.</td></tr>
<tr><td>16</td><td>Clock data</td><td>Clock data can be read out to SD210-SD213 by the clock data read request (SM213).
However, the set clock function is not supported.</td></tr>
<tr><td>17</td><td>Intelligent function module</td><td>Buffer memory for the intelligent function module is stored with the setting on the <<I/O Assignment>> tab of PLC parameter. Buffer memory (U□\G□) cannot be accessed when the I/O assignment setting is not set.
Select 'Intelligent' as the module type and specify the point to create buffer memory in compliance with the specified points.
If the module type is not specified, it becomes an empty slot.
If the module type is specified but the point is not specified, the point of the specified module becomes equivalent to one specified for "Point Occupied by Empty Slot" on the <<PLC System>> tab of PLC parameter.</td></tr>
<tr><td>18</td><td>Watchdog timer</td><td>When the program loops endlessly (when 30,000,000 or more instructions are executed during one scan), a WDT error may occur.</td></tr>
<tr><td>19</td><td>Operating status monitor</td><td>SD393, SD395, and SD396 are only supported.
○: Supported ×: Not supported
<table>
<tr><th colspan="2">Name/Description</th><th>Device</th><th>Supported/ Not supported</th><th>Description</th></tr>
<tr><td colspan="2">No. 1 CPU reset flag</td><td>SM240</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td colspan="2">No. 2 CPU reset flag</td><td>SM241</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td colspan="2">No. 3 CPU reset flag</td><td>SM242</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td colspan="2">No. 4 CPU reset flag</td><td>SM243</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td colspan="2">No. 1 CPU error flag</td><td>SM244</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td colspan="2">No. 2 CPU error flag</td><td>SM245</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td colspan="2">No. 3 CPU error flag</td><td>SM246</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td colspan="2">No. 4 CPU error flag</td><td>SM247</td><td>×</td><td>Fixed to 'OFF'</td></tr>
<tr><td rowspan="7">Multiple CPU system information</td><td>Number of multiple CPUs</td><td>SD393</td><td>○</td><td></td></tr>
<tr><td>CPU mounting information</td><td>SD394</td><td>×</td><td>Fixed to '0'</td></tr>
<tr><td>Multiple CPU number</td><td>SD395</td><td>○</td><td>Fixed to '1'</td></tr>
<tr><td>No. 1 CPU operation status</td><td>SD396</td><td>○</td><td></td></tr>
<tr><td>No. 2 CPU operation status</td><td>SD397</td><td>×</td><td>Fixed to '0'</td></tr>
<tr><td>No. 3 CPU operation status</td><td>SD398</td><td>×</td><td>Fixed to '0'</td></tr>
<tr><td>No. 4 CPU operation status</td><td>SD399</td><td>×</td><td>Fixed to '0'</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Debugging using the simulation function</th></tr>
<tr><td>20</td><td>Available drive volume</td><td>
Difference of the drive volume may originate, for the file format is different from the actual programmable controller CPU. The following lists the available volume of each drive and the file size in the virtual programmable controller CPU.
• Available volume for users: Available space for users (free space after formatting)
• File size: Minimum size of one file
For details, refer to the User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used.
Since the available memory card is RAM only, memory card (ROM) on the drive 2 cannot be used.
<table>
<tr><th colspan="2" rowspan="2">–</th><th>Program memory*1</th><th>Memory card (RAM)</th><th>Standard RAM</th><th>Standard ROM*2</th></tr>
<tr><th>Drive 0</th><th>Drive 1</th><th>Drive 3</th><th>Drive 4</th></tr>
<tr><td rowspan="2">Basic model QCPU/ High Performance model QCPU</td><td>Available volume for users</td><td>1008k bytes</td><td>2034k bytes</td><td>256k bytes</td><td>1008k bytes</td></tr>
<tr><td>File size</td><td>2048 bytes</td><td>1024 bytes</td><td>1024 bytes</td><td>2048 bytes</td></tr>
<tr><td rowspan="2">Universal model QCPU (not equal to Q100UDEH)</td><td>Available volume for users</td><td>1040k bytes</td><td>8172k bytes</td><td>1280k bytes</td><td>4096k bytes</td></tr>
<tr><td>File size</td><td>512 bytes</td><td>4096 bytes</td><td>512 bytes</td><td>2048 bytes</td></tr>
<tr><td rowspan="2">Universal model QCPU (equal to Q100UDEH)</td><td>Available volume for users</td><td>4000k bytes</td><td>8172k bytes</td><td>1792k bytes</td><td>16384k bytes</td></tr>
<tr><td>File size</td><td>512 bytes</td><td>4096 bytes</td><td>512 bytes</td><td>2048 bytes</td></tr>
<tr><td rowspan="2">LCPU</td><td>Available volume for users</td><td>1040k bytes</td><td>–</td><td>768k bytes</td><td>2048k bytes</td></tr>
<tr><td>File size</td><td>512 bytes</td><td>–</td><td>512 bytes</td><td>2048 bytes</td></tr>
</table>
</td></tr>
<tr><td>21</td><td>Considerations for Online program change</td><td>At Online program change, fall instructions are executed regardless of options.
Secured steps for Online program change are 500 steps by default at the start up of the simulation function. Secured steps can be changed at "Allocate Memory for 'Online Change' (Write to PLC only)".</td></tr>
<tr><td>22</td><td>Program monitoring</td><td>In ladder programs, line monitor is available even though the program written to the programmable controller CPU and one being edited are different.</td></tr>
<tr><td>23</td><td>Initial start for SFC programs</td><td>When 'Initial start' is selected for "SFC program start mode" and a set of operations 'STOP→Write to PLC→RUN' is performed, not 'Initial start' but 'Resume start' is adopted if programs written to the programmable controller CPU have no change.</td></tr>
<tr><td>24</td><td>Considerations for file batch online change</td><td>In the following cases, file batch online change cannot be performed.
• Program memory does not have free space larger than the program to be written.
• The maximum number of files has already been stored in program memory.</td></tr>
<tr><td>25</td><td>Operation error</td><td>Conditions of operation error occurrence is equal to ones with High Performance model QCPU.
(As 'D/ K-2147483648 K-1 D0' is operated, for example, an operation error does not occur with Universal model QCPU but occurs with High Performance model QCPU and virtual programmable controller CPU.)
Operation errors are No. 4100 at any time.</td></tr>
<tr><td>26</td><td>When "-0" is specified as the floating-point type real number</td><td>No error occurs. (Processed as '0' in operation.)</td></tr>
<tr><td>27</td><td>Monitoring local devices</td><td>If [Local device not executed] is selected, the virtual programmable controller CPU monitors the devices of the program executed at the end of each scan.
However, it may monitor the devices of the low-speed execution type or fixed scan execution type programs processed at the end of each scan if these types of program are included in the programs for simulation. If a program for local device monitoring is specified in the local device monitor, the virtual programmable controller CPU monitors the local devices in the specified program regardless of the existence of a scan execution type program.</td></tr>
<tr><td>28</td><td>Assigning base units</td><td>Slots are assigned with a maximum number of slots when "Auto" is selected for "Base Mode" on the <<I/O Assignment>> tab of PLC parameter.
To avoid slots to be assigned with a maximum number of slots, select "Details" and set the number of slots.</td></tr>
</table>

*1 : The file size unit of program memory of Universal model QCPU/LCPU is 4 bytes (equal to Q26UDH).

*2 : The value shown at 'Standard ROM' of Basic model QCPU/High Performance QCPU is one after the writing to the ROM.

● FXCPU

<table>
<tr><th>No.</th><th>Item</th><th>Debugging using the simulation function</th></tr>
<tr><td>1</td><td>Selection of programmable controller CPU and operation of FX series CPU</td><td>In the simulation function of FXCPU, the CPU-specific functions and device range operate according to the specifications of the selected FXCPU.
Application instructions can operate in the simulation function even they are not supported by the selected FXCPU.
Since a program may contain unsupported instructions after changing its programmable controller type from a top model to a low model, the program may cause a program error when it is written to the FXCPU even it can be performed in the simulation function.
For example, even the pulse execution type application instructions are not supported by FX0, FX0S, and FX0N they can be performed in the simulation function. However, a program error may occur due to the unsupported instructions when the program is written to the FXCPU.</td></tr>
<tr><td>2</td><td>Program check at STOP to RUN</td><td>The program check function at STOP to RUN detects a program error only when an MC/MCR exists in the STL instruction or the RET instruction is not input in response to the STL instruction. Note that other problems cannot be detected by the program check function at STOP to RUN, and check them in advance using the program check function of GX Works2.</td></tr>
<tr><td>3</td><td>Enable/disable setting of parameter items</td><td>Some parameter setting items of GX Works2 become disabled in the simulation function even they are set.
<table>
<tr><th colspan="2">Parameter</th><th>Setting item</th></tr>
<tr><td rowspan="7">PLC Parameter</td><td>Memory Capacity</td><td>All items are enabled</td></tr>
<tr><td>Device</td><td>All items are enabled</td></tr>
<tr><td>PLC Name</td><td>All items are disabled</td></tr>
<tr><td>PLC System (1)</td><td>All items are disabled</td></tr>
<tr><td>PLC System (2)</td><td>All items are disabled</td></tr>
<tr><td>Special Function Block</td><td>All items are disabled</td></tr>
<tr><td>Positioning</td><td>All items are disabled</td></tr>
</table></td></tr>
<tr><td>4</td><td>Program memory capacity</td><td>The simulation function is performed with the maximum step capacity of each model.</td></tr>
<tr><td>5</td><td>Watchdog timer</td><td>The watchdog timer (D8000) operates in 200ms with all CPUs. The setting value can be changed but the change is not applied to its operation.</td></tr>
<tr><td>6</td><td>Buffer memory monitor</td><td>In the simulation function, the buffer memory of a special extension device operates as a general register which can be read/written by the FROM/TO instruction. It does not have functions specific to the special extension device.</td></tr>
<tr><td>7</td><td>Variable analog potentiometer</td><td>The data register (D8030/D8031), which stores the value of the variable analog potentiometer built in FX0, FX0S, FX0N, FX1S, FX1N, and FX3G, operates as a general data register. Write a value between 0 and 255 and test the operation using GX Works2.</td></tr>
<tr><td>8</td><td>High-speed counter</td><td>The high-speed counter is not supported by the simulation function.</td></tr>
<tr><td>9</td><td>SORT/SORT2 instruction</td><td>The SORT/SORT2 instruction is executed over multiple scans on FXCPU. In the simulation function, however, its execution is always completed in one scan and M8029 (Instruction execution complete) turns ON immediately.</td></tr>
<tr><td>10</td><td>Latched type device</td><td>A latched type device keeps holding its value when the simulation function is in STOP status.
It clears its value when the simulation function is ended.</td></tr>
<tr><td>11</td><td>Non-latch type device</td><td>A non-latched type device clears its value when the simulation function is in STOP status or ended.</td></tr>
<tr><td>12</td><td>Clear PLC Memory</td><td>Execute the Clear PLC Memory function to clear and initialize user data written with the simulation function.
Execute it too when the operation of the simulation function is not stable.</td></tr>
<tr><td>13</td><td>Character string constant</td><td>Up to 16 characters can be processed as a character string constant in a program.
The 17th and later characters are ignored when the length of characters is 17 or more.
Example: $+ "12345678901234567" "abcdefghijklmnopq" D0
When the operation shown above is processed, the following data are stored in the devices starting from D0.
D0 to D15 = "1234567890123456abcdefghijklmnop"
(The 17th and later characters of each character string constant (“7” and “q”) are ignored.)</td></tr>
<tr><td>14</td><td>Write to PLC of device memory</td><td>The Write to PLC function does not support the device memory listed below.
• Input (X)
• Output (Y)
• Special relay (M8000 and later)
• Special register (D8000 and later)</td></tr>
<tr><td>15</td><td>Special Function Block</td><td>Only the buffer memory of the special function block is supported by the simulation function.</td></tr>
</table>

Appendix 3 ASCII Code Table

Q CPU L CPU Remote Head FX

–			MSD							
			0	1	2	3	4	5	6	7
			000	001	010	011	100	101	110	111
LSD	0	0000	NUL	DLE	(SP)	0	@	P	`	p
	1	0001	SOH	DC1	!	1	A	Q	a	q
	2	0010	STX	DC2	"	2	B	R	b	r
	3	0011	ETX	DC3	#	3	C	S	c	s
	4	0100	EOT	DC4	$	4	D	T	d	t
	5	0101	ENQ	NAK	%	5	E	U	e	u
	6	0110	ACK	SYN	&	6	F	V	f	v
	7	0111	BEL	ETB	'	7	G	W	g	w
	8	1000	BS	CAN	(	8	H	X	h	x
	9	1001	HT	EM	)	9	I	Y	i	y
	A	1010	LF	SUB	*	:	J	Z	j	z
	B	1011	VT	ESC	+	;	K	[	k	{
	C	1100	FF	FS	,	<	L	\ (¥)	l	|
	D	1101	CR	GS	-	=	M	]	m	}
	E	1110	SO	RS	.	>	N	^	n	~
	F	1111	SI	US	/	?	O	_	o	DEL

Appendix 4 Considerations of GX Works2 and Differences with GX Developer

Q CPU L CPU Remote Head FX

This section describes the considerations when using GX Works2 and the differences between GX Works2 and GX Developer.

Appendix 4.1 Before using GX Works2

Compared with GX Developer, GX Works2 has some differences in supported CPU modules, features, and operability. Please review the following considerations prior to use.
For (Intelligent) indicated in the Reference column, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Intelligent Function Module)

Item to be confirmed		Reference
Supported CPU modules		Appendix 4.2
Unsupported features		Appendix 4.3
Supported project types		Appendix 4.4
	Using project functions	
Programming languages supported by each project type		Appendix 4.5
	Using Ladder Diagram	
	Using Sequential Function Chart	
	Using labels	
	Using function blocks	
Using device comments		Appendix 4.6
Using device memory		Appendix 4.7
Using device initial values		Appendix 4.8
Using search/replace function		Appendix 4.9
Using online function		Appendix 4.10
Using monitor/debug function		Appendix 4.11
Using printing function		Appendix 4.12
Copying saved project data		Appendix 4.13
Using change programmable controller type function		Appendix 4.14
Using program check function		Appendix 4.15
Using IC memory card function		Appendix 4.16
Compatibility with GX Developer		Appendix 4.17
Compatibility with GX IEC Developer		Appendix 4.18
Compatibility with GX Configurator-QP		(Intelligent)
Key operation		Appendix 4.19
Program titles		Appendix 4.20

Appendix 4.2 Supported CPU modules

The following CPU modules are supported by GX Works2.

Programmable controller series	Programmable controller type
QCPU (Q mode)	Basic model QCPU (Q00J, Q00, Q01)
	High Performance model QCPU (Q02, Q02H, Q06H, Q12H, Q25H)
	Universal model QCPU (Q00UJ, Q00U, Q01U, Q02U, Q03UD, Q03UDE, Q03UDV, Q04UDH, Q04UDEH, Q04UDV, Q06UDH, Q06UDEH, Q06UDV, Q10UDH, Q10UDEH, Q13UDH, Q13UDEH, Q13UDV, Q20UDH, Q20UDEH, Q26UDH, Q26UDEH, Q26UDV, Q50UDEH, Q100UDEH)
	Remote I/O (QJ72LP25, QJ72BR15)
	Process CPU (Q02PH, Q06PH, Q12PH, Q25PH)
	Redundant CPU (Q12PRH, Q25PRH)
LCPU	L02S, L02, L02-P, L06, L26, L26-BT, L26-PBT, LJ72GF15-T2, LJ72MS15
FXCPU	FX0, FX0S, FX0N, FX1, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3GC, FX3U, FX3UC

The following CPU modules are supported by starting GX Developer from GX Works2.
For details of using the following CPU modules, refer to Appendix 14.

Programmable controller series	Programmable controller type
QCPU (A mode)	All programmable controller types
QSCPU	All programmable controller types
QnACPU	All programmable controller types
ACPU	All programmable controller types
Motion controller (SCPU)	All programmable controller types
CNC (M6, M7)	All programmable controller types

Appendix 4.3 Unsupported features

The following table shows the features that are not supported by GX Works2.
Use GX Developer, GX Simulator, or GX Configurator for the following features.

Unsupported feature		Alternate S/W
Debug function for ladder program	Timing chart monitoring function	GX Simulator
	Serial communication function	
	Device manager function	
Intelligent function module programming function	Protocol FB support	GX Configurator-SC
Device initial value	Device memory registration	GX Developer
Password	Password registration for data in project	
Interaction with GX Explorer	Boot by GX Explorer	
MEDOC print format import	Import in MEDOC print format	
Online	Intelligent module diagnostics from system monitor	GX Developer GX Configurator
Sampling trace	Sampling trace conditionally on step number	GX Developer

* In addition to the features mentioned above, the following features are not supported by FXCPU.

- Configuration function
- Sampling trace function

Appendix 4.4 Supported project types

The following table shows the supported project types in GX Works2.

Project type		Description
Simple project		–
	Without labels	This is the equivalent of the "Do not use label" project of GX Developer. 1) When a project created in the "Do not use label" of GX Developer is read with GX Works2, the project becomes the Simple project (without labels). 2) When a project created in the Simple project (without labels) of GX Works2 is read with GX Developer, the project becomes the "Do not use label" project.
	With labels*1	This is the equivalent of the "Use label" project of GX Developer.*2 1) When a project created in the "Use label" of GX Developer is read with GX Works2, the project becomes the Simple project (with labels). 2) When a project created in the Simple project (with labels) of GX Works2 is read with GX Developer, the project becomes the "Use label" project.
Structured project*3		In GX Works2, 'structured programming' is available. The structured programming proceeds while creating POUs and combining them (registering tasks in the program file). The projects created in 'Structured project' of GX Works2 cannot be read with GX Developer.

*1 : Not supported by FX0, FX0S, FX0N, FXU, and FX2C.
*2 : "Use label" projects of GX Developer are not supported by FXCPU.
*3 : Not supported by FX1.

■ Using project functions

Before using the project functions in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Protect projects	By installing as 'monitoring only', projects were protected on each personal computer.	By setting projects as 'read-only' with the 'Security' function, project-by-project protection is now available.
Change project types	Project types cannot be changed from "Do not use label" to "Use label".	The following project type changes are now available. 1) Project type change from 'Simple project (without labels)' to 'Simple project (with labels)' 2) Project type change from 'Simple project (with labels)' to 'Structured project*1
Read GX Developer format projects	–	Selecting [Project] ⇒ [Intelligent Function Module] ⇒ [Read GX Configurator-QP Data] enables GX Configurator-QP format data to be read out. *GX Developer starts and a project is opened when a project of the following CPU types is specified: ACPU, QnACPU, QCPU (A mode), Motion Controller (SCPU), CNC (M6/M7), and Safety CPU.
Read GX Configurator-QP format projects*2	–	Selecting [Project] ⇒ [Intelligent Function Module] ⇒ [Read GX Configurator-QP Data] enables GX Configurator-QP format data to be read out.
Copy data in a project to different projects	It was enabled on the project copy dialog.	Copy and paste is now available on the Navigation window.

*1 : Direct project type change from 'Simple project (without labels)' to 'Structured project' is not available.
*2 : Not supported by FXCPU.

Appendix 4.5 Programming languages supported by each project type

The following table shows the programming languages that are supported by each project type of GX Works2.

<table>
<tr><th colspan="2">Project type</th><th>Supported programming language</th></tr>
<tr><td colspan="2">Simple project</td><td>–</td></tr>
<tr><td rowspan="2"></td><td>Without labels</td><td>Ladder Diagram, Sequential Function Chart (MELSAP3, MELSAP-L)*1, Sequential Function Chart (FXCPU)*2</td></tr>
<tr><td>With labels</td><td>Ladder Diagram, Sequential Function Chart (MELSAP3, MELSAP-L)*1, Structured Text*1
<table><tr><th>Supported program element</th></tr><tr><td>Label, structure, function block</td></tr></table></td></tr>
<tr><td colspan="2">Structured project</td><td>Ladder Diagram*1, Sequential Function Chart (MELSAP3, MELSAP-L)*1, Structured Ladder/FBD, Structured Text
<table><tr><th>Supported program element</th></tr><tr><td>Label, structure, function block, function, library</td></tr></table></td></tr>
</table>

*1 : Not supported by FXCPU.
*2 : Not supported by QCPU (Q mode)/LCPU.

The following programming languages are not supported by GX Works2.
Use GX Developer for the following programming languages.

Unsupported programming language	Description	Alternate S/W
List	1) If GX Works2 reads out a program created with lists in GX Developer, it can be displayed or edited as a ladder program. 2) If GX Developer reads out a program created with ladder programs in GX Works2, it can be displayed or edited in list program.	GX Developer

■ Using Ladder Diagram

Before using Ladder Diagram in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Program giving devices an alias	It was enabled by the 'Alias' function.	Please use 'Label'.
Segment a part of program into POUs (macros)	It was enabled by the 'Macro definition/ import' function.	Please use 'Function Block'.
Find/Replace instructions/ devices/labels	Find was enabled by directly typing an instruction/device/label in 'Read mode'.	Pressing the Space key on the ladder editor allows the simple find.
		The mode can be switched to "Read Mode" by setting the option. Select "Use the Switching Ladder Edit Mode (Read, Write, Monitor, Monitor (Write))" under "Program Editor" ⇒ "Ladder" ⇒ "Ladder Diagram" in the option setting.
Check use status of device/label	It was enabled by the 'Cross Reference List' function and 'List of Used Devices' function.	Please select [Find/Replace] ⇒ [Cross Reference], or [Find/Replace] ⇒ [Device List].
Select the range specified with the drag-and-drop operation	It was enabled by left-clicking the mouse while pressing the Ctrl key.	Selecting the frame of the target range enables the drag-and-drop operation.
Select the range starting from the cursor specified by mouse under read status	It was enabled using the mouse while pressing the Shift key.	The range can be selected using only the mouse without pressing the Shift key.
Verify	–	The verify result window clearly shows the following: 'unmatched area of the programs', 'only verify source contains the program' and 'only verify destination contains the program'.
Register to Watch window	–	Devices/labels in the ladder block at the cursor position are automatically registered to the Watch window. To use this function, set "Setting for Automatic Registration to Watch Window" under "Monitor" ⇒ "Ladder" in the option setting.

■ Using Sequential Function Chart

Before using Sequential Function Chart (MELSAP3), Sequential Function Chart (MELSAP-L), or Sequential Function Chart (FXCPU) in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Change block number	It was enabled by the 'copy and paste' function in block list.	Each block data is displayed on the Navigation window, and the block number can be changed in the property of each block data. * Selecting [View] ⇒ [Open SFC Blocklist] can display the block list equivalent to that of GX Developer.
Open a start source block by block start	No corresponding function.	Selecting [View] ⇒ [Back to Start SFC Block] can open it.
Online change using SFC program	No corresponding function.	In SFC program, online change is possible in SFC block unit. Please execute from the menu of "Online Change".
Monitor during MELSAP-L display format	Device monitor was enabled by a split display.	Can monitor the device by registering to the Watch window.
Select the range specified with the drag-and-drop operation	It was enabled by left-clicking the mouse while pressing the Ctrl key.	Selecting the frame of the target range enables the drag-and-drop operation.
Select the range starting from the cursor specified by mouse under read status	It was enabled using the mouse while pressing the Shift key.	The range can be selected using only the mouse without pressing the Shift key.
Open operation output/ transition condition programs	–	Multiple Zooms (operation output/transition condition data) can be simultaneously displayed. * Changing the "Setting of Zoom Display" option can switch the display on a window in the same way as GX Developer.
Copy and paste Ladder programs in Zoom editor	Ladder programs could not be pasted.	Ladder programs can be pasted. However, ladder block may not be displayed properly.

■ Using labels

Before using labels in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Check devices automatically assigned labels	It was enabled by the 'Show assigned device' function of label editor.	Please check on the ladder editor by selecting [View] ⇒ [Device Display].
Automatically assigned devices for input variables, output variables, and input/ output variables of function blocks	Devices are automatically assigned in the order that they are registered on the FB variable (FB label) setting window.	Labels registered on the Function/FB Label Setting screen are sorted in the order of 'VAR_INPUT', 'VAR_IN_OUT', 'VAR_OUTPUT', 'VAR', and devices are automatically assigned.
Import/Export device comments to labels	It was enabled by the 'device comment import' function and 'device comment export' function.	Please use the copy and paste on the label editor and device comment editor.
Use pointer type labels	Local pointers were assigned.	Common pointers are now assigned. For projects with labels, points are set by default in "Common Pointer" in the "PLC Parameter" ⇒ "PLC System" setting. (Points set by default differ vary according to the programmable controller type.)
Unusable reserved words for label name	The definition of reserved words are different between GX Developer and GX Works2.	

■ Using function blocks

Before using function blocks in GX Works2, please review the following considerations.

Function	Description
Use function blocks created with Ladder Diagram	Function blocks created with ladder can be used for ladder program, Structured Ladder/FBD program, ST program, and SFC program operation outputs. For FXCPU, they can be used for ladder programs only. * When using function blocks created with Ladder Diagram for ladder, Structured Ladder/FBD or ST programs, select [Tool] ⇒ [Options], and select "Enable calling function block and using inline ST" under "Compile" ⇒ "Basic Setting".
Use function blocks created with Structured Ladder/FBD	Function blocks created with Structured Ladder/FBD can be used for ladder programs, Structured Ladder/FBD programs and ST programs. * When using function blocks created with Structured Ladder/FBD for ladder programs, select [Tool] ⇒ [Options], and select "Enable calling function block and using inline ST" under "Compile" ⇒ "Basic Setting".
Use function blocks created with ST	Function blocks created with ST can be used for ladder programs, Structured Ladder/FBD programs, and ST programs. For FXCPU, they can be used for Structured Ladder/FBD programs and ST programs. * When using function blocks created with Structured Text for ladder programs, select [Tool] ⇒ [Options], and select "Enable calling function block and using inline ST" under "Compile" ⇒ "Basic Setting".
Set function block call option	When the VAR_IN_OUT input variable and output variable have different label/device, the input variable value is always equal to the output variable value. This function is not supported by FXCPU.

Appendix 4.6 Using device comments

Before using device comments in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Delete unused device comments	It was enabled by the 'Delete unused comments' function.	The Delete Unused Comment button is added on the Device List screen displayed by selecting [Find/Replace] ⇒ [Device List]. (Select a program for "Find In" and the search operation needs to be performed in advance.)
Sample comment	Sample comments of special relay/ special register were provided in project format.	Comments of special relay/special register and intelligent function module can be imported by the 'Import from Sample Comment' function on the device comment editor.

Appendix 4.7 Using device memory

Before using the device memory in GX Works2, please review the following considerations.

Function	Description
Device memory display	Multiple device ranges can be displayed on a window. * By selecting "All Range" when entering a device, all the device range can be displayed on one window in the same way as that of GX Developer.
Copy and past device memory data to Excel	To copy and paste device memory data to Excel, please select [Tool] ⇒ [Read from Excel File] / [Write to Excel File].

Appendix 4.8 Using device initial values

Before using device initial values in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Maximum amount of device initial value data to be created	Only 1 data was able to be created.	Up to 800 data can be created.
Restriction of device number	It was able to create within the range of maximum points for each programmable controller of devices.	It now can be created within the range of PLC parameter device setting.
PLC write/read IC memory card write/ read	Only 1 data was able to be read and written.	Selected multiple data can be read and written.

Appendix 4.9 Using search/replace function

Before using the search/replace function in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
All Find	The batch search function was not available.	The batch search function is enabled by "All Find".
Specified Range Replacing	The replace function is enabled within a range of the specified step numbers.	The replace function is enabled within the selected range in a ladder program.
Find String	The following were the search targets: 1. Statements 2. Notes	The search targets are added as follows: 1. Statements 2. Notes 3. Device/Label names 4. Device/Label comments 5. Instruction names 6. Data types
Replace Device Device Batch Replace	The following devices could not be specified for "Find Device" or "Replace Device": devices with digit, index setting, or indirect specification.	The following devices can be specified for "Find Device" or "Replace Device": devices with digit, index setting, or indirect specification. Note that, however, one of the specification needs to be a label.
Device Batch Replace	The device batch replace function is enabled by specifying a device for "Find Device" and a label for "Replace Device", and specifying two or more points for the number of points to be replaced.	1 is the only value that can be set for the number of points to be replaced when a label is specified for "Replace Device".

Appendix 4.10 Using online function

Before using the online function in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Connection destination setting	A project was able to contain only 1 'transfer setup' information.	A project can contain multiple pieces of 'connection destination' information. To change 'connection destination' information, select 'Connection Destination' on the Navigation window.
Data write/read for intelligent function module	Data write/read was not able to be executed for CPU modules and intelligent function modules at once.	Selecting [Online] ⇒ [Write to PLC], allows simultaneous data write for CPU modules and intelligent function modules. Selecting [Online] ⇒ [Read from PLC], allows simultaneous data read for CPU modules and intelligent function modules.
Flash ROM data write of CPU module	It was enabled by the 'PLC write (Flash ROM)' function.	The 'PLC write (Flash ROM)' function is now integrated in the 'Write to PLC' function. Please select [Online] ⇒ [Write to PLC].
Remote Operation screen PLC Diagnostics screen System Monitor screen	–	Selecting [Online] ⇒ [Remote Operation] and [Diagnostics] ⇒ [System Monitor] / [PLC Diagnostics] can display the module image and the programmable controller CPU operation status is now easy to see. The remote operation, memory operation, and clock setup can be started from the PLC Diagnostics screen.
System Monitor	As the system monitor function was not supported by LCPU, [Diagnostics] ⇒ [System Monitor] could not be selected.	The system monitor function has been supported by LCPU and the module image can be displayed by selecting [Diagnostics] ⇒ [System Monitor].
PLC Diagnostics	The continuation error information display function of "PLC Diagnostics" was not supported by LCPU.	Continuation error information can be displayed using the "PLC Diagnostics" function of LCPU.
Register/Cancel Display Module Menu	Registration /cancellation function of display module menus was not supported by LCPU.	Registration/cancellation function of display module menus has been supported by LCPU. Select [Online] ⇒ [Register/Cancel Display Module Menu].
Read from PLC	–	Symbolic information in GX Developer format does not include SFC programs. Please read on the 'Simple project (without labels)'.
		If symbolic information of GX Developer or GX IEC Developer is read out, the project becomes uncompiled.
		The Read from PLC function in Simple projects (with labels) and Structured projects is supported by FXCPU of the following models only. For FX3U/FX3UC (Version 3.00 or later)
		GX Developer starts and a new project is created with data read from the programmable controller CPU when a programmable controller series of the following CPU types is specified: ACPU, QnACPU, QCPU (A mode), Motion Controller (SCPU), CNC (M6/M7), and Safety CPU.
Write to PLC	–	Writing symbolic information to programmable controller CPU is supported by FXCPU of the following models only. For FX3U/FX3UC (Version 3.00 or later)

Appendix 4.11 Using monitor/debug function

Before using the monitor/debug function in GX Works2, please review the following considerations.

Function	Description
Entry data monitor	The 'entry data monitor' function is now a dockable window as a 'watch' function so that it can be displayed without overlapping with the program editor.
	Device/label is now enabled to be entered by dragging and dropping from the program editor and the ON/OFF status of bit device and current values of word device can be modified on the monitoring window.
Device batch monitoring Buffer batch monitoring	The 'device batch monitor' and 'buffer memory batch monitor' functions are now integrated to realize the same operability.
	ON/OFF status of bit device and current values of word device can be modified on the monitoring window.
Debug function*1	The debug function can be executed by starting the simulation function.
	The break point setting and the break device setting functions become dockable windows, and they can be displayed without overlapping the program editor.
	The debug function such as step execution can be executed from the debug function toolbar.
	The STEP-RUN switch is not displayed on the GX Simulator2 screen. The operating status of the simulation switches to STEP-RUN automatically by executing the debug function from the debug function toolbar.
Monitor Condition Setting/Monitor Stop Condition Setting	The Monitor Stop Condition screen cannot be closed while setting the monitor stop condition.
	The 'monitor stop condition' function cannot be performed when the monitoring function is not being executed.
	The Monitor Condition Setting screen or the Monitor Stop Condition Setting screen cannot be opened when the following function is being performed or the screen is being opened. • Online program change/program memory transfer • Intelligent function module monitoring • Program list monitoring • Interrupt program list monitoring • SFC all block batch monitoring • The Modify Value screen • The Forced Input Output Registration/Cancellation screen • Sampling trace • The CC-Link Diagnostics screen
	The Monitor Condition Setting screen or the Monitor Stop Condition Setting screen cannot be opened in MELSAP-L.

*1 : Not supported by FXCPU.

Appendix 4.12 Using printing function

Before using the printing function in GX Works2, please review the following considerations.

Function	Description
Additional information print such as statement and device comment	For the Print Window function, displayed image is subject to print/print window preview. To print with additional information such as statement and device comment, please put the desired information on the screen and then select [Project] ⇒ [Print Window] / [Print Window Preview].

Appendix 4.13 Copying saved project data

Before copying project data saved in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Copy saved project data	Save project data was able to be copied by copying files under the project name folder.	Please copy all the workspace name folders and "workspacelist.xml" created in the same hierarchy as the workspace name folders. * When only workspace name folders or project name folders are copied, it is enabled to open the project in the copy destination. However, if saving after editing, the workspace name and the project name need to be specified again.
		A project data can be copied by saving data as a single project with the "Save as a Single File Format Project" function on the Save As screen.

Appendix 4.14 Using PLC type change function

Before using the PLC type change function in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Use PLC type change function	Intelligent function module data could not be transmitted.	Intelligent function module data can be transmitted in PLC type conversion of Q series PLC and L series PLC.

Appendix 4.15 Using program check function

Before using the program check function in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Program check	Programs which follow the END instruction and do not affect sequence control were checked.	Programs which affect sequence control up to the END instruction are checked. Programs which follow the END instruction and do not affect sequence control are not checked.
	The duplicated coil error occurs when the same local label is used at two or more locations.	Since the same local label can be used at two or more locations when the function block is called with the same instance, the duplicated error does not occur.

Appendix 4.16 Using IC memory card function

Before using the IC memory card function in GX Works2, please review the following considerations.

Function	Description (differences between GX Developer and GX Works2)	
	GX Developer	GX Works2
Read IC Memory Card	Symbolic information could not be read.	Symbolic information can be read.
Write IC Memory Card	Symbolic information could not be written.	Symbolic information can be written.
	Passwords could not be set for LCPU.	Passwords can be set for LCPU.

Appendix 4.17 Compatibility with GX Developer

For the compatibility between GX Developer and GX Works2, please review the following considerations.
An error may occur at a compilation when a project which contains ST programs created in GX Developer is opened in GX Works2. For modifying instructions which cause a compilation error, refer to Appendix 19.

Function	Description
Open other project	Before opening a GX Developer "Use label" project of which a program and function block have the same name, please change the data name in GX Developer.
	Function names of Structured Text are different between GX Developer and GX Works2. Please compile and correct errors. Alternatively, select "Use Dedicated Instruction for GX Developer, GX IEC Developer" under [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Common Setting" ⇒ "Other Project Dedicated Instruction Setting".
	For a program which contains a utilized FB, the compiled program is not identical with the program compiled with GX Developer. To conform the compiled program to that compiled with GX Developer, select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Basic Setting" and clear "Enable calling function block and using inline ST " in "Function Block Call".
	For Q00UJ, Q00U, and Q01U projects, a compilation error may occur if the string type is used for the Boolean expression (conditional expression) in the conditional syntax or iteration syntax of the ST program. When an error occurs, create a ladder program with a string comparison function block whose operation result is a Boolean value, and correct the program by using this operation result for the failed Boolean expression (conditional expression) in the conditional syntax or iteration syntax.
	The setting of 'steps secured for Online program change' which is set on the [Read from PLC]/[Write to PLC] screen of GX Developer is not set. Set the setting of 'steps secured for Online program change' on the [Read from PLC]/[Write to PLC] screen after performing the Open Other Project function in GX Works2.
	Local labels of timer, counter, retentive timer, and pointer cannot be used for function blocks of ladder program to be utilized in an ST program. Change local labels to global labels.
	Before opening a project in which constants are set to the structures, delete the constants with GX Developer.
Export to GX Developer format file	Target projects are: 1) Simple project (without labels) 2) Compiled Simple project (with labels)*1 Note: Projects using labels in Sequential Function Chart are executed.
	To execute, the following requirements must not be satisfied in the global label settings. 1) No device is set. 2) The lengths of label name exceeds 16 characters. 3) Label name contains a device name or reserved word. 4) An invalid character is used. 5) Data type that is not supported by GX Developer is used. 6) A value that is not constant is used in the constant.
	Data registered to the global label is set as "Auto External" for all the local labels.
	Projects which include inline structured text cannot be saved in GX Developer format.
	Projects which include ladder programs whose function block calls function block cannot be saved in GX Developer format.

*1 : Not supported by FXCPU.

Appendix 4.18 Compatibility with GX IEC Developer

For the compatibility between GX IEC Developer and GX Works2, please review the following considerations. Projects for FXCPU created with GX IEC Developer cannot be opened with GX Works2.

Function	Description
Open other project	Function names of Structured Text are different between GX IEC Developer and GX Works2. Please compile and correct errors.
User library	Before using GX IEC Developer user libraries with passwords enabled, please disable the passwords in GX IEC Developer.

Appendix 4.19 Key operation

This section explains the differences of key operation between GX Developer and GX Works2.

Function			Description	Shortcut key	
				GX Developer	GX Works2
Edit	Read mode		Change to the read mode.	Shift + F2	Shift + F2 *1
	Write mode		Change to the write mode.	F2	F2 *1
Find/ Replace	Cross reference		Display the cross reference.	–	Ctrl + E
	Device List		Display the device list.	–	Ctrl + D
Convert Block	Block conversion (SFC block being edited)		Convert the SFC block being edited.	F4	Ctrl + Alt + F4
View	Project data list		Switch display/non-display of project data list.	Alt + O	–
	Switch between project data list and window		Switch the project data list and each window.	Alt + 7	–
	Switch ladder program/list		Switch the ladder/list screen.	Alt + F1	–
Online	Monitor	Start Monitor (all windows)	Execute the program monitoring for all the opened programs.	Ctrl + F3	–
		Monitor (write mode)	Change to the write mode during program monitoring.	Shift + F3	Shift + F3 *1
		Stop monitor (all windows)	Stop the program monitoring for all the opened programs.	Ctrl + Alt + F3	–
	Debug	Device test	Execute the device forced ON/OFF or the current value modification.	Alt + 1	–
		Skip execution	Run selected sequence programs in skip execution.	Alt + 2	–
		Partial execution	Run sequence programs partially.	Alt + 3	–
		Step run	Run the programmable controller CPU in step run.	Alt + 4	–
	Remote operation		Perform remote operations.	Alt + 6	–

*1 : In GX Works2, select "Use the Switching Ladder Edit Mode (Read, Write, Monitor, Monitor (Write))" under "Program Editor" ⇒ "Ladder" ⇒ "Ladder Diagram" in the option setting to switch the read mode/write mode of the ladder editor and the SFC diagram editor.

Appendix 4.20 Program titles

A title of data created under each execution type of Program Setting has the equivalent function to program titles of GX Developer. Titles can be set on the Property screen of each data.
The title being set is displayed on the Online Data Operation screen and written to/read from programmable controller CPU along with the program.

Appendix 5 Compatibility with Projects Created with Existing Applications

Q CPU L CPU Remote Head FX

This section explains the compatibility of GX Works2 projects with projects created with existing applications.

Appendix 5.1 Application compatibility

■ Reading projects created with existing application to GX Works2

● Reading projects created with GX Developer and IEC Developer

The following table shows the applicability of reading project files created with existing applications to GX Works2.
Projects and data created with the CPU types or programming languages not supported by GX Works2 cannot be read.
When ST programs created with GX Developer are read to GX Works2, they are opened as Structured projects with Version 1.08J or earlier and opened as Simple projects with Version 1.12N or later.
(For the method for reading projects created with existing applications, refer to the following section.
☞ Section 4.7)

● GX Developer

○: Applicable
△: Applicable with restrictions

Programmable controller type	Application	Reading applicability
Basic model QCPU High Performance model QCPU, Q12PH, Q25PH	GX Developer Version 8.00A or later	△*1
Q02PH, Q06PH	GX Developer Version 8.68W or later	△*1
Q12PRH, Q25PRH	GX Developer Version 8.17T or later	△*1
Q03UD, Q04UDH, and Q06UDH	GX Developer Version 8.45X or later	△*1
Q02U	GX Developer Version 8.48A or later	△*1
Q13UDH and Q26UDH	GX Developer Version 8.62Q or later	△*1
Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH	GX Developer Version 8.68W or later	△*1
Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, and Q20UDEH	GX Developer Version 8.76E or later	△*1
L02, L26-BT	GX Developer Version 8.88S or later	△*1
FX3U and FX3UC	GX Developer Version 8.25B or later	○
FX3G	GX Developer Version 8.72A or later	○
FX0, FX0S, FX0N, FX1, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, and FX2NC	GX Developer Version 8.00A or later	○

*1 : When MELSAP-L format SFC programs are read with Version 1.24A or earlier, they are opened in the MELSAP3 format.

● GX IEC Developer

○: Applicable

Programmable controller type	Application	Reading applicability
Basic model QCPU High Performance model QCPU, Q12PH, Q25PH	GX IEC Developer Version 7.00A or later	○
Q03UD, Q04UDH, and Q06UDH	GX IEC Developer Version 7.03D	○
Q02U	GX IEC Developer Version 7.03D	○
Q13UDH and Q26UDH	GX IEC Developer Version 7.03D	○
Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH	GX IEC Developer Version 7.03D	○

● Reading projects created with GX Configurator

GX Configurator flash ROM setting saved files (*.UMD) cannot be read in GX Works2.
To use GX Configurator flash ROM setting saved files in GX Works2, write the data to the intelligent function module with GX Configurator, and then read the data using GX Works2.
(Reading intelligent function module data ☞ Section 12.1.4)

■ Reading projects created with GX Works2 to existing applications

● Reading projects using GX Developer and IEC Developer

Projects created with GX Works2 can be read to GX Developer by saving them using "Export to GX Developer Format File". (☞ Section 4.7)
Reading projects to GX IEC Developer or non-Windows applications such as GPPQ is not possible.

When reading projects with GX Developer, application versions that can read projects differ according to the programmable controller type of the project. The following table shows the relation between the programmable controller types of project and the read-applicable versions.

○: Applicable
△: Applicable with restrictions

Programmable controller type	Application	Reading applicability
Basic model QCPU High Performance model QCPU, Q12PH, Q25PH	GX Developer Version 8.00A or later	△*1
Q02PH, Q06PH	GX Developer Version 8.68W or later	△*1
Q12PRH, Q25PRH	GX Developer Version 8.17T or later	△*1
Q03UD, Q04UDH, and Q06UDH	GX Developer Version 8.45X or later	△*1
Q02U	GX Developer Version 8.48A or later	△*1
Q13UDH and Q26UDH	GX Developer Version 8.62Q or later	△*1
Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH	GX Developer Version 8.68W or later	△*1
Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, and Q20UDEH	GX Developer Version 8.76E or later	△*1
L02, L26-BT	GX Developer Version 8.88S or later	△*1
FX3U and FX3UC	GX Developer Version 8.25B or later	○
FX3G	GX Developer Version 8.72A or later	○
FX0, FX0S, FX0N, FX1, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, and FX2NC	GX Developer Version 8.00A or later	○

*1 : For the restrictions in reading, refer to "SW□D5C-GPPW Compatibility" of the GX Developer Operating Manual.

● Reading projects using GX Configurator

As projects cannot be saved in formats such as the GX Configurator-QP format and the GX Configurator flash ROM setting saved file format (*.UMD) in GX Works2, data set in GX Works2 cannot be read using GX Configurator.
To use GX Works2 data in GX Configurator, write the data to the intelligent function module with GX Works2, and then read the data using GX Configurator.
(Writing intelligent function module data ☞ Section 12.1.4)

Appendix 6 Compatibility of Data Read from Programmable Controller CPU

Q CPU L CPU Remote Head FX

This section explains the compatibility between the data written on the programmable controller CPU using GX Developer or GX IEC Developer and the data read using GX Works2.

Appendix 6.1 Application compatibility

■ Reading data written on the programmable controller CPU using existing applications to GX Works2

The following table shows the applicability of reading data written on the programmable controller CPU using existing applications to GX Works2.
Data created with the CPU types or programming languages not supported by GX Works2 cannot be read.

● GX Developer

○: Applicable
△: Applicable with restrictions

Programmable controller type	Application	Reading applicability
Basic model QCPU High Performance model QCPU, Q12PH, Q25PH	GX Developer Version 8.00A or later	△*1
Q02PH, Q06PH	GX Developer Version 8.68W or later	△*1
Q12PRH, Q25PRH	GX Developer Version 8.17T or later	△*1
Q03UD, Q04UDH, and Q06UDH	GX Developer Version 8.45X or later	△*1
Q02U	GX Developer Version 8.48A or later	△*1
Q13UDH and Q26UDH	GX Developer Version 8.62Q or later	△*1
Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH	GX Developer Version 8.68W or later	△*1
Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, and Q20UDEH	GX Developer Version 8.48A or later	△*1
L02, L26-BT	GX Developer Version 8.88S or later	△*1
FX3U and FX3UC	GX Developer Version 8.25B or later	○
FX3G	GX Developer Version 8.72A or later	○
FX1S, FX1N, FX1NC	GX Developer Version 6.00A or later	○
FX0, FX0S, FX0N, FX1, FXU, FX2C, FX2N, and FX2NC	GX Developer Version 2.00A or later	○

*1 : When MELSAP-L format SFC programs are read with Version 1.24A or earlier, they are opened in the MELSAP3 format.

● GX IEC Developer

○: Applicable

Programmable controller type	Application	Reading applicability
Basic model QCPU High Performance model QCPU, Q12PH, Q25PH	GX IEC Developer Version 7.00A or later	○
Q03UD, Q04UDH, and Q06UDH	GX IEC Developer Version 7.03D	○
Q02U	GX IEC Developer Version 7.03D	○
Q13UDH and Q26UDH	GX IEC Developer Version 7.03D	○
Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH	GX IEC Developer Version 7.03D	○

■ Reading data written on the programmable controller CPU using GX Works2 to existing applications

The following table shows the applicability of reading data written on the programmable controller CPU using GX Works2 to existing applications.
Data created with the CPU types or programming languages not supported by existing applications cannot be read.

● GX Developer

△: Applicable with restrictions

Programmable controller type	Application	Reading applicability
Basic model QCPU High Performance model QCPU, Q12PH, Q25PH	GX Developer Version 8.00A or later	△*1, *2, *3
Q02PH, Q06PH	GX Developer Version 8.68W or later	△*1, *2, *3
Q12PRH, Q25PRH	GX Developer Version 8.17T or later	△*1, *2, *3
Q03UD, Q04UDH, and Q06UDH	GX Developer Version 8.45X or later	△*1, *2, *3
Q02U	GX Developer Version 8.48A or later	△*1, *2, *3
Q13UDH and Q26UDH	GX Developer Version 8.62Q or later	△*1, *2, *3
Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH	GX Developer Version 8.68W or later	△*1, *2, *3
Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, and Q20UDEH	GX Developer Version 8.48A or later	△*1, *2, *3
L02, L26-BT	GX Developer Version 8.88S or later	△*1, *2, *3
FX3U and FX3UC	GX Developer Version 8.25B or later	△*1, *4
FX3G	GX Developer Version 8.72A or later	△*1
FX1S, FX1N, FX1NC	GX Developer Version 6.00A or later	△*1
FX0, FX0S, FX0N, FX1, FXU, FX2C, FX2N, and FX2NC	GX Developer Version 2.00A or later	△*1

*1 : Only execution programs can be read when programs written in Simple project (with labels) or Structured project are read from the programmable controller CPU.
They can be displayed/edited in ladder program or list.

*2 : Programs cannot be read to GX Developer Version 8.03D or later if projects are opened with the setting of "Use label". To enable reading of programs to GX Developer Version 8.03D or later, create projects without the "Use label" setting.

*3 : When Structured Ladder/FBD or ST programs are read from a programmable controller CPU using existing applications, there may be cases where ladder programs cannot be restored. Be sure to check the programs after they have been read from the programmable controller CPU using existing applications.
When programs are read from a programmable controller CPU using GX Developer, ladder blocks which cannot be displayed as ladder programs are displayed in yellow.

*4 : When a project in which a block password with the validated setting for "Read-protect the execution program" exists is written, the execution program cannot be read.

● GX IEC Developer

△: Applicable with restrictions

Programmable controller type	Application	Reading applicability
Basic model QCPU High Performance model QCPU, Q12PH, Q25PH	GX IEC Developer Version 7.00A or later	△*1
Q03UD, Q04UDH, and Q06UDH	GX IEC Developer Version 7.03D	△*1
Q02U	GX IEC Developer Version 7.03D	△*1
Q13UDH and Q26UDH	GX IEC Developer Version 7.03D	△*1
Q03UDE, Q04UDEH, Q06UDEH, Q13UDEH, and Q26UDEH	GX IEC Developer Version 7.03D	△*1
FX0, FX0S, FX0N, FX1, FXU, FX2C, FX2N, and FX2NC	GX Developer Version 2.00A or later	△*1

*1 : Only execution programs can be read.
They can be displayed/edited as MELSEC-IL programs.

Appendix 6.2 Data compatibility

■ Reading data written on the programmable controller CPU using GX Developer to GX Works2

The following table shows the reading applicability depending on the label setting when reading data written on the programmable controller CPU using GX Developer to GX Works2.
Data created with the CPU types or programming languages not supported by GX Works2 cannot be read.

● Reading data with labels

This function is not supported by FXCPU.

○: Applicable
△: Applicable with restrictions
×: Not applicable

Data		Project type of GX Works2		
		Simple project		Structured project
		Without labels	With labels	
Label program	Label program (GX Developer format symbolic information)	×	△*3,*5	△*3,*5
Program	Ladder program	△*4	×*5	×*5
	SFC program	△*1,*2	×*3	×*3
	ST Program	△*4	×*5	×*5
Parameter	PLC/Network/Remote password/ Redundant parameter	○	○	○
	Intelligent function module parameter	○	○	○
Device comment	Common comment (Global device comment)	○	○	○
	Comment by program (Local device comment)	○	○	○
Device memory	Device memory	○	○	○
Device initial value	Device initial value	○	○	○

*1 : When MELSAP-L format SFC programs are read with Version 1.24A or earlier, they are opened in the MELSAP3 format.
*2 : Block statements written with GX Developer are read as SFC block comments in GX Works2.
*3 : SFC programs are not included in label programs of GX Developer. Use 'Simple project (without labels)' when reading programs in GX Works2.
*4 : When a ladder program or ST program, in which labels of GX Developer are used, is read in Simple program (without labels), it becomes a ladder program without labels. By editing this ladder program and writing it to a programmable controller CPU again, this program becomes inconsistent with the label program written to a programmable controller CPU using GX Developer.
*5 : Ladder programs and ST programs, in which labels of GX Developer are used, are included in label programs. Read GX Developer format symbolic information when reading programs in GX Works2.

● Reading data without labels (QCPU (Q mode))

○: Applicable
△: Applicable with restrictions
×: Not applicable

Data		Project type of GX Works2		
		Simple project		Structured project
		Without labels	With labels	
Program	Ladder program	○	×	×
	SFC program	△*1, *2	×	×
Parameter	PLC/Network/Remote password/ Redundant parameter	○	○	○
	Intelligent function module parameter	○	○	○
Device comment	Common comment (Global device comment)	○	○	○
	Comment by program (Local device comment)	○	○	○
Device memory	Device memory	○	○	○
Device initial value	Device initial value	○	○	○

*1 : When MELSAP-L format SFC programs are read with Version 1.24A or earlier, they are opened in the MELSAP3 format.
*2 : Block statements written with GX Developer are read as SFC block comments in GX Works2.

● Reading data without labels (FXCPU)

○: Applicable
×: Not applicable

Data		Project type of GX Works2		
		Simple project		Structured project
		Without labels	With labels	
Program	Program	○	×	×
Parameter	PLC parameter	○	×	×
Device comment	Common comment (Global device comment)	○	×	×
	Comment by program (Local device comment)	×	×	×
Device memory	Device memory	○	×	×

■ Reading data written on the programmable controller CPU using GX IEC Developer to GX Works2

The following table shows the applicability of reading data written on the programmable controller CPU using GX IEC Developer to GX Works2.
Data created with the CPU types or programming languages not supported by GX Works2 cannot be read.

● QCPU (Q mode)

○: Applicable
△: Applicable with restrictions
×: Not applicable

Data		Project type of GX Works2		
		Simple project		Structured project
		Without labels	With labels	
Parameter	PLC parameter	○	○	○
	Network parameter	○	○	○
	Intelligent function module parameter	○	○	○
Program	Program file	○*1	×	×
Symbolic information (Symbolic data)	-	×	×	△*2

*1 : Only actual programs are read.
*2 : Programs which contain data not supported by GX Works2 cannot be read.

● FXCPU

○: Applicable
×: Not applicable

Data		Project type of GX Works2	
		Simple project (Without labels)	Structured project
Parameter	PLC parameter	○	×
Program	Program file	○	×
Symbolic information (Symbolic data)	-	×	×

■ Reading data written on the programmable controller CPU using GX Works2 to existing applications

The following table shows the applicability of reading data written on the programmable controller CPU using GX Works2 to existing applications.
Data created with the CPU types or programming languages not supported by existing applications cannot be read.

● GX Developer

○: Applicable
△: Applicable with restrictions
×: Not applicable

Data		Existing applications	
		QCPU (Q mode)	FXCPU
Symbolic information	–	×	×
Program	Program/Program file	△*1,*2,*3	△*1,*3
	SFC program/SFC program file	△*2, *4	△*5
Parameter	PLC parameter	-	△*6
	Network parameter	○	×
	Remote password	○	-
	Redundant parameter	○	-
	Intelligent function module parameter	○	-
Device comment	Global device comment (Common comment)	○	○
	Local device comment (Comment by program)	○	×
Device memory	Device memory	○	○

*1 : Only execution programs can be read.
They can be displayed/edited in ladder program or list.

*2 : Programs cannot be read to GX Developer Version 8.03D or later if projects are opened with the setting of "Use label". To enable reading of programs to GX Developer Version 8.03D or later, create projects without the "Use label" setting.

*3 : When Structured Ladder/FBD or ST programs are read from a programmable controller CPU using existing applications, they are read as ladder programs, but there may be cases where the ladder programs cannot be restored. Be sure to check the programs after they have been read from the programmable controller CPU using existing applications.
When programs are read from a programmable controller CPU using GX Developer, ladder blocks which cannot be displayed as ladder programs are displayed in yellow.

*4 : SFC block titles set in "Simple project (with labels)" are not restored when programs are read from a programmable controller CPU in GX Developer. They are restored when the device comments are read using GX Developer, after they have been set to the BL device and written in GX Works2.

*5 : SFC block titles are not restored when programs are read from a programmable controller CPU in GX Developer. The transition condition numbers are re-sorted in ascending order.

*6 : Ethernet port setting cannot be read.

● **GX IEC Developer**

○: Applicable
△: Applicable with restrictions
×: Not applicable

Data		Existing applications	
		QCPU (Q mode)	FXCPU
Symbolic information	–	×	×
Program	Program/Program file	△*1	-
	Program file	–	○*1
	SFC program/SFC program file	×	–
Parameter	PLC/Network/Remote password	○	–
	PLC parameter	–	○
	Intelligent function module parameter	○	–
Device comment	Global device comment (Common comment)	×	×
	Local device comment (Comment by program)	×	×
Device memory	Device memory	○	○

*1 : Only execution programs can be read.
They can be displayed/edited as MELSEC-IL programs.

Appendix 7 Compatibility with Existing Applications

Q CPU L CPU Remote Head FX

This section explains the considerations when handling GX Works2 projects in earlier version of GX Works2.
Read the considerations in each following item to handle projects.
Note that, depending on the combination of project-created version and project-handled version, considerations for both versions need to be read.
For example, when handling the GX Works2 Version 1.08J project in GX Works2 Version 1.05F, read the considerations of '■ Handling GX Works2 Version 1.08J projects in GX Works2 Version 1.05F' and '■ Handling GX Works2 Version 1.12N projects in GX Works2 Version 1.08J or earlier'.

■ Handling GX Works2 Version 1.08J projects in GX Works2 Version 1.05F

Function	Considerations
Open	• Projects for Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, Q20UDEH, and FXCPU cannot be opened in GX Works2 Version 1.05F. • Projects whose path includes a semicolon (;) cannot be opened in GX Works2 Version 1.05F. Before opening a project in GX Works2 Version 1.05F, perform 'Save As' with GX Works2 Version 1.08J or later so that its path does not include a semicolon (;).
Project Revision	The project revision function cannot be used when the length the full path of the project file (Project.gd2) exceeds 256 bytes. Before using the project revision function with GX Works2 Version 1.05F, perform 'Save As' in GX Works2 Version 1.08J or later so that the length of the project file is 255 bytes or less.
Parameter	When a project in which the following parameters are set is opened in GX Works2 Version 1.05F, the parameters are changed to the default settings. • When the duplicated network number is specified for 'Network No.' of the CC IE Control on the MELSECNET/CC IE/Ethernet Module Configuration screen. • When any of 'Twist' is selected for MELSECNET/H in the baud rate setting on the MELSECNET/CC IE/Ethernet Module Configuration screen. • When "Use serial communication" is selected in the serial communication setting with Q02U. • When the PLC module change setting in the PLC system setting is specified with Universal model QCPU. • When index registers are specified as local devices in the device setting with Universal model QCPU. • When "Socket Communication" is selected for 'Open System' in the open setting of the built-in Ethernet port setting in projects with Built-in Ethernet port QCPU.
Instruction	When an instruction added due to Universal model QCPU (the first five digits of the serial number is '10102' or higher) compatible is used in a project, an instruction code error occurs as the project is opened in GX Works2 Version 1.05F.

■ Handling GX Works2 Version 1.12N projects in GX Works2 Version 1.08J or earlier

Function	Considerations
Open	• Simple projects (with labels) written in Structured Text cannot be opened in GX Works2 Version 1.08J or earlier. • Projects that include inline structured text programs cannot be opened in GX Works2 Version 1.08J or earlier. • Simple projects (with labels) for FXCPU or projects for the FXCPU containing Sequential Function Chart cannot be opened in GX Works2 Version 1.08J or earlier.
Intelligent function module data	Newly added items in data of Q62AD-DGH/Q66AD-DG module cannot be displayed and changed in GX Works2 Version 1.08J or earlier. In addition, data of items newly added since Version 1.10L or later may be lost when data are written to the module in GX Works2 Version 1.05F or earlier.
Write to PLC/Read from PLC	Symbolic information of projects which include inline structured text programs and are created and written to the programmable controller CPU in GX Works2 Version 1.12N or later cannot be read from the programmable controller CPU.

■ Handling GX Works2 Version 1.15R projects in GX Works2 Version 1.12N or earlier

Function	Considerations
Open	• When a project is opened in GX Works2 Version 1.12N or earlier, system labels are read as global labels. If a project which is saved after rows of global label are moved or deleted in GX Works2 Version 1.12N or earlier, is opened in GX Works2 Version 1.15R or later, the relation with system labels is disabled. If a project which is saved after global labels are edited in GX Works2 Version 1.12N or earlier, is opened in GX Works2 Version 1.15R or later, the relation with system labels can be resolved by executing the verification synchronous function. • Contact instructions newly added for Structured Ladder and ST are not supported by GX Works2 Version 1.12N or earlier. A project which contains newly added contact instructions cannot be opened in GX Works2 Version 1.12N or earlier even if they have already been deleted.
Connection destination setting	When a project is opened in GX Works2 Version 1.12N or earlier, the connection destination setting to use the GOT (Ethernet) transparent is changed. Reconfigure the connection destination setting according to the actual communication route.
Write to PLC/Read from PLC	Symbolic information of projects which contain contact instructions newly added for Structured Ladder and ST cannot be read from the programmable controller CPU in GX Works2 Version 1.12N or earlier.
Library	A user library which contains contact instructions newly added for Structured Ladder and ST cannot be opened in GX Works2 Version 1.12N or earlier.

■ Handling GX Works2 Version 1.24A projects in GX Works2 Version 1.15R or earlier

Function	Considerations
Open	• Projects for LCPU cannot be opened in GX Works2 Version 1.15R or earlier. • Simple projects (with labels) for FXCPU that include inline structured text programs cannot be opened in GX Works2 Version 1.15R or earlier.
Intelligent function module data	When a project which contains the switch setting of Q62DA-FG/Q66DA-G module set to "4 to 20mA (extended mode)" or "1 to 5V (extended mode)" is opened in GX Works2 Version 1.15R or earlier, the setting is reset to default ("4 to 20mA").
Connection destination setting	When a project for FX3U/FX3UC is opened in GX Works2 Version 1.15R or earlier, the connection destination setting which is set for the Ethernet connection is reset to default. Reconfigure the connection destination setting according to the actual communication route.

■ Handling GX Works2 Version 1.31H projects in GX Works2 Version 1.24A or earlier

Function	Considerations
Open	• Projects for Q50UDEH, Q100UDEH, and LJ72GF15-T2 cannot be opened in GX Works2 Version 1.24A or earlier. • Projects for LCPU in which system labels are set cannot be opened in GX Works2 Version 1.24A or earlier. • When "MELSAP-L (Instruction Format)" or "MELSAP-L (Start Conditions Format)" is selected as the SFC display format, SFC is opened as MELSAP3 in GX Works2 Version 1.24A or earlier.
Parameter	When a project in which "CC IE Field (Master Station)" or "CC IE Field (Local Station)" is set in the network parameter is opened in GX Works2 Version 1.24A or earlier, the parameters are changed to the default settings.

Intelligent function module data	• When a project which contains LD62, LD62D, LD75D4, LD75P4, or LD77MH4 is opened in GX Works2 Version 1.24A or earlier, these modules become reserved modules.
	• Projects cannot be handled in GX Works2 Version 1.24A or earlier when "Disconnection detection mode setting" and "Disconnection detection setting value" are set in the parameter setting of Q62DA-FG module.
	• Projects cannot be handled in GX Works2 Version 1.24A or earlier when the following parameters are set in the parameter setting of QJ71C24N/QJ71C24N-R2.
	  • The echo back permit/prohibit specification or execution history option specification in the various control specification
	  • The predefined protocol function error code, send data storage area or receive data storage area in the auto refresh

■ Handling GX Works2 Version 1.40S projects in GX Works2 Version 1.31H or earlier

Function	Considerations
Open	• Projects for remote I/O module cannot be opened in GX Works2 Version 1.31H or earlier. • Projects for Universal model QCPU (except for Q00U, Q00UJ, Q01U, Q02U) in which "Act at Block Multi-Activated" is set for SFC program property cannot be opened in GX Works2 Version 1.31H or earlier. • Be aware the following considerations when handling a project in which system labels are used for FXCPU. System labels are read as global labels when a project is opened in GX Works2 Version 1.12N or earlier. If a project in which rows of global label are moved or deleted is saved in GX Works2 Version 1.12N or earlier, the relation with system labels is disabled. If a project is opened in GX Works2 Version 1.15R - 1.40S, system label information is resolved, but the operations related to system label functions cannot be performed. If a project which is saved after global labels are edited in GX Works2 Version 1.31H or earlier, is opened in GX Works2 Version 1.40S or later, the relation with system labels can be resolved by executing the verification synchronous function.
Connection destination setting	When a project in which the communication route via Ethernet adapter module is set is opened in GX Works2 Version 1.31H or earlier, the communication route is changed to programmable controller direct connection setting.
Parameter	• When a project in which the number of points between 1K (1024) and 7K (7168) or exceeds 8K (8192) is set for S device on the PLC parameter is opened in GX Works2 Version 1.31H or earlier, the parameters are changed to the default settings. • When a project in which "CC IE Control Ext. Mode (Control Station)" or "CC IE Control Ext. Mode (Normal Station)" is set in the network parameter is opened in GX Works2 Version 1.31H or earlier, the setting is deleted.
Device comment	For Universal model QCPU, when a project in which bit-specified word device comments are set is opened in GX Works2 Version 1.31H or earlier, the bit-specified word device comments are deleted.
Build	• When a project in which the same name is used for data name and label name is opened and compiled in GX Works2 Version 1.31H or earlier, a C4110 error occurs. Compile the program after changing the data name and label name. • When a project in which devices set with the "Device/Label Automatic-Assign Setting" function are used is opened and compiled in GX Works2 Version 1.31H or earlier, an error occurs. Compile the program after changing the devices not to duplicate with the ones set with the "Device/Label Automatic-Assign Setting" function.

■ Handling GX Works2 Version 1.48A projects in GX Works2 Version 1.44W or earlier

Function	Considerations
Open	• When a ladder program whose "Display Connection of Ladder Diagram" setting is set to 13 or more is opened in GX Works2 Version 1.44W or earlier, the program is read with the 11 contacts as the number of displayed contacts. • An FXCPU Simple project (with labels) which contains multiple programs cannot be opened in GX Works2 Version 1.44W or earlier. • Even when an FXCPU Simple project (with labels) contains only a single program, if the program data name is not "MAIN", the project cannot be opened in GX Works2 Version 1.44W or earlier.
Intelligent function module data	When a project which contains QD65PD2 or LD77MH16 is opened in GX Works2 Version 1.44W or earlier, the module becomes a reserved module.
Connection destination setting	• When a project in which the communication route via CC-Link IE Field Network board is set is opened in GX Works2 Version 1.44W or earlier, the communication route is changed to programmable controller direct connection setting. • When a project in which the communication route via GOT from Ethernet board is set is opened in GX Works2 Version 1.44W or earlier, the PLC side I/F of the connection destination setting is changed to CPU module. "GOT Transparent" is displayed on the status bar. This change does not affect the communication, however, correct the connection destination setting according to the actual communication route.
Write to PLC/Read from PLC	• When a ladder program whose "Display Connection of Ladder Diagram" setting is set to 13 or more is read from a programmable controller CPU using GX Works2 Version 1.44W or earlier, the program is displayed as an improper ladder program. • When a project which is written to a programmable controller CPU using the high-speed mode is read from the programmable controller CPU using GX Works2 Version 1.44W or earlier, the symbolic information cannot be read.
Language selection	When a project with a condition described below is opened in GX Works2 Version 1.44W or earlier, the operation is not ensured. • A language other than Japanese is selected, and characters other than one-byte characters are used. • Two or more types of two-byte characters are mixed.

■ Handling GX Works2 Version 1.53F projects in GX Works2 Version 1.49B or earlier

Function	Considerations
Open	A project in which multiple devices are selected with the "Device/Label Automatic-Assign Setting" function cannot be opened in GX Works2 Version 1.49B or earlier.
Intelligent function module data	When a project which contains QJ71MT91 or QJ71MB91 is opened in GX Works2 Version 1.49B or earlier, the module becomes a reserved module.
Connection destination setting	When a project in which the communication route via CC-Link IE Field Network master/local module is set for LCPU is opened in GX Works2 Version 1.49B or earlier, the communication route is changed to programmable controller direct connection setting.
Parameter	When a project in which "CC IE Field (Master Station)" and "CC IE Field (Local Station)" are set in the network parameter of LCPU is opened in GX Works2 Version 1.49B or earlier, the network parameters are changed to default settings.
Write to PLC/Read from PLC	A project in which multiple devices are selected with the "Device/Label Automatic-Assign Setting" function cannot be read from a programmable controller CPU in GX Works2 Version 1.49B or earlier.

■ Handling GX Works2 Version 1.62Q projects in GX Works2 Version 1.55H or earlier

Function	Considerations
Open	• Structured projects in which the operation to display/hide the left power rail is performed on the Structured Ladder/FBD editor cannot be opened in GX Works2 Version 1.55H or earlier. • For FXCPU, a project in which a block password with the validated setting for "Read-protect the execution program" exists cannot be opened in GX Works2 Version 1.55H or earlier.
Intelligent function module data	• A project which contains Q64TCTTN, Q64TCTTBWN, Q64TCRTN, or Q64TCRTBWN opens as a project of Q64TCTTN, Q64TCTTBWN, Q64TCRTN, Q64TCRTBWN respectively. Added items cannot be displayed or changed in GX Works2 Version 1.55H or earlier. • When a project which contains L60TCTT4, L60TCTT4BW, L60TCRT4, or L60TCRT4BW is opened in GX Works2 Version 1.55H or earlier, those modules become reserved modules.
Parameter	• When a project in which the simple PLC communication setting is set on the PLC parameter of LCPU is opened in GX Works2 Version 1.55H or earlier, the parameters are changed to the default settings. • When a project in which the serial communication setting is set on the PLC parameter of QnUD(H)CPU is opened in GX Works2 Version 1.55H or earlier, the parameters are changed to the default settings.

■ Handling GX Works2 Version 1.64S projects in GX Works2 Version 1.62Q or earlier

Function	Considerations
Parameter	Projects cannot be handled in GX Works2 Version 1.62Q or earlier when the following parameters are set. • When "Branch Module" is set for the I/O assignment setting on PLC parameter of LCPU.
Intelligent function module data	When a project which contains QD75P1N, QD75P2N, QD75P4N, QD75D1N, QD75D2N, or QD75D4N is opened in GX Works2 Version 1.62Q or earlier, these modules become reserved modules.
Device comment	For LCPU, when a project in which bit-specified word device comments are set is opened in GX Works2 Version 1.62Q or earlier, the bit-specified word device comments are deleted.
Print	String patterns are printed as character strings when a project in which string pattern is set to the header/footer is opened in GX Works2 Version 1.62Q or earlier. Delete the entered string patterns and set the setting again.
Write to PLC/Read from PLC	For projects of LCPU, device comment files which contain bit-specified comments cannot be read from the programmable controller CPU in GX Works2 Version 1.62Q or earlier.

■ Handling GX Works2 Version 1.73B projects in GX Works2 Version 1.64S or earlier

Function	Considerations
Open	• When a project which contains Q64ADH is opened in GX Works2 Version 1.64S or earlier, the module becomes a reserved module. • Projects in which the auto refresh parameter of temperature control module is set in the Setting item reduction mode cannot be opened in GX Works2 Version 1.64S or earlier. • Projects in which parameters are set in the FX3U/FX3UC network parameter cannot be opened in GX Works2 Version 1.64S or earlier.
Parameter	When a project in which the following parameters are set is opened in GX Works2 Version 1.64S or earlier, the parameters are changed to the default settings. • When the station information of CC-Link is set on the CC-Link configuration window. • When "Branch Module" is set on the <<I/O Assignment>> tab of PLC parameter for LCPU.
Compile	An error occurs when a program in which function blocks of ladder program are used in a Structured Ladder/FBD program, or function blocks of Structured Ladder/FBD program are used in a ladder program, is opened and compiled in GX Works2 Version 1.64S or earlier.
IC memory card write/ read	IC memory card data to which a password is set cannot be read in GX Works2 Version 1.64S or earlier.

■ Handling GX Works2 Version 1.77F projects in GX Works2 Version 1.75D or earlier

Function	Considerations
Parameter	When a project in which the following parameters are set is opened in GX Works2 Version 1.75D or earlier, the parameters are changed to the default settings. • When "Use" is selected for the IP Packet Transfer setting on the <<Built-in Ethernet Port Setting>> tab of PLC parameter. • When "CC IE Field (Sub-Master Station)" is selected for "Network Type" in the network parameter. • When "Sub-Master Station" is selected for "Station Type" of "Network Configuration Settings". • When the IP address is set for "Network Operation Settings".
Intelligent function module data	When a project which contains Q68CT, QD77MS2, QD77MS4, QD77MS16, LD75P1, LD75P2, LD75D1, or LD75D2 is opened in GX Works2 Version 1.75D or earlier, these modules become reserved modules.

■ Handling GX Works2 Version 1.87R projects in GX Works2 Version 1.77F or earlier

Function	Considerations

Open	• When opening a project in which the extended mode for device comments is set in GX Works2 Version 1.77F or earlier, the comments which exceeded the number of points of device comment that can be set in the standard mode are deleted as described below.
	  • When the number of points of device comment per device exceeds the number of points that can be set in the standard mode, points over 32K points are deleted.
	  All bit-specified comments set to the device type which corresponds to the point at 32K + 1 are deleted.
	  • When the number of points of device comment per file exceeds the number of points that can be set in the standard mode, points over 1024K points are deleted.
	  All bit-specified comments set to the device type which corresponds to the point at 1024K + 1 are deleted.
	• Saved projects in which an element is added or a comment is edited for a structure registered to a system label cannot be opened in GX Works2 Version 1.77F or earlier.
	• Projects in which structure array global labels are registered as system labels cannot be opened in GX Works2 Version 1.77F or earlier.
	• The following functions cannot be used when a project which includes ladder programs whose function block calls function block is opened in GX Works2 Version 1.77F or earlier.
	  • Watch
	  • Monitor
	  • Modify value
	  • Sampling trace
	  • PLC Diagnostics
	  • Cross reference
	• Projects for Q02PH, Q06PH, Q12PH, Q12PRH, Q25PH, and Q25PRH cannot be opened in GX Works2 Version 1.77F or earlier.
	• Projects in which parameters are set in the FX3G/FX3GC network parameter cannot be opened in GX Works2 Version 1.77F or earlier.

Global label	When any of the following system labels is registered, the system label data base cannot be connected from the project in GX Works2 Version 1.77F or earlier. • A system label in which an element is added or a comment is edited for a structure registered to a system label. • A system label in which a structure array global label is set to the data type.
Verify	Project data of GX Works2 Version 1.87R cannot be verified against that of GX Works2 Version 1.77F or earlier because of different naming methods of block data name in SFC program. Copy the names of block data of project opened in GX Works2 Version 1.87R, paste them to block data of project opened in GX Works2 Version 1.77F or earlier as a block data name, and execute [Verify].
Write to PLC/Read from PLC	The following functions cannot be used when a project which includes ladder programs whose function block calls function block is read from a programmable controller CPU using GX Works2 Version 1.77F or earlier. • Watch • Monitor • Modify value • Sampling trace • PLC Diagnostics • Cross reference
Parameter	When a project in which "CC IE Field (Local Station)" is selected for "Network Type", and "Specify station No. by program" is selected for 'specification method for station number' in the network parameter is opened in GX Works2 Version 1.77F or earlier, the parameters are changed to the default settings.
Intelligent function module data	When a project which contains QD73A1 is opened in GX Works2 Version 1.77F or earlier, the module becomes a reserved module.

■ Handling GX Works2 Version 1.91V projects in GX Works2 Version 1.87R or earlier

Function	Considerations
Open	Simple projects (with labels) for Q02PH, Q06PH, Q12PH, Q12PRH, Q25PH, and Q25PRH cannot be opened in GX Works2 Version 1.87R or earlier.
Write to PLC/Read from PLC	When using GX Works2 Version 1.87R or earlier, data cannot be written to/read from a Process CPU or Redundant CPU to which symbolic information of Simple project (with labels) is written. Delete the symbolic information with the delete PLC data function before writing/reading data to/from the programmable controller CPU.

Parameter	• When a project in which the following parameters are set is opened in GX Works2 Version 1.87R or earlier, the parameters are changed to the default settings.
	  • When the network configuration of CC-Link IE Field Network is set on the CC IE Field configuration window.
	  • When the Ethernet adapter setting is set on the PLC parameter of FX3G, FX3GC, FX3U, or FX3UC.
	• CSV files exported by the parameter processing of slave station on the CC-Link configuration window cannot be imported in GX Works2 Version 1.87R or earlier.

Intelligent function module data	When a project which contains QE81WH, QE84WH, QE81WH4W, QE83WH4W, or QE82LG is opened in GX Works2 Version 1.87R or earlier, these modules become reserved modules.

■ Handling GX Works2 Version 1.98C projects in GX Works2 Version 1.91V or earlier

Function	Considerations

Open	• The following projects cannot be opened in GX Works2 Version 1.91V or earlier.
	  • Structured projects for Q02PH, Q06PH, Q12PH, Q12PRH, Q25PH, and Q25PRH.
	  • Projects for Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV, L02S, L06, L26, and LJ72MS15.
	• When a project in which the reflection/reference targets of device comments are set to 'PLC parameter setting' is opened in GX Works2 Version 1.91V or earlier, the reflection/reference targets are set to "Local".
	• The following functions may not be performed normally when a project, in which an inline structured text program is called from the function block created in a ladder program, or a function block created in an ST program is called from the function block created in a ladder program, is opened in GX Works2 Version 1.98C or earlier.
	  • Watch
	  • Monitor
	  • Modify value
	  • Sampling trace
	  • PLC Diagnostics
	  • Cross reference
	  • Print
	  • Deletion of inline structured text box in function block of ladder program

Write to PLC/Read from PLC	• When using GX Works2 Version 1.91V or earlier, data of the following projects cannot be written to a programmable controller CPU.
	  • QCPU project in which the IP address is set for "Network Operation Settings" of CC IE Control network parameter
	  • LCPU project in which Ethernet is set for the network parameter
	  • LCPU project in which the IP packet transfer is set for "Built-in Ethernet Port Setting" of PLC parameter
	  • LCPU project in which the IP address is set for "Network Operation Settings" of CC-Link IE Field Network parameter (master station, sub-master station)
	• When using GX Works2 Version 1.91V or earlier, data cannot be written to/read from a Process CPU or Redundant CPU to which symbolic information of Structured project is written. Delete the symbolic information with the delete PLC data function before writing/reading data to/from the programmable controller CPU.

Verify	When any of the following projects is opened in GX Works2 Version 1.91V or earlier, the programmable controller data, projects, and revisions cannot be verified. • LCPU project in which the IP packet transfer is set for "Built-in Ethernet Port Setting" of PLC parameter • LCPU project in which the sub-master station is set for the network configuration of CC-Link IE Field Network parameter (master station, sub-master station) • LCPU project in which the IP address is set for "Network Operation Settings" of CC-Link IE Field Network parameter (master station, sub-master station)

Parameter	• When any of the following project is opened in GX Works2 Version 1.91V or earlier, the parameters are set to default.
	  • QCPU project in which the IP address is set for "Network Operation Settings" of CC IE Control network parameter
	  • LCPU project in which Ethernet is set for the network parameter
	  • LCPU project in which the IP packet transfer is set for "Built-in Ethernet Port Setting" of PLC parameter
	  • LCPU project in which the sub-master station is set for the network configuration of CC-Link IE Field Network parameter (master station, sub-master station)
	  • LCPU project in which the IP address is set for "Network Operation Settings" of CC-Link IE Field Network parameter (master station, sub-master station)
	  • LCPU project in which the Auto Detect Setting of the Connected Device is set for "Operation Setting" of CC-Link network parameter
	  • Project contains AnyWireASLINK configuration data
	• When a project in which the following parameter is set is opened in GX Works2 Version 1.91V or earlier, the parameters are changed to the default settings.
	  • CC IE Field (Motion Master Station) is set in the network parameter of Universal model QCPU.

Function	Considerations
Intelligent function module data	• When a project which contains QD77GF16, Q64DAH, L60AD4-2GH, QJ51AW12AL, or LJ51AW12AL is opened in GX Works2 Version 1.91V or earlier, these modules become reserved modules • QCPU waveform output data created in GX Works2 Version 1.98C or later cannot be read in GX Works2 Version 1.91V or earlier.
Remote password	When a project in which the remote password for LJ71E71-100 is set is opened in GX Works2 Version 1.91V or earlier, the module is changed to "LCPU" (Built-in Ethernet type CPU).

Appendix 8 Considerations When Saving Projects in GX Developer Format

Q CPU L CPU Remote Head FX

This section explains the considerations applied when saving projects in GX Developer format. In cases other than those listed below when data cannot be saved, a message is displayed, and saving is canceled. In such cases, follow the instructions of the message.

GX Works2 data			Considerations
Project	Title		The 33rd and later characters are deleted.
	Comment		Deleted.
Parameter	Comment		Deleted.
Intelligent function module	Intelligent function module data		Data other than intelligent function module parameters (initial setting, auto refresh) are deleted. QD75P1N, QD75P2N, QD75P4N, QD75D1N, QD75D2N, and QD75D4N are saved as QD75P1, QD75P2, QD75P4, QD75D1, QD75D2, and QD75D4 respectively.
Structured Data Types*1	Comment		Deleted.
	Label	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
Global Label*1	Number of data		The data are combined into one unit.
	Data name		A fixed character string (label) is created to combine data into one unit.
	Title		Deleted.
	Comment		Deleted.
	Label	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
		Remarks	Deleted.
		FB instance	Deleted.
	System label information		Deleted.
FB*1	Comment		Deleted.
	Label*1	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
		FB instance	Deleted*2.
Program	Comment		Deleted.
	Label*1	Comment	The 65th and later characters are deleted. If a line feed is entered, delete anything following the line feed.
		FB instance	Deleted*2.
SFC program*1	Comment		Deleted.
SFC block*1	Data name		Deleted.
	Comment		Converted to a block statement. (Characters exceeding 10 lines times 65 characters are deleted.)
Device Memory	Comment		Deleted.
	Duplicated devices		Latter device is preferred.

*1 : Not supported by FXCPU.

*2 : The function block instances created for global labels in GX Works2 are created as local labels in GX Developer. However, in GX Developer, the function block instances are not displayed on the local label setting screen.

Appendix 8.1 ST instruction table for GX Works2 and GX Developer

Instructions that can be used in ST programs differ in between GX Works2 and GX Developer. As a result, an error may occur when a project that includes an ST program and is saved in GX Developer format is read and compiled with GX Developer. In such case, correct the ST program according to the following table.

GX Works2	GX Developer
ACOS	ACOS*1
ASIN	ASIN*1
ATAN	ATAN*1
BACOS	BACOS_MD
BAND	BAND_MD
BASIN	BASIN_MD
BATAN	BATAN_MD
BCD	BCD_M
BCOS	BCOS_MD
BDSQR	BDSQR_MD
BIN	BIN_M
BKAND	BKAND_M
BKBCD	BKBCD_M
BKBIN	BKBIN_M
BKOR	BKOR_M
BKRST	BKRST_M
BKXNR	BKXNR_M
BKXOR	BKXOR_M
BMOV	BMOV_M
BRST	BRST_M
BSET	BSET_M
BSFL	BSFL_M
BSFR	BSFR_M
BSIN	BSIN_MD
BSQR	BSQR_MD
BTAN	BTAN_MD
BTOW	BTOW_MD
BXCH	BXCH_M
CML	CML_M
COM	COM_M
COS	COS*1
DATERD	DATERD_MD
DATEWR	DATEWR_MD
DBAND	DBAND_MD
DBCD	DBCD_M
DBIN	DBIN_M
DBL	DBL_M
DCML	DCML_M
DDEC	DDEC_M
DEC	DEC_M
DECO	DECO_M
DELTA	DELTA_M

GX Works2	GX Developer
DFLT	DFLT_M
DFRO	DFRO_M
DGBIN	DGBIN_M
DGRY	DGRY_M
DI	DI_M
DINC	DINC_M
DIS	DIS_M
DLIMIT	DLIMIT_MD
DMAX	DMAX_M
DMIN	DMIN_M
DNEG	DNEG_M
DOR	DOR_M
DRCL	DRCL_M
DRCR	DRCR_M
DROL	DROL_M
DROR	DROR_M
DSER	DSER_M
DSFL	DSFL_M
DSFR	DSFR_M
DSORT	DSORT_M
DSUM	DSUM_M
DTEST	DTEST_MD
DTO	DTO_M
DWSUM	DWSUM_M
DXCH	DXCH_M
DXNR	DXNR_M
DXOR	DXOR_M
DZONE	DZONE_MD
EI	EI_M
EMOD	EMOD_M
ENCO	ENCO_M
ENEG	ENEG_M
EREXP	EREXP_M
ESTR	ESTR_M
EVAL	EVAL_M
EXP	EXP*1
FLT	FLT_M
FMOV	FMOV_M
FROM	FROM_M
GBIN	GBIN_M
GRY	GRY_M
HOUR	HOUR_M

GX Works2	GX Developer
INC	INC_M
LEFT	LEFT*1
LEN	LEN*1
LIMITATION	LIMIT
MAXIMUM	MAX
MIDR	MIDR_M
MIDW	MIDW_M
MINIMUM	MIN
NDIS	NDIS_M
NEG	NEG_M
NUNI	NUNI_M
OUT	OUT_M
PLOW	PLOW_M
POFF	POFF_M
PSCAN	PSCAN_M
PSTOP	PSTOP_M
QCDSET	QCDSET_M
QDRSET	QDRSET_M
RCL	RCL_M
RCR	RCR_M
RFS	RFS_M
RIGHT	RIGHT*1
RND	RND_M
ROL_E	ROL*1
ROR_E	ROR*1
RSET	RSET_MD
RST	RST_M
SECOND	SECOND_M
SEG	SEG_M
SER	SER_M
SET	SET_M
SFL	SFL_M
SFR	SFR_M
SFT	SFT_M
SIN	SIN*1
SORT	SORT_M
SRND	SRND_M
STOP	STOP_M
SUM	SUM_M
SWAP	SWAP_MD
TAN	TAN*1
TEST	TEST_MD

GX Works2	GX Developer
UNI	UNI_M
WAND	WAND_M
WDT	WDT_M
WOR	WOR_M

GX Works2	GX Developer
WSUM	WSUM_M
WTOB	WTOB_MD
WXNR	WXNR_M

GX Works2	GX Developer
WXOR	WXOR_M
XCH	XCH_M
ZONE	ZONE_MD

*1 : Devices/labels need to be changed according to the arguments of GX Developer instructions.

Appendix 9 Character Strings that cannot be Used for Label Names and Data Names

Q CPU L CPU Remote Head FX

Character strings used for application function names, common instruction names, special instruction names, instructions and so on are called reserved words.
These reserved words cannot be used for label names or data names. If the character string defined as a reserved word is used for a label name or data name, an error occurs during registration or compilation.
The following tables shows character strings that cannot be used for label names or data names.
The numbers from ① to ⑨ in the tables indicate the following label names and data names.

<Label name and data name>
① Project file name
② Program file name (Simple (without labels))
③ Program file name (Simple (with labels))
④ Program file name (structure)
⑤ Task name
⑥ Global label data name
⑦ Structure name
⑧ POU name
⑨ Label name

○: Applicable, △: With restrictions, ×: Not applicable

Category	Character string	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Class identifier	VAR, VAR_RETAIN, VAR_ACCESS, VAR_CONSTANT, VAR_CONSTANT_RETAIN, VAR_INPUT, VAR_INPUT_RETAIN, VAR_OUTPUT, VAR_OUTPUT_RETAIN, VAR_IN_OUT, VAR_IN_EXT, VAR_EXTERNAL, VAR_EXTERNAL_CONSTANT, VAR_EXTERNAL_CONSTANT_RETAIN, VAR_EXTERNAL_RETAIN, VAR_GLOBAL, VAR_GLOBAL_CONSTANT, VAR_GLOBAL_CONSTANT_RETAIN, VAR_GLOBAL_RETAIN	×	○	×	×	×	×	×	×	×
Data type	BOOL, BYTE, INT, SINT, DINT, LINT, UINT, USINT, UDINT, ULINT, WORD, DWORD, LWORD, ARRAY, REAL, LREAL, TIME, STRING, TIMER, COUNTER, RETENTIVETIMER, POINTER, Bit, Word [Unsigned]/Bit String [16-bit], Double Word [Unsigned]/Bit String [32-bit], Word [Signed], Double Word [Signed], FLOAT (Single Precision), FLOAT (Double Precision), String, Time, Timer, Counter, Retentive Timer, Pointer	○	○	×	×	×	×	×	×	×
Data type hierarchy	ANY, ANY_NUM, ANY_BIT, ANY_REAL, ANY_INT, ANY_DATE	○	○	×	×	×	×	×	×	×
	ANY_SIMPLE, ANY16, ANY32	○	○	○	○	○	○	○	△*1	×
Device name	X, Y, D, M, T, B, C, F, L, P, V, Z, W, I, N, U, J, K, H, E, A, SD, SM, SW, SB, FX, FY, DX, DY, FD, TR, BL, SG, VD, ZR, ZZ*2	○	○	○	○	○	○	○	△*1	×
Character string recognized as device (Device name + Numeral)	Such as X0	○	○	×	×	×	×	×	△*3	×
ST operator	NOT, MOD	○	○	×	×	×	×	×	×	×
	(,), -	○	○	○	○	○	○	○	△*1	×
IL operator	LD, LDN, ST, STN, S, S1, R, R1, AND, ANDN, OR, ORN, XOR, XORN, ADD, SUB, MUL, DIV, GT, GE, EQ, NE, LE, LT, JMP, JMPC, JMPCN, CAL, CALC, CALCN, RET, RETC, RETCN	×	○	×	×	×	×	×	×	×
	LDI, LDP, LDF, ANI, ANDP, ANDF, ANB, ORI, ORP, ORF, ORB, MPS, MRD, MPP, INV, MEP, MEF, EGP, EGF, OUT(H), SET, RST, PLS, PLF, FF, DELTA(P), SFT(P), MC, MCR, STOP, PAGE, NOP, NOPLF	○	○	○	○	○	○	○	△*1	×

Category	Character string	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Application instruction in GX Works2	Application instructions such as DMOD, PCHK, and INC(P) ☞ MELSEC-Q/L Programming Manual (Common Instructions), MELSEC-Q/L Structured Programming Manual (Common Instructions)	○	○	○	○	○	○	○	△*1	×
SFC instruction	SFCP, SFCPEND, BLOCK, BEND, TRANL, TRANO, TRANA, TRANC, TRANCA, TRANOA, SEND, TRANOC, TRANOCA, TRANCO, TRANCOC, STEPN, STEPD, STEPSC, STEPSE, STEPST, STEPR, STEPC, STEPG, STEPI, STEPID, STEPISC, STEPISE, STEPIST, STEPIR, TRANJ, TRANOJ, TRANOCJ, TRANCJ, TRANCOJ, TRANCOCJ	○	○	○	○	○	○	○	△*1	×
ST code body	RETURN, IF, THEN, ELSE, ELSIF, END_IF, CASE, OF, END_CASE, FOR, TO, BY, DO, END_FOR, WHILE, END_WHILE, REPEAT, UNTIL, END_REPEAT, EXIT, TYPE, END_TYPE, STRUCT, END_STRUCT, RETAIN, VAR_ACCESS, END_VAR, FUNCTION, END_FUNCTION, FUNCTION_BLOCK, END_FUNCTION_BLOCK, STEP, INITIAL_STEP, END_STEP, TRANSITION, END_TRANSITION, FROM, UNTILWHILE	○	○	×	×	×	×	×	×	×
Function name in application function	Function names in application functions such as AND_E and NOT_E	○	○	○	○	○	○	×	×	×
Function block name in application function	Function block names in application functions such as CTD and CTU	○	○	○	○	○	○	×	×	×
Symbol	/, \, *, ?, <, >, |, ", :, [,], ,, =, +, %, ', ~, @, {, }, &, ^, ., tab character	×	×	×	×	×	×	×	×	×
	;	○	×	×	×	×	×	×	×	×
	!, #, $, `	○	○	○	○	×	○	×	×	×
Date and time literal	DATE, DATE_AND_TIME, DT, TIME, TIME_OF_DAY, TOD	×	○	×	×	×	×	×	×	×
Others	ACTION, END_ACTION, CONFIGURATION, END_CONFIGURATION, CONSTANT, F_EDGE, R_EDGE, AT, PROGRAM, WITH, END_PROGRAM, TRUE, FALSE, READ_ONLY, READ_WRITE, RESOURCE, END_RESOURCE, ON, TASK, EN, ENO, BODY_CCE, BODY_FBD, BODY_IL, BODY_LD, BODY_SFC, BODY_ST, END_BODY, END_PARAMETER_SECTION, PARAM_FILE_PATH, PARAMETER_SECTION, SINGLE, RETAIN, INTERVAL	×	○	×	×	×	×	×	×	×
String that starts with K1 to K8	Such as K1AAA	○	○	○	○	○	○	○	△*1	×
Address	Such as %IX0	○	×	×	×	×	×	×	×	×
Statement in Ladder Diagram	;FB BLK START, ;FB START, ;FB END, ;FB BLK END, ;FB IN, ;FB OUT, ;FB_NAME, ;INSTANCE_NAME, ;FB, ;INSTANCE	○	×	×	×	×	×	×	×	×
Common instruction	Such as MOV	○	○	×	○	○	×	×	△*3	×
Windows® reserved word	COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, LPT9, AUX, CON, PRN, NUL	×	×	×	×	×	×	×	×	○

*1 : Functions cannot be used.

*2 : Whether to handle a device name indexed with ZZ device as a reserved word depends on the parameter setting.
When Z device is specified for 32-bit index setting: Not handled as a reserved word
When ZZ device is specified for 32-bit index setting: Handled as a reserved word

*3 : Applicable to Simple projects without labels only.

■ Considerations for using labels

- **In a function, the same name as the function cannot be used for a label.**
- **Inapplicable character strings differ between label names and data names such as function block names and structure names. Therefore, if a label name which contains a function block name or a structure name is set when setting a label of instance or structure, an error may occur.**
- **A space cannot be used.**
- **A numeral cannot be used at the beginning of label name.**
- **A label name is not case-sensitive. An error may occur at compilation when the same label names with different cases (example: 'AAA' and 'aaa') are declared.**
- **In Structured Ladder/FBD and ST programs, the same label name can be used for a global label and local label by setting the following option*1.**

  *1 : Select "Use the same label name in global label and local label" under [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Basic Setting".
- **An underscore (_) cannot be used at the beginning or end of label name. Consecutive underscores (_) cannot be used for a data name or a label name.**
- **For Simple projects, function names and function block names in common instructions and application functions can be used.**

Appendix 10 Restrictions When Changing Programmable Controller Type

Q CPU | L CPU | Remote | Head *1 | FX

*1 : CC IE Field head module only

The following explains the restrictions applied when changing a programmable controller series or type.
For the restrictions applied when changing a programmable controller type between QCPU (Q mode)/ LCPU and QCPU (Q mode)/LCPU, refer to Appendix 10.1 and the following table.
For the restrictions applied when changing a programmable controller type between QCPU (Q mode)/ LCPU and CC IE Field head module, refer to Appendix 10.11.
For the restrictions applied when changing a programmable controller type of FXCPU, refer to Appendix 10.12.

Old programmable controller type	New programmable controller type			
	Basic model QCPU	High Performance model QCPU	Process CPU	Redundant CPU
Basic model QCPU	Table App.10.9-1	Table App.10.8-4	Table App.10.7-1	Table App.10.6-1
High Performance model QCPU	Table App.10.9-1 Table App.10.9-2	–	Table App.10.7-1	Table App.10.6-1
Process CPU	Table App.10.9-1 Table App.10.9-5	Table App.10.8-3	–	Table App.10.6-1 Table App.10.6-3
Redundant CPU	Table App.10.9-1 Table App.10.9-4	Table App.10.8-2	Table App.10.7-1 Table App.10.7-3	–
QnUD(H)CPU	Table App.10.9-1 Table App.10.9-3	Table App.10.8-1	Table App.10.7-1	Table App.10.6-1
Q00U, Q00UJ, Q01U, Q02U	Table App.10.9-1 Table App.10.9-3	Table App.10.8-1	Table App.10.7-1	Table App.10.6-1
QnUDE(H)CPU	Table App.10.9-1 Table App.10.9-3	Table App.10.8-1	Table App.10.7-1	Table App.10.6-1
High-speed Universal model QCPU	Table App.10.9-1 Table App.10.9-3	Table App.10.8-1	Table App.10.7-1 Table App.10.7-2	Table App.10.6-1 Table App.10.6-2
LCPU	Table App.10.9-1 Table App.10.9-6	Table App.10.8-5	Table App.10.7-1	Table App.10.6-1

Old programmable controller type	New programmable controller type				
	QnUD(H)CPU	Q00U,Q00UJ, Q01U,Q02U	QnUDE(H)CPU	High-speed Universal model QCPU	LCPU
Basic model QCPU	Table App.10.2-7	Table App.10.3-1 Table App.10.3-8	Table App.10.4-6	Table App.10.5-5	Table App.10.10-1 Table App.10.10-9
High Performance model QCPU	Table App.10.2-1	Table App.10.3-1 Table App.10.3-2	Table App.10.4-1	Table App.10.5-1	Table App.10.10-1 Table App.10.10-2
Process CPU	Table App.10.2-6	Table App.10.3-1 Table App.10.3-7	Table App.10.4-5	Table App.10.5-4	Table App.10.10-1 Table App.10.10-8
Redundant CPU	Table App.10.2-5	Table App.10.3-1 Table App.10.3-6	Table App.10.4-4	Table App.10.5-3	Table App.10.10-1 Table App.10.10-7
QnUD(H)CPU	–	Table App.10.3-1 Table App.10.3-3	–	–	Table App.10.10-1 Table App.10.10-3
Q00U,Q00UJ, Q01U,Q02U	Table App.10.2-2	Table App.10.3-1	Table App.10.4-2	Table App.10.5-2	Table App.10.10-1 Table App.10.10-4
QnUDE(H)CPU	Table App.10.2-3	Table App.10.3-1 Table App.10.3-4	–	–	Table App.10.10-1 Table App.10.10-5
High-speed Universal model QCPU	Table App.10.2-4	Table App.10.3-1 Table App.10.3-5	Table App.10.4-3	–	Table App.10.10-1 Table App.10.10-6

Old programmable controller type	New programmable controller type				
	QnUD(H)CPU	Q00U,Q00UJ, Q01U,Q02U	QnUDE(H)CPU	High-speed Universal model QCPU	LCPU
LCPU	Table App.10.2-8	Table App.10.3-1 Table App.10.3-9	Table App.10.4-7	Table App.10.5-6	Table App.10.10-1

Appendix 10.1 Common restrictions when changing programmable controller series/types

The following table shows the common restrictions applied when changing a programmable controller series or type.

Table App.10.1-1

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Connection destination setting	• Connection destination data other than "Connection 1" are deleted. Connection 1 is changed to the setting for accessing the programmable controller CPU directly to a personal computer. • If the changed programmable controller type is Basic model QCPU/FXCPU, 'RS-232' is set to "PC side IF". • If the changed programmable controller type is other than Basic model QCPU/FXCPU, 'USB' is set for "PC side IF".	△	△	△
Compilation status	• Programs are set in the uncompiled status.	–	△	△
Saved project status	• Programs are changed in the project-unsaved status.	△	△	△
Password/Keyword status	• Passwords returns to the registered status if unlocked.	△	△	△
Program	• Unsupported instructions, devices outside the range, and unsupported index settings are changed to SM1255 or SD1255 (SM999 or SD999).	△	–	–
Ladder Diagram	• If a program exceeds the program capacity of the changed programmable controller type, the exceeding ladder blocks are deleted.	△	–	–
	• A ladder block containing an unsupported instruction is displayed in yellow. (Motion dedicated sequence instructions for changing from QnUD(H)CPU or Built-in Ethernet port QCPU to LCPU are excluded.) • Instructions with devices outside the range or unsupported index settings are deleted, and the ladder block is displayed in yellow.	–	△	△
Structured Ladder/FBD	• An x mark is appended on an element of an unsupported instruction.	–	–	△
Library	• Common instructions/application functions are changed to libraries appropriate for the changed programmable controller type.	–	–	△
Global Device Comment Local Device Comment Device Memory Device Initial Value	• Devices not supported by the changed programmable controller type and those outside the range are deleted.	△	△	△

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
PLC Parameter Network Parameter	• Settings are changed to those appropriate for the changed programmable controller type. • The default values in the changed programmable controller series/type are set to the data which cannot be edited in the changed programmable controller series/type. • Network types which cannot be set for the changed programmable controller type are deleted. • When the module set as "Valid Module During Other Station Access" is to be deleted at the programmable controller type change (module not supported by the changed programmable controller type), the first module is set as the valid module. • If the number of device points set for the refresh device is outside the range or the device is not available, the setting for the refresh device is deleted.	△	△	△
Device/Label Automatic-Assign Setting	• Settings are changed to those appropriate for the changed programmable controller type. • The default values in the changed programmable controller series/type are set to the data which cannot be edited in the changed programmable controller series/type.	–	△	△

Appendix 10.2 Restrictions when changing to QnUD(H)CPU

The following tables show the restrictions applied when changing a programmable controller series/ type to QnUD(H)CPU.

■ Changing from High Performance model QCPU

Table App.10.2-1

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		• If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
	Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter		–	–	–	–
	PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
	Program	• If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
	Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△

■ Changing from Q00U, Q00UJ, Q01U, or Q02U

Table App.10.2-2

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series. • If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
Remote Password	• Any existing settings are cleared.	△	△	△

■ Changing from QnUDE(H)CPU

Table App.10.2-3

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	• Only the settings of Built-in Ethernet type CPU are cleared.	△	△	△

■ Changing from High-speed Universal model QCPU

Table App.10.2-4

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	• Only the settings of Built-in Ethernet type CPU are cleared.	△	△	△
PLC Parameter	–	–	–	–
Device	• If the value exceeds the capacity of changed programmable controller type is set for "File Register Extended Setting", the maximum value is set and all points are set as file register (ZR(R)). The setting of the latch range is cleared.	△	△	△

■ Changing from Redundant CPU

Table App.10.2-5

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	-	–	–	–
Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△
I/O Assignment	• Settings on the slot 0 are deleted. • If any slot after the slot 1 is set, "Empty" is set for "Type" and "0 Point" is set for "Points" on the slot 0.	△	△	△
Network Parameter	–	–	–	–
Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

■ Changing from Process CPU

Table App.10.2-6

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
Program	• If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△

■ Changing from Basic model QCPU

Table App.10.2-7

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (Except for Q00J. ☞ Appendix 11)	△	–	–
PLC Parameter	–	–	–	–
PLC File	• When changing from Q00 or Q01, "Use the following file" is selected and "Corresponding Memory: Standard RAM", "File Name: MAIN", and "Capacity: 64K Points" are set in the file register setting.	△	△	△
Boot File	• If "Do boot from standard ROM" is selected before changing the programmable controller type, "Type: Sequence", "Data Name: MAIN", "Transfer From: Memory Card (ROM)", and "Transfer To: Program Memory" are set.	△	△	△

■ Changing from LCPU

Table App.10.2-8

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing from L02/L02-P or L02S, any existing settings are cleared.
	• When changing from L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of the built-in Ethernet are cleared.
	  • The settings of LJ71C24 are replaced to the settings of QJ71C24/CMO.
	  • The settings of LJ71E71 are replaced to the settings of QJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
I/O Assignment	• Settings of "Built-in I/O Function Setting" and "Built-in CC-Link Setting" are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two, "Start I/O No." is set starting from 0000. • The IP address setting of "Network Operation Settings" for CC IE Field (Master Station) is deleted.	△	△	△
CC-Link	• If "H/W Test" or "Loop Test" is set to "Mode", the setting is deleted.	△	△	△

Appendix 10.3 Restrictions when changing to Q00U, Q00UJ, Q01U, or Q02U

The following tables show the restrictions applied when changing a programmable controller series/ type to Q00U, Q00UJ, Q01U, or Q02U.

■ Common restrictions when changing to Q00U, Q00UJ, Q01U, or Q02U

Table App.10.3-1

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Remote Password		• Any existing settings are cleared.	△	△	△
PLC Parameter		–	–	–	–
	I/O Assignment	• If a multiple CPU is set to "Type", it is deleted and closed up. • If a value which exceeds the maximum base number for the changed programmable controller type is set, the exceeding base settings are deleted.	△	△	△
	Multiple CPU	• If the number of multiple CPUs exceeds the allowable number, the settings are set to default.	△	△	△
Network Parameter		–	–	–	–
	Ethernet	• When changing to Q02U, the third and later Ethernet modules in the module settings are deleted. • When changing to Q00UJ/Q00U/Q01U, the second and later Ethernet modules in the module setting are deleted.	△	△	△
	MELSECNET/10(H), CC-Link IE Controller Network	• When changing to Q02U, the third and later modules out of total of MELSECNET/10(H) and CC-Link IE Controller Network modules are deleted. • When changing to Q00UJ/Q00U/Q01U, the second and later modules out of total of MELSECNET/10(H) and CC-Link IE Controller Network modules are deleted.	△	△	△
	CC-Link	• When changing to Q02U, the fifth and later modules are deleted. • When changing to Q00UJ/Q00U/Q01U, the third and later modules are deleted.	△	△	△

■ Changing from High Performance model QCPU

Table App.10.3-2

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		–	–	–	–
	Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter		–	–	–	–
	PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
	Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted. • If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
	Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)". (Q02U only)	△	△	△

■ Changing from QnUD(H)CPU

Table App.10.3-3

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		• If "Convert motion dedicated sequence instruction" is selected, D.instructions are converted to S.instructions. (Except for Q00UJ. ☞ Appendix 11)	△	–	–
PLC Parameter		–	–	–	–
	PLC File	• If "Capacity" exceeds 16K points in "File used for SP.DEVST/ S.DEVLD Instruction", the setting is set to 16K points for Q02U, and 1K points for Q00U, Q00UJ, and Q01U.	△	△	△
	Program	• If the number of programs exceeds the allowable number, the settings are set to default.	△	△	△
	Device	• If the points exceeding 8K points are specified for S device, the setting is set to 8K points.	△	△	△

■ Changing from QnUDE(H)CPU

Table App.10.3-4

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• If "Convert motion dedicated sequence instruction" is selected, D.instructions are converted to S.instructions. (Except for Q00UJ. ☞ Appendix 11)	△	–	–
PLC Parameter	–	–	–	–
PLC System	• If a device that exceed the range of the Device setting is set to "Latch Data Backup Operation Valid Contact", the setting is deleted.	△	△	△
PLC File	• If the capacity exceeds 16K points in "File used for SP.DEVST/S.DEVLD Instruction", the setting is set to 16K points for Q02U, and 1K points for Q00U, Q00UJ, and Q01U.	△	△	△
Program	• If the number of programs exceeds the allowable number, the settings are set to default.	△	△	△
Device	• If the points exceeding 8K points are specified for S device, the setting is set to 8K points.	△	△	△

■ Changing from High-speed Universal model QCPU

Table App.10.3-5

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• If "Convert motion dedicated sequence instruction" is selected, D.instructions are converted to S.instructions. (Except for Q00UJ. ☞ Appendix 11)	△	–	–
Remote Password	• Any existing settings are cleared.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If a device that exceed the range of the Device setting is set to "Latch Data Backup Operation Valid Contact", the setting is deleted.	△	△	△
PLC File	• If the capacity exceeds 16K points in "File used for SP.DEVST/ S.DEVLD Instruction", the setting is set to 16K points for Q02U, and 1K points for Q00U, Q00UJ, and Q01U.	△	△	△
Program	• If the number of programs exceeds the allowable number, the settings are set to default.	△	△	△
Device	• If the value exceeds the capacity of changed programmable controller type is set for "File Register Extended Setting", the maximum value is set and all points are set as file register (ZR(R)). The setting of the latch range is cleared. • If the points exceeding 8K points are specified for S device, the setting is set to 8K points.	△	△	△

■ Changing from Redundant CPU

Table App.10.3-6

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		–	–	–	–
	Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter		–	–	–	–
	PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
	Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△
	Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△
	I/O Assignment	• Settings on the slot 0 are deleted. • If any slot after the slot 1 is set, "Empty" is set for "Type" and "0 Point" is set for "Points" on the slot 0.	△	△	△
Network Parameter		–	–	–	–
	Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
	CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

■ Changing from Process CPU

Table App.10.3-7

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	–	–	–	–
Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted. • If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△

■ Changing from Basic model QCPU

Table App.10.3-8

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
PLC Parameter	–	–	–	–
PLC File	• When changing from Q00 or Q01 to other than Q00UJ, "Use the following file" is selected and "Corresponding Memory: Standard RAM", "File Name: MAIN", and "Capacity: 64K Points" are set in the File Register setting. • When changing from Q00 or Q01 to Q00UJ, "Not Used" is selected in the File Register setting.	△	△	△
Device/Label Automatic-Assign Setting	• When changing from Q00 or Q01 to Q00UJ, the default value is set.	–	△	△

■ Changing from LCPU

Table App.10.3-9

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing from L02/L02-P to Q00U or Q01U, the remote password set for the built-in Ethernet of CPU module is cleared.
	• When changing from L02/L02-P or L02S to Q00U or Q01U, the following settings are set.
	  • The settings of LJ71C24 are replaced to the settings of QJ71C24/CMO.
	  • The settings of LJ71E71 are replaced to the settings of QJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
PLC System	• If "Start I/O No." in the interrupt pointer setting of the intelligent function module setting is outside the range, the setting is deleted. • When changing to Q00UJ, if the number of points is outside the range, its maximum point is set.	△	△	△
PLC File	• When changing to Q00U, Q00UJ, or Q01U, if an item other than "Program Memory" or "Standard ROM" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Program Memory". • When changing to Q00U, Q00UJ, or Q01U, if the capacity exceeds 1K points in "File used for SP.DEVST/S.DEVLD Instruction", the setting is set to 1K point. • When changing from L06, L26, or L26-BT/L26-PBT to Q02U, if the capacity exceeds 16K points in "File used for SP.DEVST/ S.DEVLD Instruction", the setting is set to 16K points.	△	△	△
PLC RAS	• When changing to Q00UJ, "System Memory" is set to "Corresponding Memory". • When changing to Q00U, Q00UJ, or Q01U, if the number of samplings is outside the range, its maximum number is set. • When changing to Q00UJ, if the number of revisions is outside the range, its maximum number is set. If the number of revisions is less than '40', '40' is set.	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeded programs are deleted.	△	△	△
I/O Assignment	• Settings of "Built-in I/O Function Setting" and "Built-in CC-Link Setting" are deleted.	△	△	△

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Network Parameter		–	–	–	–
	CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two, "Start I/O No." is set starting from 0000. • The IP address setting of "Network Operation Settings" for CC IE Field (Master Station) is deleted.	△	△	△
	CC-Link	• If "H/W Test" or "Loop Test" is set to "Mode", the setting is deleted. • When changing to Q00UJ, or when changing from L06, L26, or L26-BT/L26-PBT, if the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two or more and the start I/O number is outside the range, "Start I/O No." is set starting from 0000. • When changing from L06, L26, or L26-BT/L26-PBT, if the number of slots exceeds the maximum number of slots of the changed programmable controller type, the exceeded setting is deleted.	△	△	△

Appendix 10.4 Restrictions when changing to QnUDE(H)CPU

The following tables show the restrictions applied when changing a programmable controller series/ type to QnUDE(H)CPU.

■ Changing from High Performance model QCPU

Table App.10.4-1

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		• If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
	Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated" and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter		–	–	–	–
	PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
	Program	• If "Low speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
	Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△

■ Changing from Q00U, Q00UJ, Q01U, or Q02U

Table App.10.4-2

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series. • If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
Remote Password	• Any existing settings are cleared.	△	△	△

■ Changing from High-speed Universal model QCPU

Table App.10.4-3

△ : With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
PLC Parameter		–	–	–	–
	Device	• If the value exceeds the capacity of changed programmable controller type is set for "File Register Extended Setting", the maximum value is set and all points are set as file register (ZR(R)). The setting of the latch range is cleared.	△	△	△

■ Changing from Redundant CPU

Table App.10.4-4

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		–	–	–	–
	Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter		–	–	–	–
	PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
	Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△
	I/O Assignment	• Settings on the slot 0 are deleted. • If any slot after the slot 1 is set, "Empty" is set for "Type" and "0 Point" is set for "Points" on the slot 0.	△	△	△
Network Parameter		–	–	–	–
	Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
	CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

■ Changing from Process CPU

Table App.10.4-5

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
Program	• If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
Boot File	• If "Standard ROM" is set to "Transfer from", it is changed to "Memory Card (ROM)".	△	△	△

■ Changing from Basic model QCPU

Table App.10.4-6

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (Except for Q00J. ☞ Appendix 11)	△	–	–
PLC Parameter	–	–	–	–
PLC File	• When changing from Q00 or Q01, "Use the following file" is selected and "Corresponding Memory: Standard RAM", "File Name: MAIN", and "Capacity: 64K Points" are set in the file register setting.	△	△	△

■ Changing from LCPU

Table App.10.4-7

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing from L02/L02-P or L02S, any existing settings are cleared.
	• When changing from L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of the built-in Ethernet are replaced to the settings appropriate for the changed programmable controller type.
	  • The settings of LJ71C24 are replaced to the settings of QJ71C24/CMO.
	  • The settings of LJ71E71 are replaced to the settings of QJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
I/O Assignment	• Settings of "Built-in I/O Function Setting" and "Built-in CC-Link Setting" are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two, "Start I/O No." is set starting from 0000.	△	△	△
CC-Link	• If "H/W Test" or "Loop Test" is set to "Mode", the setting is deleted.	△	△	△

Appendix 10.5 Restrictions when changing to High-speed Universal model QCPU

The following tables show the restrictions applied when changing a programmable controller series/ type to High-speed Universal model QCPU.

■ Changing from High Performance model QCPU

Table App.10.5-1

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
Sequential Function Chart	• The property settings of "SFC Program Type Setting", "Periodic Execution Block", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
Program	• If "Low speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
Boot File	• The setting of "Transfer From" is set to "Memory Card (SD)".	△	△	△

■ Changing from Q00U, Q00UJ, Q01U, or Q02U

Table App.10.5-2

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series. • If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
Remote Password	• Any existing settings are cleared.	△	△	△

■ Changing from Redundant CPU

Table App.10.5-3

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	–	–	–	–
Sequential Function Chart	• The property settings of "SFC Program Type Setting", "Periodic Execution Block", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
Boot File	• The setting of "Transfer From" is set to "Memory Card (SD)".	△	△	△
I/O Assignment	• Settings on the slot 0 are deleted. • If any slot after the slot 1 is set, "Empty" is set for "Type" and "0 Point" is set for "Points" on the slot 0.	△	△	△
Network Parameter	–	–	–	–
Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

■ Changing from Process CPU

Table App.10.5-4

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (☞ Appendix 11)	△	–	–
Sequential Function Chart	• The property settings of "SFC Program Type Setting", "Periodic Execution Block", and "Act at Step Multi-Activated" are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If the constant scan time is set in the PLC RAS setting, "Execute it while waiting for constant scan setting" is set to the service processing setting in the PLC System setting.	△	△	△
Program	• If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△
Boot File	• "Transfer from" is set to "Memory Card (SD)".	△	△	△

■ Changing from Basic model QCPU

Table App.10.5-5

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	If "Convert motion dedicated sequence instruction" is selected, S.instructions are converted to D.instructions. (Except for Q00J. ☞ Appendix 11)	△	–	–
PLC Parameter	–	–	–	–
PLC File	• When changing from Q00 or Q01, "Use the following file" is selected and "Corresponding Memory: Standard RAM", "File Name: MAIN", and "Capacity: 64K Points" are set in the file register setting.	△	△	△

■ Changing from LCPU

Table App.10.5-6

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing from L02/L02-P or L02S, any existing settings are cleared.
	• When changing from L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of the built-in Ethernet are replaced to the settings appropriate for the changed programmable controller type.
	  • The settings of LJ71C24 are replaced to the settings of QJ71C24/CMO.
	  • The settings of LJ71E71 are replaced to the settings of QJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
I/O Assignment	• Settings of "Built-in I/O Function Setting" and "Built-in CC-Link Setting" are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two or more, "Start I/O No." is set starting from 0000.	△	△	△
CC-Link	• If "H/W Test" or "Loop Test" is set to "Mode", the setting is deleted.	△	△	△

Appendix 10.6 Restrictions when changing to Redundant CPU

The following tables show the restrictions applied when changing a programmable controller series/ type to Redundant CPU.

■ Common restrictions when changing to Redundant CPU

Table App.10.6-1

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	–	–	–	–
Ladder	• A series-compatible SM/SD devices (SM/SD1000 to SM/SD1255) are changed to the corresponding devices for Q series. • Unsupported instructions are changed to the OUT instructions.	△	△	△
PLC Parameter	–	–	–	–
I/O Assignment	• Settings on the slot 0 are deleted. • "Redundant" is set for "Type" and "0 Point" is set for "Points" on the slot 0. Note that, if the slot 0 is set, "Type" of the slot 0 on the Switch Setting for I/O and Intelligent Function Module screen and the Intelligent Function Module Detailed Setting screen is set to "Empty".	△	△	△
Network Parameter	–	–	–	–

Ethernet	• "Ethernet" is changed to "Ethernet (Main Base)".
	• Set a number (system A station number + 1) for the system B station number. If the system A station number is 64, set 1.
	• Assign the IP address as indicated below according to the address of system A.
	  • If the address of system A is 255.255.255.255, assign the same address to the system B.
	  • If the address of system A is 0.0.0.255 or 255.255.255.254, assign 192.0.1.254 to the system B.
	  • If the address of system A is *.*.*.254, assign *.*.*.253 to the system B. (*.*.*. is the same numerical string for system A and B.)
	  • If the address of system A is *.*.*.255, assign *.*.*.254 to the system B. (*.*.*. is the same numerical string for system A and B.)
	  • If the address of system A is other than any of the above addresses, assign the address (4th number of system A address + 1) to the system B.
		△	△	△

CC-Link IE Controller Network	• If the station number is 64, 63 is set. If 63 is set on the higher number side in the network range assignment setting, "Disable" is set for "Pairing".	△	△	△
CC-Link	• "Master Station" is changed to "Master station (Extension Base)".	△	△	△

■ Changing from High-speed Universal model QCPU

Table App.10.6-2

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	• Any existing settings are cleared.	△	△	△
PLC Parameter	–	–	–	–
Device	• If the value exceeds the capacity of changed programmable controller type is set for "File Register Extended Setting", the maximum value is set and all points are set as file register (ZR(R)). The setting of the latch range is cleared.	△	△	△

■ Changing from Process CPU

Table App.10.6-3

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
PLC Parameter	–	–	–	–
PLC RAS	• If the value of "Capacity to be checked at one time" under "Memory Check" exceeds the maximum value, set the maximum value.	△	△	△
Program	• If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby". • If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△

Appendix 10.7 Restrictions when changing to Process CPU

The following tables show the restrictions applied when changing a programmable controller series/ type to Process CPU.

■ Common restrictions when changing to Process CPU

Table App.10.7-1

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
PLC Parameter	–	–	–	–
Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△

■ Changing from High-speed Universal model QCPU

Table App.10.7-2

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	• Any existing settings are cleared.	△	△	△
PLC Parameter	–	–	–	–
Device	• If the value exceeds the capacity of changed programmable controller type is set for "File Register Extended Setting", the maximum value is set and all points are set as file register (ZR(R)). The setting of the latch range is cleared.	△	△	△

■ Changing from Redundant CPU

Table App.10.7-3

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
PLC Parameter		–	–	–	–
	PC RAS	• If the value of "Capacity to be checked at one time" under "Memory Check" exceeds the maximum value, set the maximum value.	△	△	△
	I/O Assignment	• Settings on the slot 0 are deleted. • If any slot after the slot 1 is set, "Empty" is set for "Type" and "0 Point" is set for "Points" on the slot 0.	△	△	△
Network Parameter		–	–	–	–
	Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
	CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

Appendix 10.8 Restrictions when changing to High Performance model QCPU

The following tables show the restrictions applied when changing a programmable controller series/ type to High Performance model QCPU.

■ Changing from Universal model QCPU

Table App.10.8-1

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		• If "Convert motion dedicated sequence instruction" is selected, D.instructions are converted to S.instructions. (Except for Q00U, Q00UJ, Q01U, and Q02U. ☞Appendix 11)	△	–	–
Device comment		Bit-specified word device comments are deleted.	△	△	△
Remote Password		Only the settings of Built-in Ethernet type CPU are cleared.	△	△	△
PLC Parameter		–	–	–	–
	PLC System	• The setting value of "High Speed" in the timer limit setting is rounded up to the range 0.1 to 100ms. (Example: 0.01ms → 0.1ms)	△	△	△
	PLC File	• If the capacity of the file register exceeds 1019K points, the setting is set to 1018K points.	△	△	△
	Program	• When changing to Q02, Q02H, or Q06H, the Program setting and file usability setting for programs exceed the supported program number are deleted.	△	△	△
	Device	• 8K is specified for S device.	△	△	△
Network Parameter		–	–	–	–
	Ethernet	• In the news setting in the E-mail setting, condition devices outside the device range in the changed programmable controller type are deleted.	△	△	△
	CC-Link IE Controller Network	• The third and later CC-Link IE Controller Network modules in the module setting are deleted. • Modules whose station numbers are set in programs ("Specify station No. by program") are deleted. • When "Total stations" is 65 or more, 64 is set. • The 65th and later settings are deleted in the network range assignment setting. • The 65th and later I/O master stations are deleted in the LX/ LY setting in the network range assignment setting. • When '0800' or larger is specified for "Start" of SB/SW in the PLC side device range in the refresh parameters setting, the specified range is deleted. When '0800' or larger is specified for "End" of SB/SW, it is replaced to '07FF'. Devices out of the range are also deleted. • The settings of "Network Operation Settings" are deleted.	△	△	△
	MELSECNET/10(H)	• When '0800' or larger is specified for "Start" of SB/SW in the PLC side device range in the refresh parameters setting, the specified range is deleted. When '0800' or larger is specified for "End" of SB/SW, it is replaced to '07FF'. Devices out of the range are also deleted.	△	△	△

■ Changing from Redundant CPU

Table App.10.8-2

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
PLC Parameter		–	–	–	–
	Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△
	I/O Assignment	• Settings on the slot 0 are deleted. • If any slot after the slot 1 is set, "Empty" is set for "Type" and "0 Point" is set for "Points" on the slot 0.	△	△	△
Network Parameter		–	–	–	–
	Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
	CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

■ Changing from Process CPU

Table App.10.8-3

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
PLC Parameter		–	–	–	–
	Program	• If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby". • If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△

■ Changing from Basic model QCPU

Table App.10.8-4

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
PLC Parameter	–	–	–	–
PLC File	• When changing from Q00 or Q01, "Use the following file" is selected and "Corresponding Memory: Standard RAM", "File Name: MAIN", and "Capacity: 64K Points" are set in the file register setting.	△	△	△

■ Changing from LCPU

Table App.10.8-5

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Device comment	Bit-specified word device comments are deleted.	△	△	△

Remote Password	• When changing from L02/L02-P or L02S, any existing settings are cleared.
	• When changing from L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of the built-in Ethernet are cleared.
	  • The settings of LJ71C24 are replaced to the settings of QJ71C24/CMO.
	  • The settings of LJ71E71 are replaced to the settings of QJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
Boot File	• When changing from L02/L02-P, L06, L26, or L26-BT/L26-PBT, if 'Symbolic Information' is set to "Type", the setting is deleted. If "Standard ROM" is set to "Transfer To", it is changed to "Program Memory".	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeded programs are deleted.	△	△	△
I/O Assignment	• Settings of "Built-in I/O Function Setting" and "Built-in CC-Link Setting" are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link	• If "H/W Test" or "Loop Test" is set to "Mode", the setting is deleted.	△	△	△

Appendix 10.9 Restrictions when changing to Basic model QCPU

The following tables show the restrictions applied when changing a programmable controller series/ type to Basic model QCPU.

■ Common restrictions when changing to Basic model QCPU

Table App.10.9-1

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	• When changing to Q00J, file registers (R/ZR) are changed to SD999.	△	–	–
Device Initial Value	• If the name of the device initial value data is other than 'MAIN', the file is deleted. • If the setting exceeds the editable range of device initial values in the changed programmable controller type, the exceeding range is deleted.	△	△	△
Global Device Comment	• Global device comments are deleted.	△	△	△
Remote Password	• Any existing settings are cleared.	△	△	△
PLC Parameter	–	–	–	–
PLC File	• If an item other than "Not Used" is set in the initial device value setting, it is changed to "Used".	△	△	△
Device/Label Automatic-Assign Setting	• If the Device setting or the setting for the file register capacity in the PLC File setting in the PLC parameter is changed, the default value is set.	–	△	△

■ Changing from High Performance model QCPU

Table App.10.9-2

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		–	–	–	–
	Ladder Diagram	• If instructions not supported by the changed programmable controller type are used, they are deleted and displayed in yellow.	–	△	△
	Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated" and "Act at Step Multi-Activated" are deleted.	△	△	△
		• The block title in the property setting is deleted. • If device points not supported by Q00J/Q00/Q01 are used for "Block Information" in the property setting, the setting is deleted.	△	–	–
PLC Parameter		–	–	–	–
	PLC System	• The setting values of "Fixed Scan Interval" are rounded out to the one in "System Interrupt Settings".	△	△	△
	Boot File	• If "Type: Sequence", "Data Name: MAIN", "Transfer From: Standard ROM", and "Transfer To: Program Memory" are set before changing the programmable controller type, "Do boot from standard ROM" is selected.	△	△	△

■ Changing from Universal model QCPU

Table App.10.9-3

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		• If "Convert motion dedicated sequence instruction" is selected, D.instructions are converted to S.instructions. (Except for Q00U, Q00UJ, Q01U, and Q02U. ☞ Appendix 11)	△	–	–
	Ladder Diagram	• If instructions not supported by the changed programmable controller type are used, they are deleted and displayed in yellow.	–	△	△
	Sequential Function Chart	• The property setting "Act at Block Multi-Activated" is deleted.	△	△	△
		• The property setting "Block Setting" is deleted. • If device points not supported by Q00J/Q00/Q01 are used, the setting is deleted.	△	–	–
Device comment		Bit-specified word device comments are deleted.	△	△	△
PLC Parameter		–	–	–	–
	PLC System	• The setting value is rounded out to the tenth in "Timer Limit Setting (High Speed)". • The setting values of "Fixed Scan Interval" are rounded out to the one in "System Interrupt Settings".	△	△	△
	Boot File	• Any specified settings are deleted.	△	△	△
	Device	• 2K is set for S device.	△	△	△

■ Changing from Redundant CPU

Table App.10.9-4

△: With restrictions

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Program		–	–	–	–
	Ladder Diagram	• If instructions not supported by the changed programmable controller type are used, they are deleted and displayed in yellow.	–	△	△
	Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated" and "Act at Step Multi-Activated" are deleted.	△	△	△
		• The block title in the property setting is deleted. • If device points not supported by Q00J/Q00/Q01 are used for "Block Information" in the property setting, the setting is deleted.	△	–	–
PLC Parameter		–	–	–	–
	PLC System	• The setting values of "Fixed Scan Interval" are rounded out to the one in "System Interrupt Settings".	△	△	△
	Boot File	• If "Type: Sequence", "Data Name: MAIN", "Transfer From: Standard ROM", and "Transfer To: Program Memory" are set before changing the programmable controller type, "Do boot from standard ROM" is selected.	△	△	△
	Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△
	I/O Assignment	• Settings on the slot 0 are deleted. • If any slot after the slot 1 is set, "Empty" is set for "Type" and "0 Point" is set for "Points" on the slot 0.	△	△	△
Network Parameter		–	–	–	–
	Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
	CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

■ Changing from Process CPU

Table App.10.9-5

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	–	–	–	–
Ladder Diagram	• If instructions not supported by the changed programmable controller type are used, they are deleted and displayed in yellow.	–	△	△
Sequential Function Chart	• The property settings "SFC Program Type Setting", "Periodic Execution Block", "Act at Block Multi-Activated" and "Act at Step Multi-Activated" are deleted.	△	△	△
	• The block title in the property setting is deleted. • If device points not supported by Q00J/Q00/Q01 are used for "Block Information" in the property setting, the setting is deleted.	△	–	–
PLC Parameter	–	–	–	–
PLC System	• The setting values of "Fixed Scan Interval" are rounded out to the one in "System Interrupt Settings".	△	△	△
Boot File	• If "Type: Sequence", "Data Name: MAIN", "Transfer From: Standard ROM", and "Transfer To: Program Memory" are set before changing the programmable controller type, "Do boot from standard ROM" is selected.	△	△	△

■ Changing from LCPU

Table App.10.9-6

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Device comment	Bit-specified word device comments are deleted.	△	△	△
PLC Parameter	–	–	–	–
PLC System	• If "Start I/O No." in the interrupt pointer setting of the intelligent function module setting is outside the range, the setting is deleted. • When changing to Q00J, if the number of points is outside the range, its maximum point is set.	△	△	△
Boot File	• If "Type: Sequence", "Data Name: MAIN", "Transfer From: Standard ROM", and "Transfer To: Program Memory" are set before changing the programmable controller type, "Do boot from standard ROM" is selected.	△	△	△
I/O Assignment	• Settings of "Built-in I/O Function Setting" and "Built-in CC-Link Setting" are deleted.	△	△	△

Item		Restrictions	Project type		
			Simple project		Structured project
			Without labels	With labels	
Network Parameter		–	–	–	–
	CC-Link	• If "H/W Test" or "Loop Test" is set to "Mode", the setting is deleted. • When changing to Q00J, or when changing from L06, L26, or L26-BT/L26-PBT, if the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two or more and the start I/O number is outside the range, "Start I/O No." is set starting from 0000. • When changing from L06, L26, or L26-BT/L26-PBT, if the number of slots exceeds the maximum number of slots of the changed programmable controller type, the exceeded setting is deleted.	△	△	△

Appendix 10.10 Restrictions when changing to LCPU

The following tables show the restrictions applied when changing a programmable controller series/ type to LCPU.

■ Common restrictions when changing to LCPU

Table App.10.10-1

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
PLC Parameter	–	–	–	–
PLC System	• If "Start I/O No." in the interrupt pointer setting of the intelligent function module setting is outside the range, the setting is deleted. • When changing to L02/L02-P or L02S, if "Backup Start Setup Contact" and "Backup Start Contact" in the PLC module change setting are outside the range, the device settings are deleted.	△	△	△
PLC File	• If "Use the same file name as the program" is set in the file register setting, it is changed to "Not Used". • If an item other than "Memory Card (ROM)" and "Standard ROM" is set to "Corresponding Memory" in the comment file used in a comment setting, it is changed to "Memory Card (SD)". • If "Memory Card (RAM)" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Memory Card (SD)".	△	△	△
Program	• If "Low Speed" is set to "Execute Type" in the Program setting, it is changed to "Standby".	△	△	△

Device	• If the capacity of the file register setting before changing the programmable controller type exceeds the maximum capacity of the setting of the changed programmable controller type, the following settings are set.
	  • The number of normal device points is set to default.
	  • The number of extended device points is set to the maximum point that can be set for file register.
	  • The settings for Latch (1) and Latch (2) are initialized.
		△	△	△

I/O Assignment	• When changing to L02/L02-P, L02S, L06, or L26, "Type" of the slot 1 is set to "Built-in I/O Function", and "Points" is set to "16 Points". All settings of start XY are deleted. • When changing to L26-BT/L26-PBT, "Type" of the slot 1 is set to "Built-in I/O Function", and "Points" is set to "32 Points". All settings of start XY are deleted.	△	△	△
Network Parameter	–	–	–	–
Ethernet	• When changing to L02/L02-P or L02S, the second and later Ethernet modules in the module settings are deleted. • When changing to L06, L26, or L26-BT/L26-PBT, the third and later Ethernet modules in the module settings are deleted.	△	△	△
CC-Link	• When changing to L02/L02-P or L02S, if the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two or more and the start I/O number is outside the range, "Start I/O No." is set starting from 0000.	△	△	△

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Device/Label Automatic-Assign Setting	• If the Device setting or the setting for the file register capacity in the PLC File setting in the PLC parameter is changed, the default value is set.	–	△	△

■ Changing from High Performance model QCPU

Table App.10.10-2

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing to L02/L02-P or L02S, any existing settings are cleared.
	• When changing to L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of the Ethernet module are cleared.
	  • The settings of QJ71C24/CMO are replaced to the settings of LJ71C24.
	  • The settings of QJ71E71 are replaced to the settings of LJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
Boot File	• When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, the setting of "Transfer From" in the Boot File setting is changed to "Memory Card (SD)".	△	△	△
PLC System	• When changing to L02/L02-P or L02S, if the number of points is outside the range, its maximum point is set.	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeded programs are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link	• If the number of slots exceeds the maximum number of slots of the changed programmable controller type, the exceeded setting is deleted.	△	△	△

■ Changing from QnUD(H)CPU

Table App.10.10-3

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	• When changing to L02/L02-P or L02S, any existing settings are cleared. • When changing to L06, L26, or L26-BT/L26-PBT, the settings of Ethernet module are deleted. The settings of QJ71C24/CMO are replaced to the settings of LJ71C24.	△	△	△
PLC Parameter	–	–	–	–
Boot File	• When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, the setting of "Transfer From" in the Boot File setting is changed to "Memory Card (SD)".	△	△	△
Device	• If the points between 1K and 7K or exceeding 8K points are specified for S device, the setting is set to 8K points.	△	△	△
PLC System	• When changing to L02/L02-P or L02S, if the number of points is outside the range, its maximum point is set.	△	△	△
PLC File	• If the file capacity of file register is outside the range, its maximum capacity is set, and the drive is changed to "Standard RAM". • When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, if "Memory Card (RAM)" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Memory Card (SD)". • When changing to L02S, if an item other than "Program Memory" or "Standard ROM" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Standard ROM". • When changing to L02/L02-P or L02S, if the capacity exceeds 16K points in "File used for SP.DEVST/S.DEVLD Instruction", the setting is set to 16K point.	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeded programs are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two, "Start I/O No." is set starting from 0000.	△	△	△
CC-Link	• If the number of slots exceeds the maximum number of slots of the changed programmable controller type, the exceeded setting is deleted.	△	△	△

■ Changing from Q00U, Q00UJ, Q01U, or Q02U

Table App.10.10-4

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing from Q00U or Q01U to L02/L02-P or L02S, the following settings are set.
	  • The settings of QJ71C24/CMO are replaced to the settings of LJ71C24.
	  • The settings of QJ71E71 are replaced to the settings of LJ71E71.
	• When changing from Q00UJ or Q02U to L02/L02-P or L02S, any existing settings are cleared.
	• When changing to L06, L26, or L26-BT/L26-PBT, any existing settings are cleared.
		△	△	△

PLC Parameter	–	–	–	–
Boot File	• When changing from Q02U to L02/L02-P, L06, L26, or L26-BT/L26-PBT, the setting of "Transfer From" in the Boot File setting is changed to "Memory Card (SD)".	△	△	△
Device	• If the points between 1K and 8K are specified for S device, the setting is set to 8K points.	△	△	△
PLC System	• When changing from Q00U, Q01U, or Q02U to L02/L02-P or L02S, if the number of points is outside the range, its maximum point is set. • When changing from Q02U, if "Start I/O No." in the interrupt pointer setting of the intelligent function module setting is outside the range, the setting is deleted.	△	△	△
PLC File	• When changing from Q02U, if the file capacity of file register is outside the range, its maximum capacity is set, and the drive is changed to "Standard RAM". • When changing from Q02U to L02/L02-P, L06, L26, or L26-BT/L26-PBT, if an item other than "Memory Card (ROM)" and "Standard ROM" is set to "Corresponding Memory" in the comment file used in a comment setting, it is changed to "Memory Card (SD)".	△	△	△
Network Parameter	–	–	–	–
CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two, "Start I/O No." is set starting from 0000.	△	△	△
CC-Link	• When changing from Q02U to L02/L02-P or L02S, if the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two or more and the start I/O number is outside the range, "Start I/O No." is set starting from 0000. • When changing from Q02U to L02/L02-P or L02S, if the number of slots exceeds the maximum number of slots of the changed programmable controller type, the exceeded setting is deleted.	△	△	△

■ Changing from QnUDE(H)CPU

Table App.10.10-5

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing to L02/L02-P or L02S, any existing settings are cleared.
	• When changing to L06, L26, or L26-BT/L26-PBT, the following settings are set
	  • The settings of the built-in Ethernet are replaced to the settings appropriate for the changed programmable controller type.
	  • The settings of QJ71C24/CMO are replaced to the settings of LJ71C24.
	  • The settings of QJ71E71 are replaced to the settings of LJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
PLC System	• If a device that exceeds the range of the Device setting is set to "Latch Data Backup Operation Valid Contact", the setting is deleted. • When changing to L02/L02-P or L02S, if the number of points is outside the range, its maximum point is set.	△	△	△
Boot File	• When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, the setting of "Transfer From" in the Boot File setting is changed to "Memory Card (SD)".	△	△	△
Device	• If the points between 1K and 7K or exceeding 8K points are specified for S device, the setting is set to 8K points.	△	△	△
Built-in Ethernet Port Setting	• If the IP address is outside the range of 0.0.0.1 to 223.255.255.254, the default is set.	△	△	△
PLC File	• If the file capacity of file register is outside the range, its maximum capacity is set, and the drive is changed to "Standard RAM". • When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, if an item other than "Memory Card (ROM)" and "Standard ROM" is set to "Corresponding Memory" in the comment file used in a comment setting, it is changed to "Memory Card (SD)". • When changing to L02/L02-P or L02S, if the capacity exceeds 16K points in "File used for SP.DEVST/S.DEVLD Instruction", the setting is set to 16K point.	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeded programs are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two, "Start I/O No." is set starting from 0000.	△	△	△
CC-Link	• If the number of slots exceeds the maximum number of slots of the changed programmable controller type, the exceeded setting is deleted.	△	△	△

■ Changing from High-speed Universal model QCPU

Table App.10.10-6

△ : With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing to L02/L02-P or L02S, any existing settings are cleared.
	• When changing to L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of the built-in Ethernet are replaced to the settings appropriate for the changed programmable controller type.
	  • The settings of QJ71C24/CMO are replaced to the settings of LJ71C24.
	  • The settings of QJ71E71 are replaced to the settings of LJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
PLC System	• If a device that exceed the range of the Device setting is set to "Latch Data Backup Operation Valid Contact", the setting is deleted. • When changing to L02/L02-P or L02S, if the number of points is outside the range, its maximum point is set.	△	△	△
Device	• If the value exceeds the capacity of changed programmable controller type is set for "File Register Extended Setting", the maximum value is set and all points are set as file register (ZR(R)). The setting of the latch range is cleared. • If the points between 1K and 7K or exceeding 8K points are specified for S device, the setting is set to 8K points.	△	△	△
Built-in Ethernet Port Setting	• If the IP address is outside the range of 0.0.0.1 to 223.255.255.254, the default is set.	△	△	△
PLC File	• If the file capacity of file register is outside the range, its maximum capacity is set, and the drive is changed to "Standard RAM". • When changing to L02/L02-P or L02S, if the capacity exceeds 16K points in "File used for SP.DEVST/S.DEVLD Instruction", the setting is set to 16K point.	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeded programs are deleted.	△	△	△
Network Parameter	–	–	–	–
CC-Link IE Field Network	• If the number of modules is one and "Start I/O No." is outside the range, its maximum value is set. If the number of modules is two or more, "Start I/O No." is set starting from 0000.	△	△	△
CC-Link	• If the number of slots exceeds the maximum number of slots of the changed programmable controller type, the exceeded setting is deleted.	△	△	△

■ Changing from Redundant CPU

Table App.10.10-7

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing to L02/L02-P or L02S, any existing settings are cleared.
	• When changing to L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of QJ71C24/CMO are replaced to the settings of LJ71C24.
	  • The settings of QJ71E71 are replaced to the settings of LJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
Boot File	• The setting of "Transfer From" in the Boot File setting is changed to "Memory Card (SD)".	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△
PLC File	• When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, if "Memory Card (RAM)" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Memory Card (SD)". • When changing to L02S, if an item other than "Program Memory" or "Standard ROM" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Standard ROM".	△	△	△
Network Parameter	–	–	–	–
Ethernet	• "Ethernet (Main Base)" or "Ethernet (Extension Base)" is changed to "Ethernet".	△	△	△
CC-Link	• "Master station (Extension Base)" is changed to "Master Station".	△	△	△

■ Changing from Process CPU

Table App.10.10-8

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	

Remote Password	• When changing to L02/L02-P or L02S, any existing settings are cleared.
	• When changing to L06, L26, or L26-BT/L26-PBT, the following settings are set.
	  • The settings of QJ71C24/CMO are replaced to the settings of LJ71C24.
	  • The settings of QJ71E71 are replaced to the settings of LJ71E71.
		△	△	△

PLC Parameter	–	–	–	–
Boot File	• The setting of "Transfer From" in the Boot File setting is changed to "Memory Card (SD)".	△	△	△
Program	• If the number of programs exceeds the allowable number, the exceeding settings are deleted.	△	△	△
PLC File	• When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, if "Memory Card (RAM)" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Memory Card (SD)". • When changing to L02S, if an item other than "Program Memory" or "Standard ROM" is set to "Corresponding Memory" in the initial device value setting, it is changed to "Standard ROM".	△	△	△

■ Changing from Basic model QCPU

Table App.10.10-9

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	• Any existing settings are cleared.	△	△	△
PLC Parameter	–	–	–	–
PLC File	• When changing from Q00 or Q01, "Use the following file" is selected and "Corresponding Memory: Standard RAM" and "File Name: MAIN" are set in the file register setting. • If "Used" is set in the initial device value setting, "Use the following file" is selected and "Corresponding Memory: Program Memory" and "File Name: MAIN" are set.	△	△	△
PLC System	• When changing from Q00 or Q01 to L02/L02-P or L02S, if the number of points is outside the range, its maximum point is set.	△	△	△
Boot File	• When changing to L02/L02-P, L06, L26, or L26-BT/L26-PBT, if "Do boot from standard ROM" is selected before changing the programmable controller type, "Type: Sequence", "Data Name: MAIN", "Transfer From: Memory Card (SD)", and "Transfer To: Program Memory" are set.	△	△	△

Appendix 10.11 Restrictions when changing between QCPU (Q mode)/ LCPU and CC IE Field head module

The following tables show the restrictions applied when changing QCPU (Q mode)/LCPU to CC IE Field head module and when changing communication head module to QCPU (Q mode)/LCPU.

■ Changing from QCPU (Q mode)/LCPU to CC IE Field head module

Table App.10.11-1

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Device Comment	• All data are deleted.	△	–	–
Device Memory				
Device Initial Value				
Remote Password	• Any existing settings are cleared.	△	–	–
PLC Parameter, Network Parameter	• All parameters are set to default.	△	–	–

■ Changing from CC IE Field head module to QCPU (Q mode)/LCPU

Table App.10.11-2

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Remote Password	• Any existing settings are cleared.	△	–	–
PLC Parameter, Network Parameter	• All parameters are set to default.	△	–	–

Appendix 10.12 Restrictions when changing to FXCPU (FXCPU ⇔ FXCPU)

The following tables show the restrictions applied when changing FXCPU to FXCPU.

Table App.10.12-1

△: With restrictions

Item	Restrictions	Project type		
		Simple project		Structured project
		Without labels	With labels	
Program	–	–	–	–
Ladder Diagram	• Programs which exceed the program capacity of the changed programmable controller type are deleted.	△	–	–
Global Device Comment	• Devices not supported and these outside the range are deleted.	△	△	△
Local Device Comment				
PLC Parameter	–	–	–	–
Memory Capacity	• If the program capacity set before changing the programmable controller type is not supported by the changed programmable controller type, it is changed to the maximum value of the changed programmable controller type.	△	△	△
Ethernet Port	• When the device range set in the log record setting cannot be applied as it is after the programmable controller type is changed, the log record setting is set to default.	△	△	△
Network Parameter	–	–	–	–
CC-Link	• When the number of stations set for "Station Information Setting" exceeds the maximum number for the programmable controller type, all CC-Link parameter settings are set to default.	△	△	△
System label	• FX3G, FX3GC, FX3U, and FX3UC whose projects contain system labels cannot be changed to FX0, FX0S, FX0N, FX1, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, or FX2NC.	–	△	△
Block password	• A project in which a block password with the validated setting for "Read-protect the execution program" exists can be used in FX3U and FX3UC only.	–	△	△

Appendix 11 Instruction Conversion Lists

Q CPU L CPU Remote Head FX

The following tables show the instructions that can be converted when changing the programmable controller type.

Appendix 11.1 Instruction conversion for Universal model QCPU ⇔ CPU other than Universal model QCPU conversion

This section shows the lists of instructions which are converted based on selecting/clearing "Convert motion dedicated sequence instruction" when the programmable controller type of a Simple project (without label) is changed.

■ Instruction conversion list for conversion to Universal model QCPU

	Basic model QCPU (Except for Q00J), High Performance model QCPU, Process CPU, Universal model QCPU (Q00U, Q01U, Q02U)	Universal model QCPU (Except for Q00U, Q00UJ, Q01U, Q02U)	
	Before conversion	After conversion	
		Selected	Cleared
Motion dedicated instruction	S(P).SFCS	D(P).SFCS	S(P).SFCS
	S(P).SVST	D(P).SVST	S(P).SVST
	S(P).CHGV	D(P).CHGV	S(P).CHGV
	S(P).CHGT	D(P).CHGT	S(P).CHGT
	S(P).CHGA	D(P).CHGA	S(P).CHGA
	S(P).DDWR	D(P).DDWR	S(P).DDWR
	S(P).DDRD	D(P).DDRD	S(P).DDRD
	S(P).GINT	D(P).GINT	S(P).GINT

■ Instruction conversion list for conversion from Universal model QCPU

	Universal model QCPU (Except for Q00U, Q00UJ, Q01U, Q02U)	Basic model QCPU (Except for Q00J), High Performance model QCPU, Process CPU, Universal model QCPU (Q00U, Q01U Q02U)	
	Before conversion	After conversion	
		Selected	Cleared
Motion dedicated instruction	D(P).SFCS	S(P).SFCS*1	SM1255
	D(P).SVST	S(P).SVST*2	SM1255
	D(P).CHGV	S(P).CHGV*2	SM1255
	D(P).CHGT	S(P).CHGT*2	SM1255
	D(P).CHGA	S(P).CHGA*2	SM1255
	D(P).DDWR	S(P).DDWR*3	SM1255
	D(P).DDRD	S(P).DDRD*3	SM1255
	D(P).GINT	S(P).GINT*4	SM1255

*1 : When the number of arguments is 2, correct the arguments after the programmable controller type is changed.
*2 : When the number of arguments is 3, correct the arguments after the programmable controller type is changed.
*3 : When a character string is used in an argument, correct the argument after the programmable controller type is changed.
*4 : When the number of arguments is 3 or more, correct the arguments after the programmable controller type is changed.

Appendix 11.2 Instruction conversion for Redundant CPU ⇔ CPU other than Redundant CPU conversion

■ Instruction conversion list for conversion to Redundant CPU

The following instructions are converted to "OUT SM1255".

	Description	Instruction name
QCPU instruction	Program load	PLOADP
	Program unload	PUNLOADP
	Load + unload	PSWAPP
Motion dedicated instruction	Data write to host CPU shared memory	S.TO
	Other CPU device data read to host CPU device	S.DDRD
	Host CPU device data write to other CPU device	S.DDWR
	Motion SFC program start request	S.SFCS
	Torque limit value change during operation/stop in real mode	S.CHGT
	Servo program start request	S.SVST
	Axis speed change during positioning or JOG operation	S.CHGV
	Current value change for stopping axis/synchronous encoder/cam axis	S.CHGA
	Other CPU interrupt program start request	S.GINT
Display instruction	ASCII code print instruction	PR
	Comment print instruction	PRC
Peripheral device instruction	Key input from peripheral device	KEY
Other convenient instruction	1-phase input up/down counter	UDCNT1
	2-phase input up/down counter	UDCNT2
	Teaching timer	TTMR
	Special function timer	STMR
	Rotary table shortest direction control	ROTC
	Ramp signal	RAMP
	Pulse density measurement	SPD
	Fixed cycle pulse output	PLSY
	Pulse width modulation	PWM
	Matrix input	MTR
Program control instruction	Program low-speed execution registration instruction	PLOW

■ Instruction conversion list for conversion from Redundant CPU

	Before conversion	After conversion		
	Redundant CPU	Basic model QCPU	High Performance model QCPU	Process CPU
Control system switching instruction	SP.CONTSW	OUT SM999	OUT SM1255	OUT SM1255
PID control instruction	PIDINIT	PIDINIT	PIDINIT	
	PIDCONT	PIDCONT	PIDCONT	
	PIDSTOP	PIDSTOP	PIDSTOP	
	PIDRUN	PIDRUN	PIDRUN	
	PIDPRMW	PIDPRMW	PIDPRMW	
	S.PIDINIT	S.PIDINIT	S.PIDINIT	
	S.PIDCONT	S.PIDCONT	S.PIDCONT	
	S.PIDSTOP	S.PIDSTOP	S.PIDSTOP	
	S.PIDRUN	S.PIDRUN	S.PIDRUN	
	S.PIDPRMW	S.PIDPRMW	S.PIDPRMW	

Appendix 12 Functions Added Since Previous Versions

Q CPU L CPU Remote Head FX

This section shows major functions added/changed with upgrade.
For (Simple), (FB), (Structured), and (Intelligent) described in the Reference column, refer to the following manuals respectively.

(Simple) …GX Works2 Version 1 Operating Manual (Simple Project)
(FB) …GX Works2 Version 1 Operating Manual (Simple Project, Function Block)
(Structured)…GX Works2 Version 1 Operating Manual (Structured Project)
(Intelligent) …GX Works2 Version 1 Operating Manual (Intelligent Function Module)

Version	Major function added/ changed	Description	Reference
Version 1.05F	Label comment display	Label comments can be displayed in Structured projects.	(Structured)
Version 1.08J	Programmable controller type	Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, Q20UDEH, and FX series are supported.	–
	Intelligent function module	Q68TD-G-H02 is supported.	–
	Change PLC Type	The programmable controller type can be changed from Universal model QCPU to High Performance model QCPU.	Section 4.2.8
	Verify	The parts that do not match can be searched.	Section 4.2.7 Section 4.6.5 Section 12.2
	Parameter	The following parameters are supported by Universal model QCPU. • The CPU module can be replaces using a memory card. • Index registers can be specified as local devices. • The A-PLC compatibility Setting is supported.	Section 6.1.1
		Twist-bus-compatible modules are supported by MELSECNET/H.	Section 6.3.1
	Ladder	With the easy edit function, the following functions can be operated by a one-step operation (menu/shortcut key). • Draw line • Change open/close contact • Switch statement/note type • Instruction partial edit	(Simple)
		Ladder blocks can be displayed/hidden in units of one ladder block.	
		The ladder editor and function block can be displayed horizontally.	
		The instruction help can be opened from the menu.	
	ST	Arguments of a template can be selected one-by-one by the menu or shortcut key.	(Structured)
	Structured Ladder	The wrapping positions for printing can be checked on the Structured Ladder editor.	
	Monitoring	The program list can be monitored.	Section 14.4
		The interrupt program list monitor can be monitored.	Section 14.5
		The intelligent function modules can be monitored.	Section 14.7
	Debugging	The forced input/output can be registered/canceled.	Section 16.2
		The device test with execution condition is supported by the Universal model QCPU.	Section 16.3
	CC-Link/ CC-Link/LT Diagnostics	The screen for the CC-Link/CC-Link/LT diagnostics is modified.	Section 18.5
		The CC-Link/CC-Link/LT diagnostics support the following functions. • Obtain transmission speed setting • Status logging • Create check sheet	

Version	Major function added/ changed	Description	Reference
Version 1.08J	System monitor	The error reset function can be performed on the Module's Detailed Information screen.	Section 18.8
	Shortcut key customize	With the shortcut key customize function, shortcut keys can be registered arbitrarily.	Section 3.2.8
	Parameter	The socket communication through Ethernet is supported by Built-in Ethernet port QCPU.	Section 6.1.1
	FB library	FB libraries are supported.	Section 22.1.1 (FB)
Version 1.12N	Programmable controller type	Q00J, Q00, and Q01 are supported.	–
	Intelligent function module	Q64AD2DA and Q61LD are supported.	–
	Programming language	• Structured Text is supported by Simple projects (with labels) of QCPU (Q mode). • Sequential Function Chart is supported by Simple projects (without labels) of FXCPU.	(Simple)
	Project type	Simple projects (with labels) are supported by FXCPU.	
	Navigation window	The Project window is modified, and its name is changed to Navigation window.	–
	Change PLC Type	Motion dedicated instructions can be converted when the programmable controller type of a Simple project (without label) is changed.	Section 4.2.8
	Print	Device initial value can be printed.	Chapter 20
	Saving projects	The project compression/decompression function is supported.	Section 4.2.4
	Parameter	The module error history collection function for the intelligent function module is supported by Universal model QCPU.	Section 6.1.1
	Program editor	The default font color of labels is changed.	–
	Ladder	The following instructions are supported. • Rising pulse close instruction • Falling pulse close instruction • Rising pulse close branch instruction • Falling pulse close branch instruction	(Simple)
		• Simplified edit of devices/labels is supported by the Enter Symbol screen. • An undefined label can be registered following an element entry operation. • A list of possible candidates of instructions/labels can be displayed at entering elements. • A tooltip for arguments of an instruction can be displayed at entering instructions.	
		The line statement list function is supported.	
		The cursor can jump to the start of the next ladder block or the start of the previous ladder block.	
		The change TC setting function is supported.	
		The Inline structured text function is supported.	
	SFC	• The SFC editor window and the Zoom editor window can be displayed vertically at opening the SFC window. • An SFC block can be displayed automatically at auto scroll monitoring.	

Version	Major function added/ changed	Description	Reference
Version 1.12N	ST	The bookmark list function is supported.	(Structured)
	Structured Ladder	A list of possible candidates of instructions/labels can be displayed at entering elements.	
	All Device Display	In a ladder program or Structured Ladder program, the display of labels on all program editors being opened can be switched to the device display simultaneously.	(Simple)
	Find/Replace	In all programming languages, Find String/Replace String, Find Device/Replace Device, Find Instruction/Replace Instruction, and Change Open/Close Contact are supported.	Section 10.3
	Device Memory	A character string can be entered to device memory.	Section 7.2.3
		The FILL function is supported.	Section 7.2.4
	Write to PLC	In a project (with labels), file sizes can be displayed/hidden on the Write to PLC screen.	Section 12.1
	Confirm Memory Size	The memory size required when data is written to the programmable controller CPU can be calculated.	Section 12.10
	Monitoring	Detailed information of such as an error can be confirmed from the Intelligent Function Module Monitor window.	Section 14.7
	Simulation function	The minimized display at start up of simulation is supported.	Section 15.2
		The saving/reading device memory/buffer memory function is supported.	Section 15.2.1 Section 15.2.2
		The I/O system setting function is supported.	Chapter 19
	Scan Time Measurement	The scan time measurement function is supported.	Section 16.5
	CC-Link IE Control Diagnostics	The Logging screen of another station can be displayed.	Section 18.3
	CC-Link/ CC-Link/LT Diagnostics	• Up to 64 modules can be displayed. • The system configuration can be output in a check sheet.	Section 18.5
	System monitor	The module information at time of the error occurrence can be displayed in the error history list.	Section 18.8
	Shortcut key customize	User-created shortcut key settings can be registered to a template.	Section 3.2.8
	Intelligent function module tool	• The Q61LD two-point calibration setting of the analog module is supported. • The auto tuning function of the temperature control module is supported. • The preset function of the counter module is supported. • The positioning test, wave trace, location trace, offline simulation, automatic command speed calculation, and automatic sub arc calculation of QD75 positioning module are supported. • The circuit trace function of the serial communication module is supported.	(Intelligent)
	FB library	Components of the FB libraries can be imported to a project being edited using the function to obtain the libraries to a project.	Chapter 22 (FB)

Version	Major function added/ changed	Description	Reference
Version 1.15R	Parameter	The function to apply the parameters of MELSOFT Navigator is supported.	Section 6.1
	Transfer setting	The GOT (Ethernet) transparent mode is supported.	Section 11.9.1
	ST	The following instructions are supported. • Negated rising edge instruction • Negated falling edge instruction	(Structured)
	Structured Ladder	The following contact symbols are added. • Rising edge • Falling edge • Negated rising edge • Negated falling edge	
		The following instructions are supported. • Negated rising edge instruction • Negated falling edge instruction	
	Global label	System labels are supported.	(Simple) (Structured)
Version 1.24A	Programmable controller type	L02 and L26-BT are supported.	–
	Intelligent function module	L64AD4, L60DA4, LJ71C24, and LJ71C24-R2 are supported.	(Intelligent)

	Ladder	• The Inline structured text function is supported by FXCPU.
		• The following functions are supported by the Inline structured text function.
		  • Verifying projects
		  • Verifying revisions
		  • Replacing character strings
			Section 4.2.7
			Section 4.6
			Section 10.3.3

	ST	• The compilation result can be displayed in list format. • The ST control syntax templates are supported.	(Simple)
	Structured Ladder	• The compilation result can be displayed in list format. • Function blocks can be dragged and dropped from the Project view.	(Structured)
	Saving projects	A title of the change history of the project can automatically be set when it is overwritten.	Section 4.2.3
	Device List	• The number of uses of a coil which uses the device can be displayed. • Devices which are used in the parameters can be indicated.	Section 10.2
	Colors and fonts	The color and font settings can be reset to default.	Section 3.2.7
	Write to PLC	A project can automatically be saved after it is written to the programmable controller CPU.	Chapter 12
	Simulation function	The simulation function is supported by FXCPU.	Chapter 15 Chapter 19 Appendix 2
	Intelligent function module tools	• The offset/gain setting can be performed from the menu. • The predefined protocol support function of the serial communication module is supported.	(Intelligent)
	Help	The detailed explanation of instructions can be opened from the program editor or the Function Block Selection window.	–

Version	Major function added/ changed	Description	Reference
Version 1.31H	Programmable controller type	Q50UDEH, Q100UDEH, and LJ72GF15-T2 are supported.	–
	Intelligent function module	LD62, LD62D, LD75P4, LD75D4, and LD77MH4 are supported.	(Intelligent)
	Ladder	In projects (with labels), the function which enables the device display in uncompiled state is supported.	–
	SFC	The display format "MELSAP-L (Instruction Format)" / "MELSAP-L (Start Conditions Format)" are supported.	(Simple)
	Global labels	System labels are supported by LCPU.	(Simple) (Structured)
	Change PLC Type	The programmable controller type of a project which contains intelligent function modules can be changed between programmable controller series.	Section 4.2.8
	Parameter	In the network parameter, "CC IE Field (Master Station)" and "CC IE Field (Local Station)" are supported by Universal model QCPU.	Section 6.3

	Intelligent function module data	• The disconnection detection mode setting and Disconnection detection setting value setting are supported by Q62DA-FG.
		• The following settings are supported by QJ71C24N/ QJ71C24N-R2.
		  • The echo back permit/prohibit specification and the execution history option specification are supported by the various control specification.
		  • The predefined protocol function error code, the send data storage area, and the receive data storage area are supported by the auto refresh.
			(Intelligent)

	Cross Reference	In projects (with labels), the cross reference information can be displayed in uncompiled state.	Section 10.1
	Local Device Batch Read	The function which reads local device data from the programmable controller CPU and saves the data on the personal computer is supported by Universal model QCPU.	Section 12.12
	CC IE Field Diagnostics	The CC-Link IE Field Network diagnostics is supported by Universal model QCPU.	Section 18.4
	Options	For QCPU (Q mode)/LCPU, the following option is added. [Tool] ⇒ [Options] ⇒ "PLC Read/Write" ⇒ "When writing to PLC after a Rebuild All operation, clear the device ranges set in the Device/Label Auto-Assign setting to 0."	Section 12.1.7 Section 21.2 (Simple) (Structured)
Version 1.40S	Operating environment	Windows® 7 is supported.	–
	Programmable controller type	Remote I/O module is supported.	–
	Ethernet adapter module configuration tool	Ethernet adapter module configuration tool is supported.	Section 17.8
	Label	The Read from CSV File and Write to CSV File functions are supported.	(Simple) (Structured)
	Device comment	Bit-specified word device comments are supported by Universal model QCPU.	Section 9.2.1 Section 12.1.3
	Ladder	The template function in the inline structured text program is supported.	(Structured)
		The drag-and-drop operation from the ladder editor is changed.	Section 14.6.2
	SFC	"Act at Block Multi-Activated" can be set for Universal model QCPU.	(Simple)
	ST	The menu title [Create Template] is changed to [Display Template].	(Structured)
	Structured Ladder	The line connection function in "Select Mode" is supported.	(Structured)
		The automatic line connection function when entering elements is supported.	(Structured)

Version	Major function added/ changed	Description	Reference
Version 1.40S	Compile	A compilation error does not occur when the same name is used for label name and data name.	–
		The option to check whether devices are used exceeding the device range assigned to labels in the data transfer instruction such as DMOV is added.	Section 21.2
	Opening existing projects	Projects in the workspace folder/project folder which is copied or moved using Windows® Explorer can be forcibly opened.	Section 4.2.2
	Opening projects in other formats	GX Developer option setting "Copy source/display source of reference during comment edit" is utilized to GX Works2 option setting: "Program Editor" ⇒ "Ladder/SFC" ⇒ "Comment" ⇒ "Reference of Device Comment".	Section 4.7.1
	Verify	Intelligent function module parameters (initial setting, auto refresh), QD75/LD75 positioning module set data can be verified in the following verification function. • Project verification • Revision verification • Programmable controller CPU data verification	Section 4.2.7 Section 4.6.5 Section 12.2
	Parameter	The extended setting of step relay (S device) is supported by Universal model QCPU.	–
		"CC IE Control Ext. Mode (Control station)" and "CC IE Control Ext. Mode (Normal Station)" are added.	–
		The loopback function setting is added to the supplementary setting of CC-Link IE Field.	–
	Cross Reference	The Cross Reference window can be displayed vertically.	Section 10.1
	Find/Replace	The focus is not moved to the editor side after executing the search/replace function.	Section 10.3.1 Section 10.3.2 Section 10.3.3 Section 10.3.4
		The device search/replace function can be executed for indexed devices without canceling "Digit" or "Double Word" option.	Section 10.3.1
		The search function can be executed on different items when the devices are being displayed on the ladder editor.	–
		Find Device, Replace Device, Find Instruction, Replace Instruction, Change Open/Close Contact, and Device Batch Replace functions are supported by the inline structured text function.	Section 10.3
	Online Program Change	SFC block Online program change is supported by Universal model QCPU.	Section 12.9.1
	Simulation function	Local device data can be read.	Section 12.12
	Global label	System labels are supported by FX3G, FX3U, and FX3UC.	(Simple) (Structured)

Version	Major function added/ changed	Description	Reference
Version 1.48A	Intelligent function module	QD65PD2 and LD77MH16 are supported.	(Intelligent)
	Navigation window	• Titles set in the property are displayed on the Navigation window. • The color of the characters on the title bar is displayed in red when an uncompiled data exists.	Section 3.2.5
	Open other project	The secured steps for Online program change and the writing range of device comment set in GX Developer can be utilized.	Section 4.7.1
	Transfer setting	CC-Link IE Field Network board is supported.	Section 2.2 Section 2.3 Section 11.1
		Ethernet connection between personal computer and GOT is supported.	Section 11.9.1 Section 11.9.2
	Device comment	Sample comments of input/output signals can be utilized for intelligent function module.	Section 9.5.2
	Ladder	• The number of displayed contacts in a ladder program can be set to 13, 17, or 21 contacts. • For FXCPU Simple project (with labels), execution program can be divided into multiple programs.	(Simple)
	Verify	The following functions are supported on the Verify Result screen. • Copy data • Write data to CSV file	Section 4.2.7
	Print	The following information can be added when printing a ladder program. • Device comment • Statement/note • Contact/coil usage destination	Section 20.8.1
		The print preview and the print functions are supported on the Device List screen.	Section 20.9 Section 20.7
	Cross reference	For project without labels, a device on which the cursor is placed in the program editor can be searched automatically.	Section 10.1
	Write to PLC/Online program change	• 'High-speed mode' is supported when writing symbolic information to a programmable controller CPU. • A default setting of target memory can be set in the option setting for Online program change.	Section 12.1.5
	Watch window	• The automatic registration function is supported. • The list of devices/labels registered to Watch window can be write to/read from CSV files.	Section 14.6.2 Section 14.6.4
	PLC diagnostics	When the error jump is executed from the PLC Diagnostics screen, the PLC Diagnostics screen is down sized to be able to specify the error location in the program easily.	Section 18.1
	Intelligent function module tool	• The monitoring function (positioning monitor) dedicated to QD75/LD75 positioning module is supported. • The user protocol library function is supported for the predefined protocol support function.	(Intelligent)
	Language selection	Characters of the following languages are not corrupted by selecting a project language. • English • Chinese (simplified characters) • Korean	Section 3.3 Appendix 18

Version	Major function added/ changed	Description	Reference
Version 1.53F	Incorporation with GX Developer	GX Developer can be installed at the same time as installation of GX Works2.	Appendix 14
		GX Developer is used for the following functions when the programmable controller type is not supported by GX Works2. • Creating a new project • Opening a project • Opening a project in other formats • Creating a new project with data read from programmable controller CPU	Section 4.2.1 Section 4.2.2 Section 4.7.1
	Intelligent function module	QJ71MT91 and QJ71MB91 are supported.	(Intelligent)
	Ladder	Changes of function block names and deletions of function blocks are automatically applied to the target program.	–
		Changes of the function block label setting are applied to the target program at compilation.	–
	SFC	When copying and pasting SFC block data, whether to overwrite block data with the same block number, or to add data with unused block number can be selected.	–
	Structured Ladder	Operability of the Label Registration/Selection screen is improved.	(Structured)
	Print	The print function to batch print project data is supported.	Chapter 20
		The print preview and the print functions are supported on the Cross Reference screen.	Section 10.1
	Parameter	In the network parameter, "CC IE Field (Master Station)" and "CC IE Field (Local Station)" are supported by LCPU.	Section 6.3
	Search/Replace	The search/replace function can be executed for digit-specified bit devices, devices with index setting, and devices with indirect specification. Note that either a searched device or a replaced device needs to be a label when replacing devices.	Section 10.3
		Devices, instructions, strings, contacts, and coils can be searched from the shortcut menu by right-clicking the ladder editor or SFC (Zoom) editor.	
		The default setting for "Find In" is changed to "(Entire Project)".	
	Debug	The debugging function can be executed during the program simulation.	Section 16.6
	CC IE Field Diagnostics	LJ71GF11-T2 is supported.	Section 18.4
		"Selected Station Communication Status Monitor" function is supported by Ethernet adapter module.	
	Device/label automatic-assign setting	Multiple devices can be set in the device/label automatic assign setting for QCPU (Q mode) and LCPU.	(Simple) (Structured)
	Language selection	The applicability of data names and label names to be used in a language-changed project is checked when selecting the language.	–
		The applicability of language of the data name in a project to which the data is pasted is checked when data are copied between projects.	–

Version	Major function added/ changed	Description	Reference
Version 1.62Q	Project	A project can be overwritten when a project is saved with an existing project name.	Section 4.2.3
		A project can be saved in the single file format.	Section 4.2
	Programmable controller type	L02-P and L26-PBT are supported.	–
	Intelligent function module	Q64TCTTN, Q64TCRTN, Q64TCTTBWN, Q64TCRTBWN, L60TCTT4, L60TCTT4BW, L60TCRT4, and L60TCRT4BW are supported.	(Intelligent)
	Comment	The automatic start function which converts the language at the entry of device comments, statements and notes is supported.	Section 21.2
	Device comment	When a device comment is edited in a ladder or SFC program, the edited information is reflected to the referred device comment.	Section 9.2.2
	Ladder	"Read Mode", "Write Mode", "Monitor Mode", and "Monitor (Write Mode)" are supported.	(Simple)
		Line statements can be displayed on the Navigation window.	
		The initial value for the Enter HLine screen and the Delete HLine screen can be set to "1".	
		Entry or deletion of horizontal line can be stopped at the instruction or vertical line.	
		The option setting to disable the display of note on the Enter Symbol screen when editing a coil instruction is added.	
	SFC	"Read Mode", "Write Mode", "Monitor Mode", and "Monitor (Write Mode)" are supported.	(Simple)
		An SFC diagram and a Zoom editor can be tiled horizontally.	
		The jump step search function is added.	
	Structured Ladder	The display of the programming language name is changed from "Structured Ladder" to "Structured Ladder/FBD".	(Structured)
		The function to display/hide the left power rail is added.	
		Labels and devices assigned to labels can be displayed simultaneously.	
	Label	The program does not become in an uncompiled status even when information in "Comment" and "Remark" is changed.	(Simple) (Structured)
		Cells can be selected and copied on the label editor.	–
	Print	The following data can be batch printed. • Cover • PLC parameter • Network parameter • Structured Ladder/FBD • Device memory • Device initial value • TC setting value • Device list • Cross reference • Project content list • Product information list	Chapter 20
		When printing ladder programs, blank device comment lines are not printed in the default setting.	
	Parameter	The simple PLC communication setting is supported by LCPU.	Section 6.1
		The serial communication setting is supported by QnUD(H)CPU.	Section 6.1.1
	Device List	When searching for devices in a specified program, device comments can be entered in the device list.	Section 10.2
		When searching for devices in a specified program, device comments of devices which are not used in the program can be deleted.	

Version	Major function added/ changed	Description	Reference
Version 1.62Q	Search/Replace	The function to search/replace devices/labels/instructions downward from the top of the editor is added.	Section 10.3
		Data can also be searched in other programs in the project with the space key search function on the ladder editor.	(Simple)
	Write to PLC/Read from PLC	Symbolic information can be written to/read from a programmable controller CPU with FX3U/FX3UC version 3.00 or later.	Section 12.1
	CC IE Field Diagnostics	The configuration including CC-Link IE Field Network communication units can be diagnosed.	Section 18.4
	Block password	Execution programs can be protected on FX3U/FX3UC version 3.00 or later.	Section 4.12
	Intelligent Function Module Tool	The sensor correction function of temperature control module is supported.	(Intelligent)
	Help	The MELSOFT help function is supported.	Section 3.4
Version 1.64S	Product Makeup	Data are supplied with two CD-ROMs.	GX Works2 Installation Instructions
	Operation Environment	Required HDD free space for the installation is changed to 2.5GB or more.	
	Intelligent Function Module	QD75P1N, QD75P2N, QD75P4N, QD75D1N, QD75D2N, and QD75D4N are supported.	(Intelligent)
	Print	• Print job output can be selected. • Print conditions for device memory data are added. • Whether to print or not to print 'start destination block' can be selected on the SFC block list. • Setting values of timer, retentive timer, and counter can be printed according to devices when printing TC setting values.	Chapter 20
	Parameter	• For LCPU, "Branch Module" can be selected for the I/O assignment setting on PLC parameter.	Section 6.1.1
	Intelligent Function Module Data	QD75/LD75 positioning module data can be saved to/read from the file.	(Intelligent)
	Device comment	• For LCPU, bit-specified word device comment is supported. • Device comments can be saved to/read from the file.	Section 9.2.1 Section 12.1.3
	Transfer setting	A personal computer can be connected to a programmable controller CPU via a phone line.	Section 11.10

	Verify	For QCPU (Q mode)/LCPU, the following functions are supported.
		• The following data can be verified when verifying projects or revisions.
		  • Device comment
		  • Device memory
		• The following data can be verified when verifying programmable controller data.
		  • Device comment
		  • Device memory
		  • File register
			Section 4.2.7
			Section 4.6.5
			Section 12.2

	System monitor	For LCPU, extension blocks can be monitored.	Section 18.8

Version	Major function added/ changed	Description	Reference
Version 1.73B	Intelligent Function Module	• Q64ADH is supported. • A parameter item is added for Q62HLC.	(Intelligent)
	Transfer Setup	For FX3U and FX3UC, programmable controller CPU connections via CC-Link are supported.	Section 11.3
		For FXCPU, the Ethernet connection between a personal computer and a GOT is supported.	Section 11.9
	Ladder	• Ladder blocks can be pasted consecutively with incremented device numbers on the ladder editor. • Ladder programs can be saved to/read from CSV files in list format	(Simple)
	SFC	• SFC blocks can be copied/pasted on the SFC block list. • SFC diagrams can be converted in SFC block unit.	
	Structured Ladder	Function blocks of ladder program can be used in a Structured Ladder program, and function blocks of Structured Ladder program can be used in a ladder program.	(Structured)
	Parameter	• Station information of CC-Link is displayed graphically on the CC-Link configuration window. • Assignment information of CC-Link refresh devices can be checked easily on the Acknowledge CC-Link Device Assignment window. • Default parameters can be set in batch to the PLC parameter and the network parameter.	Section 6.3.3 Section 6.3.5 Section 6.7
		For FXCPU, the CC-Link setting is supported by the network parameter.	Section 6.3
		The I/O assignment setting and the acknowledge XY assignment of PLC parameter can be saved to CSV files.	Section 6.6
	Device comment	Device comment data being displayed can be deleted in batch.	Section 9.3.2
	Cross reference	• For Simple projects (with labels), the time to create cross reference information can be reduced by selecting "Fast Find". Cross reference information can be created even when a program is uncompiled. • Cross reference of SFC program block information is supported. • Elements of instructions in which devices are used in a ladder program can be displayed.	Section 10.1
	Device List	The device points to be searched can be selected.	Section 10.2
	Write to PLC	The number of characters of device comment to be written can be specified when writing data to a programmable controller CPU.	Section 12.1.3
	Monitoring	• The Entry Ladder Monitor function to monitor registered ladder blocks is supported by Simple project (without labels). • For QCPU (Q mode)/LCPU, monitoring condition/monitoring stop condition can be set.	(Simple)
	CC-Link/ CC-Link/LT Diagnostics	• For FXCPU, the CC-Link/CC-Link/LT diagnostic is supported.	Section 18.5
	Write/read IC memory card data	• A password can be set to data when writing data to an IC memory card. • Data can be written to/read from an IC memory card by specifying a folder. • Symbolic information can be written to/read from an IC memory card.	Section 12.11.1
	Options	The setting to enable compilation when opening a project contains ST programs of GX Developer is added.	Section 21.2
	Merge Data	Multiple ladder program data or device comment data can be merged and added to the project.	Section 4.3.5
	Intelligent function module data	The Setting item reduction mode can be set for the auto refresh parameter of temperature control.	(Intelligent)

Version	Major function added/ changed	Description	Reference
Version 1.77F	Programmable controller type	FX3GC is supported.	–
	Intelligent function module	Q68CT, LD75P1, LD75P2, LD75D1, LD75D2, QD77MS2, QD77MS4, and QD77MS16 are supported.	(Intelligent)
	Parameter	The IP Packet Transfer setting can be set on the <<Built-in Ethernet Port Setting>> tab of PLC parameter.	Section 6.1.1
		• CC IE Field (sub-master station) is supported by Universal model QCPU in the network parameter. • The IP Packet Transfer setting can be set in the network parameter for Built-in Ethernet port QCPU in CC-Link IE Field Network.	Section 6.3.1
		The operation at reconnection can be set in "Network Configuration Settings" for Universal model QCPU when "CC-IE Filed (Master Station)" is selected for "Network Type".	–
	Intelligent function module data	Positioning module data can be saved as a GX Configurator-QP format project file.	(Intelligent)
	Label	• Labels can be sorted in ascending or descending order. • Blank rows below the last row to which the label is set on the label setting editor can be deleted to a single blank row.	(Simple) (Structured)
	Read from PLC	When a project, in which the setting of "Compile" under [Tool] ⇒ [Options] has been changed, is read from a programmable controller CPU, the project will not be an uncompiled project.	–
	CC IE Field Diagnostics	Sub-master stations are supported.	Section 18.4
		The IP communication test is supported.	Section 18.4.2
Version 1.87R	Toolbar	Editing screens can be displayed from the toolbar in Simple projects.	Section 3.2.2
	Navigation window	Tasks in a program file can be sorted in the execution order.	Section 3.2.5
	Open other project	• For QCPU (Q mode)/LCPU, GX Developer projects with GX Works2 invalid characters can be opened. • SFC block names are set with sequential number without appending a program name. • A project can be opened with the connection destination settings saved in the GX Developer format.	Section 4.7.1
	Device Memory	Device values can be set by specifying a device range on the cell	Section 7.2.2
	Device comment	The setting method of "Specify the reference/reflection" is improved.	Section 9.1.1
		The number of points of device comment that can be set in the project can be extended.	Section 9.4
		Applicable number of characters to be entered is limited for the device comment editing mode.	Section 9.2.2
	Find/Replace	Block information set on the Property screen of SFC block can be searched.	(Simple)
	Ladder	• Labels and devices can be displayed simultaneously. • Detailed information of the label can be displayed with the tooltip when the cursor is placed on the label. • List of instructions/labels and tooltip for instructions can be displayed/hide when entering an element. • Device comments can be copied and pasted along with the copied elements. • Programs in ladder block unit can be displayed/edited in the list format. • The cursor position does not change when switching the mode to "Read Mode", "Write Mode", "Monitor Mode", or "Monitor (Write Mode)" in the ladder editor.	
		A function block can be called from a function block in the ladder program.	(Structured) (FB)

Version	Major function added/ changed	Description	Reference
Version 1.87R	SFC	• SFC step/transition comments can be pasted along with the copied blocks on the SFC block list. • Text size on the editing screen can be changed. • The comment or the step number on the Enter SFC Symbol screen can be displayed as it is in selected status when changing the SFC symbol in MELSAP3.	(Simple)
	Inline structured text	The compilation result can be displayed from the shortcut menu.	
	ST	The compilation result can be displayed from the shortcut menu.	(Structured)
	Structured Ladder	• The compilation result can be displayed from the shortcut menu. • The tool button to connect lines automatically is added.	
	Security	Access authority of multiple items can be set in batch.	Section 4.10.4
	Block password	A block password can be set for POUs in batch.	Section 4.12.1
	Cross Reference	• Devices set in simple PLC communication setting of PLC parameter can be searched. • A search range can be specified in program file unit. • Block start steps of SFC blocks can be searched. • The setting to search devices other than the start device is added under "Find Condition" on the <<Condition Setting>> tab.	Section 10.1
	Device List	• Devices set in simple PLC communication setting of PLC parameter can be searched. • All SFC blocks are searched when an SFC program is set for the search location.	Section 10.2
	Monitor	• The display format can be changed by the button on the Device/Buffer Memory Batch Monitor screen. • Device comments of monitored devices can be displayed on the Device/Buffer Memory Batch Monitor screen.	Section 14.3
		Devices and labels on the SFC editor window are automatically registered to the Watch window.	Section 14.6.2
	Options	The setting in which the program cache memory is checked and automatically fixed when a program is written to a programmable controller CPU is added.	Section 21.2
		For FXCPU, the following option can be set. When reading a project saved with GX Works 2 which does not support the following option, the item is selected. [Tool] ⇒ [Options] ⇒ "PLC Read/Write" ⇒ "When writing to PLC after a Rebuild All operation, clear the device ranges set in the Device/Label Auto-Assign setting to 0."	Section 12.1.7 Section 21.2 (Simple) (Structured)
	Read from PLC	Programs which are closed when performing the read from PLC function are reopened.	–
	Installation	When upgrading GX Works2, the information of color and fonts of the previous version is retained.	–

Version	Major function added/ changed	Description	Reference
Version 1.87R	Programmable controller type	For Simple project (without labels), Q02PH, Q06PH, Q12PH, Q12PRH, Q25PH, and Q25PRH are supported.	–
	Intelligent Function Module	QD73A1 is supported.	(Intelligent)

	Verify	For FXCPU, the following functions are supported.
		• The following data can be verified when verifying programmable controller data, projects, or revisions.
		  • Device comment
		  • Device memory
			Section 4.2.7
			Section 4.6.5
			Section 12.2

	Saving projects in other formats	A project in GX Developer format can be saved along with the connection destination settings.	Section 4.8
	Transfer Setup	For FX3G and FX3GC, a programmable controller CPU can be connected via CC-Link.	Section 11.3
	Write/read IC memory card data	For LCPU, projects can be saved on/loaded from SD memory card using the batch save/batch load function.	Section 12.11.2
	Print	The print function can be activated from the toolbar or the shortcut menu.	Chapter 20
		The following data can be printed in batch. • Redundant parameter • Program setting • User library content list	
		User libraries can be printed for the following print items. • ST • Structured Ladder/FBD • FB/FUN program • Label	
		For MELSAP3 and MELSAP-L, SFC block lists of Structured project can be printed.	Section 20.5.8 Section 20.5.9
		SFC program settings can be printed when "Property (SFC Program)" is selected under SFC Diagram Print Item for printing MELSAP3 or MELSAP-L.	
	Parameter	The following functions are added to the I/O assignment setting. • The I/O assignment setting and the base setting can be set by selecting a programmable controller type, module, and module type. • Intelligent function module data on the Navigation window are updated regarding added/deleted/changed modules.	Section 6.1.1 (Intelligent)
		The editing operations (Undo/Cut/Paste) can be performed on the MELSECNET/CC IE/Ethernet Module Configuration screen.	Section 6.3
		A number of columns to be displayed on the Setting for the CC-Link List screen can be changed to either 4 or 2 columns according to the option setting.	
		A number of rows to be displayed on the CC-Link station information screen can be changed to either 16 or 8 rows according to the option setting.	Section 6.3.1
		A station number can be set for local station in the CC-Link IE setting of a program.	
		The operability of the CC-Link configuration window is improved.	Section 6.3.3
	Label	Unused labels can be extracted and batch deleted.	(Simple)
		Devices assigned to structure are not cleared even when elements of structure are changed on the Structure Setting screen.	(Simple) (Structured)
	Color and Font	The import and export functions are added.	Section 3.2.7
	Help	FXCPU instruction help is supported by the GX Works2 help function.	Section 3.4.1

Version	Major function added/ changed	Description	Reference
Version 1.87R	Intelligent function module tool	Waveform output data can be created for analog module L60DA4.	(Intelligent)
	Structured Ladder/FBD or ST	Step relay devices can be monitored.	(Structured)
	Global label	• The operability of system label registration/deregistration is improved. • For structures registered to data type of system label, elements of structure can be added and comments can be edited. • Structure array can be used for system label.	(Simple) (Structured)
Version 1.91V	Programmable controller type	For Simple project (with labels), Process CPU (Q02PH, Q06PH, Q12PH, Q25PH) and Redundant CPU (Q12PRH, Q25PRH) are supported.	–
	Toolbar	All toolbars can be displayed. The display positions of toolbars can be maintained.	Section 3.2.2
	Transfer Setup	For FX3G, FX3GC, FX3U, and FX3UC, a CPU can be connected via Ethernet adapter.	Section 11.2.2
	Intelligent Function Module	• Energy measuring modules (QE81WH, QE81WH4W, QE82LG, QE83WH4W, and QE84WH) are supported. • The number of parameter settings for the initial setting of temperature control modules (Q64TCTTN, Q64TCTTBWN, Q64TCRTN, and Q64TCRTBWN) is added by 1.	(Intelligent)
	Device comment	A target memory to write data to a programmable controller CPU can be specified in advance.	Section 12.1.6
	Instruction	• For Universal model QCPU and LCPU, the data write/read instruction for devices targeted for auto-refresh is supported. • For Universal model QCPU (excluding Q00UJ, Q00U, Q01U, and Q02U), programs with motion dedicated instructions (Command generation axis speed change during positioning or JOG operation, Present value change of stopped command generation axis) can be used.	–
	Parameter	The Ethernet adapter setting is supported by FX3G, FX3GC, FX3U, and FX3UC.	Section 6.1.1
	Network Parameter	Network configuration of CC-Link IE Field Network can be set graphically on the CC IE Field configuration window.	Section 6.3.2
		Parameter data set on the CC-Link configuration window can be copied.	–
	Global label	Duplications of device names assigned to global labels can be checked.	(Simple) (Structured)
		Registered system labels can be deleted.	–
	Ladder	• When "A-PLC Compatibility Setting" on the <<PLC System>> tab of PLC parameter is not selected, entries of special relays/ special registers can be checked on the Enter Symbol screen and the Enter List screen. • The [Undo] operation can be performed up to 30 times when editing a program on the ladder editor. • Device comments can be displayed/hidden using tooltips on the ladder editor.	(Simple)
	SFC	• The number of contacts to be displayed on a single rung can be changed on the SFC (Zoom) editor window. • The window display operations of the SFC editor window and the Zoom editor window are linked. • Device comments can be displayed/hidden using tooltips on the Zoom editor window.	

Version	Major function added/ changed	Description	Reference
Version 1.91V	ST	• VAR_OUTPUT can be used for an argument of function block.	(Simple) (Structured)
		• Device names, monitored values, and device comments can be checked using tooltips on the ST editor.	(Structured)
	Structured Ladder/FBD	Device comments can be checked using tooltips on the Structured Ladder/FBD editor.	
	Compile	The usage of automatically assigned devices is displayed after programs are compiled.	(Simple) (Structured)
	Verify	Among the rows with mismatched devices in programs/program files of project with labels, the cursor skips the rows whose mismatched devices are within the range of devices automatically assigned to labels.	Section 4.2.7 Section 4.6.5
	Cross Reference	Constant (K) and constant (H) can be specified and searched for devices/labels.	–
		• Two or more search locations can be selected. • The search result can be displayed in the order of program setting.	Section 10.1
	Device List	• Items (contacts, coils, etc.) can be displayed/hidden. • Two or more search locations can be selected.	Section 10.2
		The default setting for "Find In" is set as "Current window".	–
	Find/Replace	Devices, such as pointers, which are not related to the search option can be searched disregarding the option setting such as "Digit" and "Multiple word".	Section 10.3.1
		Two or more search locations can be selected.	Section 10.3
	Online Program Change	For Universal model QCPU (excluding Q00UJ/Q00U/Q01UCPU)/ LCPU, the changes can be applied to the boot source after performing Online program change.	Section 12.9.1
	Monitor	ON/OFF status of device names of contacts/coils can be displayed with the monitoring function of ladder program.	(Simple)
	Sampling Trace	• CSV files can be output in the format which can be used to read data from GX LogViewer. • Changes on global device comments or label comments of global labels/local labels are applied to device comments or label comments on the Sampling Trace screen. • After data under the "Device/Label" column is edited on the Sampling Trace screen, the cursor moves to the next row. • Two or more data can be selected to be copied or to change settings of trend graph registration on the Sampling Trace screen. • When scrolling vertically on the Sampling Trace screen, the vertical axis information line is not scrolled. • The cursor jumps to the specified position by entering a value to the cell of 'currently selected number of data acquisitions'. • The setting to cancel the display of the confirmation message at the sampling trace start is applicable. • The trace result on the Sampling Trace screen can be scrolled using the shortcut keys.	Section 16.4
	Ethernet Diagnostics	The Ethernet adapter diagnostics is supported by FX3G, FX3GC, FX3U, and FX3UC.	Section 18.6 Section 18.6.2 Section 18.6.3
	CC IE Field Diagnostics	• Remote device station is supported. • The display of data link unexecuted stations is modified.	Section 18.4
	CC-Link/ CC-Link/LT Diagnostics	The CC-Link diagnostics is continued on CC-Link modules mounted on the slots following the empty slot on the extension base unit.	Section 18.5
	System monitor	Q24DHCCPU-V can be monitored with QCPU (except for Q00JCPU and Q00UJCPU).	Section 18.8
	Merge Data	Information of "Target Data List" can be displayed on tooltips.	Section 4.3.5

Version	Major function added/ changed	Description	Reference
Version 1.98C	Programmable controller type	• High-speed Universal model QCPU (Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV) is supported. • L02S, L06, L26, and LJ72MS15 are supported. • For Structured project, Process CPU (Q02PH, Q06PH, Q12PH, Q25PH) and Redundant CPU (Q12PRH, Q25PRH) are supported.	–
	Transfer Setup	For FXCPU, the GOT (Ethernet) transparent function is supported.	Section 11.9.1
	Intelligent Function Module	• L60AD4-2GH, Q64DAH, QD77GF16, QJ51AW12AL, and LJ51AW12AL are supported. • The auto refresh item is added for QD77MS2, QD77MS4, and QD77MS16.	(Intelligent)
	Security	For High-speed Universal model QCPU (Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV), projects and programmable controller CPUs can be locked/unlocked with security keys.	Section 4.11 Section 13.5
	Menu	Menu names and positions are unified between GX Works2 and iQ Works.	–
	Parameter	For LCPU, the IP packet transfer setting on the <<Built-in Ethernet Port Setting>> tab of PLC Parameter is supported.	Section 6.1.1
		• For Universal model QCPU, the network operation setting is supported by the CC IE Control network parameter. • For LCPU, Ethernet can be set in the network parameter. • For LCPU, CC IE Field (Sub-Master Station) is supported by the network parameter. • For LCPU, the IP address setting is supported by "Network Operation Settings" of CC-Link IE Field Network parameter (master station, sub-master station).	Section 6.3.1
		• Network configuration of AnyWireASLINK can be set graphically on the AnyWireASLINK configuration window. • The configuration of the actual system connected to CC-Link can be applied to the CC-Link configuration window.	Section 6.3.3
		For Universal model QCPU, CC IE Field (motion master station) is supported in the network parameter.	–
	Write to PLC	The set values of XY devices can be written when writing data to a programmable controller CPU on which the simulation function is in operation.	Section 12.1.2
	Block password	For FXCPU, a block password can be set for POUs in batch.	Section 4.12.1
	Ladder	• For FXCPU, programs in ladder block unit can be displayed/ edited in the list format. • The different sections of the same program can be monitored simultaneously using the reference window of the ladder editor. • The cursor position can be jumped to the position where the next specified device/label is used only with the shortcut key.	(Simple)
		• Inline structured text programs can be called from function blocks created in ladder programs. • Function blocks created in ST programs can be called from function blocks created in ladder programs.	–
	SFC	For FXCPU, SFC diagrams can be converted in SFC block unit.	(Simple)
	ST	Monitoring conditions can be set.	(Structured)
	Structured Ladder/FBD	• Temporary arguments can be assigned for the arguments when calling function blocks in Structured project. • Monitoring conditions can be set.	
	CC IE Control Diagnostics	The IP communication test is supported.	Section 18.3
	CC IE Field Diagnostics	CC-Link IE Field Network CC-Link Bridge module, CC-Link IE Field Network High Speed Counter module, and Simple Motion module are supported.	Section 18.4
	Ethernet Diagnostics	L series Ethernet module is supported.	Section 18.6.1

Version	Major function added/ changed	Description	Reference
Version 1.98C	Sensor/Device Monitor	Sensors and equipments on AnyWireASLINK or CC-Link can be monitored.	Section 18.7
	Print	Operation outputs and transition conditions can be appended on the print of SFC diagram.	Section 20.5.8
	Intelligent function module tool	Waveform output data of QCPU (Q mode) can be created for analog module Q64DAH.	(Intelligent)
	FB library	For QCPU (Q mode)/LCPU Simple project (with labels), FBs created in another project can be added to the project being edited on the Install screen.	(FB)
	Unused label list	For Structured project, extracted unused labels can be deleted in batch.	(Structured)
	Cross reference	When the Auto-tracking mode is selected, cross reference information can be updated only when the cursor is moved by clicking the mouse or pressing the key.	Section 10.1.2
	Watch	The display format (numerical display (1/0)/ ON/OFF display/ symbol display (●/○)) of the current value of bit device can be changed.	Section 14.6.4
	Monitor	The program can be verified with the program on the programmable controller CPU before starting the monitoring of the Structured Ladder/FBD editor or the ST editor.	(Structured)
	Intelligent function module monitoring	For QD73A1, the required items for the accumulated pulse error detection function can be monitored.	–
	Shortcut key customize	The template on which the MEDOC format shortcut keys can be set is added.	Section 3.2.8
	Options	For QCPU (Q mode)/LCPU, by setting the reference/reflection targets of device comments for 'PLC parameter setting', device comments can be referred/reflected according to the range of local devices specified on the <<Device>> tab of PLC parameter.	Section 21.2

Appendix 13 Supported Versions of Modules

Q CPU L CPU Remote Head FX

The following table shows the modules which are supported according to the upgrades.
Modules can be used in the corresponding and later versions of GX Works2.

Supported version	Supported module	
	CPU module/Remote I/O module/ Communication head module	Intelligent function module
Version 1.05F	Q02(H), Q02U, Q03UD, Q03UDE, Q04UDH, Q04UDEH, Q06H, Q06UDH, Q06UDEH, Q12H, Q13UDH, Q13UDEH, Q25H, Q26UDH, Q26UDEH	• Analog Q64AD, Q68ADV, Q68ADI, Q64AD-GH, Q62AD-DGH, Q68AD-G, Q66AD-DG, Q62DAN, Q64DAN, Q68DAVN, Q68DAIN, Q62DA, Q64DA, Q68DAV, Q68DAI, Q62DA-FG, Q66DA-G • Temperature input Q64RD, Q64RD-G, Q64TD, Q64TDV-GH, Q68TD-G-H01, Q68RD3-G • Temperature control Q64TCTT, Q64TCTTBW, Q64TCRT, Q64TCRTBW, Q62HLC • Counter QD62, QD62E, QD62D, QD63P6, QD64D2, QD60P8-G • QD75 type positioning QD75P1, QD75P2, QD75P4, QD75D1, QD75D2, QD75D4, QD75M1, QD75M2, QD75M4, QD75MH1, QD75MH2, QD75MH4 • QD70 type positioning QD70P4, QD70P8, QD70D4, QD70D8, QD72P3C3 • Serial communication/modem interface QJ71C24N, QJ71C24N-R2, QJ71C24N-R4, QJ71C24, QJ71C24-R2, QJ71CMON, QJ71CMO • AS-i master QJ71AS92 • FL-net (OPCN-2) interface QJ71FL71-F01, QJ71FL71-T-F01, QJ71FL71-B2-F01, QJ71FL71-B5-F01, QJ71FL71, QJ71FL71-T, QJ71FL71-B2, QJ71FL71-B5
Version 1.08J	Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, Q20UDEH	• Temperature input Q68TD-G-H02
	FX0, FX0S, FX0N, FX1, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3U, FX3UC	–
Version 1.12N	Q00J, Q00, Q01	• Analog Q64AD2DA, Q61LD
Version 1.15R	–	–
Version 1.24A	L02, L26-BT	• Analog L64AD4, L60DA4 • Serial communication LJ71C24, LJ71C24-R2
Version 131H	Q50UDEH, Q100UDEH	–
	LJ72GF15-T2	• Counter LD62, LD62D • LD75 type positioning LD75P4, LD75D4 • Simple motion LD77MH4
Version 1.40S	QJ72LP25, QJ72BR15	–

Supported version	Supported module	
	CPU module/Remote I/O module/ Communication head module	Intelligent function module
Version 1.48A	–	• Counter QD65PD2 • Simple motion LD77MH16
Version 1.53F	–	• MODBUS® interface QJ71MT91, QJ71MB91
Version 1.62Q	–	• Temperature control Q64TCTTN, Q64TCRTN, Q64TCTTBWN, Q64TCRTBWN,
	L02-P, L26-PBT	• Temperature control L60TCTT4, L60TCTT4BW, L60TCRT4, L60TCRT4BW
Version 1.64S	–	• QD75 type positioning QD75P1N, QD75P2N, QD75P4N, QD75D1N, QD75D2N, QD75D4N
Version 1.73B	–	• Analog Q64ADH
Version 1.77F	–	• Analog Q68CT • Simple motion QD77MS2, QD77MS4, QD77MS16
	–	• LD75 type positioning LD75P1, LD75P2, LD75D1, LD75D2
	FX3GC	–
Version 1.87R	Q02PH*1, Q06PH*1, Q12PH *1, Q25PH*1, Q12PRH*1, Q25PRH*1	• QD70 type positioning QD73A1
Version 1.91V	Q02PH*2, Q06PH*2, Q12PH*2, Q25PH*2, Q12PRH*2, Q25PRH*2	• Energy measuring QE81WH, QE81WH4W, QE84WH, QE83WH4W, QE82LG
Version 1.98C	Q02PH*3, Q06PH*3, Q12PH*3, Q25PH*3, Q12PRH*3, Q25PRH*3, Q03UDV, Q04UDV, Q06UDV, Q13UDV, Q26UDV	• Analog Q64DAH • Simple motion QD77GF16 • AnyWireASLINK interface QJ51AW12AL
	L02S, L06, L26, LJ72MS15	• Analog L60AD4-2GH • AnyWireASLINK interface LJ51AW12AL

*1 : Simple projects (without labels) are supported.
*2 : Simple projects are supported.
*3 : Simple projects and Structured projects are supported.

Appendix 14 Procedure to Use GX Works2 Unsupported Programmable Controller Type

Q CPU L CPU Remote Head FX

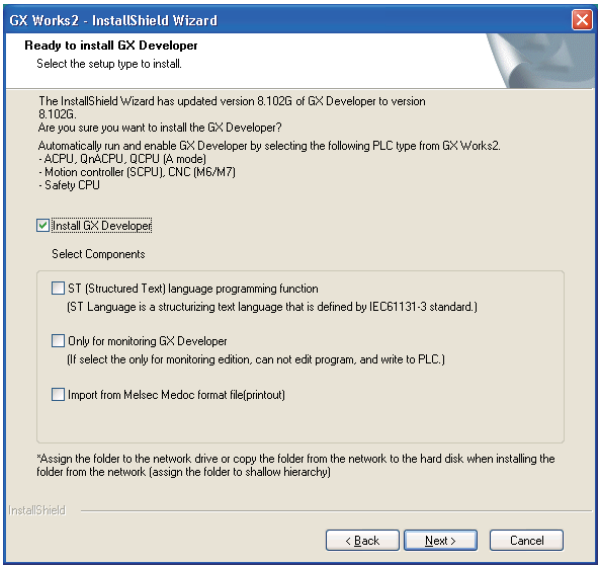
For programmable controller types which are not supported by GX Works2 (CPUs such as ACPU, QnACPU, and Safety CPU), use GX Developer.
When GX Developer Version 8.95Z or later is installed, and a new project is created in GX Works2 with a selection of an unsupported programmable controller type, GX Developer starts automatically and a new project is created. (☞ Section 4.2.1)

Appendix 14.1 Installing GX Developer

GX Developer can be installed at the same time as the installation of GX Works2.

Operating procedure

1. **Select "Install GX Developer" on the following screen displayed during the installation of GX Works2.**
   Select the items under "Select Components" as necessary.



2. **Click the Next > button, and continue the installation.**
   GX Developer is installed after GX Works2 is installed.

Point

● **Installing updated version of GX Works2**
When installing GX Developer at the same time as the installation of updated version of GX Works2, the product version of GX Developer needs to be installed in advance.
When the product version of GX Developer is not installed, install GX Developer from the product version CD-ROM, or install GX Developer included on the GX Works2 CD-ROM (Disc 1) before installing the updated version of GX Works2.
For installing GX Developer included on the GX Works2 CD-ROM (Disc 1), refer to Appendix 14.2.

Appendix 14.2 Installing GX Developer separately

GX Developer is included on the GX Works2 CD-ROM.

■ For GX Works2 Version 1.53F or later

The installation file is included in the "GXD1" folder on the CD-ROM (Disc 1). The following is the installation procedure.

Operating procedure

- **Run '\SUPPORT\GXD1\SETUP.EXE' on the CD-ROM (Disc 1).**

  The installation of GX Developer starts.
  For details of the installation procedure, refer to the following manual.
  Use the product ID of GX Works2 for the installation.
  ☞ GX Developer Version 8 Operating Manual (Startup)

■ For GX Works2 Version 1.48A or earlier

The installation file is included in the "Others" folder on the CD-ROM. The following is the installation procedure.

Operating procedure

1. **Copy the GX Developer compressed file on the CD-ROM to the HDD on the personal computer.**

   The path for the GX Developer compressed file on the CD-ROM is "\Others\d8-xxx.dat"*1.

   *1 : "xxx" is an alphanumeric string.

2. **Change the extension of the copied file from "dat" to "exe".**

   The file name is changed from "d8-xxx.dat" to "d8-xxx.exe".

3. **Double-click the "d8-xxx.exe" file and decompress the file to the specified folder.**

4. **Run the decompressed "SETUP.EXE" file.**

   The installation of GX Developer starts.

Appendix 14.3 Utilizing programs of GX Works2 unsupported programmable controller type in GX Works2

Programs of GX Works2 unsupported programmable controller type created with GX Developer can be utilized in GX Works2 by the following procedure.
The following is an example of utilizing an ACPU program created with GX Developer in the QCPU (Q mode) project of GX Works2.

Operating procedure

1. **Change the programmable controller type of the project from ACPU to QCPU (Q mode) with GX Developer.**

   To change the programmable controller type, select [Project] ⇒ [Change PLC type].

2. **Save the project with GX Developer.**

   To save the project, select [Project] ⇒ [Save As].

3. **With GX Works2, read the project for QCPU (Q mode) created with GX Developer.**

   To read a GX Developer project with GX Works2, select [Project] ⇒ [Open Other Data] ⇒ [Open Other Project]. (☞ Section 4.7.1)

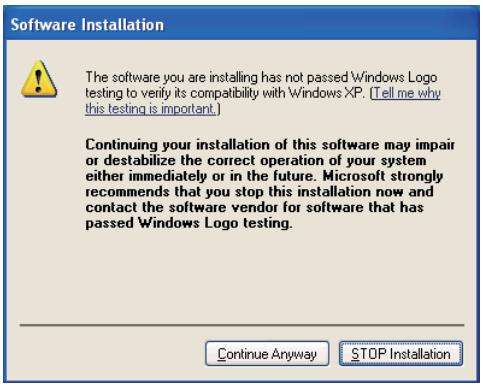
Appendix 15 Considerations of Installation

Q CPU L CPU Remote Head FX

This section explains the considerations of installation.

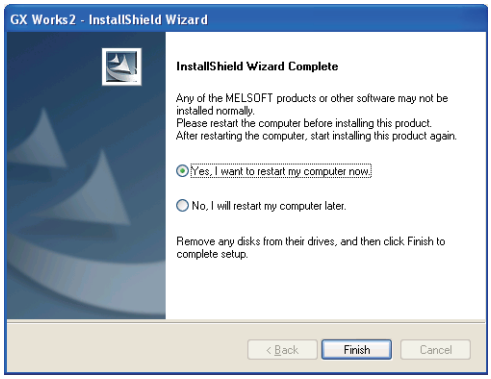
■ Installing a MELSOFT product for the first time

At the first installation of a MELSOFT product, the following screen may be displayed during installation. To continue the installation, click the Continue Anyway button on the Software Installation screen. (We have checked the operation and assured that the system operates without any problems by performing this procedure.)
The Software Installation screen may be displayed behind another screen. Press the Alt + Tab keys to bring it to the front.



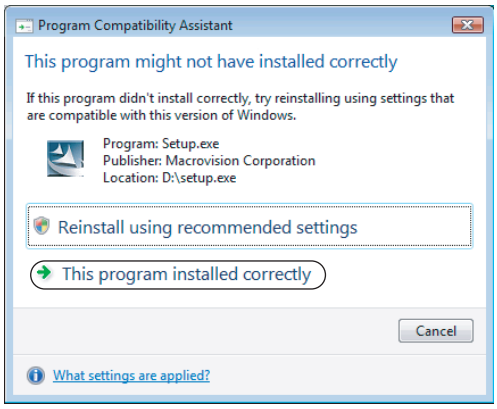
■ Procedure for continuing installation when it is not completed correctly

When the installation of a MELSOFT product or another software is not completed correctly, the following screen is displayed and the installation cannot continue unless the personal computer is restarted.
In this case, restart the personal computer and start the installation again.



■ Considerations when installing on Windows Vista® or Windows® 7

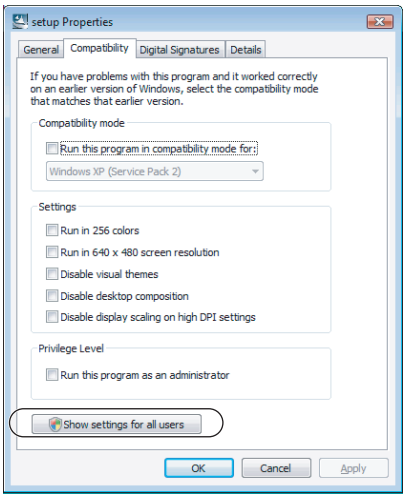
When installing on Windows Vista® or Windows® 7, the following screen may be displayed after the completion of the installation. In this case, select "This program installed correctly" and restart the personal computer.



When "Reinstall using recommended settings" is erroneously selected, the Windows XP SP2 compatibility mode is automatically set. Disable the Windows XP SP2 compatibility mode by following the procedure described below, and perform the reinstallation.

Operating procedure

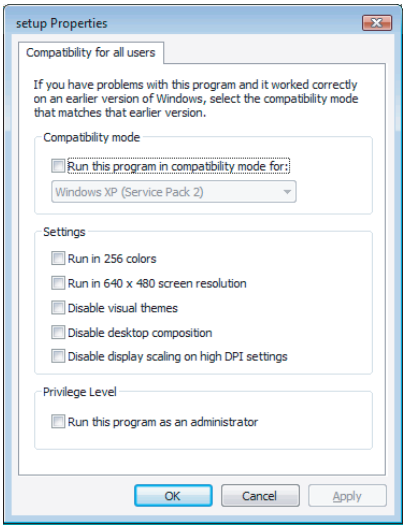
1. **Right-click on the setup.exe icon of the installation target on Windows® Explorer.**
   The setup Properties screen is displayed.



2. **Click the Show settings for all users button on the <<Compatibility>> tab.**

3. **Clear "Run this program in compatibility mode for:" and click the OK button.**

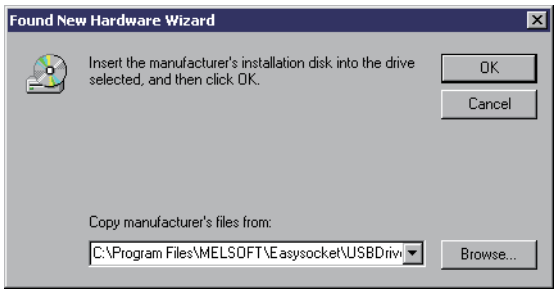
4. **Click the OK button.**



Appendix 16 USB Driver Installation

In order to communicate with a programmable controller CPU via USB, a USB driver needs to be installed.
The following explains the procedure of USB driver installation.
Drivers of FX3U-USB-BD and FX-USB-AW which are supported by FXCPU differ from the USB driver described in this section. For details, refer to Section 2.1.2 and Section 2.1.8.

■ When using Windows® 2000 Professional



Operating procedure

1. **Connect the personal computer and the programmable controller CPU with a USB cable, and then turn on the programmable controller CPU.**

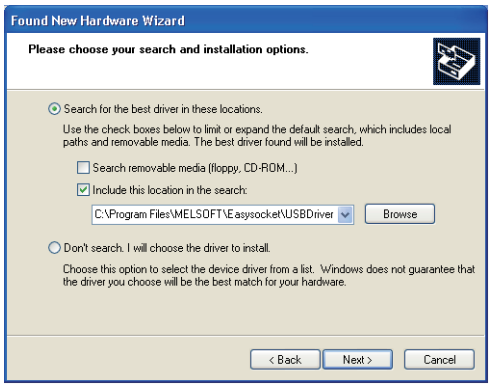
2. **The Found New Hardware Wizard screen is displayed. Select "Specify a location".**

3. **Click the Browse... button and set "Easysocket\USBdrivers" in the folder where GX Works2 has been installed to "Copy manufacturer's files from:", and then click the OK button. If multiple MELSOFT products are installed previously, refer to their installed location.**

Point

● **Considerations when installing USB driver**
If the USB driver cannot be installed, confirm the following Windows® settings.
- If "Block - Prevent installation of unsigned files" is selected under [Control Panel] - [System] - [Hardware] - [Driver Subscription], the USB driver may not be installed.
  Select "Ignore - Install all files, regardless of file signature", or "Warn - Display a message before installing an unsigned files" in [Driver Subscription], and execute the USB driver installation.

■ When using Windows® XP



Operating procedure

1. **Connect the personal computer and the programmable controller CPU with a USB cable, and then turn on the programmable controller CPU.**

2. **The Found New Hardware Wizard screen is displayed. Select "Install from a list or specific location (Advanced)".**

3. **Select "Search for the best driver in these locations" on the displayed screen. Select "Include this location in the search", and then set "Easysocket\USBdrivers" in the folder where GX Works2 has been installed. If multiple MELSOFT products are installed previously, refer to their installed location.**

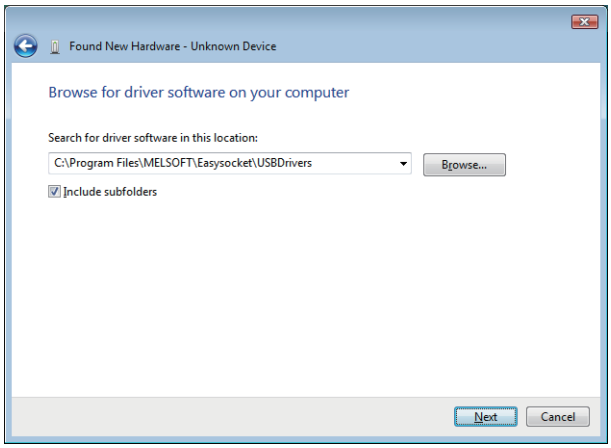
Point

● Considerations when installing USB driver

If the USB driver cannot be installed, confirm the following Windows® settings.

- If "Block - Never install unsigned driver software" is selected under [Control Panel] - [System] - [Hardware] - [Driver Signing], the USB driver may not be installed.
  Select "Ignore - Install the software anyway and don't ask for my approval", or "Warn - Prompt me each time to choose an action" in [Driver Signing], and execute the USB driver installation.

■ When using Windows Vista®



Operating procedure

1. **Connect the personal computer and the programmable controller CPU with a USB cable, and then turn on the programmable controller CPU.**

2. **The Found New Hardware screen is displayed. Select "Locate and install driver software (recommended)".**

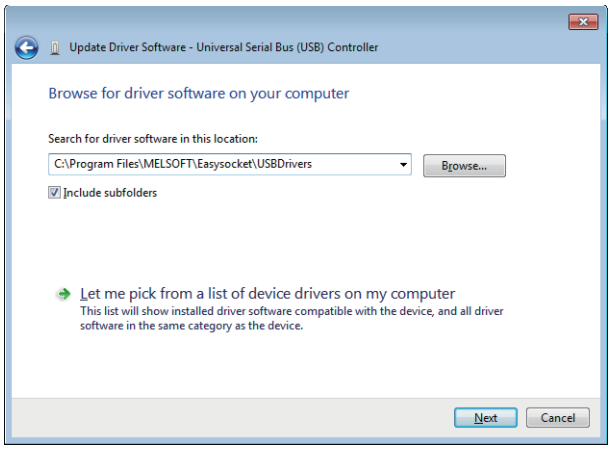
3. **Select "Browse my computer for driver software (advanced)" on the Found New Hardware screen.**

4. **Specify "Easysocket\USBdrivers" in the folder where GX Works2 has been installed on the displayed screen. If multiple MELSOFT products are installed previously, refer to their installed location. Select "Include subfolders".**

Point

● **Considerations when installing USB driver**
When the Windows can't verify the publisher of this driver software screen is displayed during the installation, select "Install this driver software anyway".

■ When using Windows® 7



Operating procedure

1. **Connect the personal computer and the programmable controller CPU with a USB cable, and then turn on the programmable controller CPU.**

2. **From Windows® Control Panel, select [System and Security] - [Device Manager]. Right-click "Unknown device" and click "Update Driver Software".**

3. **The Update Driver Software screen is displayed. Select "Browse my computer for driver software" and specify "Easysocket\USBdrivers" in the folder where GX Works2 has been installed on the displayed screen. If multiple MELSOFT products are installed previously, refer to their installed location.**

Appendix 17 Considerations When Using English Version of GX Works2

Q CPU L CPU Remote Head FX

This section explains the considerations when using project data, which is created in Japanese version of GX Works2, in English version of GX Works2.
Refer to the considerations described in this section when using Japanese version of GX Works2 Version 1.42U or earlier, or English version of GX Works2 Version 1.44W or earlier.
Note that, however, project data created in Japanese version of GX Works2 Version 1.45X or later which satisfy the following conditions can be used in English version of GX Works2 Version 1.48A or later.

- **Data names listed in the section 'Section Appendix 16.1' match with the project language selected for the "Language Selection" function.**
- **The font of the project language selected for the "Language Selection" function is installed in the operating system.**

Use the programmable controller types applicable to English version of GX Works2 when using project data created in Japanese version of GX Works2 in English version of GX Works2.

Appendix 17.1 Data to which double byte character and half-width Japanese kana character are applicable

The following tables show all data to which double byte characters are applicable. When data described in the following table contains a double byte character, any symptom described in Appendix 17.2 occur.
When using Japanese version of GX Works2 Version 1.42U or earlier, or English version of GX Works2 Version 1.44W or earlier, refer to the considerations in Appendix 17.2.
However, if a project data created in Japanese version of GX Works2 satisfies the following conditions, the project can be used in English version of GX Works2 Version 1.48A or later without any symptom described in Appendix 17.2.

- When the language used for data with ○ indicated in the 'Project language is unchangeable' column of the following table matches with the project language set for "Language Selection".
- When the font of the specified project language is installed to the operating system.

Note that; however, when data other than alphanumeric character is used for the data with ○ indicated in the 'Project language is unchangeable' column of the following table, an error occurs at the change of project language for Japanese version of GX Works2 Version 1.45X or later. Change the project language after correcting the data name to match the changed project language.

● Data to which double byte character and half-width Japanese kana character are applicable

○: Unchangeable –: Changeable

Item	Data name	Changeable/ unchangeable project language
Workspace	Workspace name	–
Project	GX Works2 project name	–
	GX Developer project name	–
	Compressed project name	–
	Property (Title/Comment)	–
Project revision	Detailed information (Title/Comment)	–
Program	Program name	○
Ladder, ST, Structured Ladder/FBD, SFC (Zoom)	Statement/Note/Comment/Label name	–
	FB instance name	–
SFC	SFC block name	○
	SFC step/Transition comment	–
	Property (Block information)	–
Parameter	☞ ● PLC parameter data	–
	☞ ● Network parameter data	–
	Property (Title/Comment)	–
Intelligent function module data	☞ ● Intelligent function module data	–
Device comment	Local device comment name	–
	Device comment	–
Device memory	Device memory name	–
	Property (Title/Comment)	–
Device initial value	Device initial value name	–
	Comment	–

Item		Data name	Changeable/ unchangeable project language
Global label/Local label/Structure		Global label name/Structure name	○
		Label name	○
		Constant value	–
		Data type	–
		Comment	–
		Remark	–
FB/FUN		Function block name/Function name	○
		Property (Result Type)	–
Program file/Task (Structured project)		Program file name/Task name	○
		Program name	○
		Comment	–
User library (Structured project)		User library name	○
		Library file name (*.SUL)	–
		Property (Help path)	–
Intelligent function module tool		–	–
	QD75/LD75 positioning module	Wave trace file name	–
		Location trace file name	–
	Serial communication module	Circuit trace data	–
		Protocol setting file name (Predefined protocol support function)	–
		Manufacturer/Model/Protocol name/Packet name/ Element name (Predefined protocol support function)	–
User data (Example: *.xls)		File name	–
Backup data for PLC Module Change Setting function		Title	–
Target memory for online operations		Title	–
IC memory card drive for IC memory card operation		Title	–
I/O system setting		I/O system setting file name	–
CSV file that can be created in Diagnostic function		Product information in System monitor	–
		PLC diagnostics	–
		Module error history	–
Shortcut key		Template file name	–

● PLC parameter data

○: Unchangeable –: Changeable

Tab name	Item	Data name	Changeable/ unchangeable project language
PLC Name	–	Label	–
		Comment	–
PLC System	PLC Module Change Setting	Title Setting	–
PLC File	File Register	File Name	–
	Comment File Used in a Command	File Name	–
	Initial Device Value	File Name	–
	File for Local Device	File Name	–
PLC RAS	Error History	File Name	–
Boot File	–	Data Name	–
Program	–	Program Name	–
I/O Assignment	I/O Assignment	Type	–
	Base Setting	Model Name	–
		Power Model Name	–
		Extension Cable	–

● Network parameter data

○: Unchangeable –: Changeable

Type	Item	Data name	Changeable/ unchangeable project language
Ethernet/CC IE/MELSECNET	Network Range Assignment	Parameter Name	–
	Network Configuration Settings	Alias	–
		Comment	–
	Network Operation Settings	Parameter Name	–
	Station Inherent Parameters	Parameter Name	–
	FTP Parameters	Login Name	–
	E-mail Setting	SMTP Server Name	–
		POP Server Name	–
	News Setting	Attached File Name	–
CC-Link	Operation Setting	Parameter Name	–

● Intelligent function module data

○: Unchangeable –: Changeable

Module type	Item	Data name	Changeable/ unchangeable project language
Positioning module	Positioning Data	Positioning Comment	–
Serial communication module/Modem interface module	Modem Function	Initialization command	–
		Telephone number	–
		Message	–
		Comment	–
	User Register Frame Content	User registration frame	–
FL-net (OPCN-2) interface module	Parameter	Node name (Equipment name)	–

Appendix 17.2 Considerations

The English version of GX Works2 (SW1DNC-GXW2-E) does not support double byte character and half-width Japanese kana character. Therefore, when using the project data, which has been created in the Japanese version of GX Works2 (SW1DNC-GXW2-J) using double byte character or half-width Japanese kana character, in the English version of GX Works2, change all the double byte character and half-width Japanese kana character to single byte alphanumeric character in the Japanese version of GX Works2. After characters are changed, execute [Compile] ⇒ [Rebuild All] or [Build] in the Japanese version of GX Works2 and save the project in a condition without any errors.

The following are the considerations when reading project data, in which double byte character or half-width Japanese kana character is used, from the programmable controller CPU.

- The symbolic information created in the Japanese version of GX Works2 and written to the programmable controller CPU, cannot be read to the English version of GX Works2. In this case, save the project created in the Japanese version of GX Works2 using the English version of GX Works2, then write the symbolic information to the programmable controller CPU.

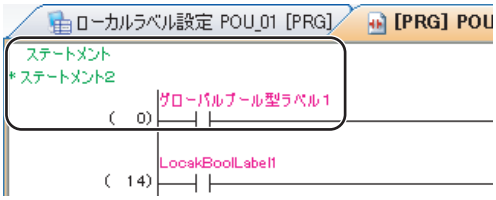
■ Symptom example

The following are examples when using the project data, which is created using double byte character or half-width Japanese kana character, in the English version of GX Works2.

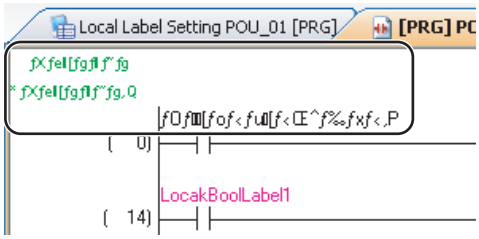
● **Displayed as garbled characters**

When double byte character or half-width Japanese kana character is set in the statement or label, they are displayed as garbled characters.

<Japanese version of GX Works2>



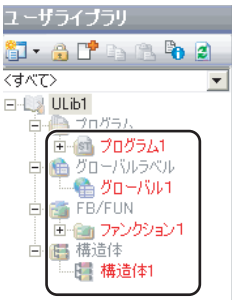
<English version of GX Works2>



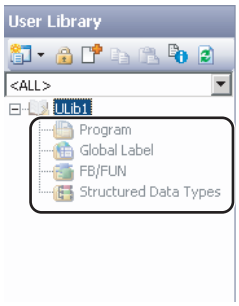
● **Data name is not displayed**

When double byte character or half-width Japanese kana character is used in data names of user library files, data names cannot be displayed and user library cannot be operated.

<Japanese version of GX Works2>



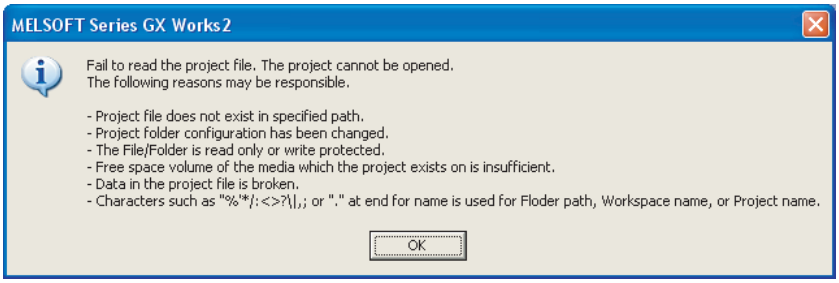
<English version of GX Works2>



● **Data cannot be opened**

When opening saved project data in which double byte character or half-width Japanese kana character is used in workspace names or project names, the message shown below is displayed and the workspace cannot be opened.

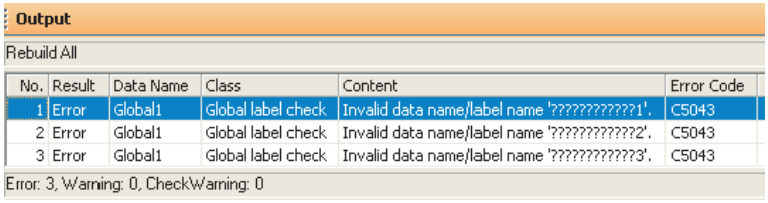
<English version of GX Works2>



● **Compilation error**

When compiling the project data in which double byte character or half-width Japanese kana character is used in label names, compilation error occurs and compilation cannot be completed normally.

<English version of GX Works2>



Appendix 18 Considerations for Selecting Project Language

Q CPU L CPU Remote Head FX

This section explains the considerations for selecting a project language.
'language of GX Works2' in the table indicates the language of installed GX Works2.

Category	Item	Considerations
OS	Windows® 2000	All characters of the selected language are corrupted when the language package is not installed.
		The operation is ensured for Japanese language only.
	Windows® XP	All characters of the selected language are corrupted when the language package is not installed.
	Windows Vista®	All characters of the selected language are corrupted when the language package is not installed. The language package is pre-installed.
	Windows® 7	
Programmable controller CPU	File name	When a file with a name using other than Japanese characters or one-byte alphanumeric characters is written to a programmable controller CPU, the file cannot be read from the programmable controller CPU, and the performance of the online function may not be normal.
Operation after installation	Language of Windows® operating system and 'language of GX Works2' are different.	When using GX Works2 in Japanese language, check the following settings. • "Language for non-Unicode programs"*1 of Windows® operating system is set to Japanese. • The project language is set to Japanese under [Tool] ⇒ [Language Selection] in GX Works2.
		When using the following functions, use alphanumeric characters or Japanese characters for folder names and file names. • Open data in other format • Save project in GX Developer format • Read/write IC memory card • Local device batch read + save CSV
		For "Language for non-Unicode programs"*1 setting, set the same language as the one set for the 'language of GX Works2' in advance. By this setting, error messages can be displayed in the 'language of GX Works2'.
Entered language	Mixing different languages	Only one language with double-byte characters can be used in a project. Japanese, Chinese (simplified characters), and Korean cannot be mixed. A language with one-byte characters and a language with double byte characters can be mixed. For example, English (one-byte alphanumeric characters) and Japanese.
	When entering data in a language other than the one set for the project language.	The operation is ensured only when the project language which is set for the language selection is used. Do not use characters of the language other than the one set for the project language. Note that alphanumeric characters and one-byte symbols can be used in all languages.

Category	Item	Considerations
Font	Korean is selected for project language. (Regarding the font 'BatangChe' which is set automatically.)	Including fixed characters such as menus, some of the characters of Japanese and Chinese (simplified characters) are displayed in smaller size.
	Displayed characters are different depending on the font even when they are the same character.	Displayed characters may be different between the ones on the screen in which font can be changed and the ones on the screen in which font cannot be changed. Change the font on the Color and Font screen. Example) With Korean is selected as the project language, when "精" is entered in the label editor and a compilation error is performed, "精" is displayed on the Output window.
		The entered text may be truncated on the screen on which fonts cannot be specified.
Function	[Verify] Projects whose project languages are different are verified.	When the same character strings with double-byte character are verified, the result will be a match, however, the character strings may not be displayed normally. Select the same language for projects to be verified.
	[Install] User library which contains characters of different language is imported to project.	The operation of user library import is ensured when the project language set for the language selection is used for user library file names and data in the user library. User library which contains file names and data with alphanumeric characters and one-byte symbol can be used in a project in any language.
	[Read from PLC], [Read IC Memory Card] Data contains characters in different language is imported, and the Read from PLC or Read IC Memory Card is executed.	The operation of Read from PLC or Read IC Memory Card function is ensured when the project language set for the language selection is used for characters in a target data. Set the same language as the one used in a target data to be read. Target data of the data read function which contains alphanumeric characters and one-byte symbol can be used in a project in any language.
	[Open Other Project] The project language selected for "Language Selection" and the operating system language are different.	Other format projects which can be opened in GX Works2: projects whose data name and label name are written in alphanumeric code.
	[Read from CSV File] (When reading a program which is written in list format.)	The operation is ensured only when the project languages for the Write to CSV File function and Read from CSV File function are the same.
Project language selection	A language is selected while the project is being displayed.	Screens which are opened from the Project view and the User Library view are closed automatically when a language is selected. Close all other open screens. The selected language is applied by reopening the screens.
	Data names, label names	When characters other than alphanumeric characters are used for data names and label names in a project before selecting a project language, the operation is not ensured after the language is selected.
	Simulation function	Project language setting is invalidated.
	Interaction with LCPU logging configuration tool	
	Interaction with Ethernet adapter module configuration tool	
	Predefined protocol support function	
	Interaction with iQ Works	

*1 : Set "Language for non-Unicode programs" by the following procedure.
[start] of Windows® operating system ⇒ [Control Panel] ⇒ [Regional and Language Options] ⇒ <<Advanced>> ⇒ "Language for non-Unicode programs".

Appendix 19 Modifying Instructions of Projects in Other Formats

Q CPU L CPU Remote Head FX

This section explains instructions which require modification and how to modify them when using projects in other formats in GX Works2.

An X mark may appear on a POU or an error may occur at a compilation when a project which contains ST programs or Structured Ladder/FBD programs created in GX Developer or GX IEC Developer is opened in GX Works2. In this case, instructions or arguments need to be modified. The following table shows the modification methods and reference sections. For instructions which require modification, read the corresponding reference.

Modification method	Reference
Replacing instruction names	☞ Appendix 19.1
Adding devices/labels	☞ Appendix 19.2
Changing positions of devices/labels	☞ Appendix 19.3
Changing arguments to constants	☞ Appendix 19.4
Changing label data types to double-precision real number	☞ Appendix 19.5
Changing label data types	☞ Appendix 19.6
Changing number of array elements of array data type labels	☞ Appendix 19.7
Changing label data type to array data type	☞ Appendix 19.8

● **Compiling programs with instructions which do not require modification**

For the instructions which do not require modification, perform the following operation to compile programs without correcting the programs.

Select "Use Dedicated Instruction for GX Developer, GX IEC Developer" under [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Common Setting", and restart GX Works2.

Appendix 19.1 Replacing instruction names

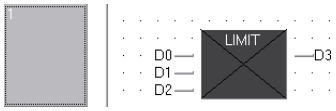
When using any of the following GX Developer or GX IEC Developer instruction, replace the instruction with the GX Works2 instruction.

Instruction to be replaced GX Developer instruction/GX IEC Developer instruction	GX Works2 instruction
LIMIT	LIMITATION
MAX	MAXIMUM
MIN	MINIMUM

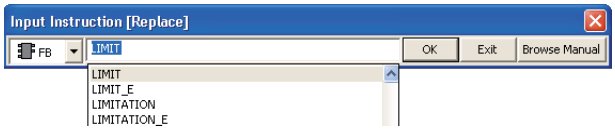
● **Replacing an instruction in Structured Ladder/FBD program**

Operation

1. **Select an instruction to be modified.**

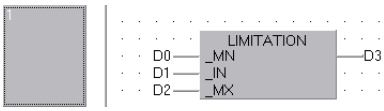


2. **Select [Edit] ⇒ [Input Instruction].**
   The Input Instruction [Replace] screen is displayed.



3. **Enter a GX Works2 instruction name.**

4. **Click the** OK **button.**
   The instruction is replaced with the GX Works2 instruction.



● **Replacing an instruction in ST program**

Operation

- **Replace the instruction with the GX Works2 instruction.**

```
Real4:=LIMIT(Real1, Real2, Real3);   ⇨   Real4:=LIMITATION(Real1, Real2, Real3);
```

Point

● **Considerations when replacing instructions in Structured Ladder/FBD programs**
The size of function/function block may be changed. Adjust the position of function/function block if a function/function block with a replaced instruction overlaps with the connected function/function block.

● **Replacing instructions in Structured Ladder/FBD programs**
The Input Instruction [Replace] screen can also be displayed by selecting an instruction and entering an instruction name from the keyboard.

● **Replacing instructions using the Replace Instruction function**
Instructions can also be replaced using the Replace Instruction function. (☞ Section 10.3.2)

Appendix 19.2 Adding devices/labels

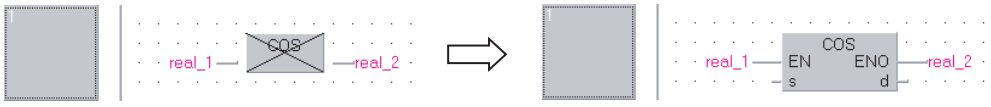
When using any of the following GX Developer or GX IEC Developer instruction, add or change device/label according to the argument of the GX Works2 instruction.
For Structured Ladder/FBD programs, instructions also need to be changed.

Instruction to be modified GX Developer instruction/GX IEC Developer instruction	GX Works2 instruction
COS	COS
LEFT	LEFT
LEN	LEN
RIGHT	RIGHT
ROL	ROL_E
ROR	ROR_E
SIN	SIN
TAN	TAN
ACOS	ACOS
ASIN	ASIN
ATAN	ATAN
EXP	EXP

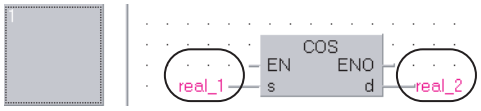
● **Modifying an instruction in Structured Ladder/FBD program**

Operation

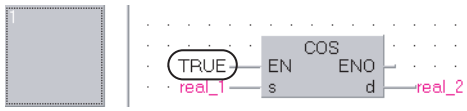
1. **Replace the instruction with the GX Works2 instruction. (☞ Appendix 19.1)**



2. **Connect the device/label set to EN to the argument (s).**
3. **Connect the device/label set to ENO to the argument (d).**



4. **Select [Edit] ⇒ [ladder Symbol] ⇒ [Input Label] (VAR), and add an input label to EN.**
5. **Set TRUE to EN.**



● **Modifying an instruction in ST program**

Operation

- **Adjust the position of the argument, and add TRUE to EN.**

In GX Works2, a return value of an instruction is ENO, not an operation result.
Programs in which instructions are nested should be rewritten as shown below.
<ST before modification>
Var_Real := COS(Var_s_Real) + 1.23;

<ST after modification>
COS(TRUE, Var_s_Real, Var_cos_Real);Var_Real := Var_cos_Real + 1.23;

Appendix 19.3 Changing positions of devices/labels

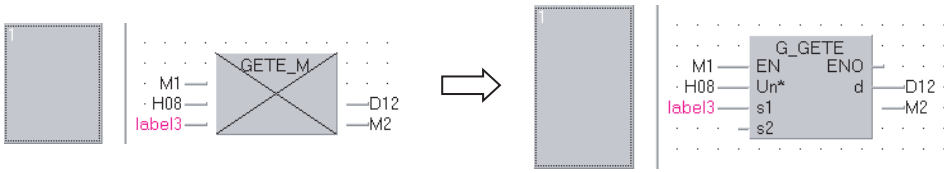
When using any of the following GX IEC Developer instruction, replace the instruction with the GX Works2 instruction, and change the position of device/label according to the corresponding argument.

Instruction to be modified GX IEC Developer instruction	GX Works2 instruction	Argument with different position	New position for argument
GETE_M	G_GETE	s2	Change the position of the device/label from the right side to the left side of the POU according to the position of the argument.
GETEP_M	GP_GETE	s2	
BUFRCV_M	ZP_BUFRCV	s2	
BUFSND_M	ZP_BUFSND	s3	
CLOSE_M	ZP_CLOSE	s2	
RISEND_MD	G_RISEND	d1	Change the position of the device/label from the left side to the right side of the POU according to the position of the argument.
RISEND_P_MD	GP_RISEND	d1	
RITO_MD	G_RITO	d	
RITO_P_MD	GP_RITO	d	

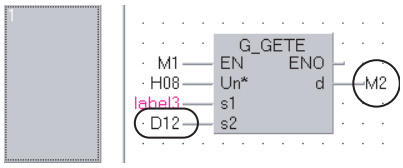
● **Modifying an instruction in Structured Ladder/FBD program**

Operation

1. **Replace the instruction with the GX Works2 instruction. (☞ Appendix 19.1)**



2. **Change the position of the device/label according to the argument of the instruction.**
   If an input label or output label does not exist at the position of argument, add it by selecting [Edit] ⇒ [Ladder Symbol] ⇒ [Input Label] (VAR=)/[Output Label] (=VAR).
   For G_GETE in the following example, move "D12" of the argument ⓓ to ⓢ2, and move "M12" which is not connected to the argument ⓓ.



● **Modifying an instruction in ST program**

Operation

- **Replace the instruction with the GX Works2 instruction.**

```
GETE_M(M1, H08, Label3, D12, M2);  ⇒  G_GETE(M1, H08, Label3, D12, M2);
```

Only for RISEND(_P)_MD, switch the positions of 4th argument and 5th argument.

Appendix 19.4 Changing arguments to constants

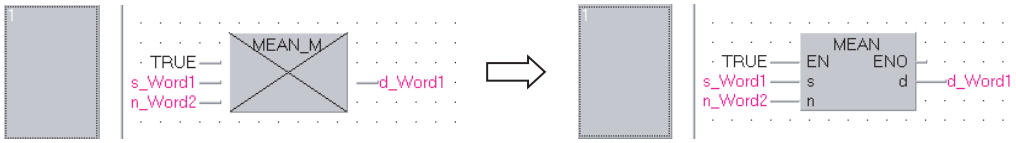
When using any of the following GX IEC Developer instruction, replace the instruction with the GX Works2 instruction, and change the data type of argument to constant.

Instruction to be modified GX IEC Developer instruction	GX Works2 instruction	Argument to which constant is to be set
MEAN_M	MEAN	n
MEANP_M	MEANP	n
BMOV_E	BMOV_E	n

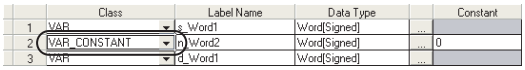
● Modifying an instruction in Structured Ladder/FBD program

Operation

1. Replace the instruction with the GX Works2 instruction. (☞ Appendix 19.1)



2. Change the argument n to constant. When a label is set to the argument n, change the class of the label to "VAR_CONSTANT" or "VAR_GLOBAL_CONSTANT" on the label setting editor.



● Modifying an instruction in ST program

Operation

1. Replace the instruction with the GX Works2 instruction.

2. Change the argument n to constant. When a label is set to the argument n, change the class of the label to "VAR_CONSTANT" or "VAR_GLOBAL_CONSTANT" on the label setting editor.

Appendix 19.5 Changing label data types to double-precision real number

When using any of the following GX IEC Developer instruction, replace the instruction with the GX Works2 instruction, and change the data type of argument to double-precision real number.

Instruction to be modified GX IEC Developer instruction	GX Works2 instruction	Argument to which double-precision real number is to be set
LD_EDEQ_M	LDED=*1	s1, s2
LD_EDGE_M	LDED>=*1	
LD_EDGT_M	LDED>*1	
LD_EDLE_M	LDED<=*1	
LD_EDLT_M	LDED<*1	
LD_EDNE_M	LDED<>*1	
AND_EDEQ_M	ANDED=*1	
AND_EDGE_M	ANDED>=*1	
AND_EDGT_M	ANDED>*1	
AND_EDLE_M	ANDED<=*1	
AND_EDLT_M	ANDED<*1	
AND_EDNE_M	ANDED<>*1	
OR_EDEQ_M	ORED=*1	
OR_EDGE_M	ORED>=*1	
OR_EDGT_M	ORED>*1	
OR_EDLE_M	ORED<=*1	
OR_EDLT_M	ORED<*1	
OR_EDNE_M	ORED<>*1	
EDPLUS_M	–*2	s1, s2
EDPLUSP_M	–*2	
EDPLUS_3_M	ED+*1	s1, s2, d
EDPLUSP_3_M	ED+P*1	
EDMINUS_M	–*2	s, d
EDMINUSP_M	–*2	
EDMINUS_3_M	ED-*1	s1, s2, d
EDMINUSP_3_M	ED-P*1	
EDDIV_M	ED/*1	s1, s2, d
EDDIVP_M	ED/P*1	
EDMUL_M	ED*1	
EDMULP_M	ED*P*1	
FLTD_M	FLTD	d
FLTDP_M	FLTDP	
DFLTD_M	DFLTD	
DFLTDP_M	DFLTDP	
EDNEG_M	EDNEG	
EDNEGP_M	EDNEGP	
EDMOV_M	EDMOV	s, d
EDMOVP_M	EDMOVP	

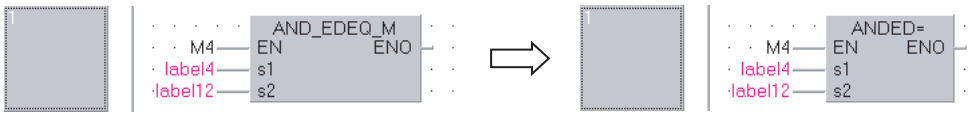
*1 : For ST program, the instruction does not need to be changed to a GX Works2 instruction.

*2 : The instruction does not need to be changed to a GX Works2 instruction.

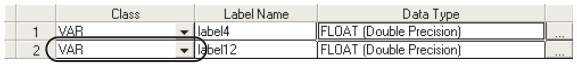
● **Modifying an instruction in Structured Ladder/FBD program**

Operation

1. **Replace the instruction with the GX Works2 instruction. (☞ Appendix 19.1)**



2. **Change the class of the label to "FLOAT (Double Precision)" on the label setting editor.**



● **Modifying an instruction in ST program**

Operation

1. **Replace the instruction with the GX Works2 instruction.**

2. **Change the class of the label to "FLOAT (Double Precision)" on the label setting editor.**

Appendix 19.6 Changing label data types

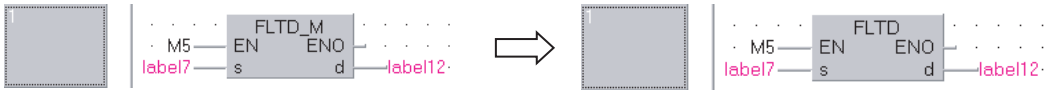
When using any of the following GX IEC Developer instruction, replace the instruction with the GX Works2 instruction, and change the data type according to the data type of the argument.

Instruction to be modified	GX Works2 instruction	Argument whose data type is to be changed	Argument data type	
GX IEC Developer instruction			Before change	After change
FLTD_M	FLTD	s	ANY16	Word [signed]
FLTDP_M	FLTDP	s	ANY16	Word [signed]
DFLTD_M	DFLTD	s	ANY32	Double word [signed]
DFLTDP_M	DFLTDP	s	ANY32	Double word [signed]
OUT_M	OUT	d	ANY_SIMPLE	Bit

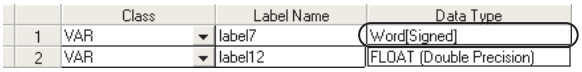
● **Modifying an instruction in Structured Ladder/FBD program**

Operation

1. **Replace the instruction with the GX Works2 instruction. (☞ Appendix 19.1)**



2. **Change the data type of the label to the corresponding data type on the label setting editor.**



● **Modifying an instruction in ST program**

Operation

1. **Replace the instruction with the GX Works2 instruction.**

```
FLTD_M(M5, label7, label12);   ⇨   FLTD(M5, label7, label12);
```

2. **Change the data type of the label to the corresponding data type on the label setting editor.**

Appendix 19.7 Changing number of array elements of array data type labels

When using any of the following GX IEC Developer instruction, replace the instruction with the GX Works2 instruction, and change the number of array elements according to the data type of the argument.

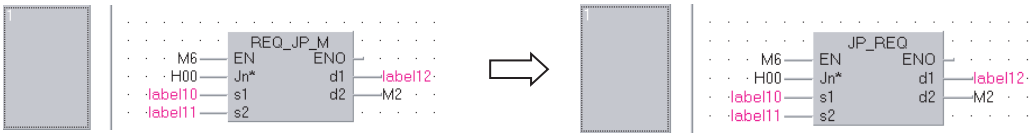
Instruction to be modified	GX Works2 instruction	Argument whose number of array elements is to be changed	Argument data type	
GX IEC Developer instruction			Before change	After change
REQ_JP_M	JP_REQ	s2	ARRAY[1..7] OF ANY16	ANY16(0..5)*1
	JP_REQ	d1	ARRAY[1..4] OF ANY16	
REQ_UP_M	GP_REQ	s2	ARRAY[1..7] OF ANY16	
	GP_REQ	d1	ARRAY[1..4] OF ANY16	

*1 : The index of the array does not need to be started from 0 if the number of array elements matches. A change of the program is not necessary when the index of the array is set to 1 to match with the previous index.

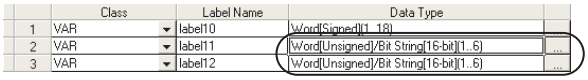
● Modifying an instruction in Structured Ladder/FBD program

Operation

1. Replace the instruction with the GX Works2 instruction. (☞ Appendix 19.1)



2. Change the number of array element of the array data type label on the label setting editor.



● Modifying an instruction in ST program

Operation

1. Replace the instruction with the GX Works2 instruction.

2. Change the number of array element of the array data type label on the label setting editor.

Point

● Considerations when changing the number of array elements

When the number of array elements is reduced by the modification, the program needs to be modified according to the change.

Example: For the argument ⓓ of REQ_JP_M, the program which accesses the 7th array element needs to be modified.

Appendix 19.8 Changing label data type to array data type

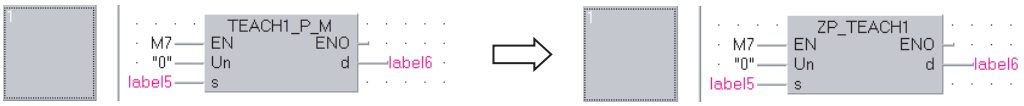
When using any of the following GX IEC Developer instruction, replace the instruction with the GX Works2 instruction, and change the data type of the argument to the array data type.

Instruction to be modified	GX Works2 instruction	Argument whose data type is to be changed to array data type	Argument data type	
GX IEC Developer instruction			Before change	After change
TEACH1_P_M	ZP_TEACH1	s	ANY16	ANY16(0..3)
TEACH2_P_M	ZP_TEACH2	s		
TEACH3_P_M	ZP_TEACH3	s		
TEACH4_P_M	ZP_TEACH4	s		
PSTRT1_P_M	ZP_PSTRT1	s	ANY16	ARRAY[0..2] OF ANY16
PSTRT2_P_M	ZP_PSTRT2	s		
PSTRT3_P_M	ZP_PSTRT3	s		
PSTRT4_P_M	ZP_PSTRT4	s		
BIDIN_M	G_BIDIN	d2	BOOL	ARRAY[0..1] OF BOOL
BIDINP_M	GP_BIDIN	d2		
BIDOUT_M	G_BIDOUT	d		
BIDOUTP_M	GP_BIDOUT	d		
INPUT_M	G_INPUT	d2		
ONDEMAND_M	G_ONDEMAND	d		
ONDEMANDP_M	GP_ONDEMAND	d		
OUTPUT_M	G_OUTPUT	d		
OUTPUTP_M	GP_OUTPUT	d		
PRR_M	G_PRR	d		
PRRP_M	GP_PRR	d		
PUTE_M	G_PUTE	d		
PUTEP_M	GP_PUTE	d		
READ_JP_M	JP_READ	d2		
READ_UP_M	GP_READ	d2		
RECV_JP_M	JP_RECV	d2		
RECV_UP_M	GP_RECV	d2		
REMFR_MD	Z_REMFR	d2		
REMFR_P_MD	ZP_REMFR	d2		
REMTO_MD	Z_REMTO	d2		
REMTO_P_MD	ZP_REMTO	d2		
REQ_JP_M	JP_REQ	d2		
REQ_UP_M	GP_REQ	d2		
SEND_JP_M	JP_SEND	d		
SEND_UP_M	GP_SEND	d		
SREAD_JP_M	JP_SREAD	d2		
SREAD_UP_M	GP_SREAD	d2		
SWRITE_JP_M	JP_SWRITE	d2		
SWRITE_UP_M	GP_SWRITE	d2		
WRITE_JP_M	JP_WRITE	d2		
WRITE_UP_M	GP_WRITE	d2		
ZNRD_J_M	J_ZNRD	d2		
ZNRD_JP_M	JP_ZNRD	d2		
ZNWR_J_M	J_ZNWR	d2		
ZNWR_JP_M	JP_ZNWR	d2		

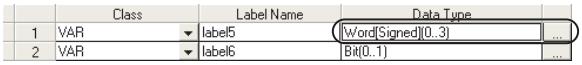
● **Modifying an instruction in Structured Ladder/FBD program**

Operation

1. **Replace the instruction with the GX Works2 instruction. (☞ Appendix 19.1)**



2. **Change the label data type to array data type on the label setting editor.**



● **Modifying an instruction in ST program**

Operation

1. **Replace the instruction with the GX Works2 instruction.**

2. **Change the label data type to array data type on the label setting editor.**

Point

● **Considerations when changing data type**
Since the label data type is changed to array data type, labels used in the program needs to be modified according to the array data type.

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[V]

[W]

[Extension]

GX Works2 Version 1
Operating Manual
(Common)

MODEL	GXW2-VER1-O-KY-E
MODEL CODE	13JU63
SH(NA)-080779ENG-P(1302)KWIX	

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