MELSOFT

Integrated FA Software

Operating Manual
(Safety Programmable Controller)

GX Developer Version 8
SW8D5C-GPPW-E

• SAFETY PRECAUTIONS •

(Always read these instructions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.
In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

| ◇ DANGER | 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 medium or slight personal injury or physical damage. |

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

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

[Design Instructions]

◇ DANGER

- When data/program change, or status control is performed from a PC to a running safety programmable controller, create an interlock circuit outside the sequence program and safety programmable controller to ensure that the whole system always operates safely.
  For the operations to a safety programmable controller, pay full attention to safety by reading the relevant manuals carefully, and establishing the operating procedure.
  Furthermore, for the online operations performed from a PC to a safety CPU module, the corrective actions of the whole system should be predetermined in case that a communication error occurs due to a cable connection fault, etc.
- When a safety remote I/O module has detected a CC-Link Safety error, it turns off all the outputs.
  Note that the outputs in a ladder program are not automatically turned off.
  If a CC-Link Safety error has been detected, create a ladder program that turns off the outputs in the program.
  If the CC-Link Safety is restored with the outputs on, it may suddenly operate and result in an accident.
- To inhibit restart without manual operation after safety function was performed and outputs were turned OFF, create an interlock program which uses a reset button for restart.

[Startup/Maintenance Instructions]

⚠ CAUTION

- The online operations performed from a PC to a running safety programmable controller (Program change when a safety CPU is RUN, device test, and operating status change between RUN and STOP) have to be executed after the manual has been carefully read and the safety has been ensured.
  Following the operating procedure predetermined at designing, the operation has to be performed by an instructed person.
  When changing a program while a safety CPU is RUN (Write during RUN), it may cause a program breakdown in some operating conditions.
  Fully understand the precautions described in the GX Developer's manual before use.

INTRODUCTION

Thank you for choosing the Mitsubishi MELSOFT series Integrated FA software.
Please read this manual and make sure you understand the functions and performance of MELSEC series sequencer thoroughly in advance to ensure correct use.
Please make this manual available to the end user.

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MANUALS

Introductory Manual

Make sure to read the following manual before configuring/designing a safety system.

Manual Name	Manual No. (Model Code)
Safety Application Guide Explains the overview and construction method of the safety system, laying and wiring examples, application programs and others. (Sold separately.)	SH-080613ENG (13JR90)

Related Manuals

The following lists the manuals for this software package.
Refer to the following table when ordering manuals.

Manual Name	Manual No. (Model Code)
GX Developer Version 8 Operating Manual Explains the online functions of the GX Developer, such as the programming, printout, monitoring, and debugging methods. (Sold separately.)	SH-080373E (13JU41)
GX Developer Version 8 Operating Manual (Startup) Explains the system configuration, installation and starting methods of the GX Developer. (Sold separately.)	SH-080372E (13JU40)
QSCPU User's Manual (Function Explanation, Program Fundamentals) Explains the functions, programming methods, devices and others that are necessary to create programs with the QSCPU. (Sold separately.)	SH-080627ENG (13JR93)
QSCPU Programming Manual (Common Instructions) Explains how to use the sequence instructions, basic instructions, and QSCPU dedicated instructions. (Sold separately.)	SH-080628ENG (13JW01)
CC-Link Safety System Master Module User's Manual QS0J61BT12 Explains the specifications, procedures and settings up to operation, parameter settings and trouble shootings of the QS0J61BT12-type CC-Link Safety system master module. (Sold separately.)	SH-080600ENG (13JR88)
CC-Link Safety System Remote I/O Module User's Manual QS0J65BTB2-12DT Explains the specifications, procedures and settings up to operation, parameter settings and trouble shootings of the CC-Link Safety Remote I/O Module. (Sold separately.)	SH-080612ENG (13JR89)

REMARK

Printed materials are separately available for single item purchase. Order the manual by quoting the manual number on the table above (Model Code).

The availability of the menu selection/operation, differs depend on the combination of safety CPU operation mode and an access level, is described. (☞(1))

5.2.3 Registering or changing a CPU access password

	Admin.	Develop.	Users
SAFETY	△	×	×
TEST	△	×	×

△: Registration to a safety CPU is disabled in the safety mode. Can perform in the test mode only when a safety CPU is in STOP status.

The restriction on the setting/operation is described. (☞(1))

What to set in the section is described.

[Purpose]
Registers the access password for certification (CPU access password) with a project and safety CPU.
Matching the project password with the CPU access password enables the safety CPU operation.
(For the functions for which CPU access password certification is performed ☞ Appendix 2)

Following the direction, open the setting screen.

[Operating Procedure]
Select [Online] → [Safety CPU operation] → [CPU access password registration/change].

[Dialog Box]

CPU access password registration/change

Password settings
CPU access certification password will be set to project.

Password settings   1)

Register to PLC
The same password as project CPU access password is registered to PLC.

PLC register   2)

Close
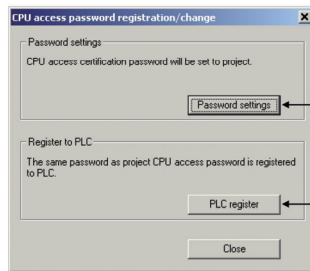
The screen for the setting is indicated. The numbered items are described in [Description].

The items and buttons numbered in [Dialog Box] are described.

[Description]

1) Password settings button
Displays the Password settings screen. (☞ (1) in this section)

2) PLC register button
Registers the CPU access password set in a project with a safety CPU. (☞ (2) in this section)

Reference:
The Chapter or Section including the relative explanation is indicated.

POINT
Be sure to carefully manage a CPU access password.
(For actions when losing a CPU access password ☞ Section 3.2 (2))

This gives the information related to the topic discussed and also the helpful information.

5 - 18   5 - 18

(1) Availability of menu selection/operation (Upper right of the page)
In each operation explained in the Chapter 5, the availability of the menu selection/operation, differs depend on the combination of safety CPU operation mode and an access level, is listed as the table below on the upper right corner of the first pages for each section.

Safety CPU operation mode {

	Admin.	Develop.	Users	← Access level
SAFETY	○	△	×	
TEST	○	△	×	

} Availability of menu selection/operation

(a) Safety CPU operation mode
SAFETY : Indicates the SAFETY MODE.
TEST : Indicates the TEST MODE.

(b) Access level
Admin. : Indicates "Administrators".
Develop. : Indicates "Developers".
Users : Indicates "Users".

(c) Availability of menu selection/operation
○ : Menu selection/operation is available.
△ : Menu selection/operation is available with restrictions.
Restrictions are described under the table.
× : Menu selection/operation is not available.

(2) Symbols used for GX Developer screen and function explanation
Symbols used in this manual, and their contents and examples are shown below.
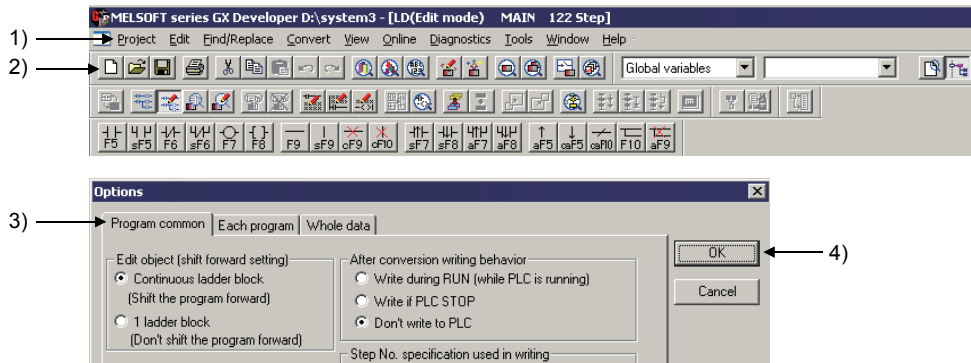
No.	Symbol	Contents	Example
1)	[ ]	Menu name of menu bar	[Project]
2)	🔲	Icon in toolbar	🖨
3)	<< >>	Tab name of dialog box	<<Program common>>
4)	⬜	Command button in dialog box	OK button

(3) Functions that cannot be operated by GX Developer
The functions that cannot be operated using the GX Developer are grayed (masked) and cannot be selected. There are the following reasons why they are not selectable.

(a) The programmable controller CPU used does not have the functions.
For example, when the QSCPU is chosen in the "PLC series", selecting the [Project] → [Change PLC type] is disabled since the QSCPU does not have another programmable controller type.
To see if the programmable controller CPU has the operable functions, refer to the specifications in the User's Manual of the programmable controller CPU.

(b) The functions that cannot be selected because they cannot be used with the currently operated function.
For example, when the monitor screen is open, Change PLC type, Transfer setup, Change PLC data attributes, Marge data, Check parameter, and Clear all parameters cannot be performed.

GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL

This manual uses the abbreviations and generic terms listed in the following table to explain a software package and module such as programmable controller CPU.
In addition, the following table lists the module model according to need.

Abbreviation/generic term	Description/target module
GX Developer	Generic product name of the product types SW8D5C-GPPW-E, SW8D5C-GPPW-EA, SW8D5C-GPPW-EV and SW8D5C-GPPW-EVA
Safety programmable controller	Generic term for safety CPU module, CC-Link Safety master module, CC-Link Safety remote I/O module, safety power supply module, and safety main base unit
Safety system	System which executes the required safety functions
Safety function block	Safety-approved function block which represents safety control logic such as emergency stop and two-hand switch control in function block
Safety project	Project for a safety programmable controller created with GX Developer
Safety remote I/O station	Remote station which treats only bitwise information This station is compliant with the safety system.
Safety CPU	Abbreviation for a safety CPU module (QS001CPU type safety CPU module)
Standard remote I/O station	Remote station which treats only bitwise information This station is not compliant with safety system.
Remote I/O station	Generic term for safety remote I/O station and standard remote I/O station
CC-Link Safety	Safety-approved CC-Link network compliant with safety standards This network is configured with CC-Link Safety master module and CC-Link Safety remote I/O module.
FB	Abbreviation for function block

1. GENERAL DESCRIPTION

This manual explains the added and updated GX Developer functions to support a safety programmable controller.
Be sure to read this manual before using a safety programmable controller.
For any unchanged functions, refer to the GX Developer Version 8 Operating Manual.

1.1 Features

The following shows the features of the GX Developer supporting a safety programmable controller.

(1)   Security functions
The main feature of the GX Developer is that only the defined users can edit project data and operate a safety programmable controller.
The following shows the functions for protecting data and restricting operations.
(a) User registration and login certification   (☞ Section 1.1.1 and 1.1.2)
(b) CPU access password   (☞ Section 1.1.3)
(c) Safety CPU operation mode   (☞ Section 1.1.4)
(d) Operation lock   (☞ Section 1.1.5)

(2)   Improvement in project data reliability
If the project data saved in a PC have been damaged, the damage is detected when opening the data.

(3)   Improvement of reliability in communications with a safety CPU
The function for detecting a transmission error in communications with a safety CPU is enhanced.

(4)   Efficiency in the creation and maintenance of a user program
The efficiency for the creation and maintenance of a user program has been increased by highlighting the safety I/O devices on a ladder.
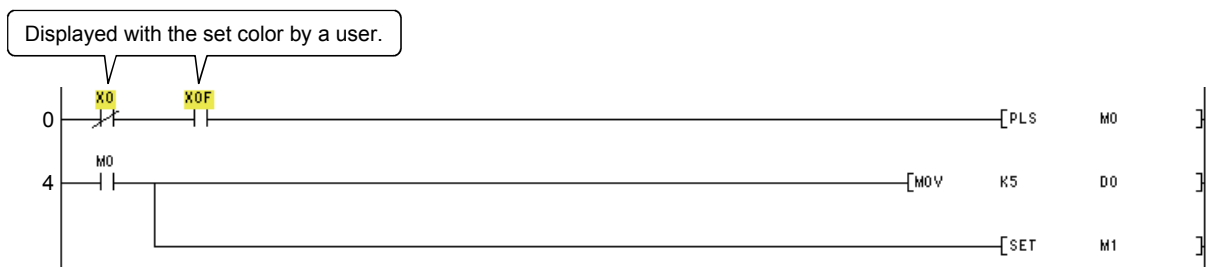
(5)   Display and save of operation/error logs
The operation/error logs saved in a safety CPU can be read and displayed.
They can also be saved in a CSV file.

1.1.1 Access level

1

An access level designates the operation authority given to a user who logs in to a project.
The access level is classified into the following three levels, in order from the highest level where all of operations are allowed to project data and a safety programmable controller.

Access Level		Operation Authority
High ↑ ↓ Low	Administrators	<Manager level> Can perform all operations. Only Administrators can perform user management and security settings.
	Developers	<Developer level> Can perform all the operations except for user management and security settings.
	Users	<Operator level> Can edit but cannot overwrite the project data in a PC. Can read (e.g. monitoring) but cannot write data as for the online operation to a safety programmable controller.

1.1.2 User registration and login certification

A safety programmable controller performs login certification when opening a project for the purpose of preventing unauthorized users from illegally accessing.

(1) User registration
A system manager has to define the person in charge, and then register the user information required for login certification with the project.
The following information is required in user registration.

1) User name

2) Access level (⭲ Section 1.1.1)

3) Password (Omissible if access level is set to "Users".)

Maximum 128 users can be registered with each project, and the operation authority for each user is determined by the user's access level.
For example, the user whose access level is Users is not authorized to rewrite a safety programmable controller program.

(2) Login certification
When opening a project, a user name and password are required.
After inputting them, login certification is performed based on the set user registration information.
The available operations determined by the user's access level can be performed after login.
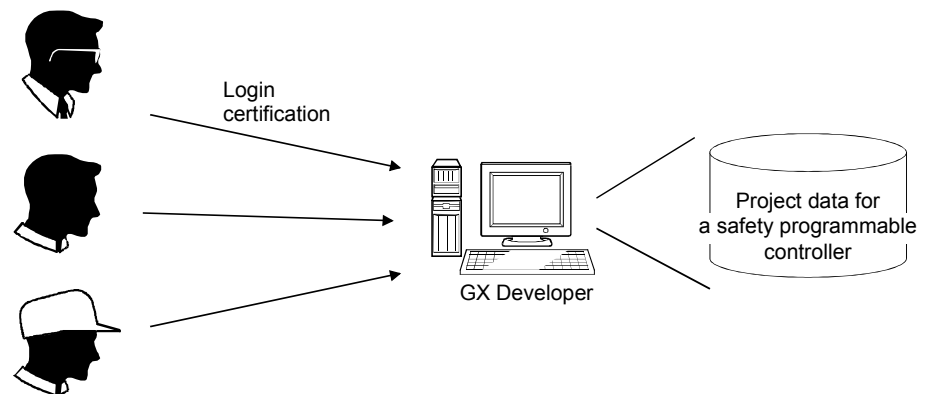
Note that login certification is performed to the operation such as "Delete project". (⭲ Section 5.1.3)

> **POINT**
> - The users unregistered with a project cannot open the project.
> - The users registered with a project can only perform the operations enabled in the given access level. (⭲ Section 1.2.2)

1.1.3 CPU access password

A safety CPU performs access certification by using a password to prevent the misconnected GX Developer from illegally operating.
The password is referred to a CPU access password.

The CPU access password has to be set to both the GX Developer project and safety CPU.
When performing the operation that changes control (e.g. program change) from the GX Developer, the CPU access password of the GX Developer project is compared with that of the safety CPU.
Only when they are identical, the operation will be allowed.

CPU access password "ABC123"

Can operate, as the CPU access passwords are identical.

Cannot operate, as the CPU access passwords are not identical.

GX Developer

GX Developer

CPU access password "ABC123"

CPU access password "DEF123"

Project A

Project B
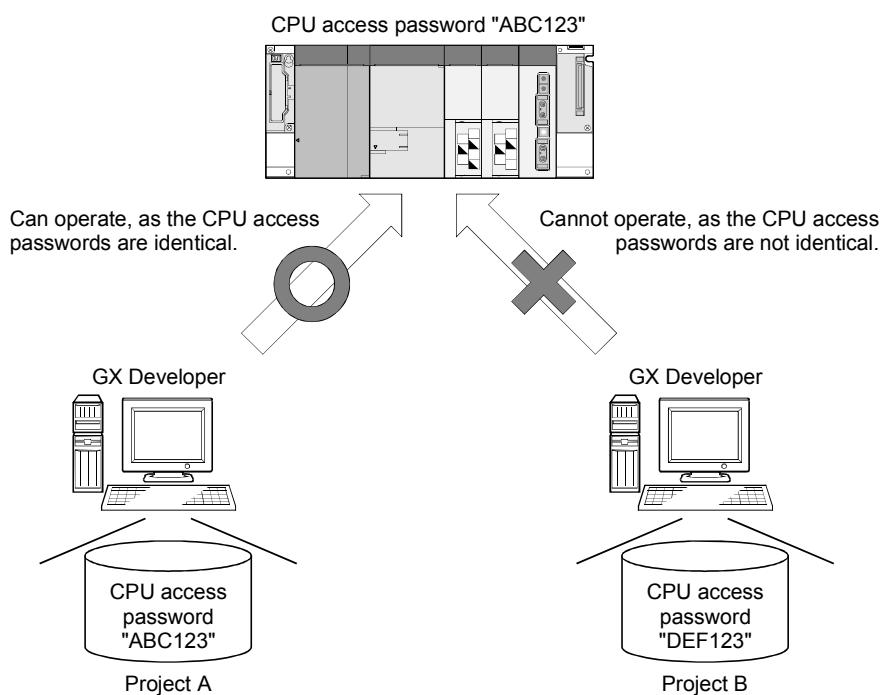
POINT
Set different CPU access passwords for each safety CPU.

1.1.4 Safety CPU operation mode (SAFETY MODE and TEST MODE)

A safety CPU operation mode includes a SAFETY MODE and TEST MODE.
The safety CPU operation mode can be switched from the GX Developer.

(1)   SAFETY MODE
The SAFETY MODE is used when operating a safety system.
In this mode, the operations may lead a safety programmable controller to a
control change (e.g. Write to PLC, Device test) are inhibited so that the running
system is protected.

(2)   TEST MODE
The TEST MODE is used when starting or maintaining a system.
In this mode, all operations including "Write to PLC" and "Device test" are
available. (The available functions depend on the login user's access level.)

1.1.5 Operation lock

An operation lock inhibits other users from operating the open project. The operation
lock has the following two methods.

Method	Contents
Automatic operation lock	Automatically locks operation if the GX Developer has not been operated for a certain period of time.
Manual operation lock	Manually locks operation.

The following Operation lock screen appears at operation lock.
The user during login or user whose access level is Administrators can unlock the
setting.

(Operation lock screen)

1.2 Functions Lists

1.2.1 Functions lists

The GX Developer functions are listed below.

(1) Common functions list
The following shows the fixed functions independent of the editing and the type of setting target.

Project (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
New project	Creates a new project.	×	●	5.1.1
Open project	Opens the existing project.	○	●	5.1.3
Close project	Closes an open project.	○	●	1.2.2
Save	Saves a project.	○	●	1.2.2
Save as	Names and saves a project.	○	●	3
Delete project	Deletes the existing project.	×	●	3 5.1.3
Verify	Verifies data between projects.	○	●	5.1.3
Copy	Copies data between projects.	×	●	5.1.3
Change PLC type	Changes a programmable controller type.	×	×	Appendix 1
Import file		—	—	—
Import from GPPQ format file	Reads a GPPQ file.	×	×	—
Import from GPPA format file	Reads a GPPA file.	×	×	—
Import from FXGP(WIN) format file	Reads a FXGP(WIN) format file.	×	×	—
Import from FXGP(DOS) format file	Reads a FXGP(DOS) format file.	×	×	—
Import from Melsec Medoc format file (Print out)	Reads a Melsec Medoc printing format file.	×	×	—
Import from TEXT, CSV format file…	Reads a text and CSV file.	×	×	—
Export file		—	—	—
Export to GPPQ format file	Writes data to a GPPQ file.	×	×	—
Export to GPPA format file	Writes data to a GPPA file.	×	×	—
Export to FXGP(WIN) format file	Writes data to a FXGP(WIN) format file.	×	×	—
Export to FXGP(DOS) format file	Writes data to a FXGP(DOS) format file.	×	×	—
Export to TEXT, CSV format file…	Writes data to a text and CSV file.	×	×	—

*1: Indicates the availability when the GX Developer is installed as "Only for monitoring GX Developer".
    ○: Available, ×: Unavailable

*2: Indicates the menu selectability when using the QSCPU.
    ◎: Selectable (Only for the QSCPU),
    ●: Selectable (Some changes for the QSCPU in the function common to all models),
    ○: Selectable (No changes for the QSCPU in the function common to all models),
    ×: Cannot be selected.

*3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(Continued from the previous page.)

Project (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
Macro		—	—	—
Registration macros	Registers macros.	×	×	—
Macro utilize	Utilizes macros.	×	×	—
Delete macros	Deletes a macro file.	×	×	—
Macro reference path	Changes the macro instruction reference path.	×	×	—
Security operation		—	—	—
User management	Registers/deletes/changes a login user.	○	◎	5.1.2
Wait time settings	Sets the wait time to an operation lock.	○	◎	5.1.4
Operation lock	Manually locks operation.	○	◎	5.1.4
Printer setup	Changes printer settings.	○	○	—
Print	Prints data.	○	●	Appendix 1
Start new GX Developer session	Starts a new GX Developer session.	○	○	—
Exit GX Developer	Exits the GX Developer.	○	○	—
View		Only for monitoring *1	QSCPU *2	Reference *3
Toolbar	Displays or hides the toolbar.	○	○	—
Status bar	Displays or hides the status bar.	○	○	—
Project data list	Displays or hides the project data list.	○	○	—
Project data display format		—	—	—
Not sort	Does not sort the project data list.	○	○	—
Sort data name ascending	Sorts the project data list in ascending order.	○	○	—
Sort data name descending	Sorts the project data list in descending order.	○	○	—
Elapsed time	Displays the Elapsed time dialog box.	×	×	—

(To the next page)

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×: Cannot be selected.

∗3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

Online (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
Transfer setup	Specifies a programmable controller CPU destination from the GX Developer.	○	○	—
Read from PLC	Reads data from a programmable controller CPU.	○	○	—
Write to PLC	Writes data to a programmable controller CPU.	×	○	—
Verify with PLC	Verifies data with programmable controller CPU data.	○	○	—
Write to PLC (Flash ROM)		—	—	—
Write the program memory to ROM	Writes program memory data to standard ROM/IC memory card (ROM).	×	●	5.7
Write to PLC (Flash ROM)	Writes data to standard ROM/IC memory card (ROM).	×	×	—
Delete PLC data	Deletes the data in a programmable controller CPU.	×	○	—
Change PLC data attributes	Changes programmable controller CPU data attributes.	×	×	—
PLC user data		—	—	—
Read PLC user data	Reads user data from a programmable controller CPU.	×	×	—
Write PLC user data	Writes user data to a programmable controller CPU.	×	×	—
Delete PLC user data	Deletes the user data in a programmable controller CPU.	×	×	—
Monitor		—	—	Appendix 1
Monitor mode	Places the ladder editing screen in the monitor mode.	○	○	—
Monitor (Write mode)	Sets the ladder (Monitor write) mode.	×	○	—
Start monitor (All windows)	Starts monitoring all open windows.	○	○	—
Stop monitor (All windows)	Stops monitoring all open windows.	○	○	—
Local device monitor	Switches the execute/non-execute of the local device monitor.	×	×	—
Device batch	Monitors devices in the batch mode.	○	○	—
Entry data monitor	Monitors devices in one screen.	○	○	—
Buffer memory batch	Monitors buffer memory in the batch mode.	○	○	—
Program monitor list	Monitors a program list.	×	○	—
Interrupt program monitor list	Lists interrupt programs.	×	×	—
Debug (ladder)		—	—	—
Device test	Turns on/off the device or changes the value.	×	●	Appendix 1
Forced input output registration/cancellation	Registers/cancels the forced I/O of input relays (X)/output relays (Y).	×	×	—
Trace	Performs sampling trace.	×	×	—
Remote operation	Remotely operates a programmable controller CPU.	×	●	Appendix 1
Redundant operation	Performs redundant operation.	×	×	—

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∗3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(Continued from the previous page.)

Online (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
Safety CPU operation		—	—	—
Switch safety CPU operation mode	Switches a programmable controller CPU mode.	×	◎	5.2.1
ROM information	Displays the ROM information of a project/ programmable controller CPU.	×	◎	5.2.2
CPU access password registration/change	Registers/changes a CPU access password.	×	◎	5.2.3
PLC memory initialization	Initializes programmable controller CPU memory.	×	◎	5.2.4
Monitor destination select option	Switches the CPU to be monitored.	○	◎	5.2.5
Password		—	—	—
Register password	Registers/changes a password.	×	×	—
Delete password	Cancels the password.	×	×	—
Disable password	Temporarily unlocks the password.	×	×	—
Clear PLC memory	Clears the memory cassette or device memory in a programmable controller CPU.	×	○	—
Format PLC memory	Formats the programmable controller CPU memory.	×	○	—
Arrange PLC memory	Arranges the data area in programmable controller CPU memory.	×	○	—
Set clock	Sets the time of a programmable controller CPU.	○	○	—
Diagnostics (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
PLC diagnostics	Diagnoses a programmable controller CPU.	○	●	5.6 Appendix 1
MELSECNET(II)/10/H diagnostics	Diagnoses the network.	○	●	Appendix 1
MELSECNET/G diagnostics	Diagnoses MELSECNET/G.	○	●	Appendix 1
Ethernet diagnostics	Diagnoses the Ethernet.	○	●	Appendix 1
CC-Link / CC-Link/LT diagnostics	Diagnoses the CC-Link or CC-Link/LT.	○	○	Appendix 1
System monitor	Monitors the system status of a programmable controller CPU.	○	○	—
Online module change	Changes a module during online.	×	×	—
Tools (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
Confirm project memory size	Calculates the file size to be written to a programmable controller CPU.	×	×	—
Marge data	Merges data.	×	●	Appendix 1
Check parameter	Checks parameters.	○	○	—
Transfer ROM		—	—	—
Read	Reads data from ROM.	×	×	—
Write	Writes data to ROM.	×	×	—
Compare	Compares the data in a PC with the ROM data.	×	×	—
Write to file	Writes ROM data to a file.	×	×	—

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　　×: Cannot be selected.

*3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(Continued from the previous page.)

Tools (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
Delete unused comments	Deletes the unused device comments in a program.	×	○	—
Clear all parameters	Deletes parameters.	×	○	—
IC memory card		—	—	—
Read IC memory card	Reads data from an IC memory card.	×	×	—
Write IC memory card	Writes data to an IC memory card.	×	×	—
Read image data…	Reads image data.	×	×	—
Write image data…	Writes image data.	×	×	—
Start ladder logic test	Starts/stops the ladder logic test.	×	×	—
Set TEL data		—	—	—
Connection	Connects the line for the A6TEL/Q6TEL.	×	×	—
Disconnect	Disconnects the line.	×	×	—
TEL data	Sets the notice destination data of the A6TEL or Q6TEL.	×	×	—
AT command	Registers the modem.	×	×	—
Call book	Sets phone numbers.	×	×	—
Intelligent function utility		—	—	—
Utility list	Shows the utility names required to edit the intelligent function unit parameters.	×	×	—
Customize keys	Changes the key assignment for ladder symbol input.	○	○	—
Options	Sets the options.	○	●	Appendix 1
Create start-up settings file	Creates a file to save the initial settings of a project.	○	○	—
Window (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
Cascade	Overlaps windows.	○	○	—
Tile vertically	Vertically arranges windows.	○	○	—
Tile horizontally	Horizontally arranges windows.	○	○	—
Arrange icons	Arranges icons at the bottom of the window.	○	○	—
Close all Windows	Closes all open windows.	○	○	—
Help (Common function)		Only for monitoring *1	QSCPU *2	Reference *3
CPU error	Displays the description of each programmable controller CPU error code.	○	○	—
Special relay/register	Displays the description of special relays or special registers.	○	○	—
Key operation list	Displays the description of each key operation.	○	○	—
Product information	Displays product information such as a version number.	○	○	—
Connect to MELFANSweb	Connects to the MELFANSweb.	○	○	—

  *1: Indicates the availability when the GX Developer is installed as "Only for monitoring GX Developer".
     ○: Available,　×: Unavailable

  *2: Indicates the menu selectability when using the QSCPU.
     ◎: Selectable (Only for the QSCPU),
     ●: Selectable (Some changes for the QSCPU in the function common to all models),
     ○: Selectable (No changes for the QSCPU in the function common to all models),
     ×: Cannot be selected.

  *3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(2) Ladder editing functions list
The following functions can be performed to edit ladders, operation outputs, and transition conditions.
When installing the GX Developer with its functions limited, the ladder symbols can be used for searching.

Project		Only for monitoring *1	QSCPU *2	Reference *3
Edit data		—	—	—
New	Adds data to a project.	×	○	—
Copy	Copies the data in a project.	×	×	—
Delete	Deletes the data in a project.	×	○	—
Rename	Renames the data in a project.	×	○	—
Change program type	Changes a ladder and SFC with each other.	×	×	—
Function Block		—	—	—
Diversion	Diverts the FB to a ladder program.	×	○	—
Rename	Renames the diverted FB.	×	○	—
FB change module address	Sets the module start I/O No. used in FB definition.	×	○	—

Edit		Only for monitoring *1	QSCPU *2	Reference *3
Undo	Reverses the last operation.	×	○	—
Restore after ladder conversion	Restores a program to the status after ladder conversion.	×	○	—
Cut	Moves the selected data to the clipboard.	×	○	—
Copy	Copies the selected data to the clipboard.	○	●	Appendix 1
Paste	Pastes the clipboard contents at the cursor position.	×	●	Appendix 1
Insert line	Inserts a row at the cursor position.	×	○	—
Delete line	Deletes a row at the cursor position.	×	○	—
Insert row	Inserts a column at the cursor position.	×	○	—
Delete row	Deletes a column at the cursor position.	×	○	—
Insert NOP batch	Inserts NOP before the ladder block at the cursor position.	×	○	—
Delete NOP batch	Deletes all the NOPs in a program at a time.	×	○	—
Draw line	Inserts a line.	×	○	—
Delete line	Deletes a line.	×	○	—
Change TC setting	Changes the setting value of the timer/counter.	×	●	Appendix 1
Read mode	Places a ladder screen in the read mode.	○	○	—
Write mode	Places a ladder screen in the write mode.	×	○	—

(To the next page)

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　　×: Cannot be selected.

*3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(Continued from the previous page.)

Edit		Only for monitoring *1	QSCPU *2	Reference *3
Ladder symbol		—	—	—
Open contact	Inserts ⊣⊢ at the cursor position.	×	○	—
Close project contact	Inserts ⊣/⊢ at the cursor position.	×	○	—
Open branch	Inserts �4 Ⴒ at the cursor position.	×	○	—
Close project branch	Inserts 4/Ⴒ at the cursor position.	×	○	—
Coil	Inserts ⟨○⟩ at the cursor position.	×	○	—
Application instruction	Inserts ⊣ ⅂ at the cursor position.	×	○	—
Vertical line	Inserts │ at the cursor position.	×	○	—
Horizontal line	Inserts ─── at the cursor position.	×	○	—
Delete vertical line	Inserts ⋇ at the cursor position.	×	○	—
Delete Horizontal line	Inserts ⇥ at the cursor position.	×	○	—
Rising pulse	Inserts ⊣↑⊢ at the cursor position.	×	○	—
Falling pulse	Inserts ⊣↓⊢ at the cursor position.	×	○	—
Rising pulse Open branch	Inserts 4↑Ⴒ at the cursor position.	×	○	—
Falling pulse Close branch	Inserts 4↓Ⴒ at the cursor position.	×	○	—
Invert operation results	Inserts ⇥ at the cursor position.	×	○	—
Convert operation results to rising pulse	Inserts ↑ at the cursor position.	×	○	—
Convert operation results to falling pulse	Inserts ↓ at the cursor position.	×	○	—
Documentation		—	—	—
Comment	Edits the comment at the cursor position.	×	○	—
Statement	Edits the statement at the cursor position in a ladder.	×	○	—
Note	Edits the note at the cursor position in a ladder.	×	○	—
Statement/Note block edit	Edits the statement/note under program at a time.	×	○	—

(To the next page)

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(Continued from the previous page.)

| Find/Replace		Only for monitoring *1	QSCPU *2	Reference *3
Find device	Searches for a device.	O	O	—
Find instruction	Searches for an instruction.	O	O	—
Find step No.	Searches for a step number.	O	O	—
Find character string	Searches for the character string in a comment, note, or statement.	O	O	—
Find contact or coil	Searches for a contact or coil.	O	O	—
Replace device	Searches for and replaces a device.	×	O	—
Device block replacement	Searches for and replaces multiple devices at a time.	×	O	—
Replace instruction	Searches for and replaces an instruction.	×	O	—
Change open/close contact	Searches for and replaces a contact a with a contact b.	×	O	—
Replace character string	Searches for and replaces the character string in a comment, note, or statement.	×	O	—
Change module start address	Searches for and replaces the module start I/O No. of the buffer memory address instructions.	×	O	—
Replace statement/note type	Searches for and replaces the type of a note/statement.	×	O	—
Cross reference window display	Displays where the specified device or label is used.	O	O	—
Cross reference list	Lists the step numbers and usage types of the specified device.	O	O	—
List of used devices	Finds where the device is used.	O	O	—
Convert		Only for monitoring *1	QSCPU *2	Reference *3
Convert	Converts a program.	×	O	—
Convert (All programs being edited)	Converts all the programs (not converted yet) at a time.	×	O	—
Convert block (All programs)	Converts all programs at a time.	×	O	—
Convert block (Online change)	Converts a program and writes it to a programmable controller CPU during RUN.	×	●	Appendix 1

(To the next page)

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    ×: Cannot be selected.

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(Continued from the previous page.)

View		Only for monitoring *1	QSCPU *2	Reference *3
Comment	Displays or hides comments.	O	O	—
Statement	Displays or hides statements.	O	O	—
Note	Displays or hides notes.	O	O	—
Alias	Displays or hides device names.	O	O	—
Display device program	Displays or hides the device display screen.	O	O	—
Macro instruction format display	Displays the instructions in the user macro instruction format.	×	×	—
Display current monitored values	Displays or hides the current monitored values.	O	O	—
Comment format		—	—	—
4 × 8 characters, 2 × 8 characters	Displays comments in 4 × 8 or 2 × 8 characters.	O	O	—
3 × 5 characters	Displays comments in 3 × 5characters.	O	O	—
Alias format display		—	—	—
Displayed instead of device	Displays the machine name at the device name display position.	O	O	—
Displayed with device	Arranges and displays the machine name above the device name.	O	O	—
Device program display mode		—	—	—
Below	Vertically splits the screen in two in the zoom/device display.	O	O	—
Right	Horizontally splits the screen in two in the zoom/device display.	O	O	—
Number of comment lines	Displays device comments in the specified number of rows (1 to 4 rows).	O	O	—
Zoom	Displays a ladder in the specified magnification.	O	O	—
Instruction list/Ladder	Switches between the ladder mode and list mode.	×	×	—
Set the contact		—	—	—
9 contacts	Displays a ladder in 9 contacts.	O	O	—
11 contacts	Displays a ladder in 11 contacts.	O	O	—
Elapsed time	Displays the Elapsed time dialog box.	×	×	—
Display step synchronization	Synchronizes the steps of label display with those of device display.	O	O	—

(To the next page)

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(Continued from the previous page.)

Online		Only for monitoring *1	QSCPU *2	Reference *3
Monitor		—	—	—
Monitor mode	Places the ladder editing screen in the monitor mode.	O	O	—
Monitor (Write mode)	Sets the ladder (Monitor write) mode.	×	O	—
Start monitor	Restarts monitoring.	O	O	—
Stop monitor	Stops monitoring.	O	O	—
Change current value monitor (Decimal)	Displays the current device values of a ladder monitor in decimal form.	O	O	—
Change current value monitor (Hexadecimal)	Displays the current device values of a ladder monitor in hexadecimal form.	O	O	—
Monitor condition setup	Sets monitor execution conditions.	×	×	—
Monitor stop condition setup	Sets monitor stop conditions.	×	×	—
Scan time measurement	Measures scan time.	×	×	—
Entry ladder monitor	Registers ladder blocks.	O	O	—
Delete all entry ladder	Deletes all the registered ladder blocks.	O	O	—
Debug		—	—	—
Debug	Performs/disables the debugging function.	×	×	—
Skip execution	Makes settings for skip.	×	×	—
Partial execution	Makes settings for partial execution.	×	×	—
Step execution	Makes settings for step execution.	×	×	—
Tools		Only for monitoring *1	QSCPU *2	Reference *3
Check program	Checks a program.	O	O	—
Change display color	Changes a display color.	O	●	5.4

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　　×: Cannot be selected.

*3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(3) Label program editing functions list
The following functions can be performed to edit a label program.

Project		Only for monitoring *1	QSCPU *2	Reference *3
Edit data		—	—	—
New	Adds data to a project.	×	○	—
Copy	Copies the data in a project.	×	○	—
Delete	Deletes the data in a project.	×	○	—
Rename	Renames the data in a project.	×	○	—
Change program type	Changes a ladder and SFC with each other.	×	×	—
Function Block		—	—	—
Diversion	Diverts the FB to a ladder program.	×	×	—
Rename	Renames the diverted FB.	×	×	—
FB change module address	Sets the module start I/O No. used in FB definition.	×	×	—

Edit		Only for monitoring *1	QSCPU *2	Reference *3
Undo	Reverses the last operation.	○	○	—
Cut	Moves the selected data to the clipboard.	○	○	—
Copy	Copies the selected data to the clipboard.	○	○	—
Paste	Pastes the clipboard contents at the cursor position.	○	○	—
Insert line	Inserts a row at the cursor position.	○	○	—
Add line	Adds a row under the cursor position.	○	○	—
Delete line	Deletes a row at the cursor position.	○	○	—
Delete Auto External (Au)	Deletes all Auto External.	○	○	—
Delete all	Deletes all variables.	○	○	—
Auto device setting	Sets the ranges for the devices to be automatically assigned.	○	○	—
Global variable setting	Opens the global variable setting screen.	○	○	—
Import the device comment	Imports device comments (Local label variables only).	○	○	—
Export the device comment	Exports label comments.	○	○	—

Find/Replace		Only for monitoring *1	QSCPU *2	Reference *3
Find device	Searches for the device in the label variable setting screen.	○	○	—
Find character string	Searches for the character string in the label variable setting screen.	○	○	—
Replace device	Searches for and replaces the device in the label variable setting screen.	○	○	—
Replace character string	Searches for and replaces the character string in the label variable setting screen.	○	○	—

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∗3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(Continued from the previous page.)

Convert (Function for local label variable/global label variable editing)		Only for monitoring *1	QSCPU *2	Reference *3
Convert/Compile	Compiles a label program.	×	○	—
Convert/Compile (All programs being edited)	Compiles all the label programs (not compiled yet).	×	○	—
Convert/Compile (All programs)	Compiles all label programs.	×	○	—
Online		Only for monitoring *1	QSCPU *2	Reference *3
Monitor		—	—	—
Monitor mode	Sets the monitor mode.	×	×	—
Monitor (Write mode)	Sets the write mode during ladder monitoring.	×	×	—
Start monitor	Starts monitoring.	×	×	—
Stop monitor	Stops monitoring.	×	×	—
Change current value monitor (Decimal)	Displays the current device values of a ladder monitor in decimal form.	×	×	—
Change current value monitor (Hexadecimal)	Displays the current device values of a ladder monitor in hexadecimal form.	×	×	—
Monitor condition setup	Sets monitor execution conditions.	×	×	—
Monitor stop condition setup	Sets monitor stop conditions.	×	×	—
Scan time measurement	Measures scan time.	×	×	—
Entry ladder monitor	Registers ladder blocks.	×	×	—
Delete all entry ladder	Deletes all the registered ladder blocks.	×	×	—
Debug		—	—	—
Debug	Performs/disables the debugging function.	×	×	—
Skip execution	Makes settings for skip.	×	×	—
Partial execution	Makes settings for partial execution.	×	×	—
Step execution	Makes settings for step execution.	×	×	—
Tools		Only for monitoring *1	QSCPU *2	Reference *3
Check program	Checks a program.	×	×	—
Sort		—	—	—
Label order	Sorts by label.	×	○	—
Device/Constant order	Sorts by device/constant.	×	○	—
Device type order	Sorts by device type.	×	○	—
Change display color	Changes a display color.	×	×	—

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　　×: Cannot be selected.

*3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(4) Device comment editing functions list
The following functions can be performed to edit device comments.

Project		Only for monitoring *1	QSCPU *2	Reference *3
Edit data		—	—	—
New	Adds data to a project.	×	○	—
Copy	Copies the data in a project.	×	○	—
Delete	Deletes the data in a project.	×	○	—
Rename	Renames the data in a project.	×	○	—
Change program type	Changes a ladder and SFC with each other.	×	×	—
Function Block		—	—	—
Diversion	Diverts the FB to a ladder program.	×	×	—
Rename	Renames the diverted FB.	×	×	—
FB change module address	Sets the module start I/O No. used in FB definition.	×	×	—
Edit		Only for monitoring *1	QSCPU *2	Reference *3
Cut	Moves the selected data to the clipboard.	×	○	—
Copy	Copies the selected data to the clipboard.	×	○	—
Paste	Pastes the clipboard contents at the cursor position.	×	○	—
Clear all (all devices)	Deletes the comments or device names of all devices.	○	○	—
Clear all (displayed devices)	Deletes the displayed device comments or device names.	○	○	—
Setup comment	Sets a comment type to common comments/comments by program.	○	○	—
Setup comment range	Sets comment ranges.	○	○	—
Find/Replace		Only for monitoring *1	QSCPU *2	Reference *3
Find character string	Searches for the character string in the device comment screen.	○	○	—
Replace character string	Searches for and replaces the character string in the device comment screen.	○	○	—
Convert		Only for monitoring *1	QSCPU *2	Reference *3
Convert (All programs being edited)	Converts/compiles all programs at a time.	×	×	—

(To the next page)

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*2: Indicates the menu selectability when using the QSCPU.
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    ×: Cannot be selected.

*3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(Continued from the previous page.)

Online		Only for monitoring *1	QSCPU *2	Reference *3
Monitor		—	—	—
Monitor mode	Sets the monitor mode.	×	×	—
Monitor (Write mode)	Sets the write mode during ladder monitoring.	×	×	—
Start monitor	Starts monitoring.	×	×	—
Stop monitor	Stops monitoring.	×	×	—
Change current value monitor (Decimal)	Displays the current device values of a ladder monitor in decimal form.	×	×	—
Change current value monitor (Hexadecimal)	Displays the current device values of a ladder monitor in hexadecimal form.	×	×	—
Monitor condition setup	Sets monitor execution conditions.	×	×	—
Monitor stop condition setup	Sets monitor stop conditions.	×	×	—
Scan time measurement	Measures scan time.	×	×	—
Entry ladder monitor	Registers ladder blocks.	×	×	—
Delete all entry ladder	Deletes all the registered ladder blocks.	×	×	—
Debug		—	—	—
Debug	Performs/disables the debugging function.	×	×	—
Skip execution	Makes settings for skip.	×	×	—
Partial execution	Makes settings for partial execution.	×	×	—
Step execution	Makes settings for step execution.	×	×	—
Tools		Only for monitoring *1	QSCPU *2	Reference *3
Check program	Checks a program.	×	×	—
Change display color	Changes a display color.	×	×	—

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*3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(5) Device memory editing functions list
The following functions can be performed to edit device memory.

Project		Only for monitoring *1	QSCPU *2	Reference *3
Edit data		—	—	—
New	Adds data to a project.	×	○	—
Copy	Copies the data in a project.	×	○	—
Delete	Deletes the data in a project.	×	○	—
Rename	Renames the data in a project.	×	○	—
Change program type	Changes a ladder and SFC with each other.	×	×	—
Function Block		—	—	—
Diversion	Diverts the FB to a ladder program.	×	×	—
Rename	Renames the diverted FB.	×	×	—
FB change module address	Sets the module start I/O No. used in FB definition.	×	×	—
Edit		Only for monitoring *1	QSCPU *2	Reference *3
Cut	Moves the selected data to the clipboard.	×	○	—
Copy	Copies the selected data to the clipboard.	×	○	—
Paste	Pastes the clipboard contents at the cursor position.	×	○	—
Clear all (all devices)	Deletes all device data.	○	○	—
Clear all (displayed devices)	Deletes the displayed device data.	○	○	—
FILL	Sets all data to the specified value.	○	○	—
Find/Replace		Only for monitoring *1	QSCPU *2	Reference *3
Finding data	Searches for the data in the device memory screen.	○	○	—
Find character string	Searches for the character string in the device memory screen.	○	○	—
Replacing data	Searches for and replaces the data in the device memory screen.	○	○	—
Replace character string	Searches for and replaces the character string in the device memory screen.	○	○	—
Convert		Only for monitoring *1	QSCPU *2	Reference *3
Convert (All programs being edited)	Converts/compiles all programs at a time.	×	×	—

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×: Cannot be selected.

∗3: For functions without references, refer to the GX Developer Version 8 Operating Manual.

(Continued from the previous page.)

Online		Only for monitoring *1	QSCPU *2	Reference *3
Monitor		—	—	—
Monitor mode	Sets the monitor mode.	×	×	—
Monitor (Write mode)	Sets the write mode during ladder monitoring.	×	×	—
Start monitor	Starts monitoring.	×	×	—
Stop monitor	Stops monitoring.	×	×	—
Change current value monitor (Decimal)	Displays the current device values of a ladder monitor in decimal form.	×	×	—
Change current value monitor (Hexadecimal)	Displays the current device values of a ladder monitor in hexadecimal form.	×	×	—
Monitor condition setup	Sets monitor execution conditions.	×	×	—
Monitor stop condition setup	Sets monitor stop conditions.	×	×	—
Scan time measurement	Measures scan time.	×	×	—
Entry ladder monitor	Registers ladder blocks.	×	×	—
Delete all entry ladder	Deletes all the registered ladder blocks.	×	×	—
Debug		—	—	—
Debug	Performs/disables the debugging function.	×	×	—
Skip execution	Makes settings for skip.	×	×	—
Partial execution	Makes settings for partial execution.	×	×	—
Step execution	Makes settings for step execution.	×	×	—
Tools		Only for monitoring *1	QSCPU *2	Reference *3
Check program	Checks a program.	×	×	—
Change display color	Changes a display color.	×	×	—

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   ×: Cannot be selected.

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1.2.2 Restricting operations by using safety CPU operation mode/access level

This section explains the operability and restrictions of each GX Developer function differ depends on the combination of safety CPU operation mode and an access level.

(1) Common functions

Menu Item		SAFETY MODE			TEST MODE			Restrictions
		Admin.	Develop.	Users	Admin.	Develop.	Users	
Project								—
	New project	—	—	—	—	—	—	—
	Open project	O	O	O	O	O	O	—
	Close project	O	O	O	O	O	O	—
	Save	O	O	×	O	O	×	—
	Save as	△	△	△	△	△	△	△: Refer to ∗1.
	Delete project	△	△	△	△	△	△	△: Refer to ∗2.
	Verify	O	O	O	O	O	O	—
	Copy	O	O	O	O	O	O	—
	Security operation							—
	User management	O	×	×	O	×	×	—
	Wait time settings	O	×	×	O	×	×	—
	Operation lock	O	O	O	O	O	O	—
	Printer setup	O	O	O	O	O	O	—
	Print	O	O	O	O	O	O	—
	Start new GX Developer session	O	O	O	O	O	O	—
	Exit GX Developer	O	O	O	O	O	O	—
View								—
	Toolbar	O	O	O	O	O	O	—
	Status bar	O	O	O	O	O	O	—
	Project data list	O	O	O	O	O	O	—
	Project data display format							—
	Not sort	O	O	O	O	O	O	—
	Sort data name ascending	O	O	O	O	O	O	—
	Sort data name descending	O	O	O	O	O	O	—

(To the next page)

O: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
−: Can perform independent of the access level.

∗1: When overwriting the existing project, logging in to the project is required.
"Save as" can be performed, when the access level of the login user is "Administrators" or "Developers".

∗2: Log in to the project to be deleted is required.
"Delete project" can be performed, when the access level of the login user is "Administrators" or "Developers".

(Continued from the previous page.)

Menu Item	SAFETY MODE			TEST MODE			Restrictions
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Online							—
Transfer setup	O	O	O	O	O	O	—
Read from PLC	△	×	×	△	×	×	△: Refer to ∗3.
Write to PLC	×	×	×	O	O	×	
Verify with PLC	O	O	O	O	O	O	—
Write to PLC (Flash ROM)							—
Write the program memory to ROM	×	×	×	O	O	×	—
Delete PLC data	×	×	×	O	O	×	—
Monitor							—
Start monitor (All windows)	O	O	O	O	O	O	—
Stop monitor (All windows)	O	O	O	O	O	O	—
Device batch	O	O	O	O	O	O	—
Entry data monitor	O	O	O	O	O	O	—
Buffer memory batch	O	O	O	O	O	O	—
Program monitor list	O	O	O	O	O	O	—
Debug							—
Device test	×	×	×	O	O	×	Refer to Appendix 1.
Remote operation	O	O	×	O	O	×	Refer to Appendix 1.
Safety CPU operation							—
Switch safety CPU operation mode	O	O	×	O	O	×	—
ROM information	O	O	O	O	O	O	—
CPU access password registration/change	△	×	×	O	×	×	△: Refer to ∗4.
PLC memory initialization	O	×	×	O	×	×	—
Monitor destination select option	△	△	△	△	△	△	△: Refer to ∗5.
Clear PLC memory	×	×	×	O	O	×	—
Format PLC memory	×	×	×	O	O	×	—
Arrange PLC memory	×	×	×	O	O	×	—
Set clock	O	O	×	O	O	×	—

(To the next page)

O: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
−: Can perform independent of the access level.

∗3: "Read from PLC" cannot be newly performed from the safety CPU.

∗4: Cannot register a CPU access password with a safety CPU.

∗5: The CPU to be monitored cannot be switched during monitoring.

(Continued from the previous page.)

Menu Item	SAFETY MODE			TEST MODE			Restrictions
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Diagnostics							Refer to Appendix 1.
PLC diagnostics	△	△	△	○	○	△	△: Refer to *6.
MELSECNET(II)/10/H diagnostics	△	△	△	○	○	△	△: Refer to *7.
MELSECNET/G diagnostics	△	△	△	○	○	△	△: Refer to *8.
Ethernet diagnostics	△	△	△	○	○	△	△: Refer to *9.
CC-Link / CC-Link/LT diagnostics	△	△	△	○	○	△	△: Refer to *10.
System monitor	○	○	○	○	○	○	—
Tools							—
Marge data	○	○	○	○	○	○	Refer to Appendix 1.
Check parameter	○	○	○	○	○	○	—
Delete unused comments	○	○	○	○	○	○	—
Clear all parameters	○	○	○	○	○	○	—
Customize keys	○	○	○	○	○	○	—
Options	○	○	×	○	○	×	Refer to Appendix 1.
Create start-up settings file	○	○	○	○	○	○	—
Window							—
Cascade	○	○	○	○	○	○	—
Tile vertically	○	○	○	○	○	○	—
Tile horizontally	○	○	○	○	○	○	—
Arrange icons	○	○	○	○	○	○	—
Close all Windows	○	○	○	○	○	○	—
Help							—
CPU error	○	○	○	○	○	○	—
Special relay/register	○	○	○	○	○	○	—
Key operation list	○	○	○	○	○	○	—
Product information	○	○	○	○	○	○	—
Connect to MELFANSweb	○	○	○	○	○	○	—

○: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
—: Can perform independent of the access level.

*6: "Clear log" cannot be performed in the PLC Diagnostics screen.

*7: "Clear of error history" cannot be performed in the Error history monitor screen of the MELSECNET(II)/10/H diagnostics.

*8: "Clear error info" cannot be performed in the Logging screen of the MELSECNET/G diagnostics.

*9: The ⟨COM. ERR off⟩ button of the Ethernet diagnostics cannot be selected. "Clear history" on the <<Error log>> tab cannot be performed.

*10: "Loop test" cannot be performed in the CC-Link / CC-Link/LT diagnostics screen.

(2) Ladder editing functions

Menu Item	SAFETY MODE			TEST MODE			Restrictions
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Project							—
Edit data							—
New	○	○	○	○	○	○	—
Delete	○	○	○	○	○	○	—
Rename	○	○	○	○	○	○	—
Function Block							—
Diversion	○	○	○	○	○	○	—
Rename	○	○	○	○	○	○	—
FB change module address	○	○	○	○	○	○	—
Edit							—
Undo	○	○	○	○	○	○	—
Restore after ladder conversion	○	○	○	○	○	○	—
Cut	○	○	○	○	○	○	—
Copy	○	○	○	○	○	○	Refer to Appendix 1.
Paste	○	○	○	○	○	○	Refer to Appendix 1.
Insert line	○	○	○	○	○	○	—
Delete line	○	○	○	○	○	○	—
Insert row	○	○	○	○	○	○	—
Delete row	○	○	○	○	○	○	—
Insert NOP batch	○	○	○	○	○	○	—
Delete NOP batch	○	○	○	○	○	○	—
Draw line	○	○	○	○	○	○	—
Delete line	○	○	○	○	○	○	—
Change TC setting	○	○	○	○	○	○	Refer to Appendix 1.
Read mode	○	○	○	○	○	○	—
Write mode	○	○	○	○	○	○	—
Ladder symbol	○	○	○	○	○	○	—
Documentation	○	○	○	○	○	○	—

○: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
—: Can perform independent of the access level.

(Continued from the previous page.)

Menu Item	SAFETY MODE			TEST MODE			Restrictions
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Find/Replace							—
Find device	O	O	O	O	O	O	—
Find instruction	O	O	O	O	O	O	—
Find step No.	O	O	O	O	O	O	—
Find character string	O	O	O	O	O	O	—
Find contact or coil	O	O	O	O	O	O	—
Replace device	O	O	O	O	O	O	—
Device block replacement	O	O	O	O	O	O	—
Replace instruction	O	O	O	O	O	O	—
Change open/close contact	O	O	O	O	O	O	—
Replace character string	O	O	O	O	O	O	—
Change module start address	O	O	O	O	O	O	—
Replace statement/note type	O	O	O	O	O	O	—
Cross reference window display	O	O	O	O	O	O	—
Cross reference list	O	O	O	O	O	O	—
List of used devices	O	O	O	O	O	O	—
Convert							—
Convert	O	O	O	O	O	O	—
Convert (All programs being edited)	O	O	O	O	O	O	—
Convert block (All programs)	O	O	O	O	O	O	—
Convert block (Online change)	×	×	×	O	O	×	—
View							—
Comment	O	O	O	O	O	O	—
Statement	O	O	O	O	O	O	—
Note	O	O	O	O	O	O	—
Alias	O	O	O	O	O	O	—
Display device program	O	O	O	O	O	O	—
Display current monitored values	O	O	O	O	O	O	—
Comment format	O	O	O	O	O	O	—
Alias format display	O	O	O	O	O	O	—
Device program display mode	O	O	O	O	O	O	—
Number of comment lines	O	O	O	O	O	O	—
Zoom	O	O	O	O	O	O	—
Set the contact	O	O	O	O	O	O	—
Display step synchronization	O	O	O	O	O	O	—

O: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
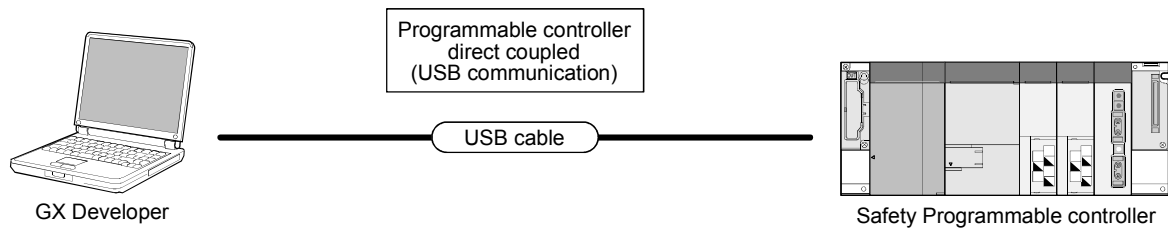−: Can perform independent of the access level.

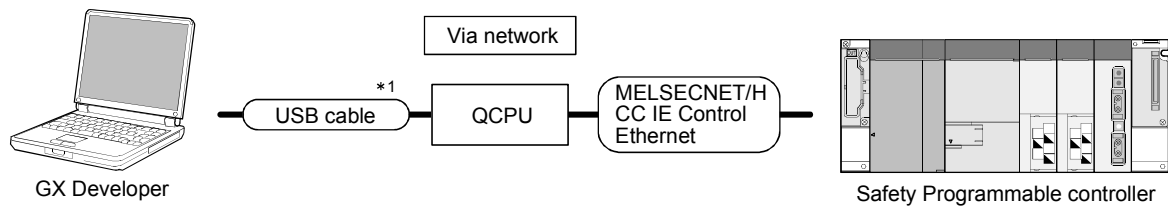| Menu Item	SAFETY MODE			TEST MODE			Restrictions
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Online							—
Monitor							—
Monitor mode	○	○	○	○	○	○	—
Monitor (Write mode)	○	○	×	○	○	×	—
Start monitor	○	○	○	○	○	○	—
Stop monitor	○	○	○	○	○	○	—
Change current value monitor (Decimal)	○	○	○	○	○	○	—
Change current value monitor (Hexadecimal)	○	○	○	○	○	○	—
Entry ladder monitor	○	○	○	○	○	○	—
Delete all entry ladder	○	○	○	○	○	○	—
Tools							—
Check program	○	○	○	○	○	○	—
Change display color	○	○	○	○	○	○	—

○: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
–: Can perform independent of the access level.

(3) Label program editing functions

Menu Item	SAFETY MODE			TEST MODE			Restrictions
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Project							−
Edit data							−
New	○	○	○	○	○	○	−
Copy	○	○	○	○	○	○	−
Delete	○	○	○	○	○	○	−
Rename	○	○	○	○	○	○	−
Edit							
Undo	○	○	○	○	○	○	−
Cut	○	○	○	○	○	○	−
Copy	○	○	○	○	○	○	−
Paste	○	○	○	○	○	○	−
Insert line	○	○	○	○	○	○	−
Add line	○	○	○	○	○	○	−
Delete line	○	○	○	○	○	○	−
Delete Auto External (Au)	○	○	○	○	○	○	−
Delete all	○	○	○	○	○	○	−
Auto device setting	○	○	○	○	○	○	−
Global variable setting	○	○	○	○	○	○	−
Import the device comment	○	○	○	○	○	○	−
Export the device comment	○	○	○	○	○	○	−
Find/Replace							−
Find device	○	○	○	○	○	○	−
Find character string	○	○	○	○	○	○	−
Replace device	○	○	○	○	○	○	−
Replace character string	○	○	○	○	○	○	−
Convert							−
Convert/Compile	○	○	○	○	○	○	−
Convert/Compile (All programs being edited)	○	○	○	○	○	○	−
Convert/Compile (All programs)	○	○	○	○	○	○	−
Tools							−
Sort							−
Label order	○	○	○	○	○	○	−
Device/Constant order	○	○	○	○	○	○	−
Device type order	○	○	○	○	○	○	−

○: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
−: Can perform independent of the access level.

(4) Device comment editing functions

Menu Item	SAFETY MODE			TEST MODE			Restrictions
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Project							−
Edit data							−
New	O	O	O	O	O	O	−
Copy	O	O	O	O	O	O	−
Delete	O	O	O	O	O	O	−
Rename	O	O	O	O	O	O	−
Edit							−
Cut	O	O	O	O	O	O	−
Copy	O	O	O	O	O	O	−
Paste	O	O	O	O	O	O	−
Clear all (all devices)	O	O	O	O	O	O	−
Clear all (displayed devices)	O	O	O	O	O	O	−
Setup comment	O	O	O	O	O	O	−
Setup comment range	O	O	O	O	O	O	−
Find/Replace							−
Find character string	O	O	O	O	O	O	−
Replace character string	O	O	O	O	O	O	−

O: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
−: Can perform independent of the access level.

(5) Device memory editing functions

Menu Item	SAFETY MODE			TEST MODE			Restriction
	Admin.	Develop.	Users	Admin.	Develop.	Users	
Project							−
Edit data							−
New	O	O	O	O	O	O	−
Copy	O	O	O	O	O	O	−
Delete	O	O	O	O	O	O	−
Rename	O	O	O	O	O	O	−
Edit							−
Cut	O	O	O	O	O	O	−
Copy	O	O	O	O	O	O	−
Paste	O	O	O	O	O	O	−
Clear all (all devices)	O	O	O	O	O	O	−
Clear all (displayed devices)	O	O	O	O	O	O	−
FILL	O	O	O	O	O	O	−
Find/Replace							−
Finding data	O	O	O	O	O	O	−
Find character string	O	O	O	O	O	O	−
Replacing data	O	O	O	O	O	O	−
Replace character string	O	O	O	O	O	O	−

O: Can be operated. △: Can be operated with restrictions. ×: Cannot be operated.
−: Can perform independent of the access level.

MEMO

2. SYSTEM CONFIGURATION

This section explains the system configuration when the GX Developer is connected to a safety CPU.

(1) Direct coupling to a safety CPU

GX Developer

Programmable controller
direct coupled
(USB communication)

USB cable

Safety Programmable controller

    (a) Connection cable
        For USB cables connecting a PC with a safety CPU, refer to the GX Developer Version 8 Operating Manual.

    (b) Compatible GX Developer
        Use the GX Developer Version 8.40S or later.

(2) Connecting via network

GX Developer

Via network

USB cable *1

QCPU

MELSECNET/H
CC IE Control
Ethernet

Safety Programmable controller

    *1: For details on connecting a personal computer to a QCPU, refer to the GX Developer Version 8 Operating Manual.

    (a) Connection cable
        For details on cables used to connect a safety CPU, refer to the GX Developer Version 8 Operating Manual.

    (b) Compatible GX Developer
        Use the GX Developer Version 8.65T or later.

POINT
The access via safety CPU cannot be performed.

MEMO

3 RESTRICTIONS AND PRECAUTIONS

3.1 Precautions for the GX Developer Version Earlier than the Safety CPU Compatible Version

(1) Precautions for saving and deleting a project
When using the GX Developer whose version is earlier than the safety CPU compatible version (Version 8.39R or earlier), the login certification to a safety project cannot be performed to the following operations.
Therefore, take care not to lose a safety project due to malfunctions.

[Relevant Operation]
   • Overwriting a safety project and then saving it by using "Save as".
   • Deleting a safety project by using "Delete project".

(2) Precautions for opening a project
When using the GX Developer whose version is earlier than the safety CPU compatible version (Version 8.39R or earlier), the safety project cannot be opened.

3.2 Precautions for Management

(1) Precautions for project data management
     Be sure to read the Safety Application Guide for correct management/operation
     of project data.
     A system manager has to back up the project and save the backup data so that
     the data restoration is always possible.

(2) Precautions for password management
     A system manager has to manage the user information (e.g. user name, login
     password, and CPU access password) registered to a project with attention.

     If losing a login password or CPU access password, either of the following
     actions is required.

     (a) Losing a login password
          The project cannot be opened.
          If a system manager has lost the password, re-creating a project is
          required.

     (b) Losing a CPU access password
          When a CPU access password has been set to a safety CPU, "Write to
          PLC" cannot be performed unless the same password is set to the project.
          Note that the CPU access password that has been set to a safety CPU
          cannot be changed.
          If losing a CPU access password, initialize the safety CPU by using "PLC
          memory initialization" and then rewrite the project to the PLC.
          (For "PLC memory initialization" ☞ Section 5.2.4)

(3) Precautions for ROM information management
     A system manager has to record and store "ROM information" each time
     program memory is written to ROM.
     When the ROM information in a safety CPU matches with the previously saved
     one, a system manager can judge that the data have not been changed.
     (For "ROM information confirmation" ☞ Section 5.2.2)

     (Main display contents of ROM information)
      • The year/month/day/hour/minute/second when program memory is written to
        ROM.
      • The parameters and program ID when program memory is written to ROM.
      • The user who wrote program memory to ROM.

4 PROCEDURES TO OPERATION

This section explains the procedures from creating to operating a project for a safety PLC (Safety project).

4.1 When Creating a Safety Project

The following shows the procedure from creating to operating the safety project.

Creating the new project	Reference
1) Create a new project.	GX Developer Operating Manual
2) Register the user(s) whose access level is/are Administrators.	5.1.1
3) Create a program and parameters.	GX Developer Operating Manual
4) Register the user(s) who log(s) in to the project.	5.1.2

Safety CPU STOP	Reference
Switch the safety CPU to STOP.	—

Safety CPU initial settings	Reference
1) Register a CPU access password for both the project and safety CPU. *1	5.2.3
2) Format the program memory.	GX Developer Operating Manual

*1: If the previous CPU access password has been registered with the safety CPU, initialize the PLC memory in advance. (☞ Section 5.2.4)

Writing the parameters and program	Reference
1) Write the parameters and program to the PLC.	GX Developer Operating Manual
2) Reset the safety CPU.	—

Operation check	Reference
Switch the safety CPU to RUN and check the operation.	GX Developer Operating Manual

Switching to the safety mode	Reference
1) Switch the safety CPU to STOP.	—
2) Write the program memory to the ROM.	5.7
3) Switch the safety CPU operation mode to the safety mode.	5.2.1
4) Reset the safety CPU.	—

Switching the safety CPU to RUN	Reference
Switch the safety CPU to RUN and confirm the RUN LED turns ON.	—

Operation

4.2 When Modifying the Safety Project in Operation

The following shows the procedure from modifying the safety project in operation to operating the project.

Open project	Reference
Open the operating project.	5.1.3

Changing the parameters and program	Reference
Change the parameters and program.	GX Developer Operating Manual

Switching to the test mode	Reference
Switch the safety CPU operation mode to the test mode.	5.2.1

Writing the parameters and program	Reference
1) Switch the safety CPU to STOP.	—
2) Write the parameters and program to the PLC.	GX Developer Operating Manual
3) Reset the safety CPU.	—

Operation check	Reference
Switch the safety CPU to RUN and check the operation.	GX Developer Operating Manual

Switching to the safety mode	Reference
1) Switch the safety CPU to STOP.	—
2) Write the program memory to the ROM.	5.7
3) Switch the safety CPU operation mode to the safety mode.	5.2.1
4) Reset the safety CPU.	—

Switching the safety CPU to RUN	Reference
Switch the safety CPU to RUN and confirm the RUN LED turns ON.	—

Operation

5 ADDED FUNCTIONS TO CORRESPOND TO A SAFETY PROGRAMMABLE CONTROLLER

5.1 Security Operations

5.1.1 Registering the user when creating a new project

A system manager has to create a new project for a safety programmable controller.
When creating a new project, the following screen appears.
A system manager has to register the login user whose access level is Administrators.
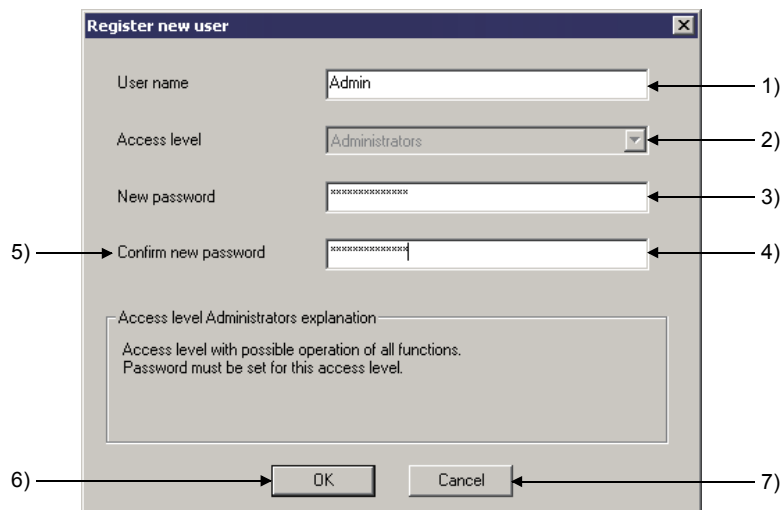
[Description]

1) User name
    Input a user name within 20 characters with the alphabets, numbers, and symbols corresponding to ASCII code ($\square$ Appendix 3) 20$_H$ to 7E$_H$.
    (For alphabets, an upper-case character is differentiated from a lower-case character.)

2) Access level
    "Administrators" has been set to the access level (Fixed).

3) New password
    Input a CPU access password within 6 to 14 characters with the alphabets, numbers, and symbols corresponding to ASCII code ($\square$ Appendix 3) 20$_H$ to 7E$_H$.
    (For alphabets, an upper-case character is differentiated from a lower-case character.)

4) Confirm new password
    Input the same password with 3) for confirmation.

5) Access level explanation field
    Displays the explanation for Administrators.

6) OK button

Closes the screen when the setting is correct.
The login to the project is performed with the registered user.
In addition, the new user is registered with the User management screen
described in Section 5.1.2.

7) Cancel button

Cancels the setting and returns to the New Project screen.

POINT
For the additional registration of login users, refer to Section 5.1.2.

5.1.2 Registering/deleting/changing a login user

	Admin.	Develop.	Users
SAFETY	○	×	×
TEST	○	×	×

[Purpose]
Registers/deletes/changes the login user of the project for a safety programmable controller.

[Operating Procedure]
Select [Project] → [Security operation] → [User management].

[Dialog Box]
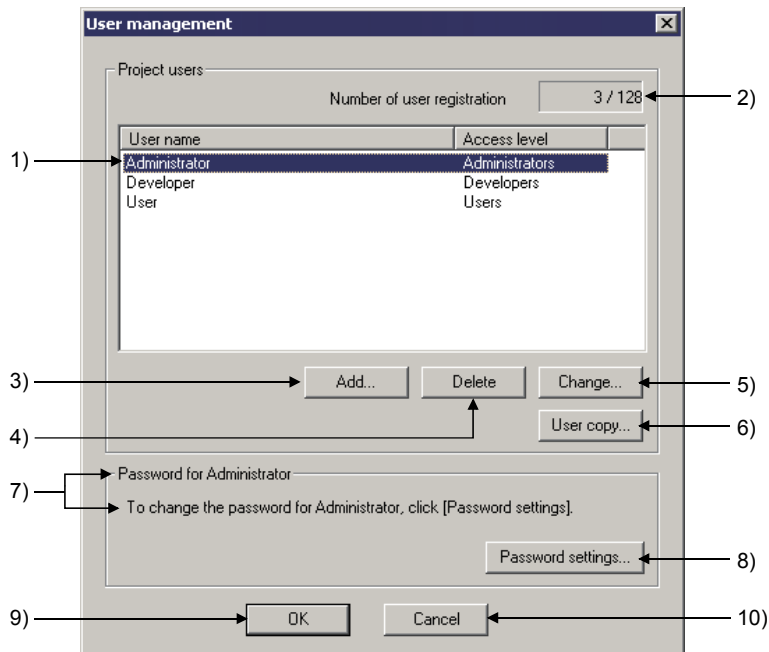
[Description]

1) User list/selection field

• Display/Selection
  Displays the user names with their access levels registered with the project.
  Select the registered user to be deleted or the user whose information is to
  be changed.

• Search
  Inputting the first character of a user name finds the user name(s) having
  the same first character.

• Sort
  Clicking the title (User name or access level) by using a mouse sorts the
  list based on the title.
  The list is alternatively sorted between ascending order and descending
  order.

2) Number of user registration
Displays the number of the users registered to the project (Max. 128).

3) ⬜ Add ⬜ button

Displays the Add new user screen. (☞ (1) in this section)

4) ⬜ Delete ⬜ button

Deletes the selected user.

5) ⬜ Change ⬜ button

Displays the User change screen. (☞ (2) in this section)

6) ⬜ User copy ⬜ button

Copies (Adds or overwrites) the user information registered with other project to
the open project.
(For operating procedure ☞ (4) in this section)

7) Password for ✳✳✳✳✳✳
Displays the user name selected in the list of 1).

8) ⬜ Password settings ⬜ button

Displays the Password settings screen. (☞ (3) in this section)

9) ⬜ OK ⬜ button

Registers the set user information, and closes the screen.

10) ⬜ Cancel ⬜ button

Cancels the set user information, and closes the screen.

(1) Adding a new user

[Purpose]
 Adds the user who can log in to the project under editing.

[Operating Procedure]
 Select [Project] → [Security operation] → [User management] → ⬚Add⬚ button.

[Dialog Box]
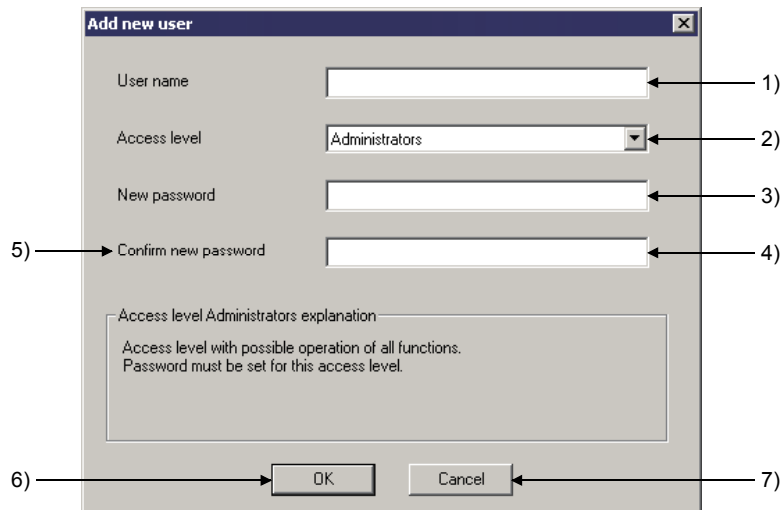
[Description]

1) User name
   Input a user name within 20 characters with the alphabets, numbers, and
   symbols corresponding to ASCII code (☞ Appendix 3) 20H to 7EH.
   (For alphabets, an upper-case character is differentiated from a lower-case
   character.)

2) Access level
   Select an access level for the new user from the combo box.

3) New password
   Input a CPU access password within 6 to 14 characters with the alphabets,
   numbers, and symbols corresponding to ASCII code (☞ Appendix 3) 20H to
   7EH.
   (For alphabets, an upper-case character is differentiated from a lower-case
   character.)
   When the access level is set to "Users", the password input can be skipped.

4) Confirm new password
   Input the same password with 3) for confirmation.

5) Access level explanation field
   Displays the explanation for the access level selected in 2).

6) ⬚OK⬚ button
   Closes the screen when the setting is correct.
   The new user is registered with the User management screen.

7) ⬚Cancel⬚ button
   Cancels the setting, and closes the screen.

(2) Changing the registered user information

[Purpose]
 Changes the registered user information.

[Operating Procedure]
 Select [Project] → [Security operation] → [User management] → | Change | button.

[Dialog Box]
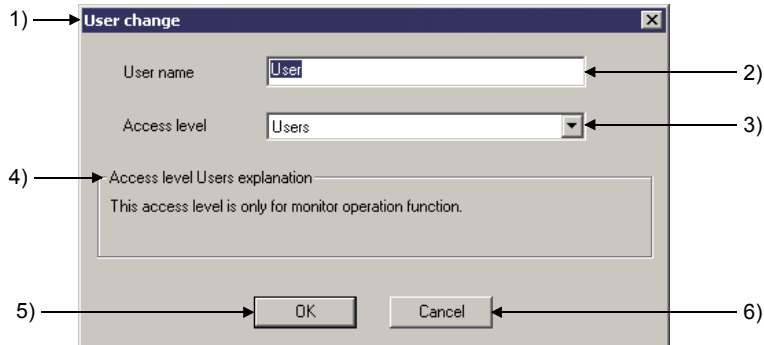
[Description]
  1) Title bar
    Displays the user whose information is to be changed.

  2) User name
    Displays the user whose information is to be changed.
    To change the user name, input a new user name within 20 characters with the
    alphabets, numbers, and symbols corresponding to ASCII code (Appendix
    3) 20_H to $7E_H$.
    (For alphabets, an upper-case character is differentiated from a lower-case
    character.)

  3) Access level
    Displays the access level for the user whose information is to be changed.
    To change the access level, select the desired level from the combo box.

  4) Access level explanation field
    Displays the explanation for the access level selected in 3).

  5) | OK | button
    Closes the screen when the setting is correct.
    The new user information is registered with the User management screen.

  6) | Cancel | button
    Cancels the setting, and closes the screen.

+--+
| POINT |
| • Changing user information |
| The information on the user (User name and access level) during login cannot be |
| changed. |
| • Changing access level |
| When changing the access level to other than "Users", the "Password settings" |
| screen appears. Then, set a password in the screen. |
| When changing the access level to "Users", the password settings can be |
| skipped. |
+--+

(3) Setting/changing a password

[Purpose]
 Sets/changes the registered user password.

[Operating Procedure]
 Select [Project] → [Security operation] → [User management] →
 ⎡ Password settings ⎤ button.

[Dialog Box]

[Description]

1) New password
 Input a CPU access password within 6 to 14 characters with the alphabets,
 numbers, and symbols corresponding to ASCII code (☞ Appendix 3) 20H to
 7EH.
 (For alphabets, an upper-case character is differentiated from a lower-case
 character.)

2) Confirm new password
 Input the same password with 1) for confirmation.

3) ⎡ OK ⎤ button

 Closes the screen when the setting is correct.
 The new password is set.

4) ⎡ Cancel ⎤ button

 Cancels the setting, and closes the screen.

(4) Copying user information

[Purpose]
  Copies (Adds or overwrites) the user information registered with other project to the
  open project.

[Operating Procedure]
  Select [Project] → [Security operation] → [User management] → | User copy |
  button.

[Dialog Box]
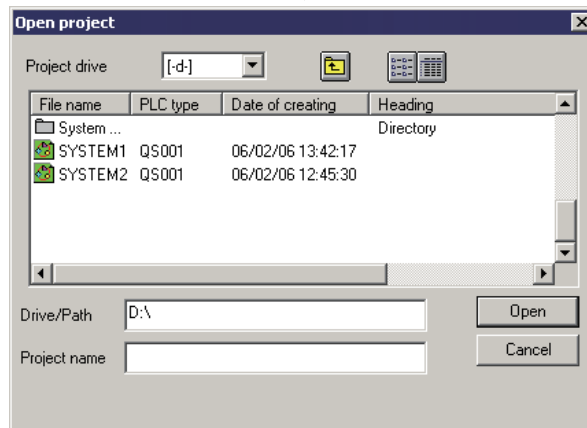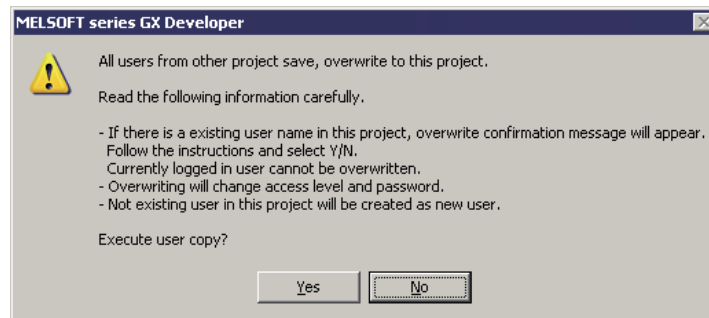
Select the original project in the screen above.

┌───┐
│   POINT   │
├───┤
│ Copying user information   │
│   • Selecting the original project displays the Login certification screen.   │
│   Input the user name and password for logging in to the original project. Only the │
│   users whose access levels are Administrators can log in to the project. (For login │
│   certification ☞ Section 5.1.3)   │
└───┘

5.1.3 Logging in to a project

(1) Functions require login certification
    The following functions require login certification to the project for a safety
    programmable controller.

Function
Project
Open project
Save as (When selecting the existing safety project as the "Project name")
Delete project
Verify (When selecting a safety project as a verify source)
Copy (When selecting a safety project as a copy source)
When selecting: Security operation → User management → User copy button (Section 5.1.2)
Tool
Marge data

(2) Login operation
    When performing the functions require login certification, the following setting
    screen appears.
    Then, perform login operation with the user name and password.

[Dialog Box]
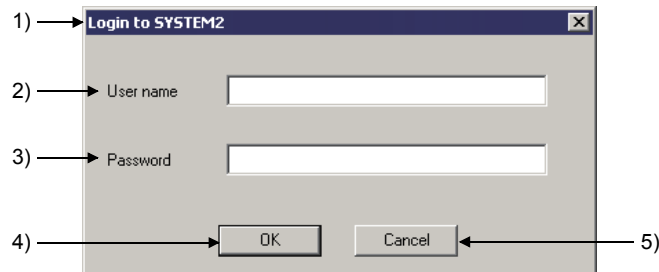
[Description]

1) Title bar
   Displays the project to be logged in.

2) User name
   Input the user name registered with the project to be logged in.
   (For alphabets, an upper-case character is differentiated from a lower-case
   character.)

3) Password
   Input the login password for the user of 2).

4) OK button

   Perform login certification with the input user name and password. If the user is
   allowed to operate the function, the function is performed.

5) Cancel button

   Closes the screen without login certification.

(3) Displaying login user information
   Login information is displayed on the bottom of the Project data list screen.

Login information ⟶

User information icon ⟶

User name

Access level
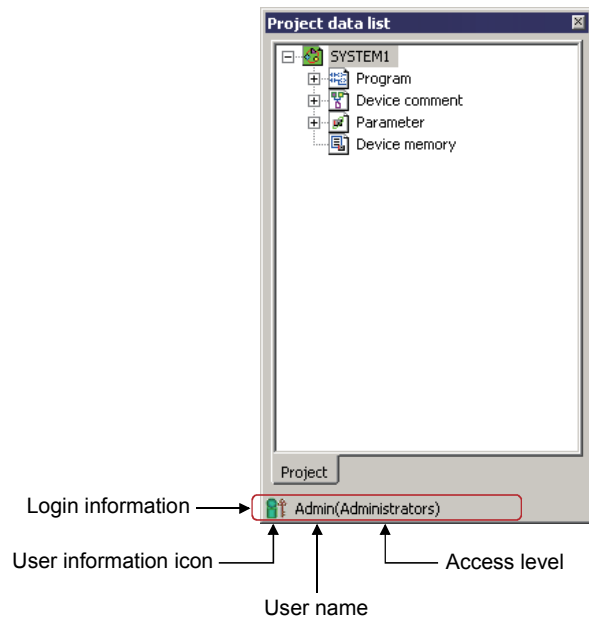
5.1.4 Locking operations

The GX Developer operations by other than the login users are inhibited.
An operation lock has two types, automatic operation lock and manual operation lock.
This section explains how to use the operation lock function.

(1) Setting wait time for the automatic operation lock

	Admin.	Develop.	Users
SAFETY	○	×	×
TEST	○	×	×

[Purpose]
  Sets the wait time to inhibit the GX Developer operations.
  When the GX Developer has not been operated over the set time, the Operation
  lock screen appears, and the GX Developer operation is locked.

[Operating Procedure]
  Select [Project] → [Security operation] → [Wait time settings].

[Dialog Box]
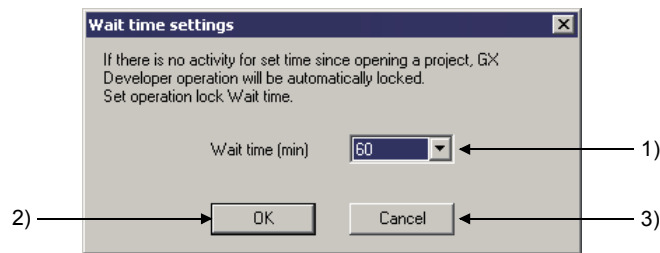
[Description]

  1) Wait time (min)
     Select the wait time for automatic operation lock from the combo box.
     The time can be set between 10 and 120 minutes (10-minute intervals).

  2) OK button
     Registers the set wait time, and closes the screen.

  3) Cancel button
     Cancels the set wait time, and closes the screen.

POINT

- The wait time for the automatic operation lock is counted while the GX Developer has not been operated, and is reset when operating the GX Developer. However, the wait time is not reset in the following operations.

  <Selecting a menu item when a pull-down menu is displayed>
    Example) When displaying the pull-down menu of the Project

Pull-down menu
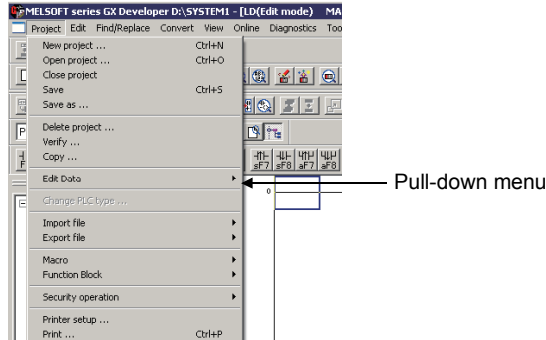
  <All the operations when a message box is displayed>
    Example) The message box displayed when exiting the GX Developer
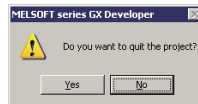
  <All the operations when a dialog box is displayed>
    Example) When the New Project dialog box is displayed
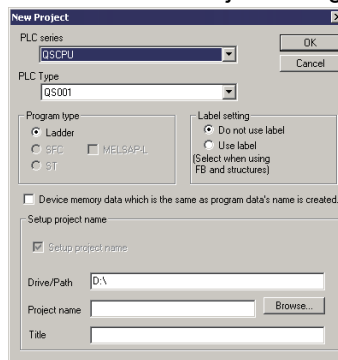
  Note when the key/mouse operation outside the open dialog box is enabled (Designated as a modeless dialog box), the monitoring time is reset.
    Example) When the "Cross reference list" dialog box is displayed

Cross reference list
dialog box
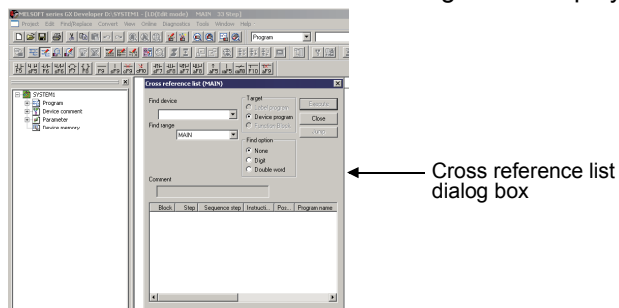
- Unlocking the operation lock enables to operate the GX Developer. ((3) in this section)
- When saving the project, the set wait time is treated as project data.
- The monitor screen displayed before the operation lock keeps updated even during operation lock.

---

(2) Locking operation manually

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

[Purpose]
  Manually locks operation when not operating the GX Developer.

[Operating Procedure]
  Select [Project] → [Security operation] → [Operation lock].

[Dialog Box]

MELSOFT series GX Developer

⚠ Operations for this GX Developer will be locked.
   Only Admin or user with Administrator access level can unlock this project.

   Lock operation?

   [Yes]   [No]

Clicking the [Yes] button displays the Operation lock screen and locks the GX
Developer operation.

POINT

• The monitor screen displayed before the operation lock keeps updated even
  during operation lock.
• Unlocking the operation lock enables to operate the GX Developer. (☞ (3) in
  this section)

(3) Unlocking an operation lock

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

[Purpose]
  Unlocks an operation lock to enable the GX Developer operation.
  Only the users during login or whose access levels are Administrators can unlock
  the operation lock.

[Dialog Box]
  After performing the operation lock, the following Operation lock screen appears.

Operation lock

This GX Developer is locked.
Only Admin or users with Administrators access level can unlock the project.

User name   Admin   1)

Password   ××××××××××××××   2)

3)   OK
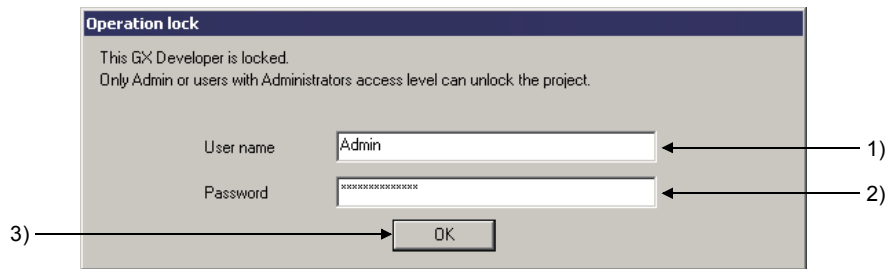
[Description]

  1) User name
     Input the user name who unlocks the operation lock.

  2) Password
     Input the password of the user who unlocks the operation lock.

  3) OK button

     Checks the user name and password, and then unlocks the operation lock
     (Closes the Operation lock screen.)

5.2 Safety CPU Operation

5.2.1 Switching safety CPU operation mode

	Admin.	Develop.	Users
SAFETY	△	△	×
TEST	△	△	×

△: Can perform only when the safety CPU is in STOP.

[Purpose]
 Switches safety CPU operation mode (SAFETY MODE/TEST MODE).

[Operating Procedure]
 Select [Online] → [Safety CPU operation] → [Switch safety CPU operation mode].

[Dialog Box]

Switch to safety CPU operation mode

1) → Current operation mode   Safety mode

2) → Execute switch   Close
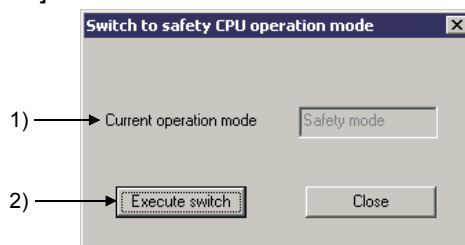
[Description]

1) Current operation mode
    Displays the current safety CPU operation mode.

2) Execute switch button

    Switches the current safety CPU operation mode.
    Switches to TEST MODE when the current operation mode is set to SAFETY
    MODE, and vice versa.

POINT

- Switching of safety CPU operation mode is only possible when the safety CPU is
  in STOP.
- Write the program memory to the ROM before switching from TEST MODE to
  SAFETY MODE.
  If trying to switch to the safety mode without the writing, the following confirmation
  message appears.

  Clicking the Yes button starts the writing to the standard ROM.

  MELSOFT series GX Developer

  ⚠ Program memory and standard ROM data are different.
      All standard ROM data will be deleted and program memory data will be saved.
      Are you sure?

      Yes   No
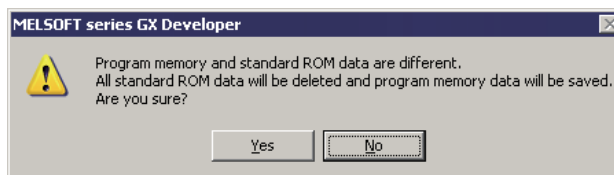
- Restarting the safety CPU is required to enable the safety mode after switching
  from TEST MODE to SAFETY MODE.
  For restarting the safety CPU, refer to the QSCPU User's Manual (Function
  Explanation, Program Fundamentals).

5.2.2 Displaying ROM information

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

[Purpose]
  Displays the ROM information on a project and safety CPU.

[Operating Procedure]
  Select [Online] → [Safety CPU operation] → [ROM information].

[Dialog Box]
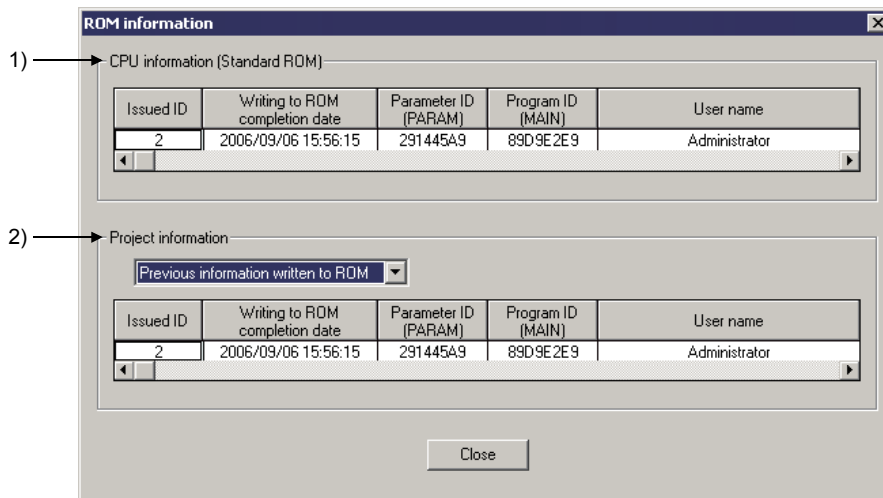
[Description]

1) CPU information (Standard ROM)
   Displays the information on the connecting safety CPU, such as the date,
   parameter ID, and program ID when the program memory was written to the
   ROM, and the user who wrote the program memory to the ROM.

2) Project information
   Displays the ROM information on the selected item.
   - When selecting "Currently edited information"
     Displays the parameter ID, program ID, and login user of the open project. *1

Issued ID	Writing to ROM completion date	Parameter ID (PARAM)	Program ID (MAIN)	User name
		291445A9	89D9E2E9	Administrator

   *1: When a program is not created, the Program ID field is not displayed.

   - When selecting "Previous information written to ROM"
     Displays the issued ID, date, parameter ID, and program ID when the program memory was previously written to the ROM, and the user who wrote the program memory to the ROM.

Issued ID	Writing to ROM completion date	Parameter ID (PARAM)	Program ID (MAIN)	User name
2	2006/09/06 15:56:15	291445A9	89D9E2E9	Administrator

REMARK

The fields are left in blank when the program memory has not been written in the ROM, the information cannot be received from the CPU due to an communication error, or the information cannot be read from the file.

Issued ID	Writing to ROM completion date	User name

5.2.3 Registering or changing a CPU access password

	Admin.	Develop.	Users
SAFETY	△	×	×
TEST	△	×	×

△: Registration to a safety CPU is disabled in the
    SAFETY MODE.
    Can perform in the TSET MODE only when a
    safety CPU is in STOP status.

[Purpose]
　Registers the access password for certification (CPU access password) with a
　project and safety CPU.
　Matching the project password with the CPU access password enables the safety
　CPU operation.
　(For the functions for which CPU access password certification is performed ☞
　Appendix 2)

[Operating Procedure]
　Select [Online] → [Safety CPU operation] → [CPU access password registration/
　change].

[Dialog Box]
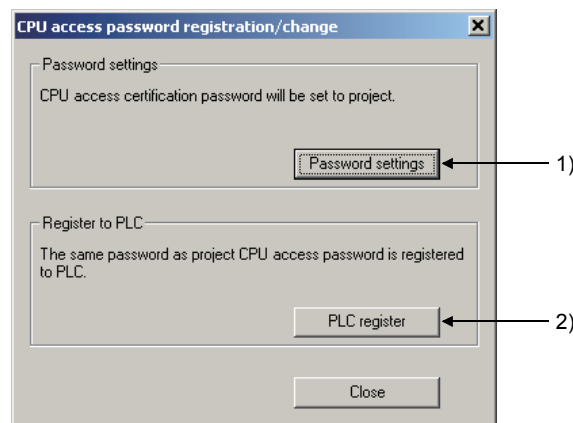
[Description]

1)　│ Password settings │ button

　　Displays the Password settings screen. (☞ (1) in this section)

2)　│ PLC register │ button

　　Registers the CPU access password set in a project with a safety CPU. (☞
　　(2) in this section)

┌───┐
│ ┌──────────┐   │
│ │ POINT   │   │
│ └──────────┘   │
│ Be sure to carefully manage a CPU access password.   │
│ (For actions when losing a CPU access password ☞ Section 3.2 (2)) │
└───┘

(1) Password settings

[Purpose]
  Sets a CPU access password to a project.

[Operating Procedure]
  Select [Online] → [Safety CPU operation] → [CPU access password registration/
  change] → | Password settings | button.

[Dialog Box]
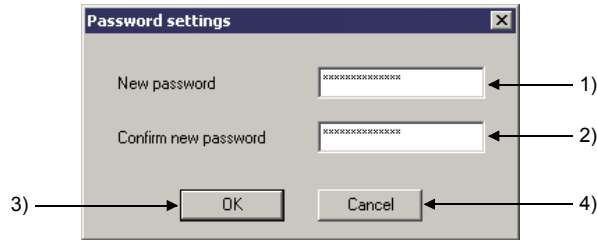
[Description]

  1) New password
     Input a password within 6 to 14 characters with the alphabets, numbers, and
     symbols corresponding to ASCII code (Appendix 3) 20$_H$ to 7E$_H$.
     (For alphabets, an upper-case character is differentiated from a lower-case
     character.)

  2) Confirm new password
     Input the same password with 1) for confirmation.

  3) | OK | button
     Sets the CPU access password to the project if the password 1) and 2) are
     identical.

  4) | Cancel | button
     Cancels the input password and closes the screen.

POINT

After the CPU access password setting to the project, the confirmation message to
register the password with the safety CPU appears. ((2) in this section)
Following the message, register the password with the safety CPU.

---

(2) PLC register

[Purpose]
 Registers the CPU access password set in a project with a safety CPU.

[Operating Procedure]
 Select [Online] → [Safety CPU operation] → [CPU access password registration/
 change] → PLC register button.

[Dialog Box]
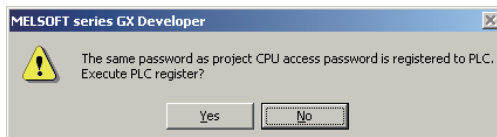
Clicking the ┃ Yes ┃ button registers the CPU access password set to the project
with the safety CPU.

POINT

When a CPU access password has been registered with a safety CPU, the following
screen appears at PLC register.
Therefore, input the registered password.

(The screen displayed at password certification)
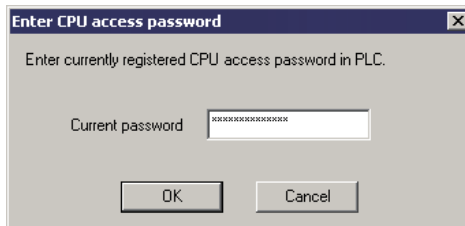
(For actions when losing a CPU access password ☞ Section 3.2 (2))

5.2.4 PLC memory initialization

	Admin.	Develop.	Users
SAFETY	△	×	×
TEST	△	×	×

△: Can perform only when the safety CPU is in STOP.

[Purpose]
Initializes a safety CPU memory and returns it to the factory default.
(Refer to the following table for the processing contents of the initialization.)

[Operating Procedure]
Select [Online] → [Safety CPU operation] → [PLC memory initialization].

[Dialog Box]
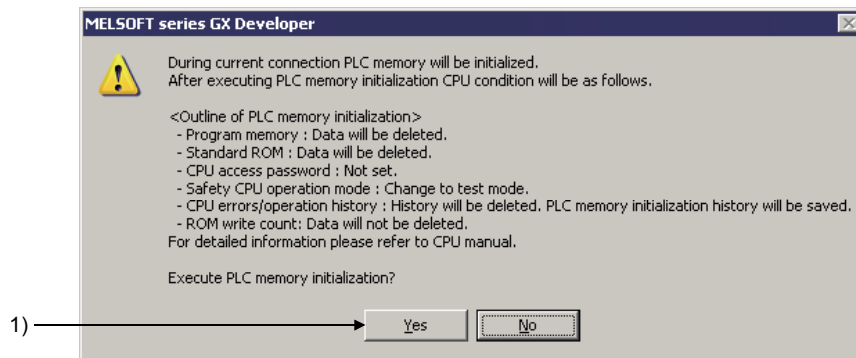
Clicking the Yes button initializes the safety CPU memory. (The following table shows the contents of the initialization.)
For details, refer to the QSCPU User's Manual (Function Explanation, Program Fundamentals).

Item	Processing Contents
Program memory	The data are deleted.
Standard ROM	The data are deleted.
CPU access password	Not set.
Safety CPU operation mode	Switched to TSET MODE.
Operation/error log of a safety CPU	After clearing the current logs, the operation log of PLC memory initialization is written.
ROM write count	The data are not deleted.

> **POINT**
> - PLC memory initialization can be used only when the safety CPU is in STOP.
> - When PLC memory initialization has been completed, the safety CPU error LED blinks.
>   For failure prevention, do not turn off the safety CPU power until the LED blinks.
> - After initializing the programmable controller memory, set a CPU access password first, and then writing data to the CPU.
> - Use the "Format PLC memory" function when deleting only the data written in the program memory.
>   The data other than program memory (Standard ROM, CPU access password, safety CPU operation/error log, and ROM write count) retain the current status.
>   (For "Format PLC memory" ☞ GX Developer Version 8 Operating Manual)

5.2.5 Switching the CPU to be monitored

	Admin.	Develop.	Users
SAFETY	△	△	△
TEST	△	△	△

△: Cannot perform during monitoring.

[Purpose]

Switches the CPU to be monitored for checking the information on "CPU A" or "CPU B" individually.

The relevant functions are as follows.

• Ladder monitor
• Device batch monitor
• Entry data monitor
• PLC diagnostics

[Operating Procedure]

Select [Online] → [Safety CPU operation] → [Monitor destination select option].

[Dialog Box]
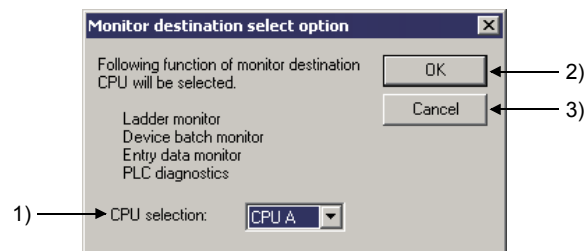
[Description]

1) CPU selection
   Specify the CPU to be monitored.
     CPU A (Default)
     CPU B

2) ☐ OK ☐ button

   Switches the CPU to be monitored.

3) ☐ Cancel ☐ button

   Cancels the CPU selection setting and closes the screen.

5.3 Detecting the Damaged Project Data

The GX Developer checks that the project data for a safety programmable controller are not damaged before accessing it.
This section explains about the target project data of damage detection, the target operation of damage detection, and the actions when damaged data are detected.

(1) Target project data of damage detection
    The following items show the target project data of damage detection.

   • Parameter
   • Program
   • Device comment
   • Device memory
   • Label program (Function block, structure)
   • Project management information *1

   *1: Includes necessary information for performing login certification to the user
       who logs in to the project.

(2) Target operation of damage detection
    Damage detection is performed at the following operations.

	Target Operation of Damage Detection
1	Open project
2	Save as (When overwriting the existing safety project and save it)
3	Delete project
4	Copying a project
5	Copying user information (Copying the information in the User management screen)
6	Verifying a project
7	Marge data

(3) Displays and actions when damaged data are detected
The following shows the display screens and actions when damaged data are detected.

(a) Display screen

MELSOFT series GX Developer	✕
ⓘ Project data is damaged, project open failed.	
OK	

(b) Action
• Click the OK button.

• If the data is backed up, restore the project from the backup data.

• If the data is not backed up, recreate the project. (☞ Section 5.1.1)

POINT

When damaged project data is detected, restoring it from the backup data is recommended.
A system manager has to back up the project and save the backup data so that the data restoration is always possible.

5.4 Highlighting Safety Devices

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

When displaying the ladder program of a safety programmable controller project, the refresh devices in safety remote stations are highlighted.

(1) Safety device
    The safety device designates the refresh device of the remote I/O in safety remote station.
    The refresh device ranges for the number of occupied station in safety remote station (occupies 32 points/station) is used for safety devices.

    (Example) When the safety remote stations occupy one station are connected

        The ranges indicated in ▢ are highlighted as safety devices.
        The following device ranges that are not input/output to the safety remote I/O stations are also used as safety devices.

            Station No.1: X110 to X11F, Y100 to Y11F
            Station No.3: X140 to X15F, Y150 to Y15F
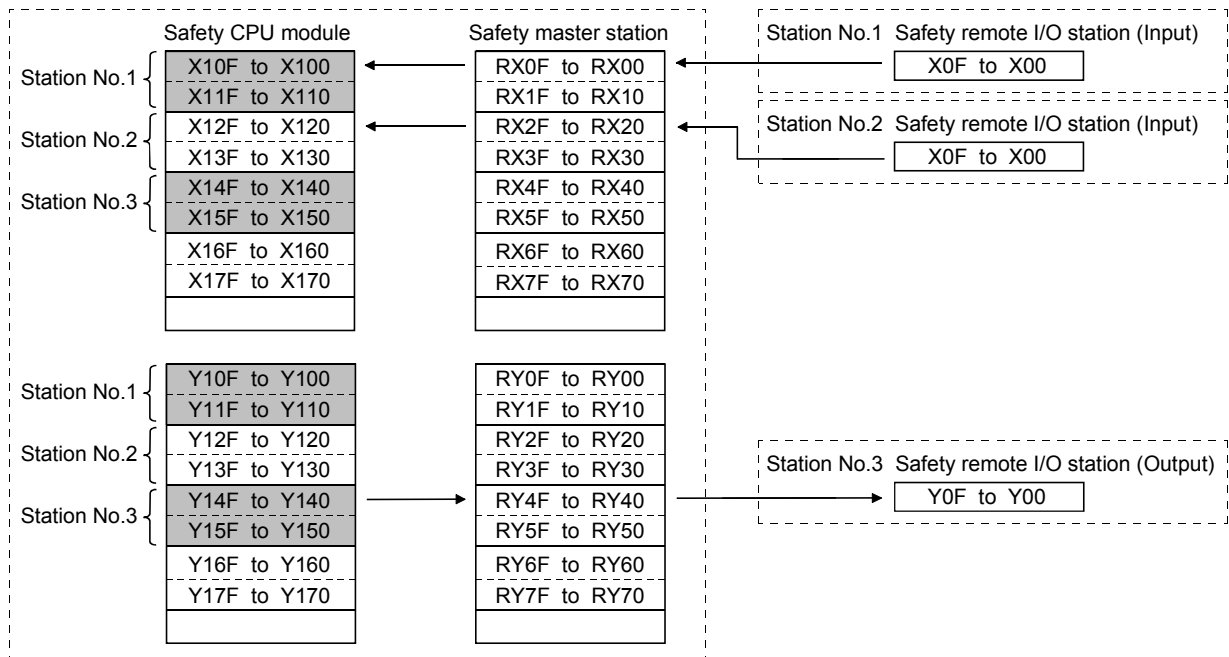
POINT

- The labels assigned to refresh devices are also used as safety devices.
- Refresh devices can be set in the "CC-Link" of "Network parameter".

(2) Highlighting safety devices
Safety devices are highlighted on a ladder program as follows.

Device Type	Highlighting Description
Bit device Word device bit specification	The safety device names are filled with yellow (Default).
Word device	The safety device names are filled with yellow (Default).
Digit specification for bit device	When all the bits specified by digit specification are safety devices, the device names are filled with yellow (Default).
Digit specification for bit device (Safety/normal mixed device)	When the safety device(s) is/are included in the information of the bit, specified by digit specification, the device names are filled with green (Default).

POINT

- When a label program is not compiled, the safety devices are not highlighted.
- The program can be printed for highlighting (☞ Appendix 1).
- When using the instruction which processes word devices with multiple points, the safety device is not highlighted if the safety device(s) is/are included but the device specified as the argument to the instruction is not a safety device.

  (Example) Transferring the D0 to D9 data with the block 16-bit data transfer instruction (BMOV)

  (When D0 is a safety device and D1 to D9 are normal devices)
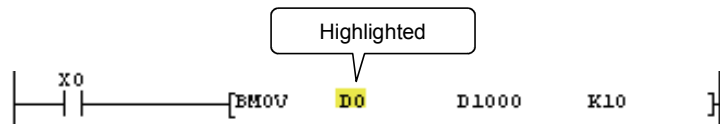
  (When D0 is a normal device and D1 to D9 are safety devices)
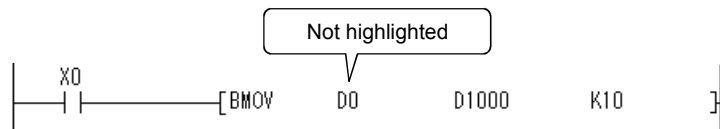
(3) Changing the highlight color
The highlight color for a safety device can be changed in the Change display
color screen, displayed by selecting [Tool] → [Change display color].
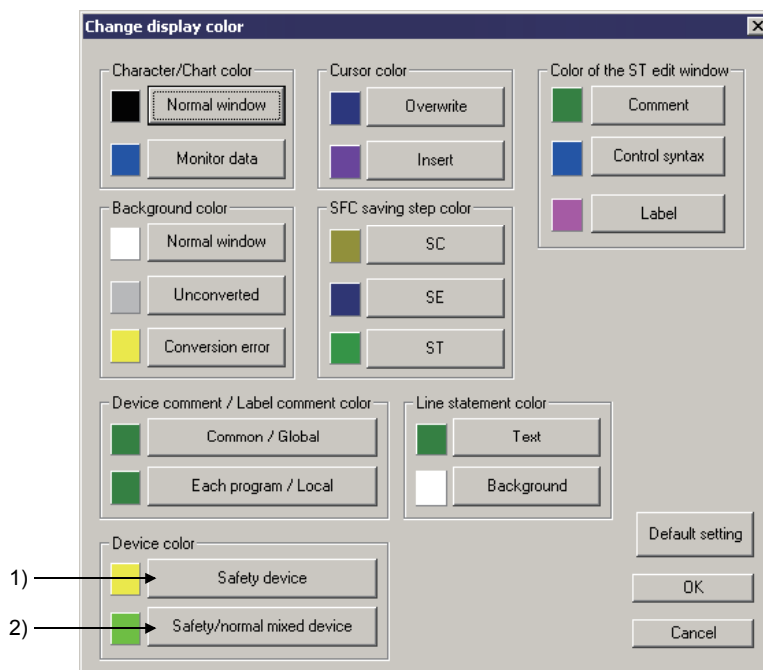
1) ⬜ Safety device ⬜ button

Sets the display color for a safety device. The default color is yellow.

2) ⬜ Safety/normal mixed device ⬜ button

Sets the display color for the device where (a) safety device(s) and (a) normal
device(s) are mixed together. The default color is green.

5.5 Setting Parameters

5.5.1 Setting the parameters for a safety CPU

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

This section explains the setting items for safety CPU parameters.

(1) PLC parameter items list
The following shows the PLC parameter items list.

PLC name
— Label
    Set a safety CPU label.
— Comment
    Set a safety CPU comment.

PLC system
— Timer limit setting
    Set the time limits of the low-/high-speed timers.
— RUN-PAUSE contacts
    Set the contact to control the RUN/PAUSE of a safety CPU. (Can be set only to RUN. The device range of the X is 0 to 17FF.)
— Remote reset
    Set whether to enable or to disable remote reset operation.
— Output mode at STOP to RUN
    Set the output mode at STOP to RUN.
— Floating point arithmetic processing
    Cannot be set to a safety CPU.
— Intelligent function module setting
    Cannot be set to a safety CPU.
— Common pointer No.
    Cannot be set to a safety CPU.
— Points occupied empty slot
    Set the number of points for (an) empty slot(s).
— System interrupt settings
    Cannot be set to a safety CPU.
— Interrupt program/Fixed scan program setting
    Cannot be set to a safety CPU.
— Module synchronization
    Cannot be changed the setting for a safety CPU.
— A-PLC
    Cannot be set to a safety CPU.

PLC RAS
— WDT [Watchdog timer] setting
    Set the watchdog timer of a safety CPU.
— Operating mode when there is an error
    Cannot be set to a safety CPU.
— Error check
    Cannot be set to a safety CPU.
— Constant scanning
    Set the constant scan time.
— Low speed program execution time
    Cannot be set to a safety CPU.
— Breakdown history
    Cannot be set to a safety CPU.

Device
— Dev. Point
    Set the number of device points to be used.
— Latch range
    Cannot be set to a safety CPU.
— Local dev. setting
    Cannot be set to a safety CPU.

Boot file
— Boot file setting
    Set whether to boot from standard ROM. (In SAFETY MODE, the setting is fixed to "Do boot from standard ROM".)

I/O assignment
— I/O assignment
    Set the loading status of each module in the system. (Only "Empty" and "Intelli". can be selected from the "Type".)
— Standard setting
    Set the base model, power supply module model, etc.

Safety setting
— Continuous RUN in test mode
    Set continuous RUN of tolerance time in TEST MODE.
— Operation settings during remote station error
    Set whether to continue or to stop the operation when a remote station error occurs.

(2) Safety setting screen
     Clicking the <<Safety setting>> tab on the QS Parameter screen displays the
     Safety setting screen.

Safety setting screen   <<Safety setting>> tab

POINT
For information and details required for the parameter settings, refer to the QSCPU
User's Manual (Function Explanation, Program Fundamentals).

5.5.2 Setting the parameters for the CC-Link Safety master module

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

This section explains the setting items for CC-Link parameters of a CC-Link Safety master module.

(1) CC-Link parameter items list
    The following shows the items list of the Setting the CC-Link list screen.

CC-Link

— No. of boards in module
      Set the number of modules (1 or 2 modules).
— Start I/O No.
      Set the start I/O No.
— Operational setting
      Set "Parameter name" and "Case of CPU STOP setting"
— Type
      Cannot be set to a safety CPU.
— Station No.
      Set the number of remote station for which a loop test is performed.
— Master station data link type
      The setting is fixed to "PLC parameter auto start".
— Mode
      Set the mode.
— Transmission speed
      Set the transmission speed of the CC-Link Safety master module.
— Safety refresh monitoring time
      Set the monitoring time for communications between a safety master station and safety remote station.
— Safety data monitoring time
      Set the monitoring time between safety input and output.
— Link ID
      Set the ID assigned to each CC-Link master module.
— All connect count
      Set the number of modules connected (1 to 64 modules).
— Remote input [RX]
      Set the devices to be batch-refreshed.
— Remote output [RY]
      Set the devices to be batch-refreshed.
— Remote register [RWr]
      Set the devices to be batch-refreshed.
— Remote register [RWw]
      Set the devices to be batch-refreshed.
— Special relay [SB]
      Set the devices to be batch-refreshed.
— Special register [SW]
      Set the devices to be batch-refreshed.
— Retry count
      Set the number of transmission retries.
— Automatic reconnection station count
      Set the number of stations automatically reconnected during one scan.
— PLC down select
      Cannot be set to a safety CPU.

CC-Link

— Scan mode setting
      Specify either synchronous or asynchronous with the sequence scan.
— Delay information setting
      Cannot be set to a safety CPU.
— Station information setting
      Set the station type, number of occupied stations, etc.
— Remote device station initial setting
      Cannot be set to a safety CPU.

(2) Safety remote station parameters settings

(a) Safety remote station items list
     The following shows the items list of Safety remote station settings.

```
┌──────────────────────────────────┐
│ Safety remote station settings   │
└──────────────────────────────────┘
        │
        ├── Module name
        │      Set the model name of a safety remote I/O module.
        ├── Module technical version
        │      Set the module technical version written on the rating plate
        │      (TECH.VER field) of a module.
        ├── Specify production information to find module
        │      Check when setting the following "Production information".
        ├── Production information
        │      Set the product information written on the rating plate
        │      (SERIAL field) of the module.
        └── Setting value
               Set each parameter for safety remote station.
```

(b) Safety remote station settings screen
     Clicking the | Setting | button of the Safety remote station settings on the
     Station information setting screen displays the Safety remote station
     settings screen.
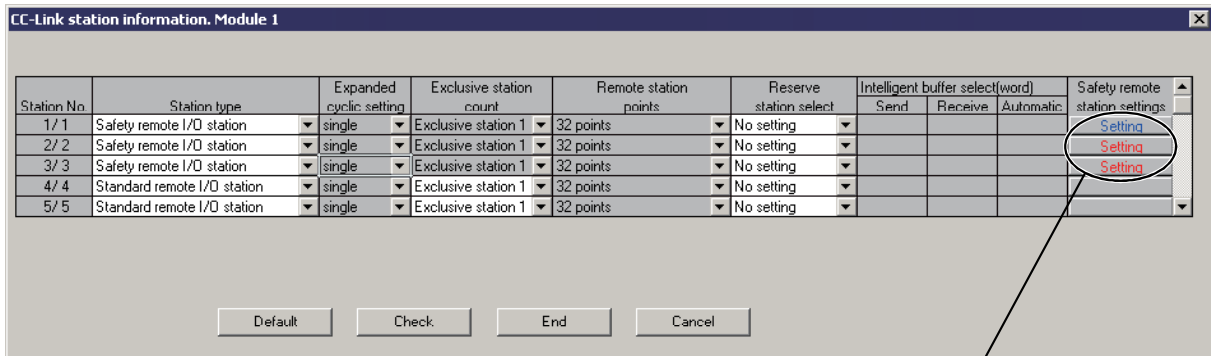
Station information setting screen

Click the "Setting" button.

Safety remote station settings screen
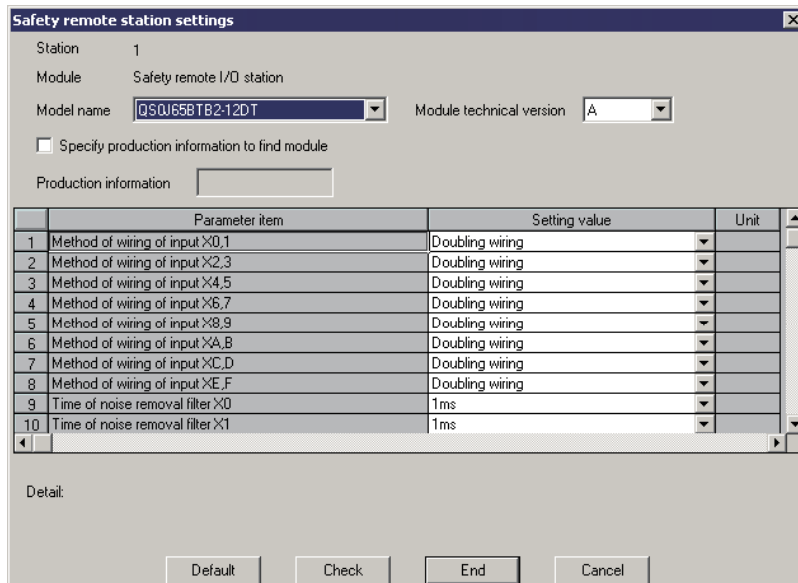
> **POINT**
>
> - Information and details required for the parameter settings
>   For information and details required for the parameter settings, refer to the following manuals.
>   (CC-Link Safety parameter settings)
>   CC-Link Safety System Master Module User's Manual QS0J61BT12
>   (Parameter settings for a safety remote station)
>   CC-Link Safety System Remote I/O Module User's Manual QS0J65BTB2-12DT
>
> - Safety CSP file
>   A safety CSP file refers to a file where the information for setting the parameters of a safety remote station has been defined.
>   If the CSP file compatible with the safety remote I/O module technical version does not exist, the parameters of the safety remote station cannot be set.
>   Refer to the following manual for the methods of obtaining/registering the safety CSP file compatible with the safety remote I/O module technical version.
>   CC-Link Safety System Remote I/O Module User's Manual QS0J65BTB2-12DT

5.6 Diagnosing a Safety Programmable Controller

	Admin.	Develop.	Users
SAFETY	△	△	△
TEST	○	○	△

△: Cannot use "Clear log".

[Purpose]
Checks safety CPU operation status, a present error, and operation/error logs
(Including the error log of a CC-Link Safety system).
The display contents of operation/error logs can be saved in a CSV file.

[Operating Procedure]
Select [Diagnostics] → [PLC diagnostics].

[Dialog Box]
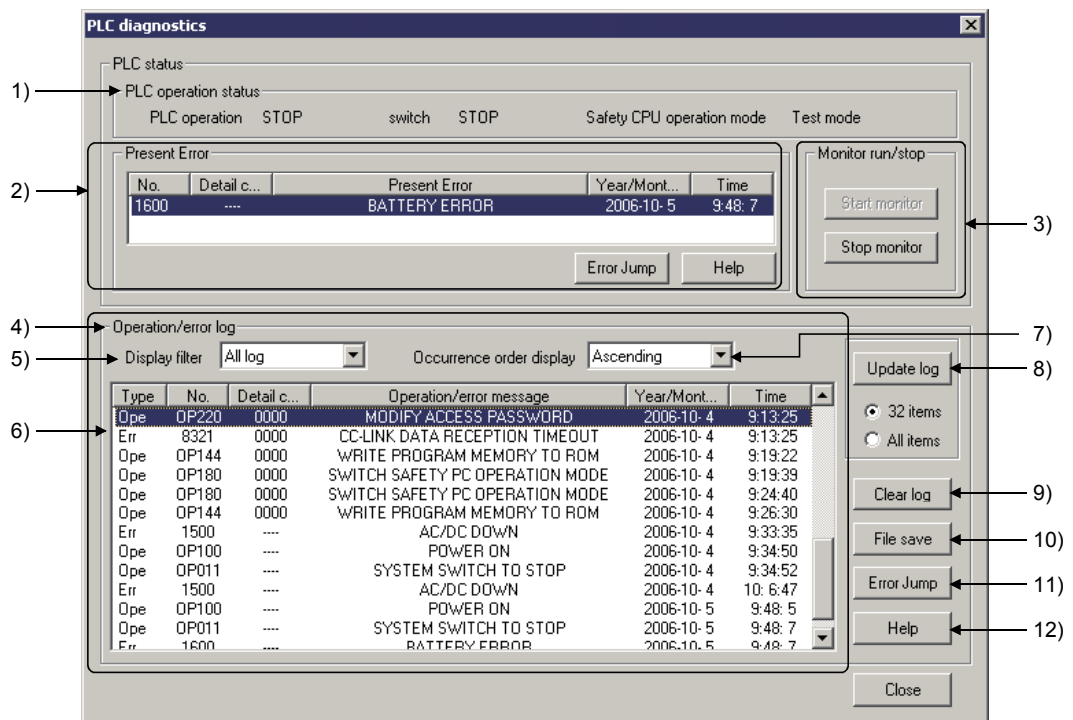
[Description]

1) PLC operation status
   Displays the operation status of a safety CPU and safety CPU operation mode.

2) Present Error
   Displays the current error.
   Double-clicking the error displays the Error details screen.

   Clicking the ⌊ Error Jump ⌋ button jumps to the step number corresponding to

   the displayed error in the sequence program.

   Clicking the ⌊ Help ⌋ button displays the Help screen about the error.

3) Monitor run/stop

Clicking the [Start monitor] button initiates communications with a safety CPU and updates the screen display.

Clicking the [Stop monitor] button stops monitoring.

4) Operation/error log
Displays the logs of the operation to a safety CPU and error occurred in a safety CPU.

5) Display filter
Specify the log type to be displayed on the log list.

Type	Log List display
All log	Displays all logs.
Operation log	Displays only operation logs.
Error log	Displays only error logs.

6) Log list
Displays the logs selected in the Display filter.

Item	Contents

Type	Displays the log type.
	    Ope: Operation log
	    Err: Error log

No.	Displays the operation/error number.
Detail code	Displays the 4-digit code of the operation log or the error log for the error occurred in a CC-Link Safety remote I/O module. Displays ---- when no detail code exists.
Operation/error message	Displays the operation contents or error message. Displays the following message when the log data has been damaged. "BROKEN OPERATION/ERROR LOG"

Double-clicking the log in the log list displays the Operation details screen or the Error details screen about the log.

- Operation details screen
  Displays the detailed operating information, according to the operation log information saved in a safety CPU.

  (Example) The Operation details screen for a file
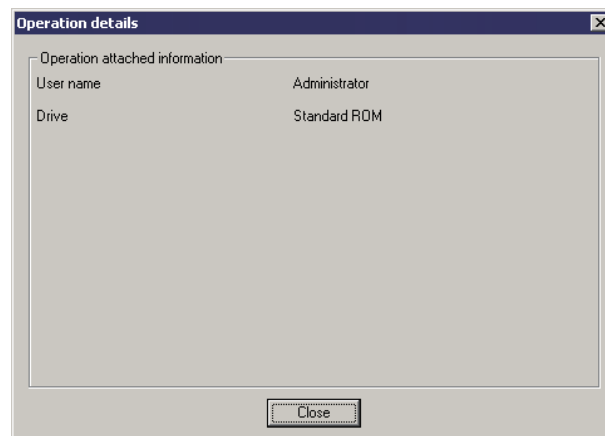
- Error details screen
  Displays common error information and individual error information, based on the information stored in the SD4 and SD5 or later of a safety CPU.
  For details of common error information and individual error information, refer to the QSCPU User's Manual (Function Explanation, Program Fundamentals).

  (Example) Error details screen for a safety CPU error
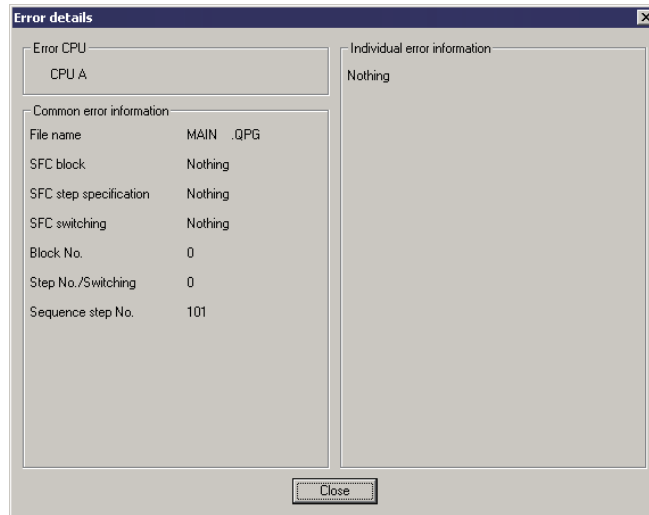
  Note that the "Individual error information∗1" display of a safety remote I/O station can be switched between decimal notation and hexadecimal notation. (Default: HEX)
  Switch the display according to the error code (Decimal/hexadecimal) referred to the manual for a safety remote I/O station.
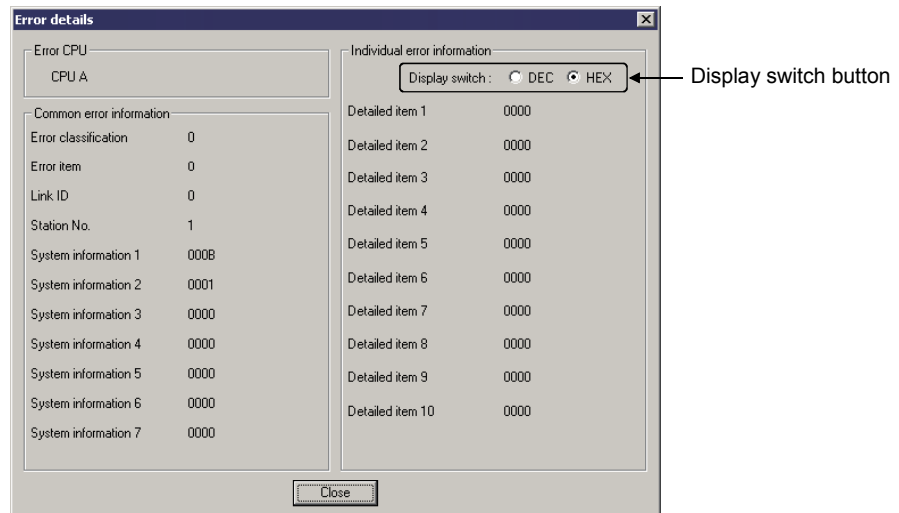
  ∗1: When a CC-Link Safety master module could not receive all error information from a safety remote I/O station, the items have failed to receive are displayed with "****".

7) Occurrence order display
   Sorts the log list in ascending/descending order.

8) Update log button
Updates the log list with the radio button.

Radio Button	Log List display
32 items	Displays the latest 32 logs.
All items	Displays all the registered logs (Max. 3000 logs).

9) Clear log button
Deletes all the logs registered with a safety CPU.
Logs can be deleted in the following situations.
- The access level of the current login user is Administrators or Developers.
- The safety CPU operation mode is set to TEST MODE.

10) File save button
Saves the logs displayed in the log list as a CSV file.

11) $\boxed{\text{Error Jump}}$ button

Jumps to the step number corresponding to the selected error log in the sequence program.

12) $\boxed{\text{Help}}$ button

Displays the help screen about the selected error in the present error field.

POINT

- The "CPU A" or "CPU B" information in a safety CPU that is selected in the Monitor destination select option screen is displayed in the PLC diagnostics/Error details/Operation details screen.
  To confirm the CPU information that is not displayed, switch the CPU to be monitored in the Monitor destination select option screen in advance.
  (⟡ Section 5.2.5)

- The following operating information is displayed as operation log. [1]
  Power on
  Write the program memory to ROM
  Remote operation (Remote RUN, remote STOP)
  Switch safety CPU operation mode
  Clearing error log or operation log
  Set clock
  CPU access password registration

  [1]: Except for the information above, the information on a safety CPU processing
      (Corresponding to the operation code OP001 to OP100) is also displayed.
      For safety CPU processing and operation code, refer to the QSCPU User's
      Manual (Function Explanation, Program Fundamentals).

5.7 Writing Program Memory to ROM

	Admin.	Develop.	Users
SAFETY	×	×	×
TEST	○	○	×

[Purpose]
Writes the data in program memory to standard ROM at a time.

[Operating Procedure]
Select [Online] → [Write to PLC (Flash ROM)] → [Write the program memory to ROM].

[Dialog Box]
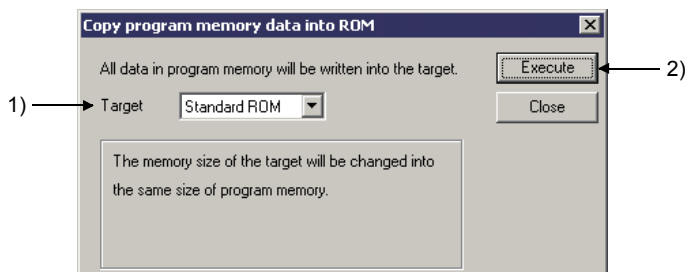
[Description]

1) Target
   Only "Standard ROM" is displayed (Fixed).

2) ⎢Execute⎢ button

   Writes the data in program memory to standard ROM at a time.
   Note that before the writing, the project data and program memory in a PC are verified. If a mismatch has been detected by the verification, the following dialog box appears and the processing is suspended.

(When the verification between parameters and a program results in a mismatch)
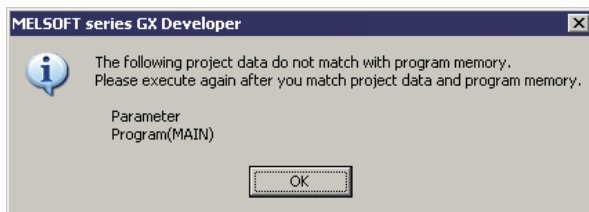
5.8 Checking Devices for Duplication Use

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

[Purpose]

Checks if devices in the range set in Auto device setting are not used in the user-created program during program check.

[Operating Procedure]

Select [Tools] → [Check program] or ⚙.

[Dialog Box]
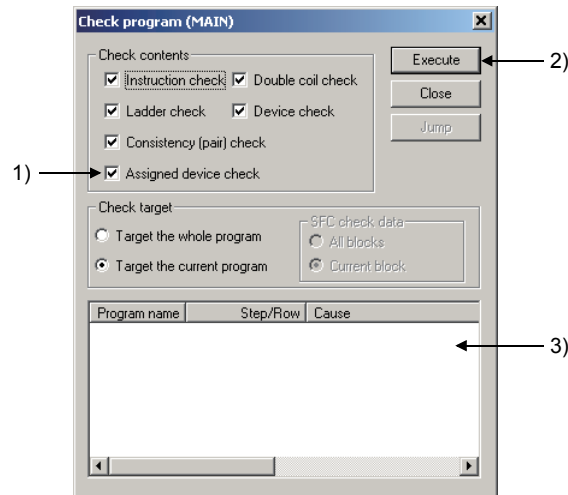
[Description]

1) Assigned device check
Select this item to check a device set by Auto device setting and a device used in the user-created program for duplication.

2) Execute button

Checks a program.

3) Check result
Displays the program check result.

6 SAFETY FUNCTION BLOCK

The safety function block represents safety control logic in function block for easier creation of a safety program.
The safety function has the following features.

(1) Creating safety program easily
Basic safety ladders are provided as safety function blocks.
Using safety function blocks can create safety programs easily and surely.

(2) Developing and maintaining safety programs easily
The number of steps in user-created programs is reduced with the use of safety function blocks, resulting in the reduction of development man-hours and the improvement of readable and maintenance performance of the program.

(3) Ensuring safety of safety program
Users cannot change the program using safety function blocks of safety-approved.
Therefore, the safety is not blocked due to careless program change.

(4) Shortening the time for safety review of user-created programs
As for safety review of user-created programs, preapproved safety function block programs are not subject to safety review.
Using safety function blocks can shorten the man-hours and time required for safety review.

6

POINT
• Safety function blocks are supported with GX Developer Version 8.58L (SW8D5C-GPPW-E) or later.

6.1 Programming Using Safety Function Blocks

The following flowchart shows creating procedure of the program using safety function blocks.

Create "Use labels" project. (Or open the existing "Use labels" project.)	☞	GX Developer Version 8 Operating Manual
Incorporate safety function blocks in the project.	☞	Section 6.1.1
Paste safety function blocks to the sequence program.	☞	Section 6.1.2
Check the I/O variables for the safety function blocks and edit the sequence program.	☞	Section 6.1.3
Compile the project. Write the program to the programmable controller.	☞	GX Developer Version 8 Operating Manual

6

6.1.1 Incorporating safety function blocks in a project

	Admin.	Develop.	Users
SAFETY	○	○	○
TEST	○	○	○

[Purpose]
Incorporates safety function blocks to the project by copying them from the safety function library.

[Operating Procedure]
Select [Project] → [Copy].

[Dialog Box]
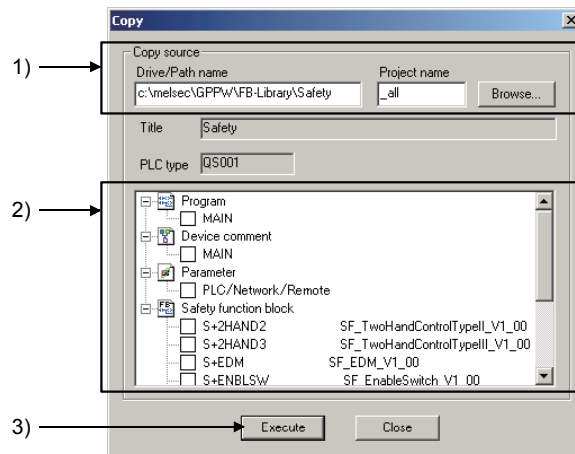
[Description]

1) Drive/Path name, Project name
Set the drive/path and project names.

The safety function library is installed to the following folder when GX Developer is installed.

Drive/Path name: (Installed location)\GPPW\FB-Library\Safety
User name   : SaftyFB
Password   : (Not necessary)

2) Copy source data list
Select a safety function block to be used.

3) Execute button

Click this button after setting.
After copying the safety function block, the copied safety function block is added to the safety function block of the <<FB>> tab in the Project data list screen.

POINT

If the safety function block having the same name exists on the open project, it is overwritten.

6.1.2 Pasting safety function blocks to the sequence program

Paste function blocks to the sequence program.
The following three methods are available for pasting the function blocks.

For details of each pasting method, refer to the GX Developer Version 8 Operating Manual (Function Block).

(1)   Method by dragging and dropping from the <<FB>> tab
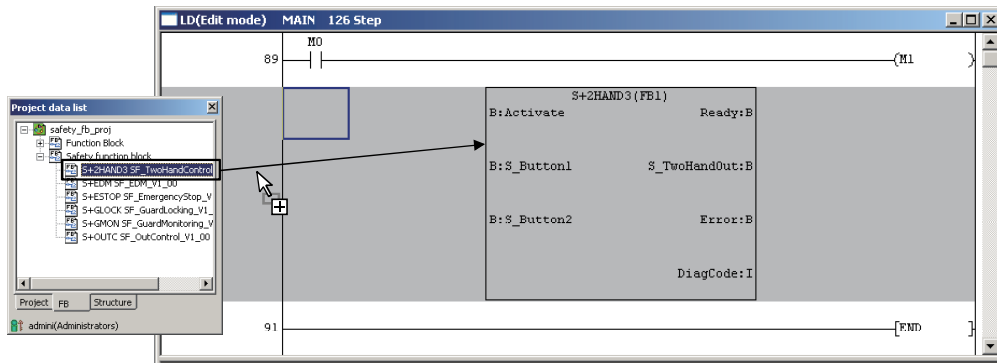
(2)   Method using the Function block utilization dialog box
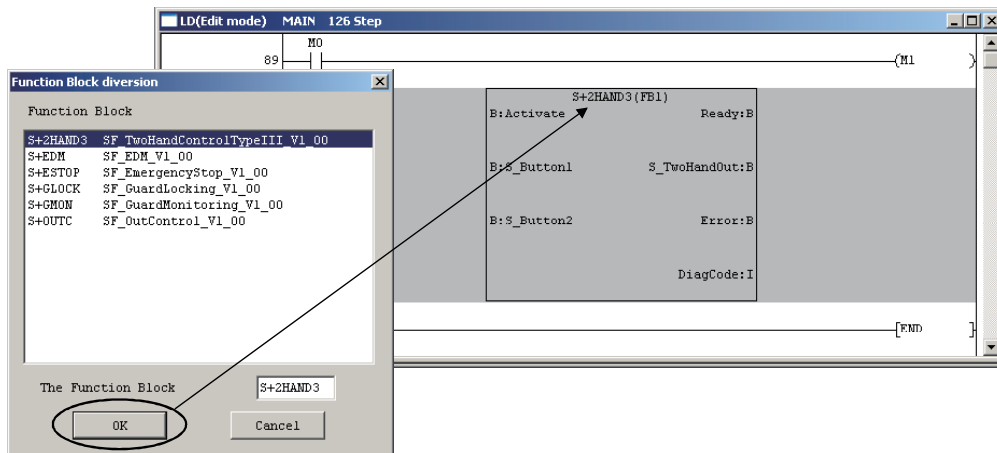
(3)   Method using the instruction dialog box
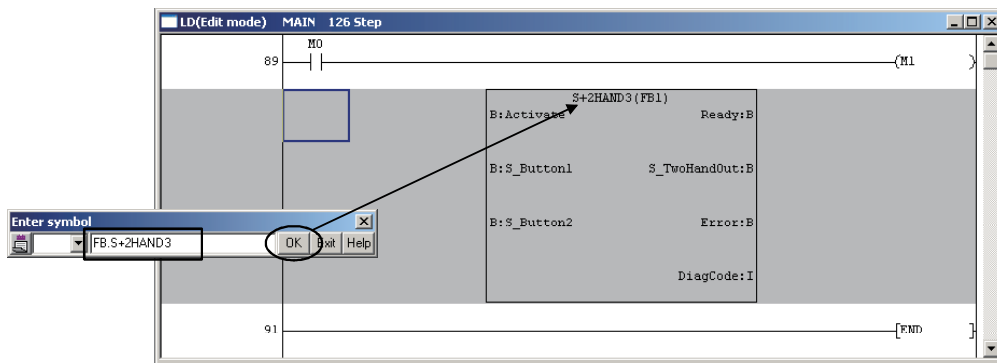
6.1.3 Checking I/O variables for safety function block

Check I/O variables to create input ladder section/output ladder section of the safety function block pasted to the sequence program.
Add other ladders to the safety function block on which input ladder section and output ladder section were created, and complete the sequence program.

For editing a program, refer to the GX Developer Version 8 Operating Manual.

The following two methods are available for opening the FB variable window.

(1) Method by double-clicking the FB definition name
Double-clicking the FB definition name of the safety function block on the <<FB>> tab opens the FB variable window.
I/O variables for the safety function block can be seen.

Double-click FB definition name.
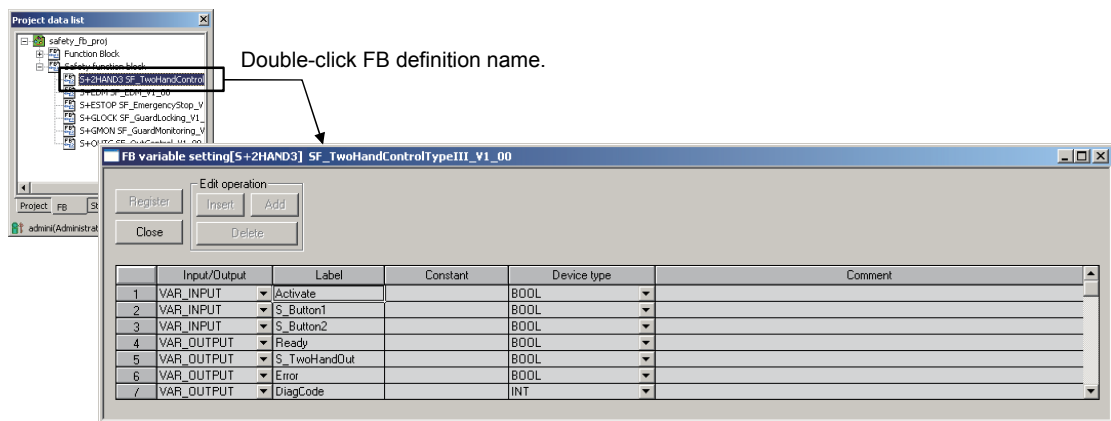
(2) Method using the Project data list change toolbar
Select "Safety FB". 'FB definition name (L)' for the safety function block is displayed. Then, select a FB definition name to be checked.
The FB variable window appears and I/O variables for the safety function block can be seen.

Select FB definition name.
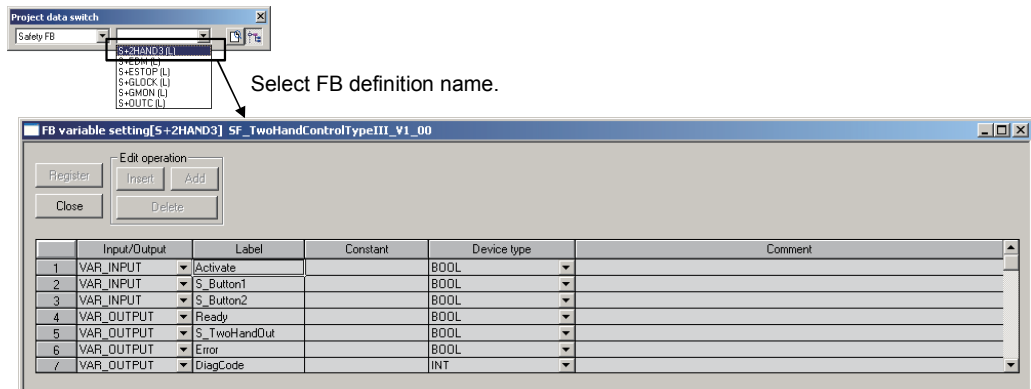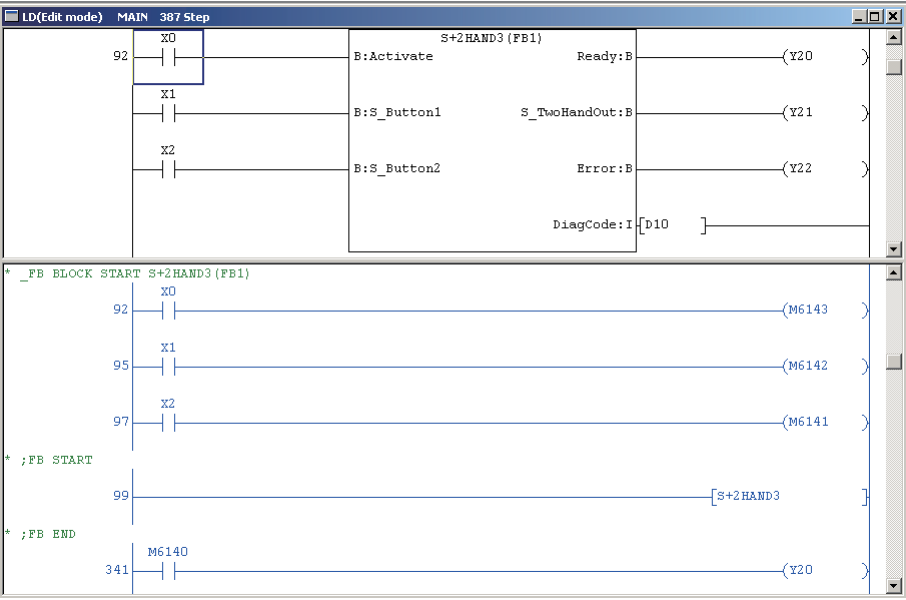
6.2 Restricting the Safety Function Block Operations/Displays

Some operations/displays of the safety function blocks are restricted for safety assurance.
The following table shows restrictions on operation/display in each function.

Function/screen		Restrictions on operation/display
Project data list <<FB>> tab		Only FB definition name is displayed at the tree item of the safety function block. Double-clicking the FB definition name displays the FB variable window.
Project data list change toolbar		Only 'FB definition name (L)' (FB variable) can be selected in the safety function block. A program cannot be selected.
Ladder editing screen		Even double-clicking on the safety function block or pressing the Enter key, the safety function block program body is not displayed.
FB variable window		Only input variable, output variable, and I/O variable are displayed. FB variable cannot be edited.
Edit data	New	New safety function block cannot be added.
	Copy	Safety function block cannot be copied.
	Rename	Safety function block data cannot be renamed.
Cross reference		Safety function block definition name cannot be specified at find range.
Cross reference list		
List of used devices		

Function/screen		Restrictions on operation/display
Device display screen		As for safety function block, only FB definition name is displayed in application instruction format. [*1] The program contents of the safety function block are not displayed.
Verify		In a program including a safety function block, the program contents in the safety function block are not displayed.
Verify with PLC		
Print	Print Ladder (Device)	As for safety function block section, the FB definition name is printed in application instruction format. The safety function block program body is not printed.
	Label/FB	When printing "Header", only the input variable, output variable, and I/O variable of the safety function block are printed. When printing "Body", the safety function block program body is not printed.

*1: When the jump destination such as for searching exists in the safety function block program, the jump is made to the position where the FB definition name is displayed in application instruction format.

APPENDICES

Appendix 1 Differences with the Q Series Project

This chapter explains about the GX Developer functions, except for the functions described in Chapter 5 "ADDED FUNCTIONS TO CORRESPOND TO A SAFETY PROGRAMMABLE CONTROLLER", added to/updated from the Basic model QCPU project

(1) Differences with the parameters

(a) [PLC RAS] setting on PLC parameter.
Consistency check for setting time on WDT setting and constant scanning. Setting time for constant scanning should not exceed WDT setting's setting time.

Constant scanning $\leqq$ WDT setting

(b) [CC-Link] setting on Network parameter.
Default value for "Scan mode setting" is "Synchronous".

(2) Differences in the Project menu

(a) Programmable controller type change
The project for a safety programmable controller cannot be changed its programmable controller type.
Furthermore, the programmable controller type of the project created by other than a safety programmable controller cannot be changed to the QSCPU.

(b) Ladder copy/paste
The ladder created in a safety programmable controller project can only be copied to/pasted in (a) safety programmable controller project(s).

(c) Print
The following functions have been added or updated.

1) The print functions of "Safety setting" and "Safety remote station settings" have been added to "PLC Parameter" and "Network param (CC-Link)" respectively.

• Print example of "Safety setting"

Safety setting	
Cont. RUN of tol. time in Testmode	10s
Ope. set. during remote sta. err.	Stop

APP

• Print example of "Safety remote station settings"
The following shows the print example when the "Safety remote station settings" is being performed under the settings as the screen below.

(Setting example)
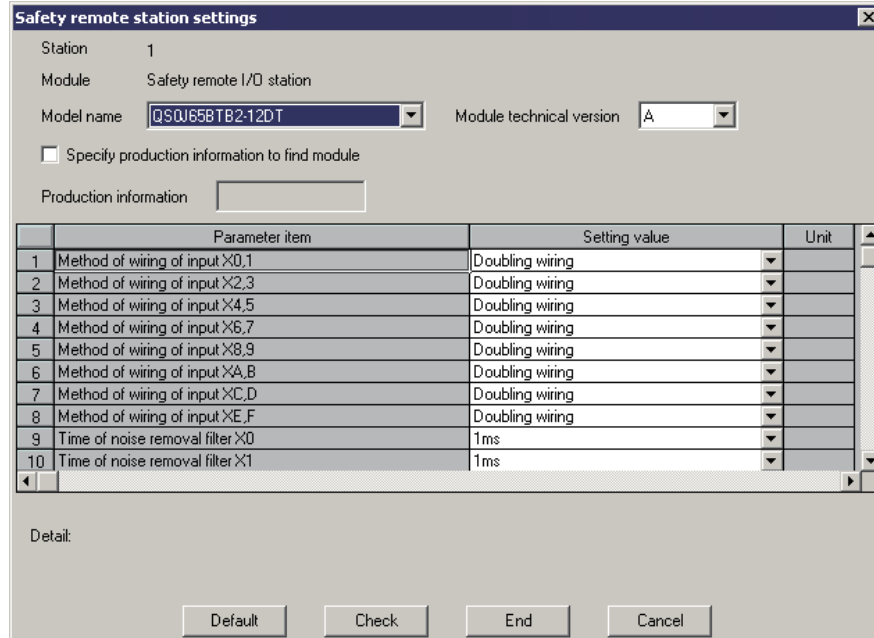
(Print example)

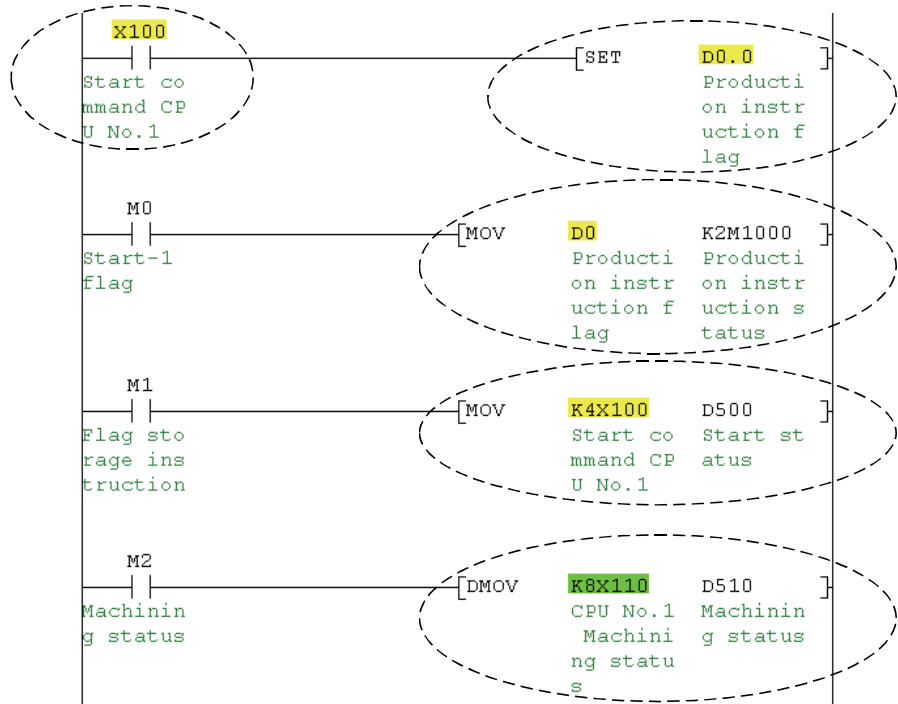|	Safety remote station settings	
	CC-Link	1Mdl.
	Start I/O No.	0000

1	Target station number	1
2	Module type	Safety remote I/O station
3	Model name	QS0J65BTB2-12DT
4	Module technical version	A
5	Production information	--------
6	Parameter setting	

Parameter item	Setting value	Unit
Method of wiring of input X0,1	Doubling wiring	
Method of wiring of input X2,3	Doubling wiring	
Method of wiring of input X4,5	Doubling wiring	
Method of wiring of input X6,7	Doubling wiring	
Method of wiring of input X8,9	Doubling wiring	
Method of wiring of input XA,B	Doubling wiring	
Method of wiring of input XC,D	Doubling wiring	
Method of wiring of input XE,F	Doubling wiring	
Time of noise removal filter X0	1ms	
Time of noise removal filter X1	1ms	

APP

2) Safety device names are printed enclosed by a solid line or broken line.

Device Type	Highlighting Description
Bit device Word device bit specification	The safety device names are printed enclosed by a solid line. X100 ——| |—————————————[SET D0.0] Start co Producti mmand CP on instr U No.1 uction f lag

Word device	The safety device names are printed enclosed by a solid line.
	
	M0 ——| |—————————————[MOV D0 K2M1000]
	Start-1 Producti Producti
	flag on instr on instr
	                         uction f uction s
	                         lag tatus

Digit specification for bit device	When all the bits specified by digit specification are safety devices, the safety device names are printed enclosed by a solid line. M1 ——| |—————————————[MOV K4X100 D500] Flag sto Start co Start st rage ins mmand CP atus truction U No.1

Digit specification for bit device
(Safety/normal mixed device)
	When all the bits specified by digit specification include (a) safety device(s), the safety device name(s) is/are printed enclosed by a broken line.
	
	M2 ——| |—————————————[DMOV K8X110 D510]
	Machinin CPU No.1 Machinin
	g status Machini g status
	                         ng statu
	                         s

(Print example)

```
     X100
     ─| |──────────────────────────────[SET      D0.0     ]
     Start co                                    Producti
     mmand CP                                    on instr
     U No.1                                      uction f
                                                 lag

     M0
     ─| |──────────────────────────────[MOV      D0       K2M1000  ]
     Start-1                                     Producti Producti
     flag                                        on instr on instr
                                                 uction f uction s
                                                 lag      tatus

     M1
     ─| |──────────────────────────────[MOV      K4X100   D500     ]
     Flag sto                                    Start co Start st
     rage ins                                    mmand CP atus
     truction                                    U No.1

     M2
     ─| |──────────────────────────────[DMOV     K8X110   D510     ]
     Machinin                                    CPU No.1 Machinin
     g status                                     Machini g status
                                                 ng statu
                                                 s
```

✳ Cannot be printed in the macro instruction format.

(3) Differences in the Online menu

(a) Monitor
The following monitors display the "CPU A" or "CPU B" information in a safety CPU selected in the Monitor destination select option screen.

• Ladder monitor
• Device batch monitor
• Entry data monitor

To confirm the CPU information that is not displayed, switch the CPU to be monitored in the Monitor destination select option screen in advance.
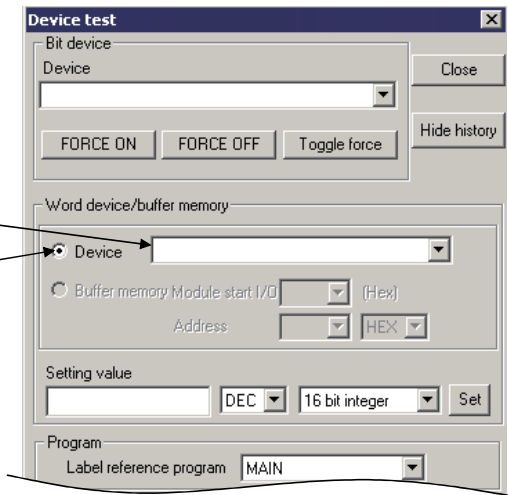(☞ Section 5.2.5)

(b) Device test
When using a safety CPU, the project cannot be written to the buffer memory.

Cannot specify the intelligent function module device (Unn\Gmm)

Cannot select "Buffer memory".

(c) Remote operation
To perform the remote RUN while the safety CPU operation mode is set to SAFETY MODE, make the following settings.

"Operation during RUN" setting items
Device memory: Not cleared
Signal flow: Hold
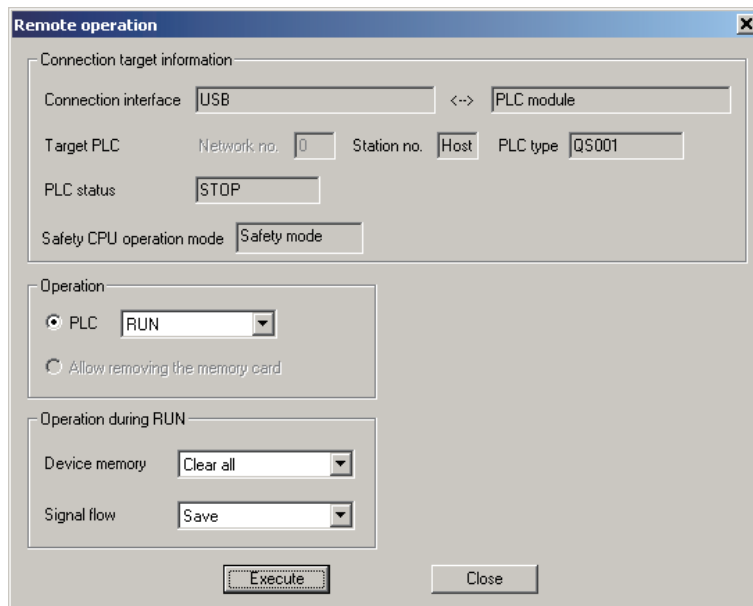
(d) Change TC setting
Setting values of counter/timer cannot be changed more than 32.

(e) Exclusive processing when simultaneously writing a program to a safety CPU from multiple GX Developers
For a safety CPU, the following processing cannot be simultaneously performed from multiple GX Developers.

1) Write to PLC

2) Online change

3) Change TC setting
(When selecting "Currently open program + PLC program")

4) Write the program memory to ROM

5) Switch safety CPU operation mode

6) Create title… (Write to PLC screen)

7) Delete PLC data

When other GX Developer is performing any of the processing above, the following message appears. After confirming the message, click the Yes or No button.

```
MELSOFT series GX Developer                                    [X]

 ⚠   Because of another application in process, selected operation could not be executed.
      Please try again later.

      Communication error. If the operation is locked, there is a possibility to force the execution of the operation.
      If a forced execution is selected, there is a possibility that other running application will end by error.

      Execute forced operation?

                            [    Yes    ]   [    No    ]
```

The No button: Suspends the processing.

The Yes button: Forcibly performs the processing.

In this case, other GX Developer's processing has been stopped and the following message appears.

```
MELSOFT application                          [X]

 ⓘ   PLC was received interruption by other S/W during busy status.
      Therefore, it could not complete process.
      Please execute it again after confirming the state of PLC.

      <ES:010a42a2>

                    [      OK      ]
```
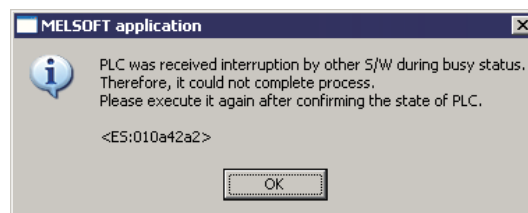
(4) Differences in the Diagnostics menu

(a) PLC diagnostics
The PLC diagnostics screen displays the "CPU A" or "CPU B" information in a safety CPU selected in the Monitor destination select option screen.
To confirm the CPU information that is not displayed, switch the CPU to be monitored in the Monitor destination select option screen in advance.
(☞ Section 5.2.5)

(b) MELSECNET(II)/10/H diagnostics
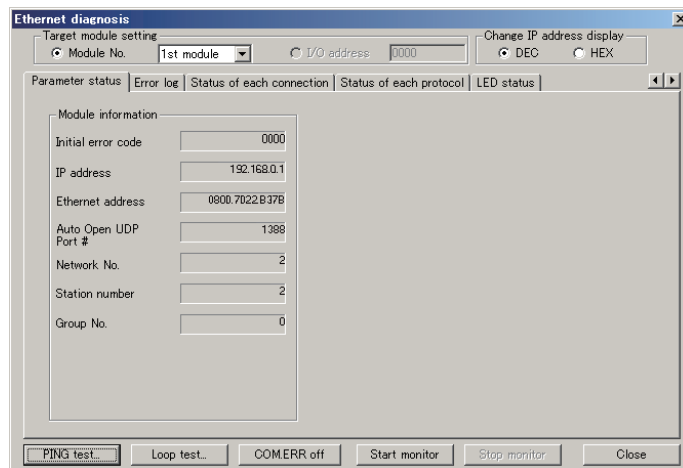The following test cannot be performed.

• Network test

• Communication test
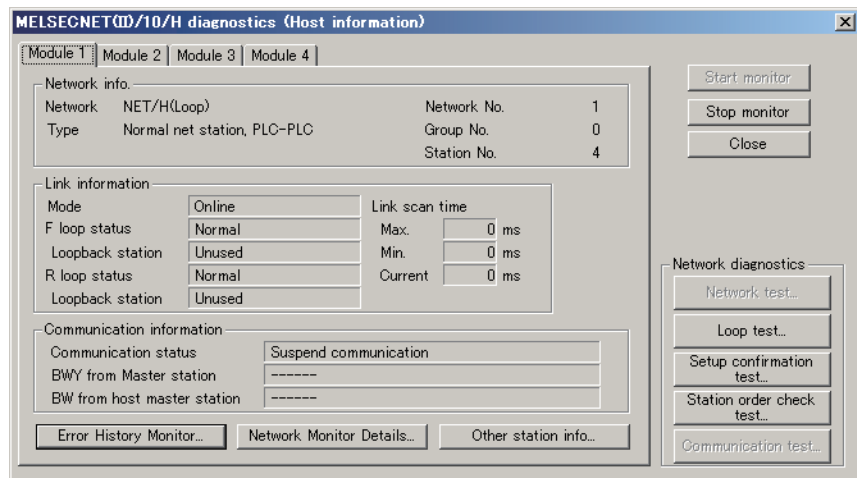
In addition to the network test and communication test, the following tests cannot be performed if the first 5 digits of QS0001CPU serial number are "10031" or lower.

• Loop test

• Setup confirmation test

• Station order check test

(c) MELSECNET/G diagnostics
The following function cannot be used.
• Link start/stop
• Communication test
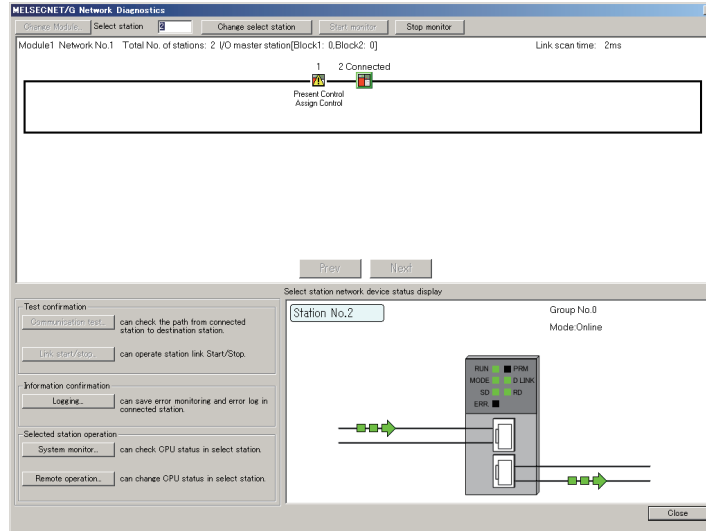
(d) Ethernet diagnostics
The following functions cannot be used.
• Received e-mail information
• Send e-mail information

(e) CC-Link / CC-Link/LT diagnostics

• Network test cannot be performed.
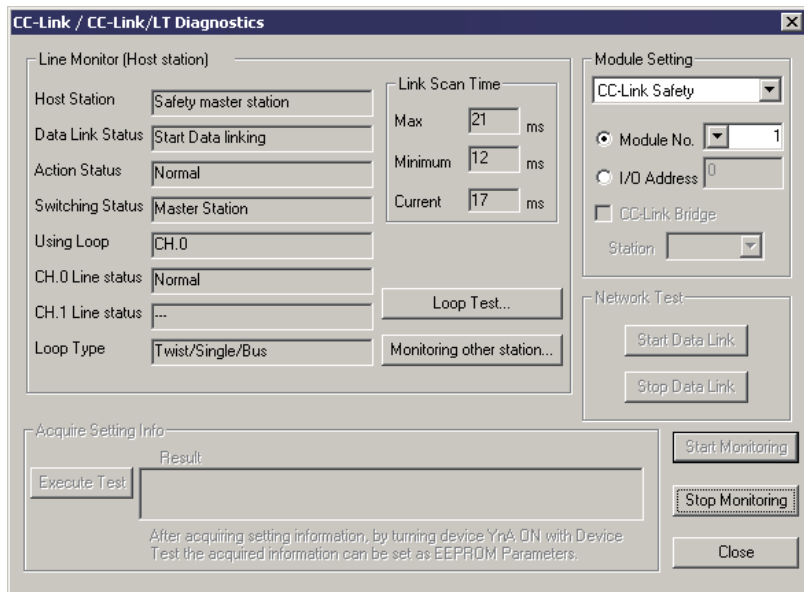
• "Invalid station if temporary error" in the CC-Link / CC-Link/LT diagnostics (Other station) screen cannot be set.
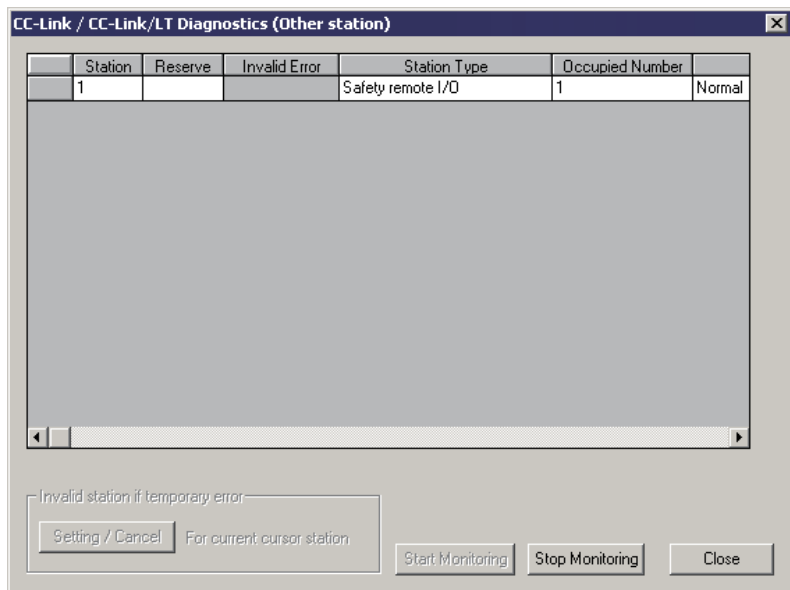
(5) Differences in the Tool menu

(a) Merge data
The program or comment data created in a safety programmable controller project can only be merged with (a) safety programmable controller project(s).

(b) Options
<<Program common>> tab
The following items cannot be selected for a safety CPU.

- Statement insertion method
- Step No. specification used in writing
- Instruction setting for online change
- Buffer, Link memory monitor
- Ladder monitor of PLS/PLF instruction
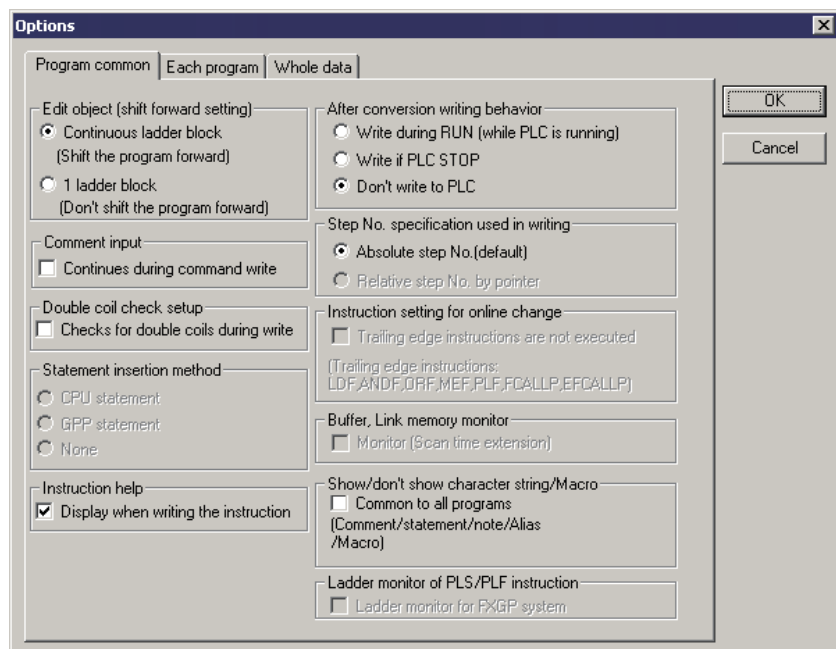
<<Each program>> tab
For a safety CPU, the "Device comment" field is fixed to "Comment for each program".
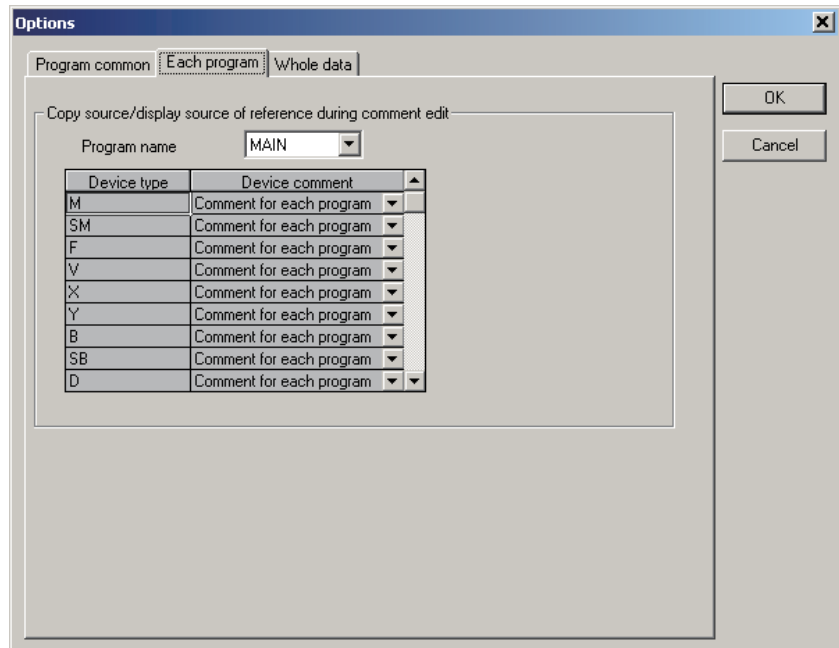
<<Whole data>> tab
For a safety CPU, "All common data" and "Extended setting" cannot be selected.
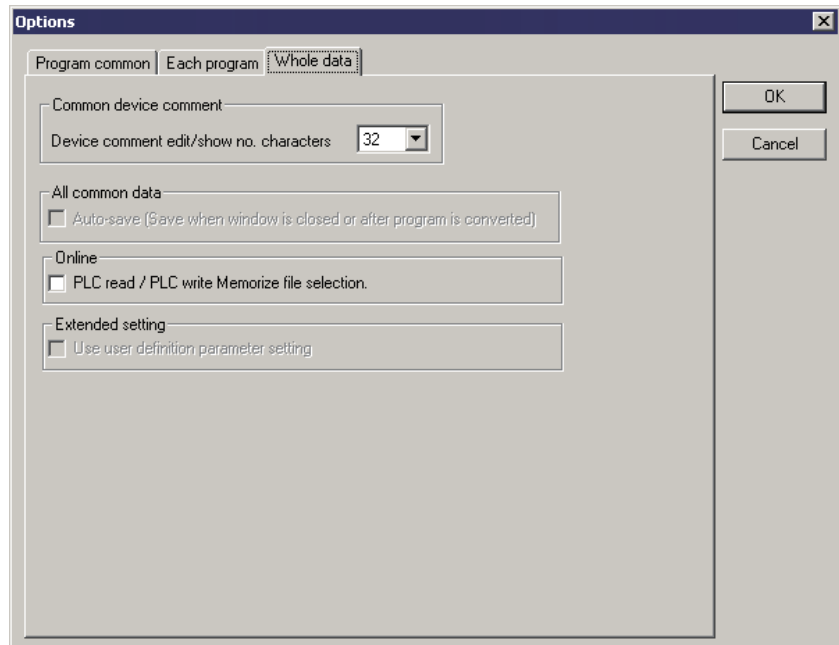
<<TEL>> tab
Since a safety CPU does not support the TEL function, the <<TEL>> tab cannot be displayed.

Appendix 2 Functions for which CPU Access Password Certification is Performed

CPU access password certification is performed when the safety CPU status is to be changed by the GX Developer operation.
Note when reading data from a safety CPU (e.g. Read from PLC, monitor), the CPU access password certification is not performed.

The following shows the GX Developer functions for which the CPU access password certification is performed.

Menu	Function
Edit	Change TC setting
Convert	Online change
Online	Write to PLC
	Delete PLC data
	Write the program memory to ROM
	Switch safety CPU operation mode
	CPU access password registration/change
	PLC memory initialization
	Remote operation
	Clear PLC memory
	Format PLC memory
	Arrange PLC memory
	Set clock
	Present value change
	Device test
Diagnostics	PLC Diagnostics – Clear log
	MELSECNET(II)/10/H diagnostics – Clear of error history…
	CC-Link / CC-Link/LT diagnostics – Loop test

Appendix 3 ASCII Code Table

	MSD	0	1	2	3	4	5	6	7
LSD		000	001	010	011	100	101	110	111
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

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MEMO

GX Developer Version 8

Operating Manual (Safety Programmable Controller)

MITSUBISHI ELECTRIC CORPORATION

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