CC-Link IE Field Network Temperature Control Module FB Library Reference Manual

Applicable module:
NZ2GF2B-60TCTT4, NZ2GF2B-60TCRT4

<CONTENTS>

Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M122-A	2014/1/31	First edition
FBM-M122-B	2015/7/31	1) Added applicable GX Works2 Version. • This FB is able to install on GX Works2 of all language versions.

1. Overview

1.1. Overview of the FB Library

This FB Library is for using the CC-Link IE Field Network Temperature Control Module NZ2GF2B-60TCTT4 and NZ2GF2B-60TCRT4.

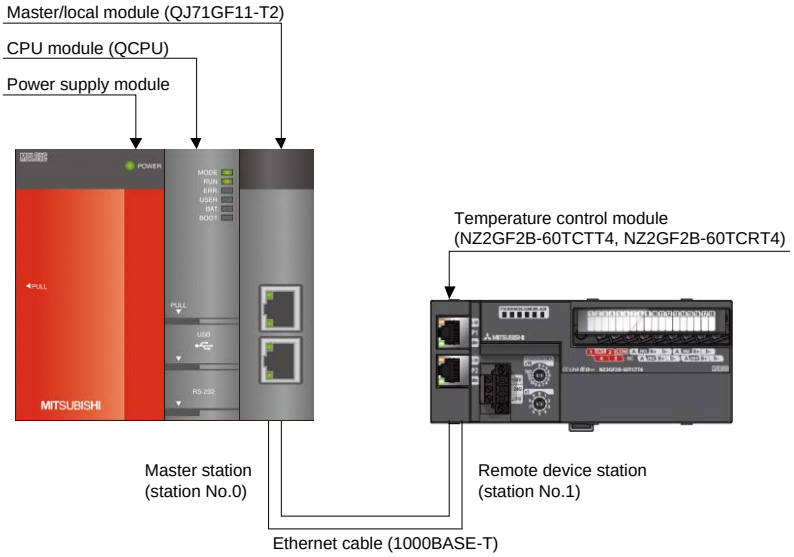
1.2. Function of the FB Library

Item	Description
M+NZ2GF2B60TC4_SetInitData	Configures the initial data setting.
M+NZ2GF2B60TC4_SetOperationData	Executes the during operation setting change instruction.
M+NZ2GF2B60TC4_CorrectOnePSensor	Sets the sensor one-point correction.
M+NZ2GF2B60TC4_CorrectTwoPSensor	Sets the sensor two-point correction.
M+NZ2GF2B60TC4_Autotuning	Sets and executes auto tuning.

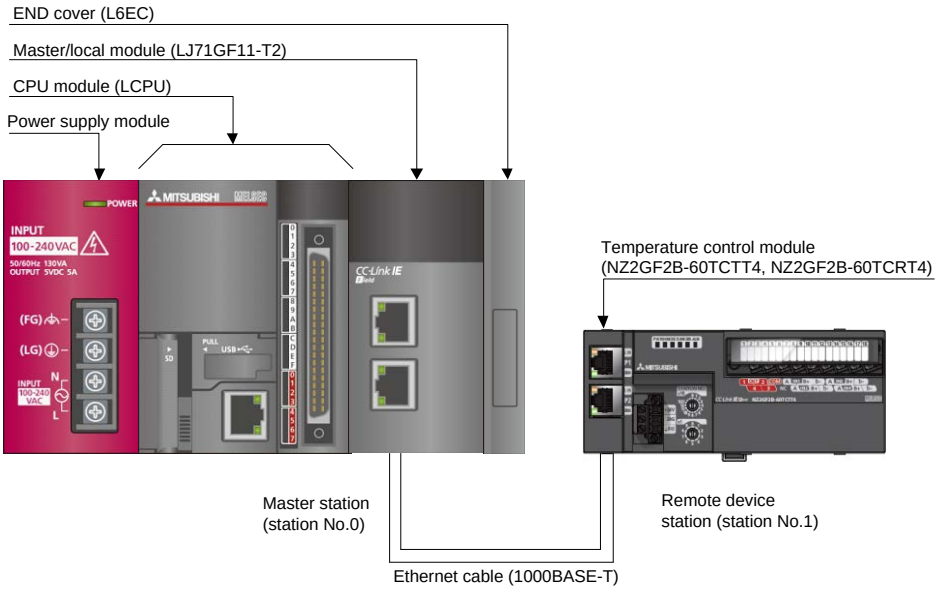
1.3. System Configuration Example

The following shows the system configuration when the CC-Link IE Field Network remote device station temperature control module (NZ2GF2B-60TCTT4 or NZ2GF2B-60TCRT4) is used as the remote device station.

(1) Q-series system configuration



(2) L-series system configuration

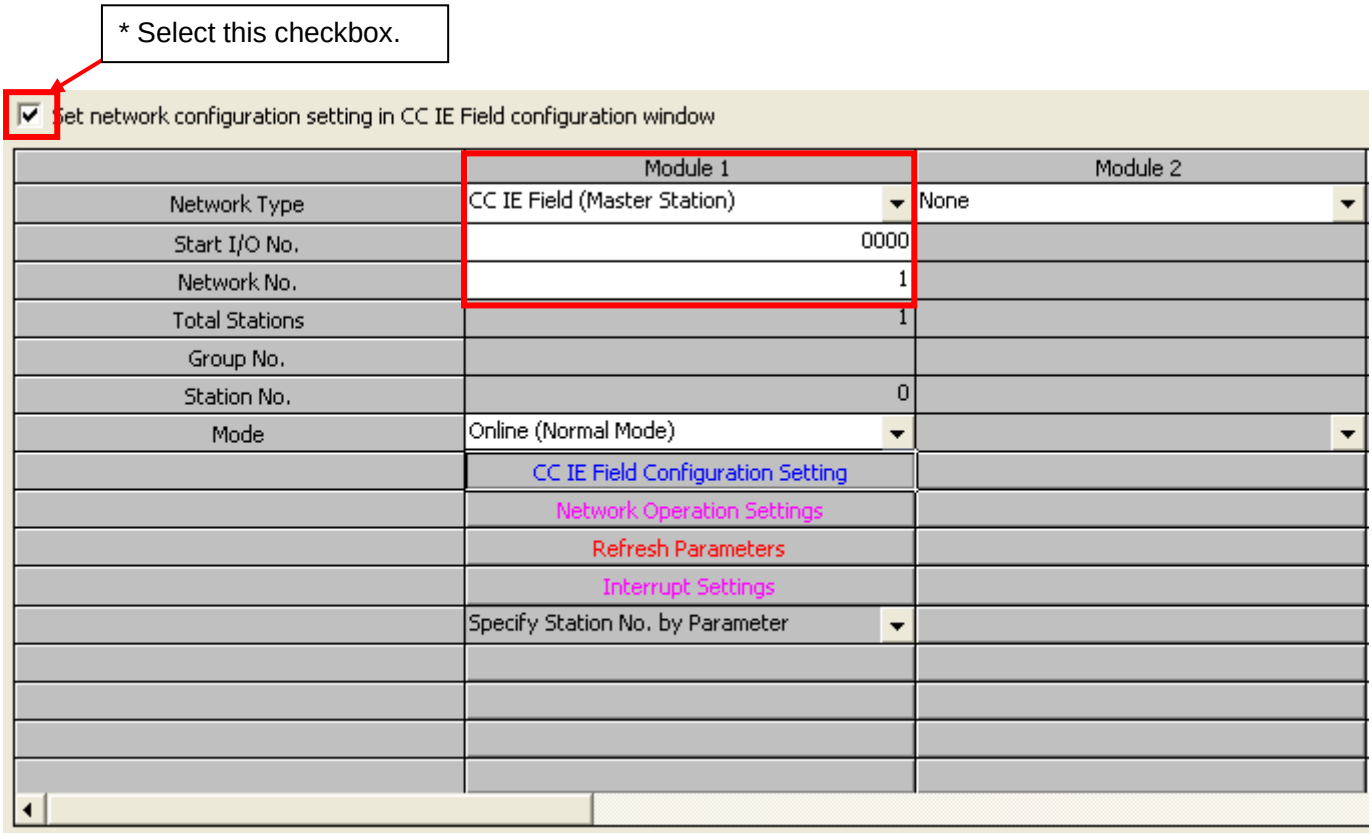


1.4. Setting the CC-Link IE Field Network Master/Local Module

This section explains the setting of the CC-Link IE Field Network master/local module based on Section "1.3 System Configuration Example". Set the following items with GX Works2.

(1) Network parameters

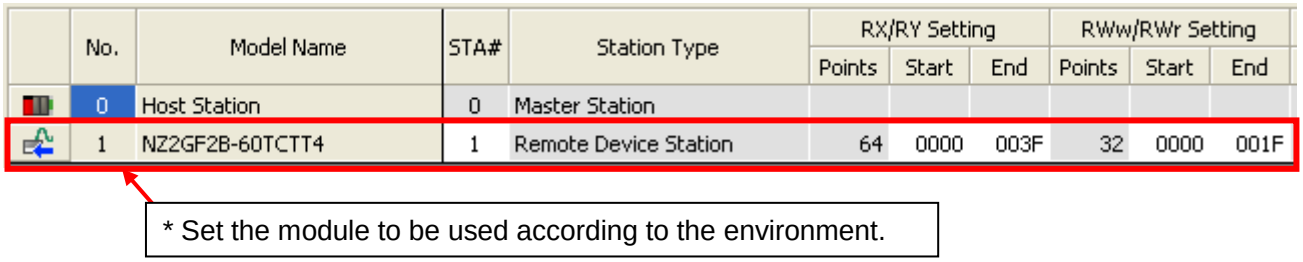
Item	Description
Network Type	Select "CC IE Field (Master Station)".
Start I/O No.	Set the start I/O number of the master/local module in increments of 16 points. Set "0000".
Network No.	Set the network number of the master/local module. Set "1".



(2) CC IE Field configuration setting

Item	Description
Station No.	Set the station number of the remote device stations connected to the master station. Set "1".
Station Type	Set the station type of the remote device stations connected to the master station. Set "Remote Device Station".
RX/RY Setting	Set assignment for RX/RY for the remote device station connected to the master station. (a) Start Set "0000". (b) Last Set "003F".
RWw/RWr Setting	Set assignment for RWw/RWr for the remote device station connected to the master station. (a) Start Set "0000". (b) Last Set "001F".

[For NZ2GF2B-60TCTT4]



	No.	Model Name	STA#	Station Type	RX/RY Setting			RWw/RWr Setting		
					Points	Start	End	Points	Start	End
	0	Host Station	0	Master Station						
	1	NZ2GF2B-60TCTT4	1	Remote Device Station	64	0000	003F	32	0000	001F

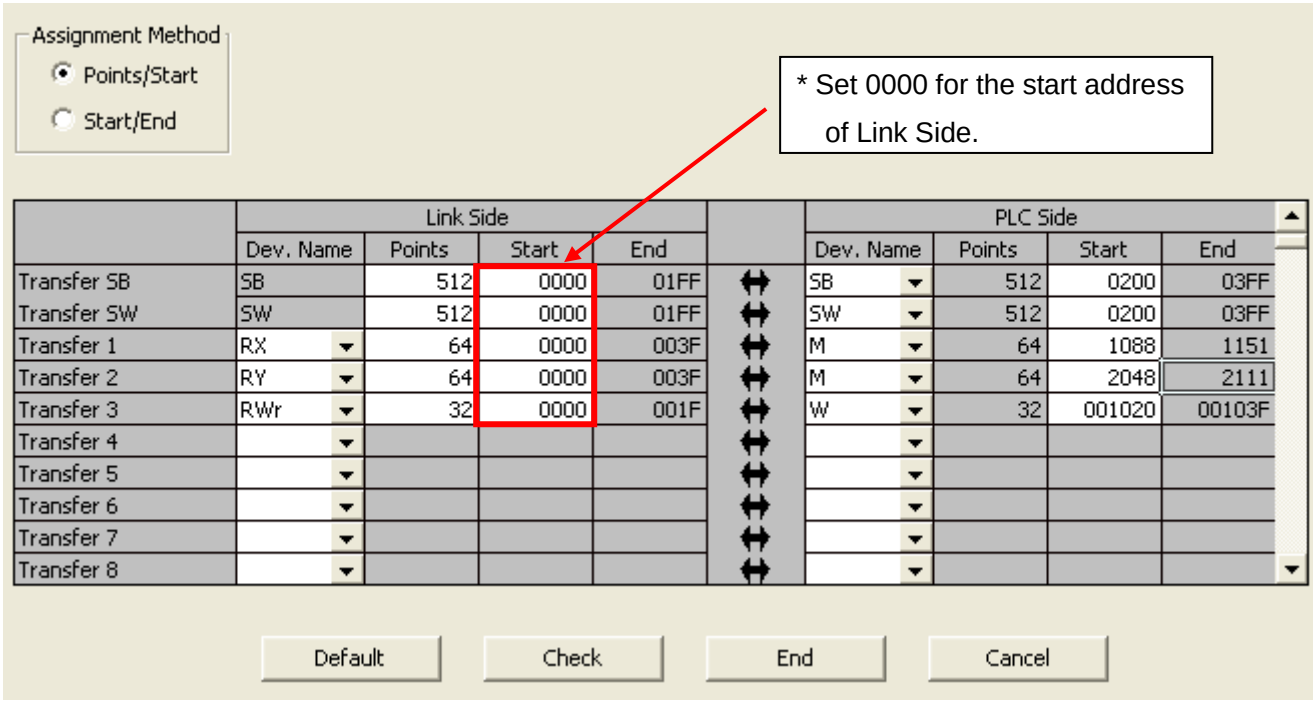
(3) Refresh parameter setting

Item	Description	Setting value
Transfer SB	Select the link refresh range of SB device.	• "Link Side Points": 512 • "Link Side Start": 0000 • "PLC Side Dev. Name": SB • "PLC Side Start": 0000
Transfer SW	Select the link refresh range of SW device.	• "Link Side Points": 512 • "Link Side Start": 0000 • "PLC Side Dev. Name": SW • "PLC Side Start": 0000
Transfer 1	Select the link refresh range of RX device.	• "Link Side Dev. Name": RX • "Link Side Points": 64 • "Link Side Start": 0000 • "PLC Side Dev. Name": M • "PLC Side Start": 1024
Transfer 2	Select the link refresh range of RY device.	• "Link Side Dev. Name": RY • "Link Side Points": 64 • "Link Side Start": 0000 • "PLC Side Dev. Name": M • "PLC Side Start": 2048
Transfer 3	Select the link refresh range of RWr device.	• "Link Side Dev. Name": RWr • "Link Side Points": 32 • "Link Side Start": 0000 • "PLC Side Dev. Name": W • "PLC Side Start": 1000

* Make sure to set "0000" for Start of Link Side.

* Change the Points of Link Side and Dev. Name and Start of PLC Side according to the system.

They must be the same as for "M_F_RX", "M_F_RY", and "M_F_RWr" devices of the global label setting.


Assignment Method
Points/Start
Start/End
* Set 0000 for the start address of Link Side.
Link Side
PLC Side
Dev. Name
Points
Start
End
Transfer SB SB 512 0000 01FF SB 512 0200 03FF
Transfer SW SW 512 0000 01FF SW 512 0200 03FF
Transfer 1 RX 64 0000 003F M 64 1088 1151
Transfer 2 RY 64 0000 003F M 64 2048 2111
Transfer 3 RWr 32 0000 001F W 32 001020 00103F
Transfer 4
Transfer 5
Transfer 6
Transfer 7
Transfer 8
Default
Check
End
Cancel

1.5. Setting Global Labels

Global labels must be set before using this FB. This section explains global label settings.

(1) M_F_RX Set remote input (RX).

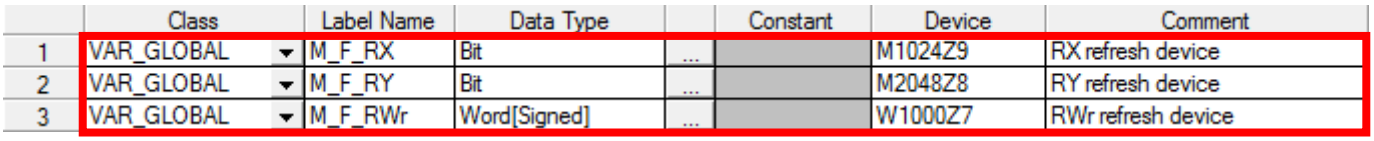
Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RX".
Data Type	Select "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z9" prefix.

(2) M_F_RY Set remote output (RY).

Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RY".
Data Type	Select "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z8" prefix.

(3) M_F_RWr Set remote output (RWr).

Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RWr".
Data Type	Select "Word[Signed]".
Device	Enter the refresh device set for the refresh parameter with a "Z7" prefix.



	Class	Label Name	Data Type		Constant	Device	Comment
1	VAR_GLOBAL	M_F_RX	Bit	...		M1024Z9	RX refresh device
2	VAR_GLOBAL	M_F_RY	Bit	...		M2048Z8	RY refresh device
3	VAR_GLOBAL	M_F_RWr	Word[Signed]	...		W1000Z7	RWr refresh device

1.6. Creating Interlock Programs

Interlock programs must be created for the FBs. The following is an example of an interlock program.

Set one interlock program to the cyclic transmission.

(Set a corresponding FB between MC and MCR instructions.)

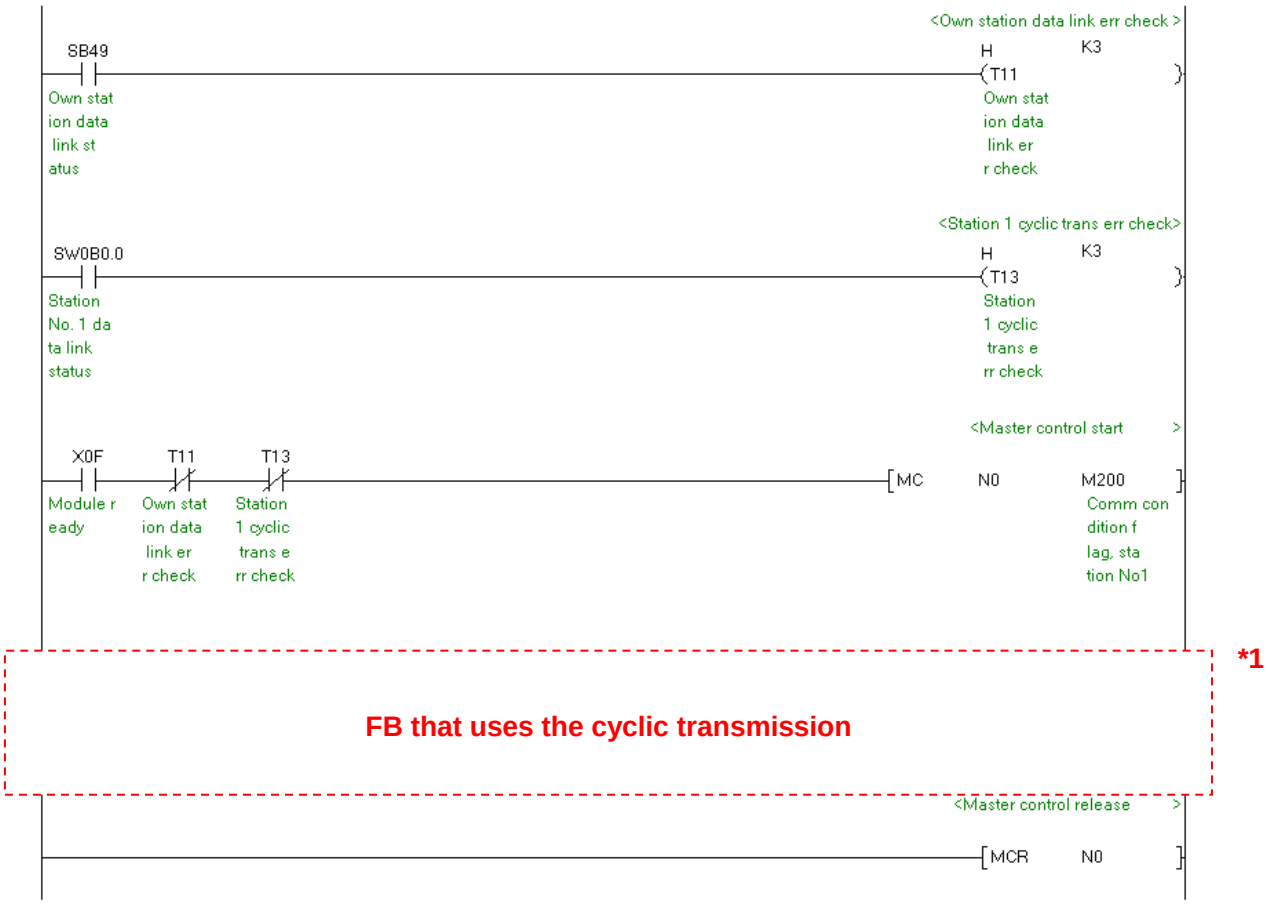
1.6.1. Cyclic Transmission Program

Use link special relay (SB) and link special register (SW) to create an interlock for a cyclic transmission program.

• Own station data link status (SB0049)

• Each station data link status (SW00B0 to SW00B7)

Example: Interlock example (station No.1)



*1 For the FBs that use the cyclic transmission, refer to "1.6.3 List of Transmissions Used by the FBs".

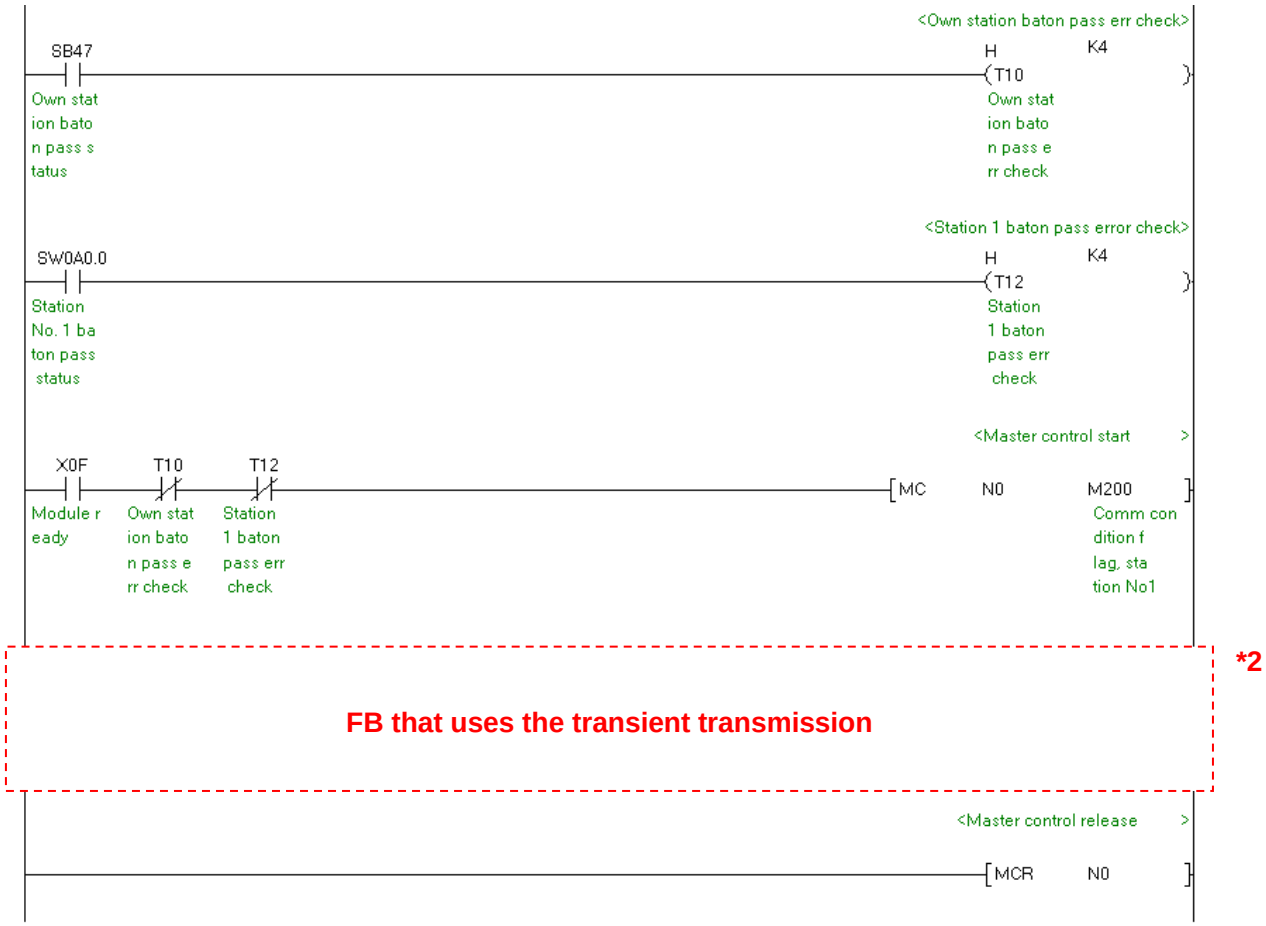
1.6.2. Transient Transmission Program

Use link special relay (SB) and link special register (SW) to create an interlock for a transient transmission program.

• Own station baton pass status (SB0047)

• Each station baton pass status (SW00A0 to SW00A7)

Example: Interlock example (station No.1)



*2 For the FBs that use the transient transmission, refer to "1.6.3 List of Transmissions Used by the FBs".

1.6.3. List of Transmissions Used by the FBs

The following lists the transmissions that are used by each FB.

FB name	Cyclic transmission	Transient transmission
M+NZ2GF2B60TC4_SetInitData	○	-
M+NZ2GF2B60TC4_SetOperationData	○	-
M+NZ2GF2B60TC4_CorrectOnePSensor	○	○
M+NZ2GF2B60TC4_CorrectTwoPSensor	○	○
M+NZ2GF2B60TC4_Autotuning	○	○

-: Not used

○: Used

1.7. Relevant Manuals

- CC-Link IE Field Network Temperature Control Module User's Manual
- MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual
- MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual
- QCPU User's Manual (Hardware Design, Maintenance and Inspection)
- MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
- GX Works2 Version 1 Operating Manual (Common)
- GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

1.8. Note

Please make sure to read user's manuals for the corresponding products before using the products.

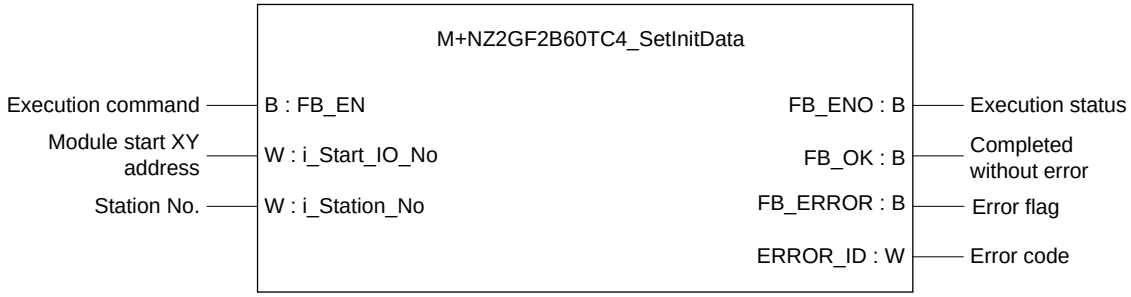
2. Details of the FB Library

2.1. M+NZ2GF2B60TC4_SetInitData (Initial data setting)

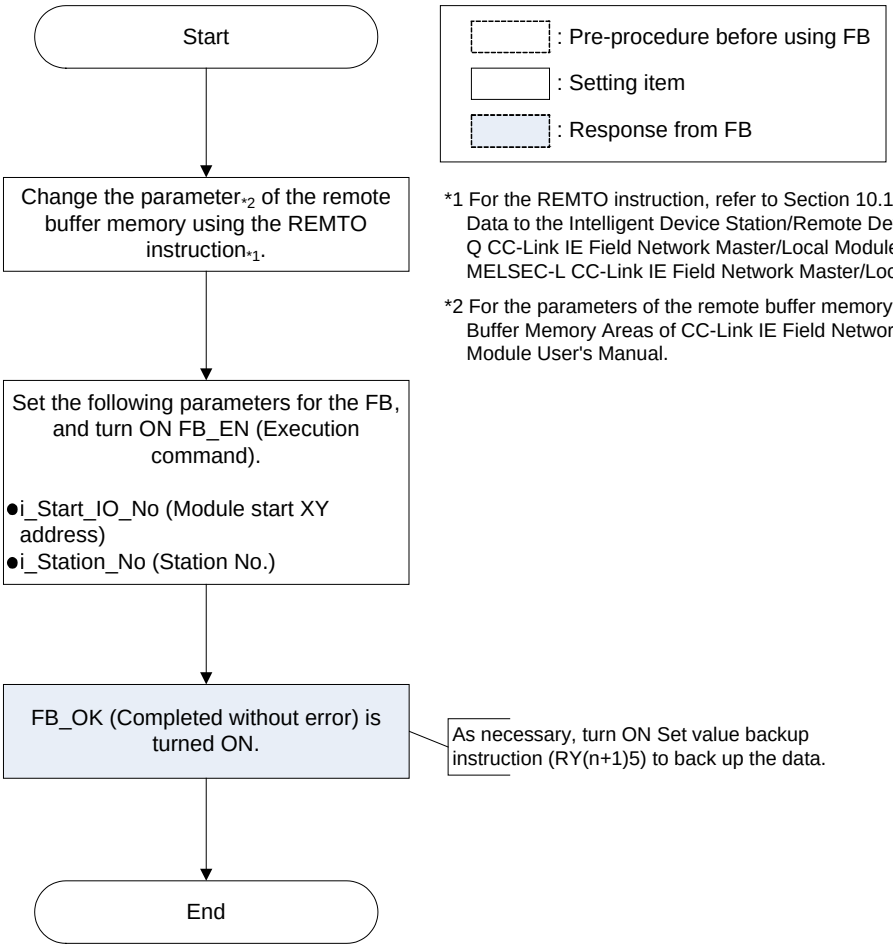
FB Name

M+NZ2GF2B60TC4_SetInitData

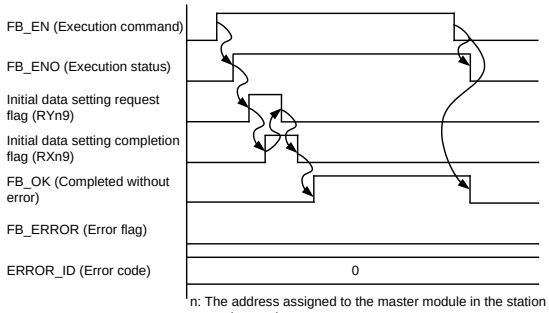
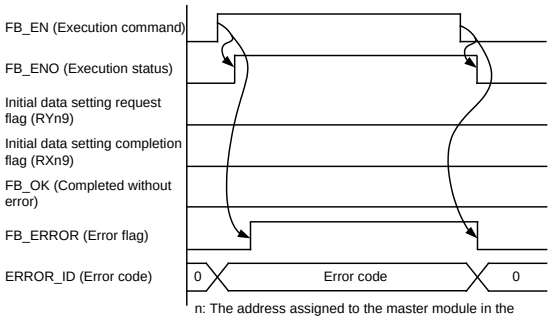
Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Configures the initial data setting.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>CC-Link IE Field Network temperature control module</td><td>NZ2GF2B-60TCTT4, NZ2GF2B-60TCRT4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module *1
*1 The first five digits of the serial number are "14102" or later.</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>Japanese version</td><td>Version1.86Q or later</td></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese (Simplified) version</td><td>Version1.49B or later</td></tr>
<tr><td>Chinese (Traditional) version</td><td>Version1.49B or later</td></tr>
<tr><td>Korean version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
</table>

Item	Description
Programming language	Ladder
Number of steps	620 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command) while CH□ Operation monitor (RX(n+1)1 to RX(n+1)4) for all the channels are set to "OFF: Stopped", the operating condition for the target module is set. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) After FB_EN (Execution command) is turned ON, the FB is completed in multiple scans. 4) When the operating condition is set in the parameter processing screen of the slave station, this FB is not necessary. 5) When the network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the setting value of i_Station_No (Station No.) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 60 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 7) When FB_EN (Execution command) is turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) is ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 61 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 8) When CH□ Operation monitor (RX(n+1)1 to RX(n+1)4) for all the channels are not set to "OFF: Stopped", the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 62 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
	9) Use this FB as follows.  *1 For the REMTO instruction, refer to Section 10.14 ZP.REMTO (Writing Data to the Intelligent Device Station/Remote Device Station) of MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual or MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual. *2 For the parameters of the remote buffer memory, refer to Lists of Remote Buffer Memory Areas of CC-Link IE Field Network Temperature Control Module User's Manual.
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) When this FB is used, implement an interlock to prevent it from being executed with other FBs simultaneously. 4) Do not turn ON RYn9 (Initial data setting request flag) and RY(n+1)0 (During operation setting change instruction) while this FB is executed because a parameter setting request is executed in the FB. 5) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 6) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 7) A duplicated coil warning may occur during compile operation due to the RY signal being operated by index modification in the FB. However this is not a problem and the FB will operate without error. 8) Every input must be provided with a value for proper FB operation. 9) This FB uses the cyclic transmission. Therefore, an interlock program for the cyclic transmission is required. For the interlock program, refer to "1.6.1 Cyclic Transmission Program". 10) Set the refresh device of the network parameter setting according to "1.4 Setting the CC-Link IE Field Network Master/Local Module". 11) Set the global label setting according to "1.5 Setting Global Labels". 12) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1. When Using the FB for 2 or More Master/Local Modules". 13) If processing of the FB is not completed, check if the station number of CC-Link IE Field matches with the network station number and an error occurs in a module.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2. FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error]  n: The address assigned to the master module in the station number setting. [When an error occurs]  n: The address assigned to the master module in the station number setting.
Relevant manuals	• CC-Link IE Field Network Temperature Control Module User's Manual • MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual • MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual • QCPU User's Manual (Hardware Design, Maintenance and Inspection) • MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection) • GX Works2 Version 1 Operating Manual (Common) • GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Error codes

●Error code list

Error code	Description	Action
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. • Network configuration setting Refer to (2) of "1.4 Setting the CC-Link IE Field Network Master/Local Module". • The value entered in i_Station_No
60 (Decimal)	The specified station number is not valid. The station number is not within the range of 1 to 120.	Please try again after confirming the setting.
61 (Decimal)	FB_EN (Execution command) was turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) was ON.	Turn ON FB_EN (Execution command) after turning OFF the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0).
62 (Decimal)	CH☐ Operation monitor (RX(n+1)1 to RX(n+1)4) is set to "ON: Operating".	Set CH☐ Operation monitor (RX(n+1)1 to RX(n+1)4) for all the channels to "OFF: Stopped".

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the CC-Link IE Field Network master/local module is mounted or connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the station number of the target station.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the initial data setting is completed.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/1/31	First edition

Note

This chapter includes information related to the function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

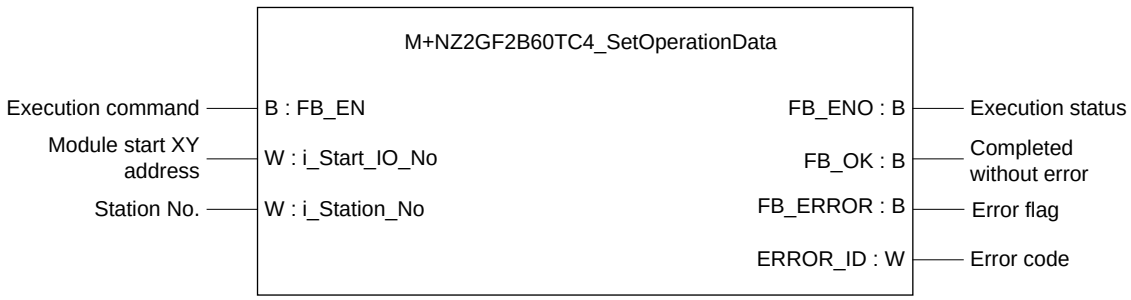
Please make sure to read user's manuals for the corresponding products before using the products.

2.2. M+NZ2GF2B60TC4_SetOperationData (During operation setting change)

FB Name

M+NZ2GF2B60TC4_SetOperationData

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Executes the during operation setting change instruction.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
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<tr><td>CPU module</td><td>
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<tr><th>Series</th><th>Model</th></tr>
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</table>
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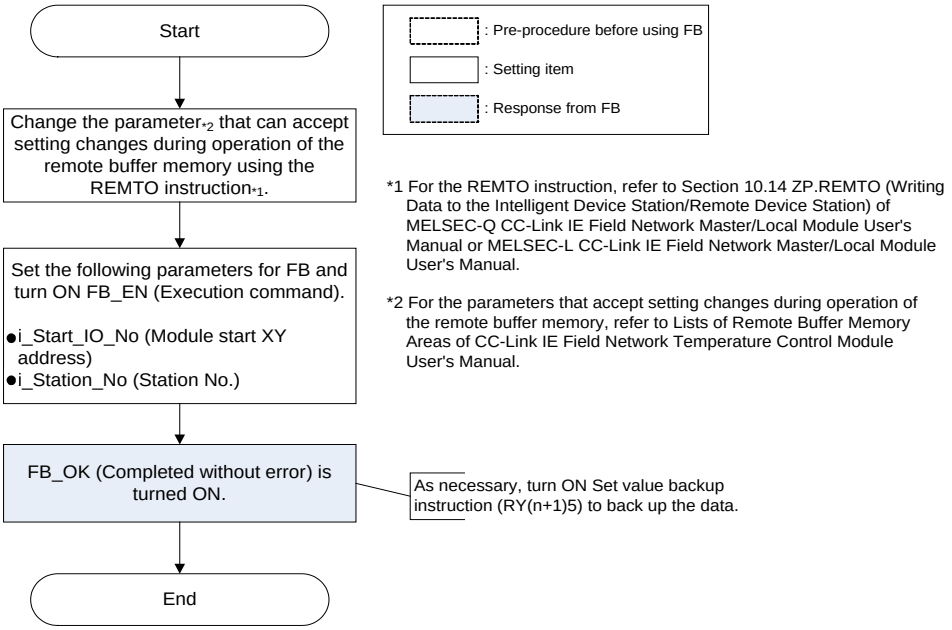
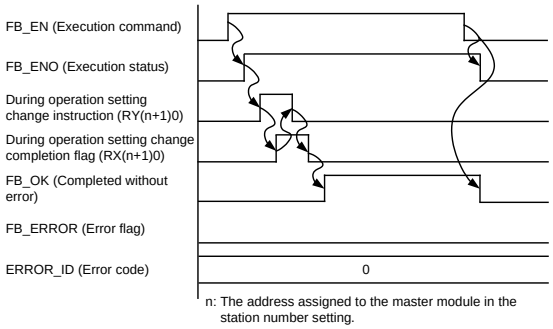
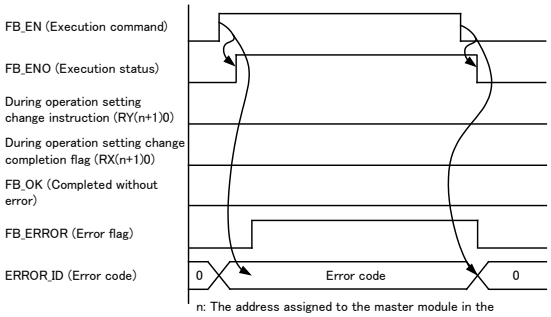
</td></tr>
</table>

Item	Description
Programming language	Ladder
Number of steps	573 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the operating condition for the parameters whose setting can be changed during operation is set. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) After FB_EN (Execution command) is turned ON, the FB is completed in multiple scans. 4) Even if FB_OK (Completed without error) is turned ON, setting changes in a parameter that accepts setting changes only during stop is not applied. Change the setting of parameters that accept setting changes during operation only. For details, refer to Lists of Remote Buffer Memory Areas of "CC-Link IE Field Network Temperature Control Module User's Manual". 5) When the network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the setting value of i_Station_No (Station No.) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 60 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 7) When FB_EN (Execution command) is turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) is ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 61 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
Function description	8) Use this FB as follows.  *1 For the REMTO instruction, refer to Section 10.14 ZP.REMTO (Writing Data to the Intelligent Device Station/Remote Device Station) of MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual or MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual. *2 For the parameters that accept setting changes during operation of the remote buffer memory, refer to Lists of Remote Buffer Memory Areas of CC-Link IE Field Network Temperature Control Module User's Manual.
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) When this FB is used, implement an interlock to prevent it from being executed with other FBs simultaneously. 4) Do not turn ON RYn9 (Initial data setting request flag) and RY(n+1)0 (During operation setting change instruction) while this FB is executed because a parameter setting request is executed in the FB. 5) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 6) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 7) A duplicated coil warning may occur during compile operation due to the RY signal being operated by index modification in the FB. However this is not a problem and the FB will operate without error. 8) Every input must be provided with a value for proper FB operation. 9) This FB uses the cyclic transmission. Therefore, an interlock program for the cyclic transmission is required. For the interlock program, refer to "1.6.1 Cyclic Transmission Program". 10) Set the refresh device of the network parameter setting according to "1.4 Setting the CC-Link IE Field Network Master/Local Module". 11) Set the global label setting according to "1.5 Setting Global Labels". 12) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1. When Using the FB for 2 or More Master/Local Modules". 13) If processing of the FB is not completed, check if the station number of CC-Link IE Field matches with the network station number and an error occurs in a module.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2. FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error]  n: The address assigned to the master module in the station number setting. [When an error occurs]  n: The address assigned to the master module in the station number setting.
Relevant manuals	• CC-Link IE Field Network Temperature Control Module User's Manual • MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual • MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual • QCPU User's Manual (Hardware Design, Maintenance and Inspection) • MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection) • GX Works2 Version 1 Operating Manual (Common) • GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Error codes

●Error code list

Error code	Description	Action
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. • Network configuration setting Refer to (2) of "1.4 Setting the CC-Link IE Field Network Master/Local Module". • The value entered in i_Station_No
60 (Decimal)	The specified station number is not valid. The station number is not within the range of 1 to 120.	Please try again after confirming the setting.
61 (Decimal)	FB_EN (Execution command) was turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) was ON.	Turn ON FB_EN (Execution command) after turning OFF the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0).

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the CC-Link IE Field Network master/local module is mounted or connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the station number of the target station.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the execution of the during operation setting change instruction is completed.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/1/31	First edition

Note

This chapter includes information related to the function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

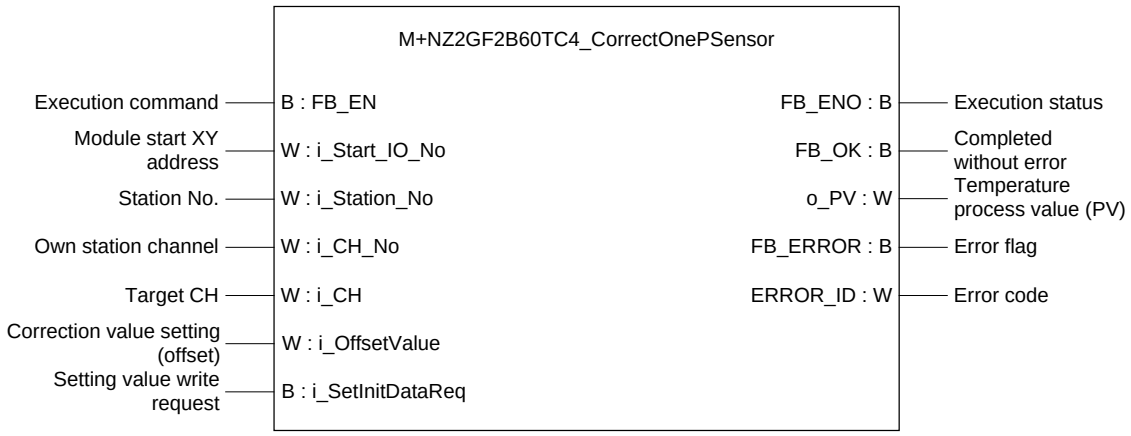
Please make sure to read user's manuals for the corresponding products before using the products.

2.3. M+NZ2GF2B60TC4_CorrectOnePSensor (Sensor one-point correction)

FB Name

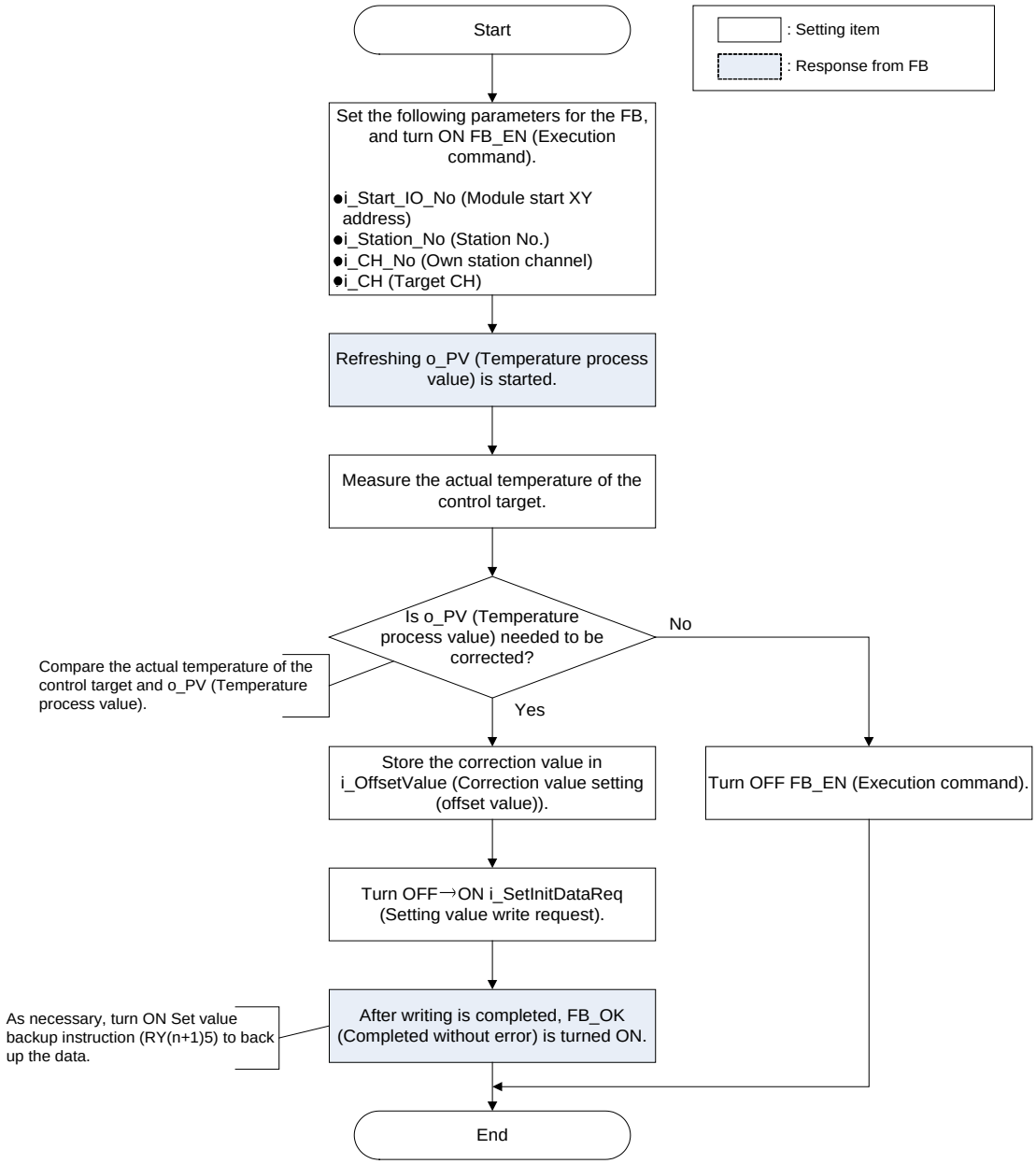
M+NZ2GF2B60TC4_CorrectOnePSensor

Function Overview

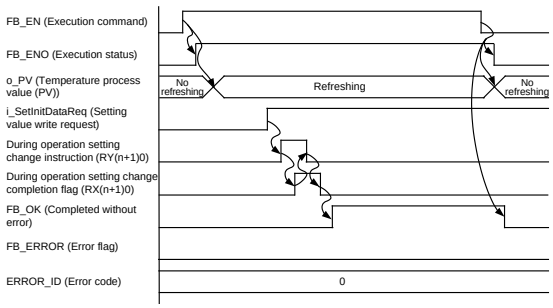
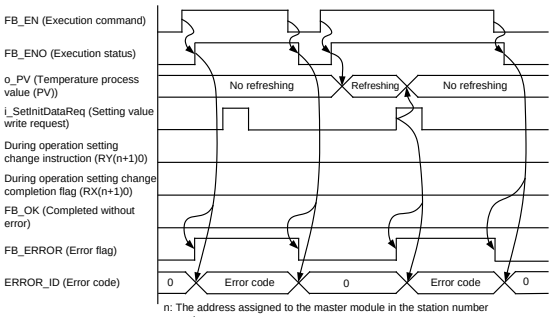
<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the sensor one-point correction.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>CC-Link IE Field Network temperature control module</td><td>NZ2GF2B-60TCTT4, NZ2GF2B-60TCRT4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module *1
*1 The first five digits of the serial number are "14102" or later.</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
</table>

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td></td><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>Japanese version</td><td>Version1.86Q or later</td></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese (Simplified) version</td><td>Version1.49B or later</td></tr>
<tr><td>Chinese (Traditional) version</td><td>Version1.49B or later</td></tr>
<tr><td>Korean version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">985 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), o_PV (Temperature process value (PV)) is refreshed. 2) By turning ON i_SetInitDataReq (Setting value write request), the during operation setting change instruction (RY(n+1)0) is processed. After wiring is completed, FB_OK (Completed without error) is turned ON. 3) To set a correction value again, turn OFF FB_EN (Execution command) then turn it ON again. 4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 10 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 50 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the setting value of i_Station_No (Station No.) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 60 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 7) When i_SetInitDataReq (Setting value write request) is turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) is ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 61 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 8) When Sensor correction function selection (1E4H) of i_CH (Target CH) is not set to "0: Normal sensor correction (one-point correction)", the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 63 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 9) When the setting value of i_OffsetValue (Correction value setting (offset value)) in i_CH (Target CH) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 64 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 10) When the CC-Link IE Field Network error occurs, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code D000 to DAF9 (Hexadecimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
	11) Use this FB as follows. 
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) When this FB is used, implement an interlock to prevent it from being executed with other FBs simultaneously. 4) Do not turn ON RYn9 (Initial data setting request flag) and RY(n+1)0 (During operation setting change instruction) while this FB is executed because a parameter setting request is executed in the FB. 5) This FB uses the REMFR and REMTO instructions. When using the REMFR or REMTO instruction in the ladder program, make sure that the channels used by the own station are not duplicated. 6) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 7) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 8) A duplicated coil warning may occur during compile operation due to the RY signal being operated by index modification in the FB. However this is not a problem and the FB will operate without error. 9) Every input must be provided with a value for proper FB operation. 10) This FB uses the cyclic transmission and transient transmission. Therefore, interlock programs for the both transmission are required. 11) Set the refresh device of the network parameter setting according to "1.4 Setting the CC-Link IE Field Network Master/Local Module". 12) Set the global label setting according to "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1. When Using the FB for 2 or More Master/Local Modules". 14) If processing of the FB is not completed, check the following. • The station number of CC-Link IE Field matches with the network station number. • No error occurs in a module. • The channels used by the own station are not duplicated.
FB operation type	Pulsed execution (multiple scan execution type) However, the real-time execution type is applied to o_PV (Temperature process value (PV)).
Application example	Refer to "Appendix 2. FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error] (CH1)  n: The address assigned to the master module in the station number setting. [When an error occurs] (CH1)  n: The address assigned to the master module in the station number setting.
Relevant manuals	• CC-Link IE Field Network Temperature Control Module User's Manual • MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual • MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual • QCPU User's Manual (Hardware Design, Maintenance and Inspection) • MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection) • GX Works2 Version 1 Operating Manual (Common) • GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Error codes

●Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH (Target CH) is not within the range of 1 to 4.	Please try again after confirming the setting.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect.	Review the following setting. • Network configuration setting Refer to (2) of "1.4 Setting the CC-Link IE Field Network Master/Local Module". • The value entered in i_Station_No (Station No.)
60 (Decimal)	The specified station number is not valid. i_Station_No (Station No.) is not within the range of 1 to 120.	Please try again after confirming the setting.
61 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) was turned ON.	Turn ON i_SetInitDataReq (Setting value write request) after turning OFF the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0).

Error code	Description	Action
63 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON while "0: Normal sensor correction (one-point correction)" was not stored in Sensor correction function selection (1E4H) of i_CH (Target CH).	Turn ON i_SetInitDataReq (Setting value write request) after storing "0: Normal sensor correction (one-point correction)" in Sensor correction function selection (1E4H) of i_CH (Target CH).
64 (Decimal)	i_SetInitDatReq (Setting value write request) was turned ON while a value out of the setting range was stored in i_OffsetValue (Correction value setting (offset value)).	Turn ON i_SetInitDataReq (Setting value write request) after storing a value within the setting range (-5000 to 5000).
D000 to DAF9 (Hexadecimal)	A CC-Link IE Field Network error occurs related to the system configuration.	For details, refer to Error Code List of MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual or MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the CC-Link IE Field Network master/local module is mounted or connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the station number of the target station.
Own station channel	i_CH_No	Word	1 to 32	Specify the channels used by the own station.
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Correction value setting (offset)	i_OffsetValue	Word	-5000 to 5000	Stores the offset correction value.

Name (Comment)	Label name	Data type	Setting range	Description
Setting value write request	i_SetInitDataReq	Bit	ON, OFF	The setting value is written.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the execution of the setting value write request is completed.
Temperature process value (PV)	o_PV	Word	0	Stores the temperature process value (PV).
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/1/31	First edition

Note

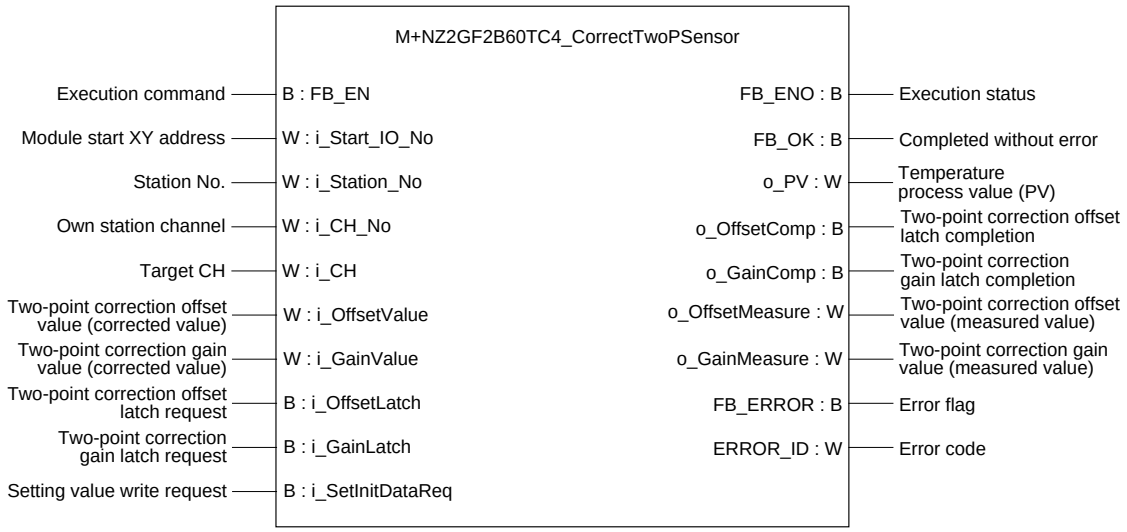
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.4. M+NZ2GF2B60TC4_CorrectTwoPSensor (Sensor two-point correction)

FB Name

M+NZ2GF2B60TC4_CorrectTwoPSensor

Function Overview

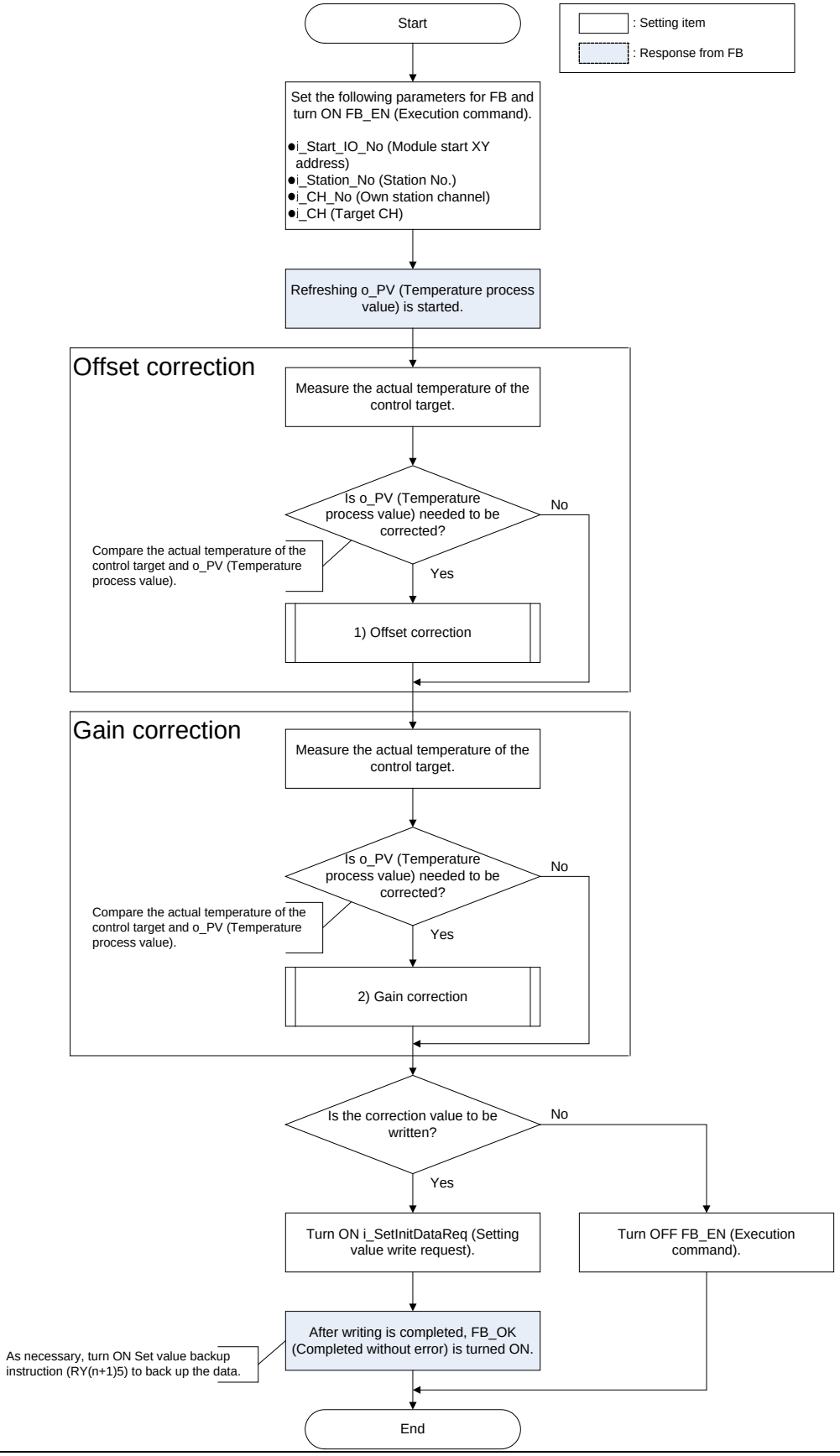
<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the sensor two-point correction.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>CC-Link IE Field Network temperature control module</td><td>NZ2GF2B-60TCTT4, NZ2GF2B-60TCRT4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module *1
*1 The first five digits of the serial number are "14102" or later.</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
</table>

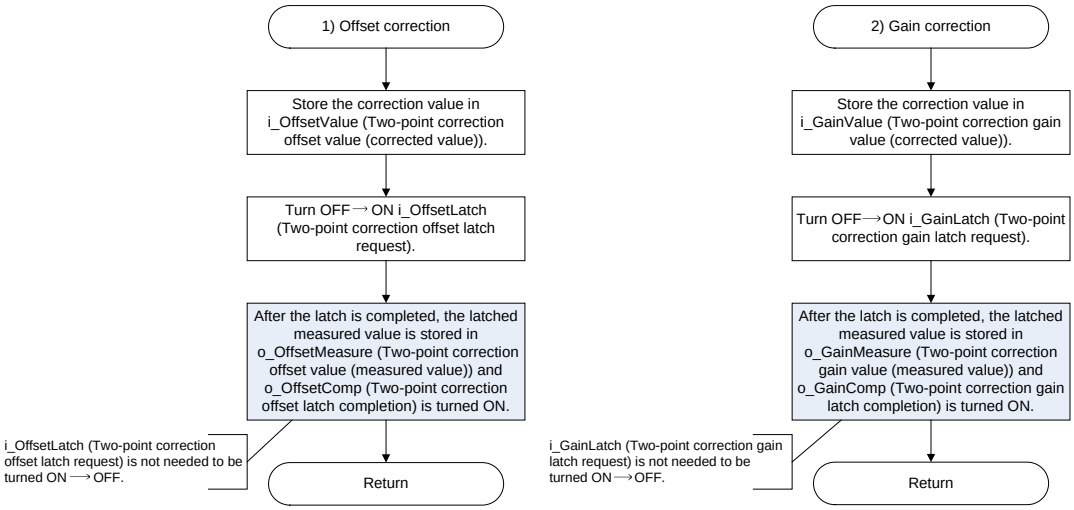
<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td></td><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>Japanese version</td><td>Version1.86Q or later</td></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese (Simplified) version</td><td>Version1.49B or later</td></tr>
<tr><td>Chinese (Traditional) version</td><td>Version1.49B or later</td></tr>
<tr><td>Korean version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">2250 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

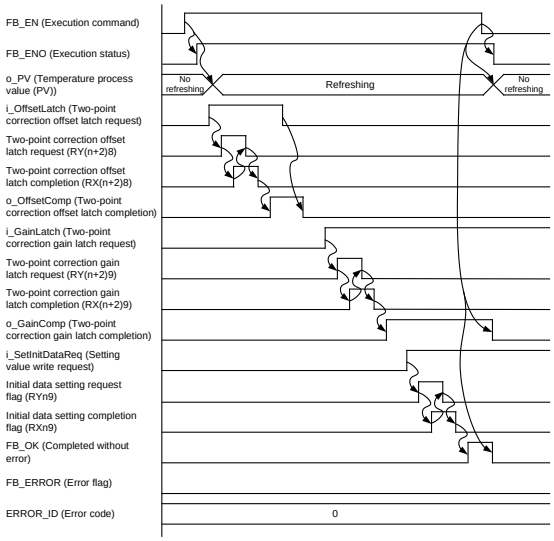
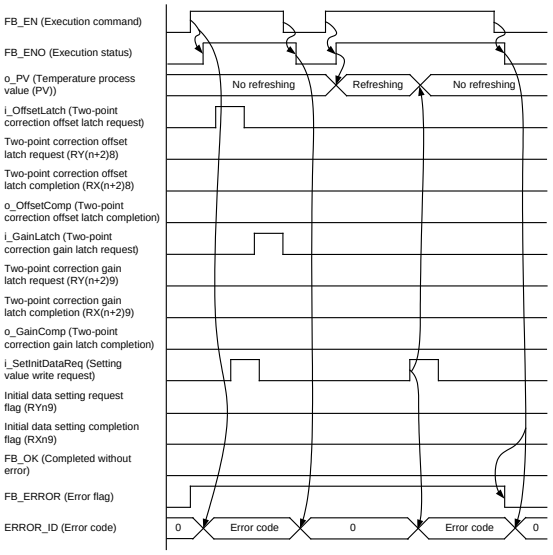
Item	Description
Function description	1) By turning ON FB_EN (Execution command), o_PV (Temperature process value (PV)) is refreshed. 2) The temperature process value (PV) is latched and stored in i_OffsetMeasure (Two-point correction offset value (measured value)) or GainMeasure (Two-point correction gain value (measured value)) when i_OffsetValue (Two-point correction offset latch request) or GainValue (Two-point correction gain latch request) is turned ON. 3) By turning ON i_SetInitDataReq (Setting value write request), the initial data setting request flag (RYn9) is processed. After the initial data setting is completed, FB_OK (Completed without error) is turned ON. 4) To set the correction value again after writing the correction value, turn OFF FB_EN (Execution command) then turn it ON again. 5) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 10 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect, FB_ERROR (Error flag) is turned ON and the processing is interrupted, and the error code 50 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 7) When the setting value of i_Station_No (Station No.) is out of range, the FB_ERROR (Error flag) turns ON, processing is interrupted, and the error code 60 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
	8) When FB_EN (Execution command) is turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) is ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 61 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 9) When CH☐ Operation monitor (RX(n+1)1 to RX(n+1)4) for all the channels are not set to "OFF: Stopped", the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 62 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 10) When Sensor correction function selection (1E4H) of i_CH (Target CH) is not set to "1: Sensor two-point correction", the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 63 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 11) When either of the following conditions is satisfied after FB_EN (Execution command) is turned ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 65 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 1) After i_OffsetLatch (Two-point correction offset latch request) is turned ON, i_GainLatch (Two-point correction gain latch request) is turned ON before i_OffsetComp (Two-point correction offset latch completion) has been turned ON. 2) After i_GainLatch (Two-point correction gain latch request) is turned ON, i_OffsetLatch (Two-point correction offset latch request) is turned ON before i_GainComp (Two-point correction gain latch request) has been tuned ON. 3) i_SetInitDataReq (Setting value write request) is turned ON when neither i_OffsetComp (Two-point correction offset latch completion) nor i_GainComp (Two-point correction gain latch completion) is turned ON. 12) When CH☐ Stop mode setting (118, 148, 178, 1A8H) of i_CH (Target CH) is not set to "1: Monitor", the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 66 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 13) When Sensor two-point correction offset value (corrected value) (285, 289, 28D, or 291H) is equal to or greater than Sensor two-point correction gain value (corrected value) (287, 28B, 28F, or 293H) in i_CH (Target CH), the FB_ERROR (Error code) output turns ON, the processing is interrupted, and the error code 67 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
	14) When Sensor two-point correction offset value (measured value) (284, 288, 28C, or 290H) is equal to or greater than Sensor two-point correction gain value (measured value) (286, 28A, 28E, or 292H) in i_CH (Target CH), the FB_ERROR (Error code) output turns ON, the processing is interrupted, and the error code 68 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 15) When the CC-Link IE Field Network error occurs, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code D000 to DAF9 (Hexadecimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
	16) Use this FB as follows. 

Item	Description
	
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) When this FB is used, implement an interlock to prevent it from being executed with other FBs simultaneously. 4) Do not turn ON RYn9 (Initial data setting request flag) and RY(n+1)0 (During operation setting change instruction) while this FB is executed because a parameter setting request is executed in the FB. 5) This FB uses the REMFR and REMTO instructions. When using the REMFR or REMTO instruction in the ladder program, make sure that the channels used by the own station are not duplicated. 6) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 7) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 8) A duplicated coil warning may occur during compile operation due to the RY signal being operated by index modification in the FB. However this is not a problem and the FB will operate without error. 9) Every input must be provided with a value for proper FB operation. 10) This FB uses the cyclic transmission and transient transmission. Therefore, interlock programs for the both transmission are required. 11) Set the refresh device of the network parameter setting according to "1.4 Setting the CC-Link IE Field Network Master/Local Module". 12) Set the global label setting according to "1.5 Setting Global Labels".

Item	Description
	13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1. When Using the FB for 2 or More Master/Local Modules". 14) If processing of the FB is not completed, check the following. • The station number of CC-Link IE Field matches with the network station number. • No error occurs in a module. • The channels used by the own station are not duplicated.
FB operation type	Pulsed execution (multiple scan execution type) However, the real-time execution type is applied to o_PV (Temperature process value (PV)).
Application example	Refer to "Appendix 2. FB Library Application Examples".
Timing chart	[When operation completes without error] (Two-point correction, CH1)  n: The address assigned to the master module in the station number setting. [When an error occurs] (Two-point correction, CH1)  n: The address assigned to the master module in the station number setting.
Relevant manuals	• CC-Link IE Field Network Temperature Control Module User's Manual • MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual • MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual • QCPU User's Manual (Hardware Design, Maintenance and Inspection) • MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection) • GX Works2 Version 1 Operating Manual (Common) • GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Error codes

●Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH (Target CH) is not within the range of 1 to 4.	Please try again after confirming the setting.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect.	Review the following setting. • Network configuration setting Refer to (2) of "1.4 Setting the CC-Link IE Field Network Master/Local Module". • The value entered in i_Station_No (Station No.)
60 (Decimal)	The specified station number is not valid. i_Station_No (Station No.) is not within the range of 1 to 120.	Please try again after confirming the setting.
61 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) was turned ON.	Turn ON i_SetInitDataReq (Setting value write request) after turning OFF the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0).
62 (Decimal)	CH□ Operation monitor (RX(n+1)1 to RX(n+1)4) is set to "ON: Operating".	Set CH□ Operation monitor (RX(n+1)1 to RX(n+1)4) for all the channels to "0: Stopped".
63 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON while "1: Sensor two-point correction" was not stored in Sensor correction function selection (1E4H) of i_CH (Target CH).	Turn ON i_SetInitDataReq (Setting value write request) after storing "1: Sensor two-point correction" in Sensor correction function selection (1E4H) of i_CH (Target CH).

Error code	Description	Action
65 (Decimal)	Either of the following conditions is satisfied. • i_SetInitDataReq (Setting value write request) was turned ON before o_OffsetComp (Offset latch completion) or o_GainComp (Gain latch completion) was turned ON. • i_OffsetLatch (Offset latch request) and i_GainLatch (Gain latch request) were turned ON simultaneously.	Operate this FB with the following conditions. • Turn ON SetInitDataReq (Setting value write request) after at least either of Offset latch completion or Gain latch completion is turned ON. • When a latch request is turned ON, do not turn ON another latch request until the latch completion is turned ON.
66 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON while "1: Monitor" was not set in CH☐ Stop mode setting (118, 148, 178, or 1A8H) of i_CH (Target CH).	Turn ON i_SetInitDataReq (Setting value write request) after setting "1: Monitor" in CH☐ Stop mode setting (118, 148, 178, or 1A8H) of i_CH (Target CH).
67 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON when Sensor two-point correction offset value (corrected value) (285, 289, 28D, or 291H) was equal to or greater than Sensor two-point correction gain value (corrected value) (287, 28B, 28F, or 293H) in i_CH (Target CH).	Turn ON i_SetInitDataReq (Setting value write request) after setting Sensor two-point correction offset value (corrected value) (285, 289, 28D, or 291H) lower than Sensor two-point correction gain value (corrected value) (287, 28B, 28F, or 293H) in i_CH (Target CH) and latching the temperature process value (PV).
68 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON when Sensor two-point correction offset value (measured value) (284, 288, 28C, or 290H) was equal to or greater than Sensor two-point correction gain value (measured value) (286, 28A, 28E, or 292H) in i_CH (Target CH).	Turn ON i_SetInitDataReq (Setting value write request) after latching the temperature process value (PV) to set Sensor two-point correction offset value (measured value) (284, 288, 28C, or 290H) lower than Sensor two-point correction gain value (measured value) (286, 28A, 28E, or 292H) in i_CH (Target CH).
D000 to DAF9 (Hexadecimal)	A CC-Link IE Field Network error occurs related to the system configuration.	For details, refer to Error Code List of MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual or MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the CC-Link IE Field Network master/local module is mounted or connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the station number of the target station.
Own station channel	i_CH_No	Word	1 to 32	Specify the channels used by the own station.
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Two-point correction offset value (corrected value)	i_OffsetValue	Word	Equal to the input range. (Two-point correction offset value (corrected value)) < Two-point correction gain value (corrected value))	Stores the offset correction value.
Two-point correction gain value (corrected value)	i_GainValue	Word	Equal to the input range. (Two-point correction offset value (corrected value)) < Two-point correction gain value (corrected value))	Stores the offset correction value.
Two-point correction offset latch request	i_OffsetLatch	Bit	ON, OFF	Turn ON Sensor two-point correction offset latch request (RY(n+2)8, RY(n+2)A, RY(n+2)C, or RY(n+2)E).

Name (Comment)	Label name	Data type	Setting range	Description
Two-point correction gain latch request	i_GainLatch	Bit	ON, OFF	Turn ON Sensor two-point correction gain latch request (RY(n+2)9, RY(n+2)B, RY(n+2)D, or RY(n+2)F).
Setting value write request	i_SetInitDataReq	Bit	ON, OFF	The setting value is written.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the execution of the setting value write request is completed.
Temperature process value (PV)	o_PV	Word	0	Stores the temperature process value (PV).
Two-point correction offset latch completion	o_OffsetComp	Bit	OFF	Turns ON after the two-point correction offset value (measured value) is set.
Two-point correction gain latch completion	o_GainComp	Bit	OFF	Turns ON after the two-point correction gain value (measured value) is set.
Two-point correction offset value (measured value)	o_OffsetMeasure	Word	0	Stores the temperature process value (PV) of when the two-point correction offset latch request is turned ON.
Two-point correction gain value (measured value)	o_GainMeasure	Word	0	Stores the temperature process value (PV) of when the two-point correction gain latch request is turned ON.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/1/31	First edition

Note

This chapter includes information related to the function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

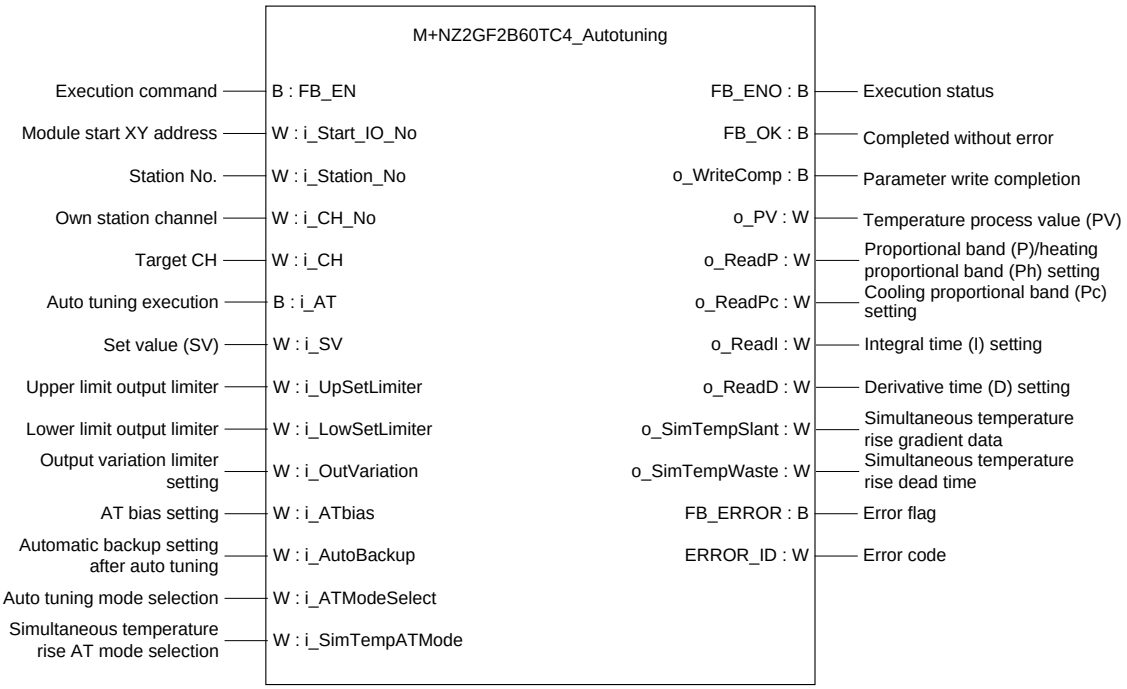
Please make sure to read user's manuals for the corresponding products before using the products.

2.5. M+NZ2GF2B60TC4_Autotuning (Auto tuning)

FB Name

M+NZ2GF2B60TC4_Autotuning

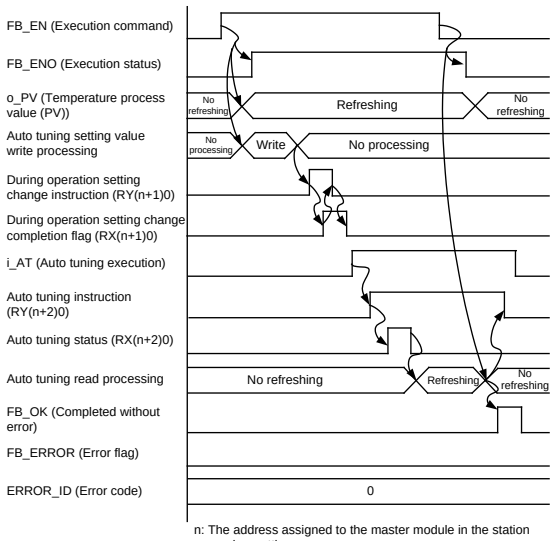
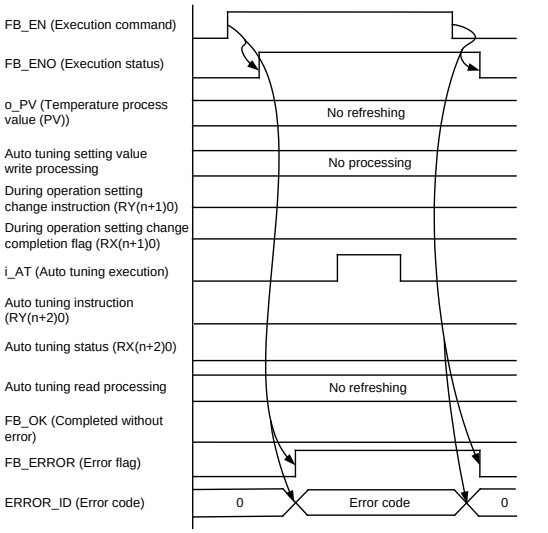
Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets and executes auto tuning.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>CC-Link IE Field Network temperature control module</td><td>NZ2GF2B-60TCTT4, NZ2GF2B-60TCRT4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module *1
*1 The first five digits of the serial number are "14102" or later.</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
</table>

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td></td><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>Japanese version</td><td>Version1.86Q or later</td></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese (Simplified) version</td><td>Version1.49B or later</td></tr>
<tr><td>Chinese (Traditional) version</td><td>Version1.49B or later</td></tr>
<tr><td>Korean version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">1556 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the parameters are set, and by turning ON i_AT (Auto tuning execution), auto tuning is executed. 2) By turning OFF FB_EN (Execution command), Auto tuning instruction (RY(n+2)0 to RY(n+2)3) of i_CH (Target CH) is turned OFF. 3) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 10 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 4) When the network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 50 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the setting value of i_Station_No (Station No.) is out of range, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 60 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When FB_EN (Execution command) is turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) is ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 61 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 7) When i_AT (Auto tuning execution) is turned ON before o_WriteComp (Parameter write completion) is turned ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 69 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 8) When the control mode (1H) is the temperature input mode, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 71 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 9) When FB_EN (Execution command) is turned ON while Auto tuning status (RX(n+2)0 to RX(n+2)3) of i_CH (target CH) is ON, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code 72 (Decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 10) When the CC-Link IE Field Network error occurs, the FB_ERROR (Error flag) output turns ON, the processing is interrupted, and the error code D000 to DAF9 (Hexadecimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.

Item	Description
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) When this FB is used, implement an interlock to prevent it from being executed with other FBs simultaneously. 4) Do not turn ON RYn9 (Initial data setting request flag) and RY(n+1)0 (During operation setting change instruction) while this FB is executed because a parameter setting request is executed in the FB. 5) This FB uses the REMFR and REMTO instructions. When using the REMFR or REMTO instruction in the ladder program, make sure that the channels used by the own station are not duplicated. 6) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 7) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 8) A duplicated coil warning may occur during compile operation due to the RY signal being operated by index modification in the FB. However this is not a problem and the FB will operate without error. 9) Every input must be provided with a value for proper FB operation. 10) This FB uses the cyclic transmission and transient transmission. Therefore, interlock programs for the both transmission are required. 11) Set the refresh device of the network parameter setting according to "1.4 Setting the CC-Link IE Field Network Master/Local Module". 12) Set the global label setting according to "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1. When Using the FB for 2 or More Master/Local Modules". 14) If processing of the FB is not completed, check the following. • The station number of CC-Link IE Field matches with the network station number. • No error occurs in a module. • The channels used by the own station are not duplicated.
FB operation type	Pulsed execution (multiple scan execution type) However, the real-time execution type is applied to o_PV (Temperature process value (PV)).
Application example	Refer to "Appendix 2. FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error] (CH1)  n: The address assigned to the master module in the station number setting. [When an error occurs] (CH1)  n: The address assigned to the master module in the station number setting.
Relevant manuals	• CC-Link IE Field Network Temperature Control Module User's Manual • MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual • MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual • QCPU User's Manual (Hardware Design, Maintenance and Inspection) • MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection) • GX Works2 Version 1 Operating Manual (Common) • GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Error codes

●Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH (Target CH) is not within the range of 1 to 4.	Please try again after confirming the setting.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No (Station No.) is incorrect.	Review the following setting. • Network configuration setting Refer to (2) of "1.4 Setting the CC-Link IE Field Network Master/Local Module". • The value entered in i_Station_No (Station No.)
60 (Decimal)	The specified station number is not valid. i_Station_No (Station No.) is not within the range of 1 to 120.	Please try again after confirming the setting.

Error code	Description	Action
61 (Decimal)	i_SetInitDataReq (Setting value write request) was turned ON while the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0) was turned ON.	Turn ON i_SetInitDataReq (Setting value write request) after turning OFF the initial data setting request flag (RYn9) or during operation setting change instruction (RY(n+1)0).
69 (Decimal)	i_AT (Auto tuning execution) was turned ON before o_WriteComp (Parameter write completion) was turned ON.	Turn ON i_AT (Auto tuning execution) after o_WriteComp (Parameter write completion) is turned ON.
71 (Decimal)	FB_EN (Execution command) was turned ON while Control switching monitor (602H) is set to "100H: Temperature input mode".	Turn ON FB_EN (Execution command) after setting Control mode shift (80H) to other than "100H: Temperature input mode".
72 (Decimal)	FB_EN (Execution command) was turned ON while auto tuning for i_CH (Target CH) was being executed.	Before executing this FB, disable the auto tuning for i_CH (Target CH).
D000 to DAF9 (Hexadecimal)	A CC-Link IE Field Network error occurs related to the system configuration.	For details, refer to Error Code List of MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual or MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the CC-Link IE Field Network master/local module is mounted or connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the station number of the target station.
Own station channel	i_CH_No	Word	1 to 32	Specify the channels used by the own station.

Name (Comment)	Label name	Data type	Setting range	Description
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Auto tuning execution	i_AT	Bit	ON, OFF	By turning ON, auto tuning is executed.
Set value (SV)	i_SV	Word	Equal to the input range.	Specify the set value for outputting to an external device.
Upper limit output limiter	i_UpSetLimiter	Word	Standard control -50 to 1,050 (-5.0 to 105.0%) Heating-cooling control 0 to 1,050 (0.0 to 105.0%)	Specify the upper limit value for outputting to an external device.
Lower limit output limiter	i_LowSetLimiter	Word	Standard control -50 to 1,050 (-5.0 to 105.0%) Heating-cooling control *1 This parameter is disabled even if it is set.	Specify the lower limit value for outputting to an external devise. *1: Set 0 for heating-cooling control.
Output variation limiter setting	i_OutVariation	Word	0: Disabled 1 to 1,000 (0.1 to 100.0%/s)	Specify a range to prevent a sudden manipulated value change.
AT bias setting	i_ATbias	Word	Equal to the input range.	Set the AT bias.
Automatic backup setting after auto tuning	i_AutoBackup	Word	0: Disable 1: Enable	Set whether to automatically back up the PID constants.
Auto tuning mode selection	i_ATModeSelect	Word	0: Standard mode 1: High response mode	Set the auto tuning mode.
Simultaneous temperature rise AT mode selection	i_SimTempATMode	Word	0: Standard auto tuning 1: Simultaneous temperature rise auto tuning	Set the auto tuning mode for the simultaneous temperature rise.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the auto tuning is completed.
Parameter write completion	o_WriteComp	Bit	OFF	By turning ON FB_EN, the set parameters are written. This label turns ON when writing is completed.
Temperature process value (PV)	o_PV	Word	0	Stores the temperature process value (PV).
Proportional band (P)/heating proportional band (Ph) setting	o_ReadP	Word	0	Stores the proportional band (P)/heating proportional band (Ph) setting.
Cooling proportional band (Pc) setting	o_ReadPc	Word	0	Stores the cooling proportional band (Pc).
Integral time (I) setting	o_ReadI	Word	0	Stores the integral time (I).
Derivative time (D) setting	o_ReadD	Word	0	Stores the derivative time (D) setting.
Simultaneous temperature rise gradient data	o_SimTempSlant	Word	0	Set the temperature rise per minute.
Simultaneous temperature rise dead time	o_SimTempWaste	Word	0	Set the time from when the output is turned ON to when the temperature starts rising.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/1/31	First edition

Note

This chapter includes information related to the function block.

It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

Please make sure to read user's manuals for the corresponding products before using the products.

Appendix 1. When Using the FB for 2 or More Master/Local Modules

To use 2 or more CC-Link IE field master/local modules and to use an FB for the second and subsequent CC-Link IE field master/local modules, it is necessary to create an FB for the second and subsequent modules from the MELSOFT Library CC-Link IE field master/local module FB using the following procedure.

The following four steps are required to create the FB for the second and subsequent modules.

(1) Enter network parameters

(2) Set global labels

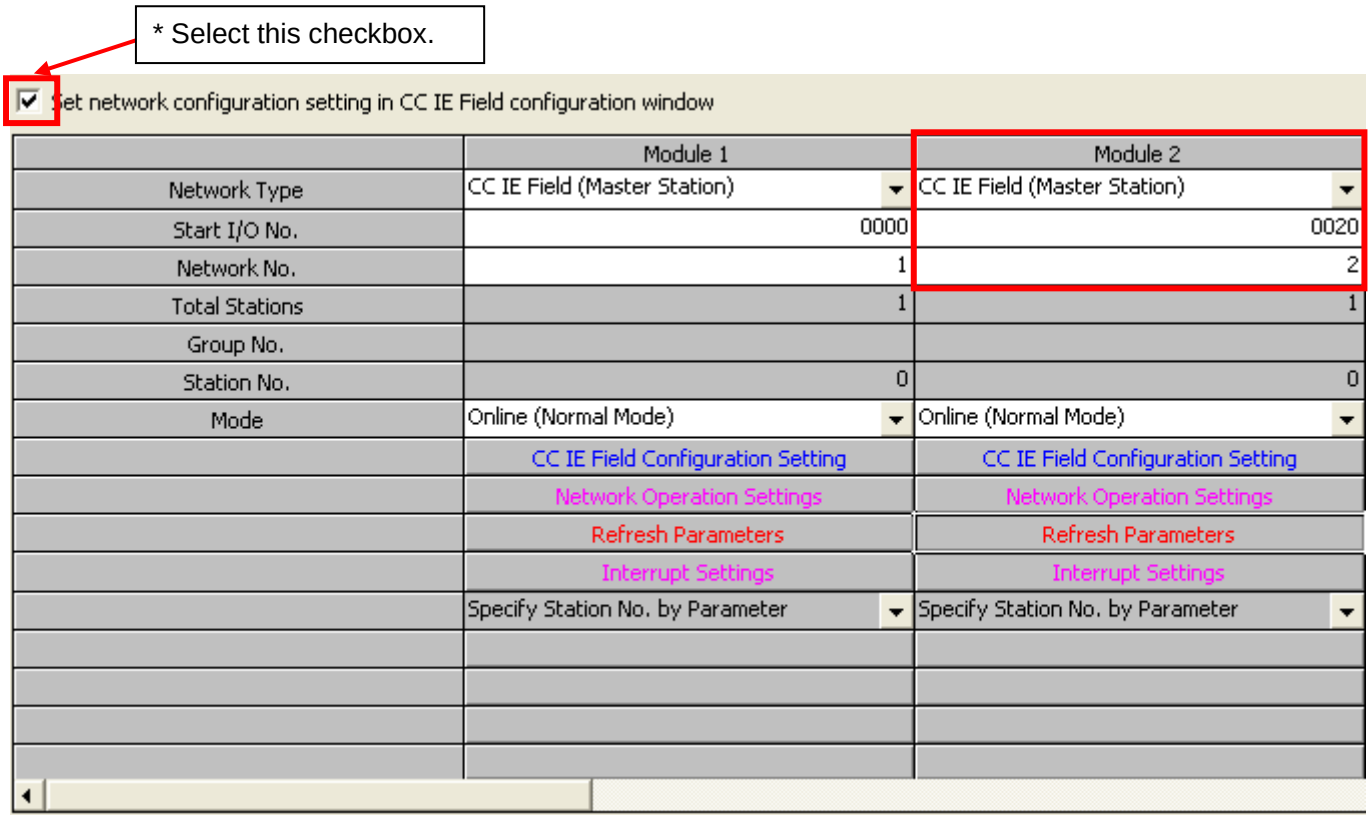
(3) Copy MELSOFT Library to create the FB for the second module

(4) Replace devices to create the FB for the second module

Appendix 1.1. Entering Network Parameters

(1) Enter the network parameters for the second module.

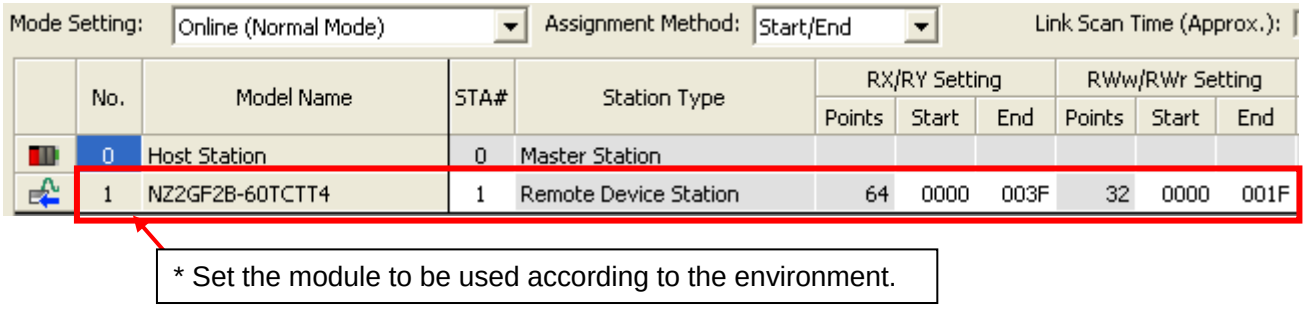
Item	Description
Network Type	Select "CC IE Field (Master Station)".
Start I/O No.	Set the start I/O number of the master/local module in increments of 16 points. Set "0020".
Network No.	Set the network number of the master/local module. Set "2".



(2) Set the CC IE Field configuration setting for the second module.

Item	Description
Station No.	Set the station number of the remote device stations connected to the master station. Set "1".
Station Type	Set the station type of the remote device stations connected to the master station. Set "Remote Device Station".
RX/RY Setting	Set assignment for RX/RY for the remote device station connected to the master station. (a) Start Set "0000". (b) Last Set "003F".
RWr/RWw Setting	Set assignment for RWr/RWw for the remote device station connected to the master station. (a) Start Set "0000". (b) Last Set "001F".

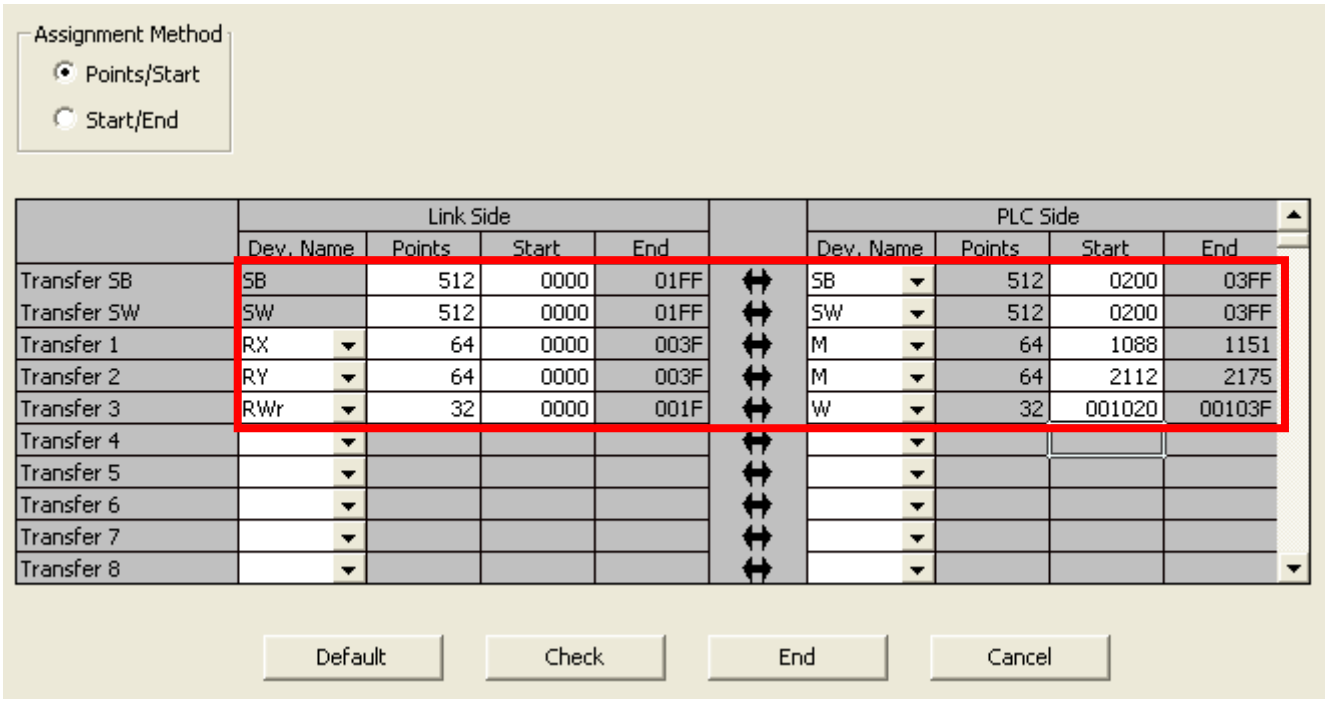
[For NZ2GF2B-60TCTT4]



(3) Enter the network parameters for the second module.

Item	Description	Setting value
Transfer SB	Select the link refresh range of SB device.	• "Link Side Points": 512 • "Link Side Start": 0000 • "PLC Side Dev. Name": SB • "PLC Side Start": 0200
Transfer SW	Select the link refresh range of SW device.	• "Link Side Points": 512 • "Link Side Start": 0000 • "PLC Side Dev. Name": SW • "PLC Side Start": 0200
Transfer 1	Select the link refresh range of RX device.	• "Link Side Dev. Name": RX • "Link Side Points": 64 • "Link Side Start": 0000 • "PLC Side Dev. Name": M • "PLC Side Start": 1088
Transfer 2	Select the link refresh range of RY device.	• "Link Side Dev. Name": RY • "Link Side Points": 64 • "Link Side Start": 0000 • "PLC Side Dev. Name": M • "PLC Side Start": 2112
Transfer 3	Select the link refresh range of RWr device.	• "Link Side Dev. Name": RWr • "Link Side Points": 32 • "Link Side Start": 0000 • "PLC Side Dev. Name": W • "PLC Side Start": 1020

* Change the Points of Link Side and Dev. Name and Start of PLC Side according to the system.


Assignment Method
Points/Start
Start/End
Link Side
PLC Side
Dev. Name
Points
Start
End
Transfer SB
SB
512
0000
01FF
SB
512
0200
03FF
Transfer SW
SW
512
0000
01FF
SW
512
0200
03FF
Transfer 1
RX
64
0000
003F
M
64
1088
1151
Transfer 2
RY
64
0000
003F
M
64
2112
2175
Transfer 3
RWr
32
0000
001F
W
32
001020
00103F
Transfer 4
Transfer 5
Transfer 6
Transfer 7
Transfer 8
Default
Check
End
Cancel

Appendix 1.2. Setting Global Labels

Enter the global labels for the second module.

Specify label names for the second module. The names must be different from the label names for the first module.

The following explains how to set the global label for the second module.

(1) M_F_RX2 Set remote input (RX).

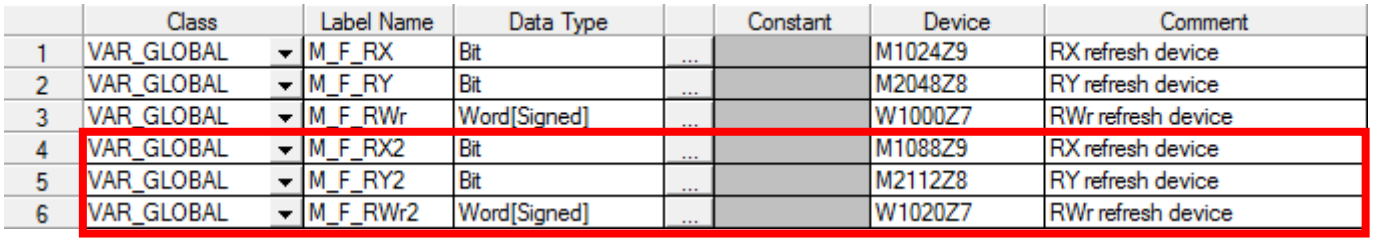
Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RX2".
Data Type	Select "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z9" prefix.

(2) M_F_RY2 Set remote output (RY).

Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RY2".
Data Type	Select "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z8" prefix.

(3) M_F_RWr2 Set remote output (RWr).

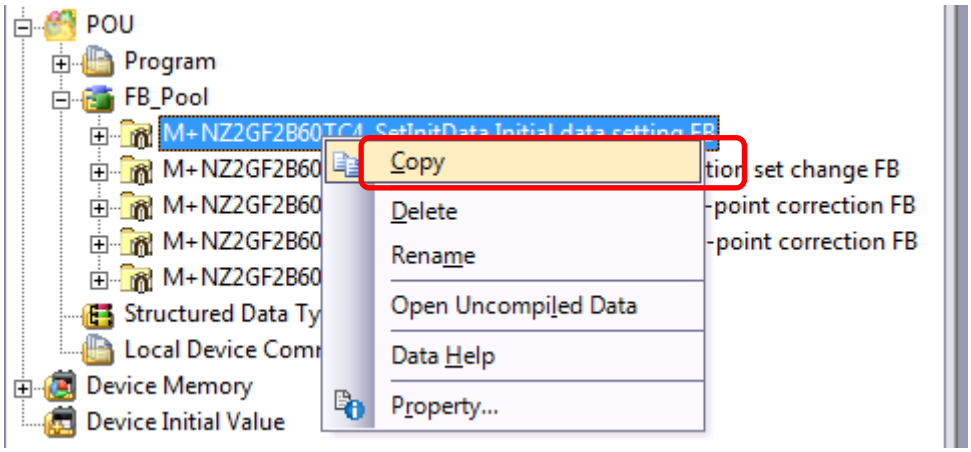
Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RWr2".
Data Type	Select "Word[Signed]".
Device	Enter the refresh device set for the refresh parameter with a "Z7" prefix.



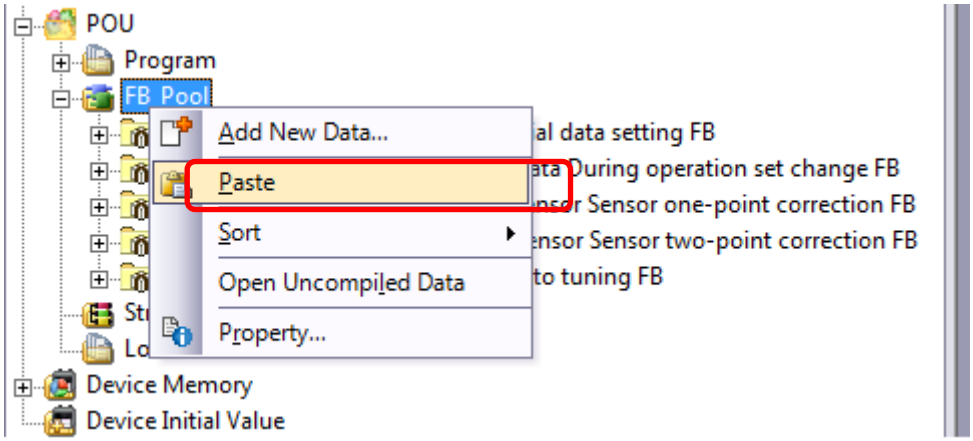
	Class	Label Name	Data Type		Constant	Device	Comment
1	VAR_GLOBAL	M_F_RX	Bit	...		M1024Z9	RX refresh device
2	VAR_GLOBAL	M_F_RY	Bit	...		M2048Z8	RY refresh device
3	VAR_GLOBAL	M_F_RWr	Word[Signed]	...		W1000Z7	RWr refresh device
4	VAR_GLOBAL	M_F_RX2	Bit	...		M1088Z9	RX refresh device
5	VAR_GLOBAL	M_F_RY2	Bit	...		M2112Z8	RY refresh device
6	VAR_GLOBAL	M_F_RWr2	Word[Signed]	...		W1020Z7	RWr refresh device

Appendix 1.3. Copying MELSOFT Library to Create an FB for the Second module

(1) Select an FB necessary for the second module from the Project tab of the Navigation window. Execute the Copy command.



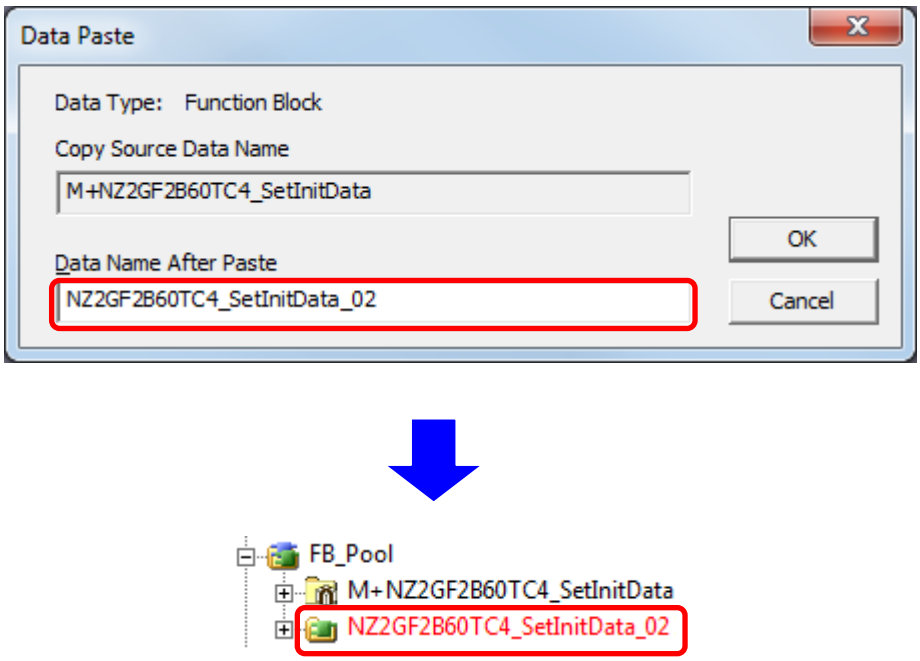
(2) Paste the copied FB to "FB_Pool" on the Project tab of the Navigation window.



(3) After selecting the paste command, a window appears to enter an FB name. Enter an FB name after paste.

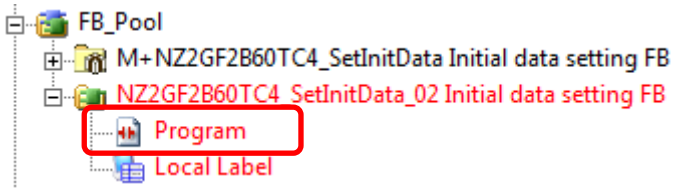
(Example: NZ2GF2B60TC4_SetInitData_02)

[Note] The character string "+" of M+... cannot be entered.

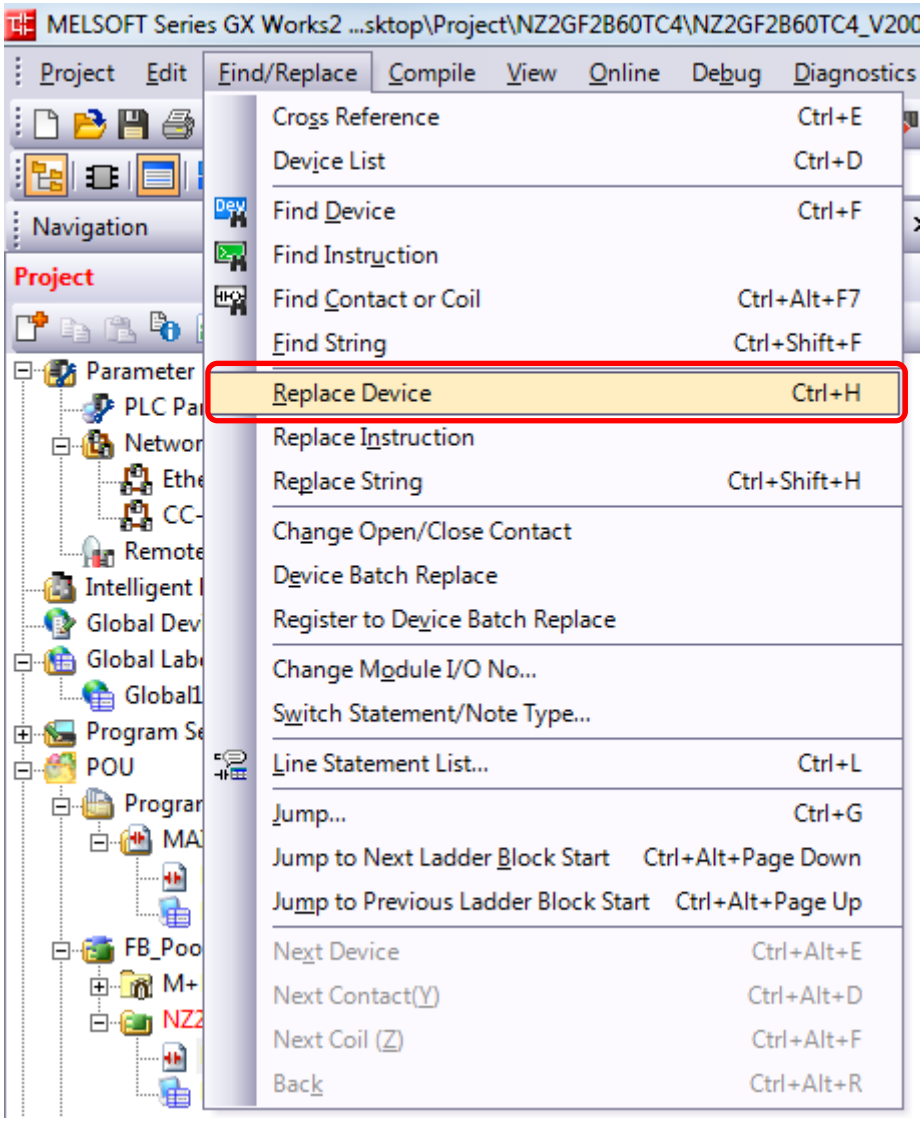


Appendix 1.4. Replacing Devices to Create the FB for the Second Module

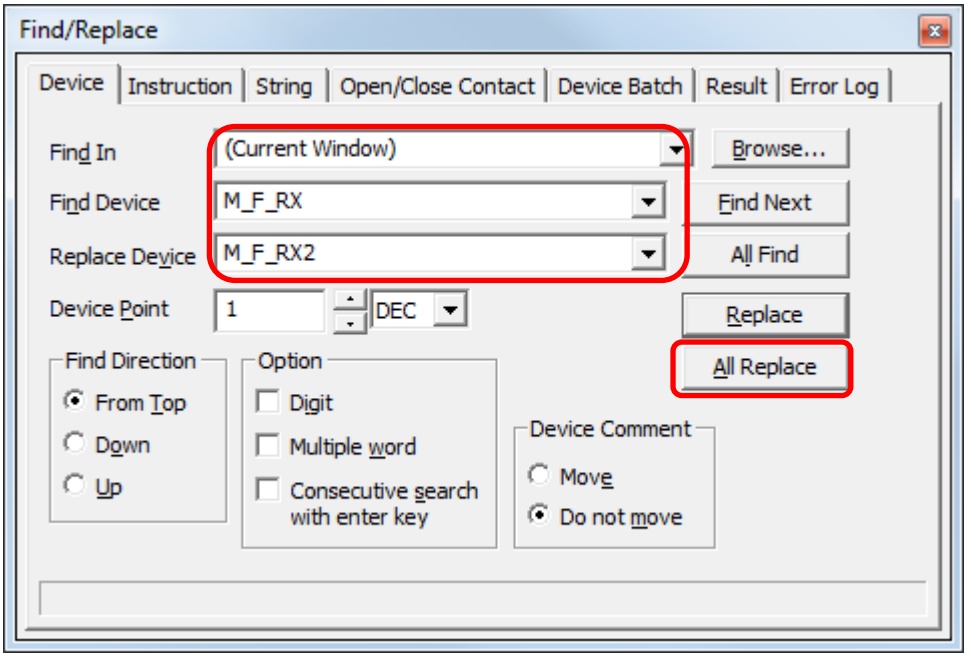
(1) Open "Program" of the added FB.



(2) Select "Find/Replace" menu and then select "Replace Device". "Find/Replace" window appears.



(3) Select "Current Window" from Find In, "M_F_RX" from Find Device, and "M_F_RX2" from Replace Device. Then replace all devices. In the same way, replace "M_F_RY" and "M_F_RWr".



By performing the steps above, the CC-Link IE field master/local FB can be used for the second module.

[Point]

(1) To use multiple FBs for the second CC-Link IE field master/local module, repeat the steps in Appendix 1. When Using the FB for 2 or More Master/Local Modules.

(2) To use an FB for third or subsequent CC-Link IE field master/local modules, make sure that the preset "Global label name", "Data Name After Paste" that was set when pasting FB data and "Replace Device" that was set when replacing devices are not duplicated for the first and second modules.

[Note]

If MELSOFT Library is upgraded, MELSOFT Library FBs can be upgraded by importing them again. However, the FBs that were created by following these procedures for the second and subsequent modules are not upgraded even if the FBs are imported again.

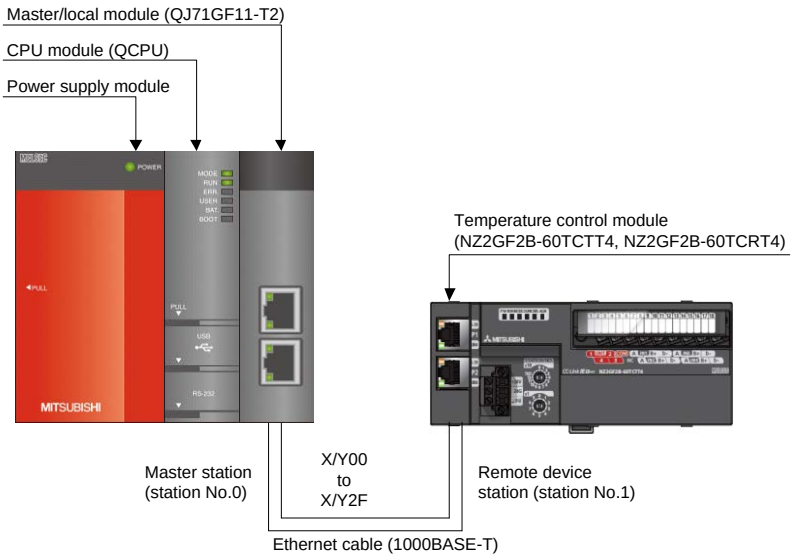
Therefore, to upgrade FBs that were created by following these procedures, after upgrading MELSOFT Library, follow these procedures again.

Appendix 2. FB Library Application Examples

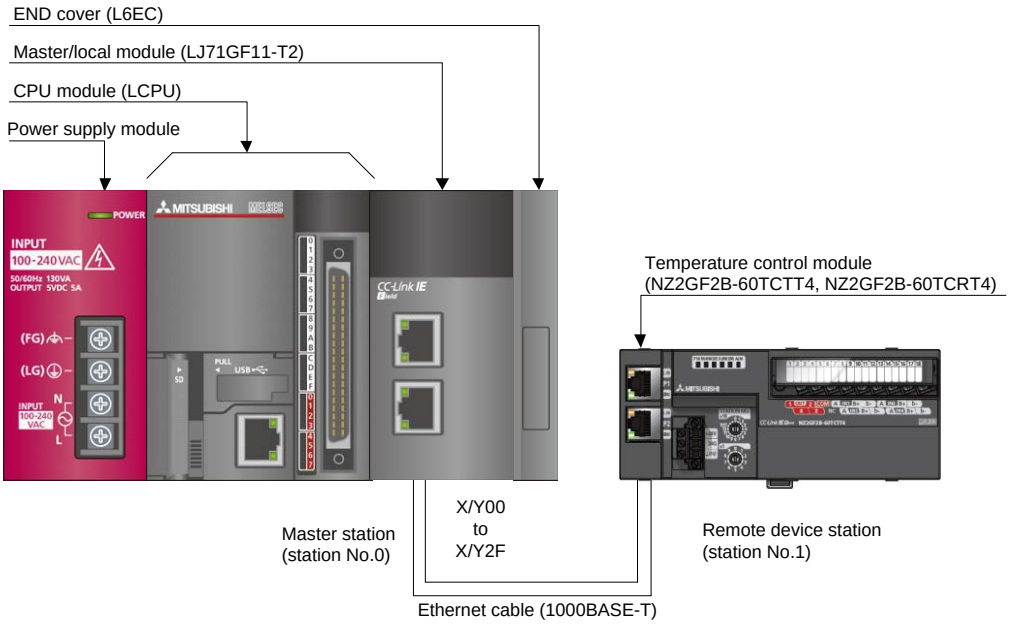
CC-Link IE Field Network device station converter module FB application examples are as follows.

1) System configuration

(1) Q-series system configuration



(2) L-series system configuration

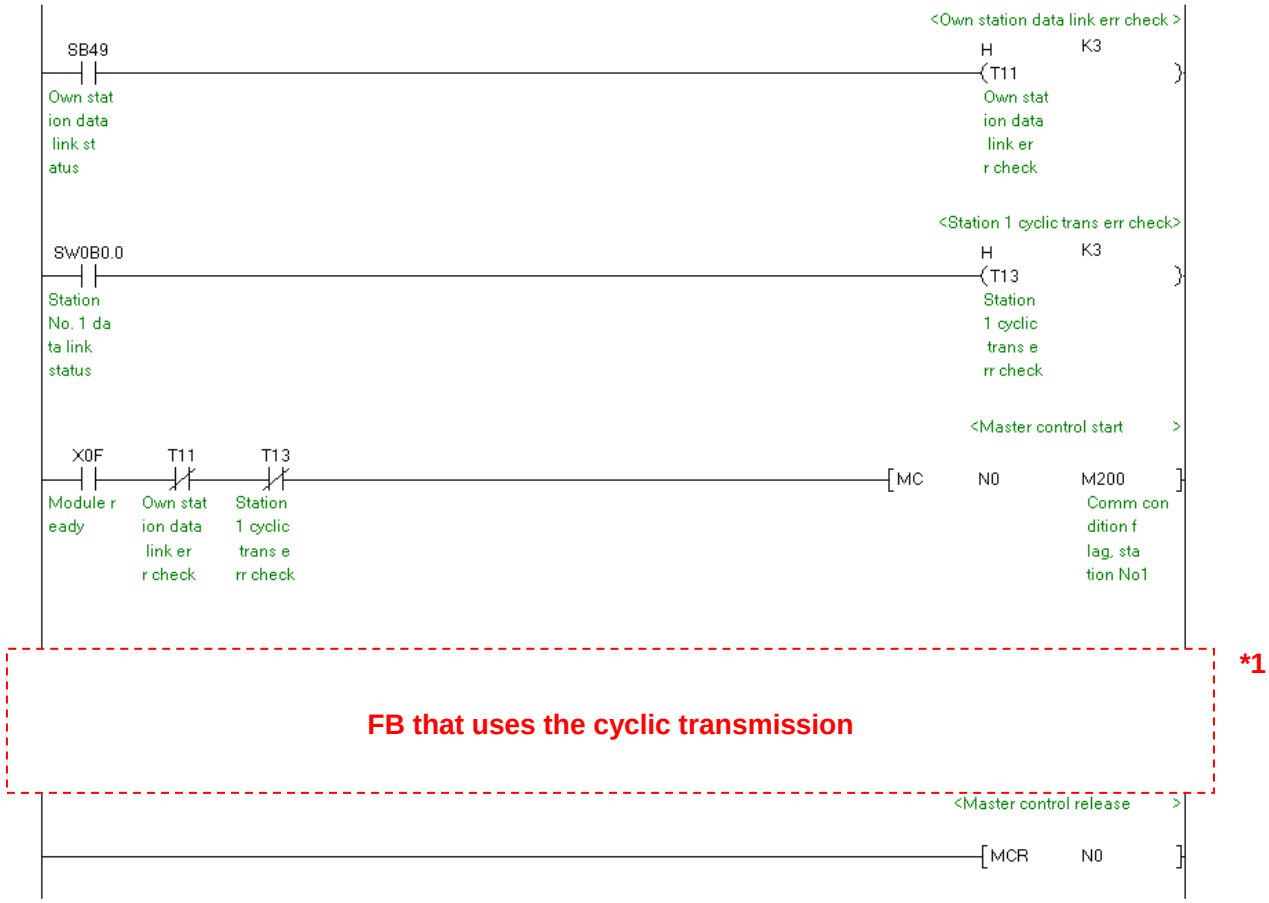


Reminder

- Every input must be provided with a value for proper FB operation.
  If not set, the values will be unspecified.
- Abbreviations may be used in the label comments due to the limitation on the number of the characters to display in GX Works2.

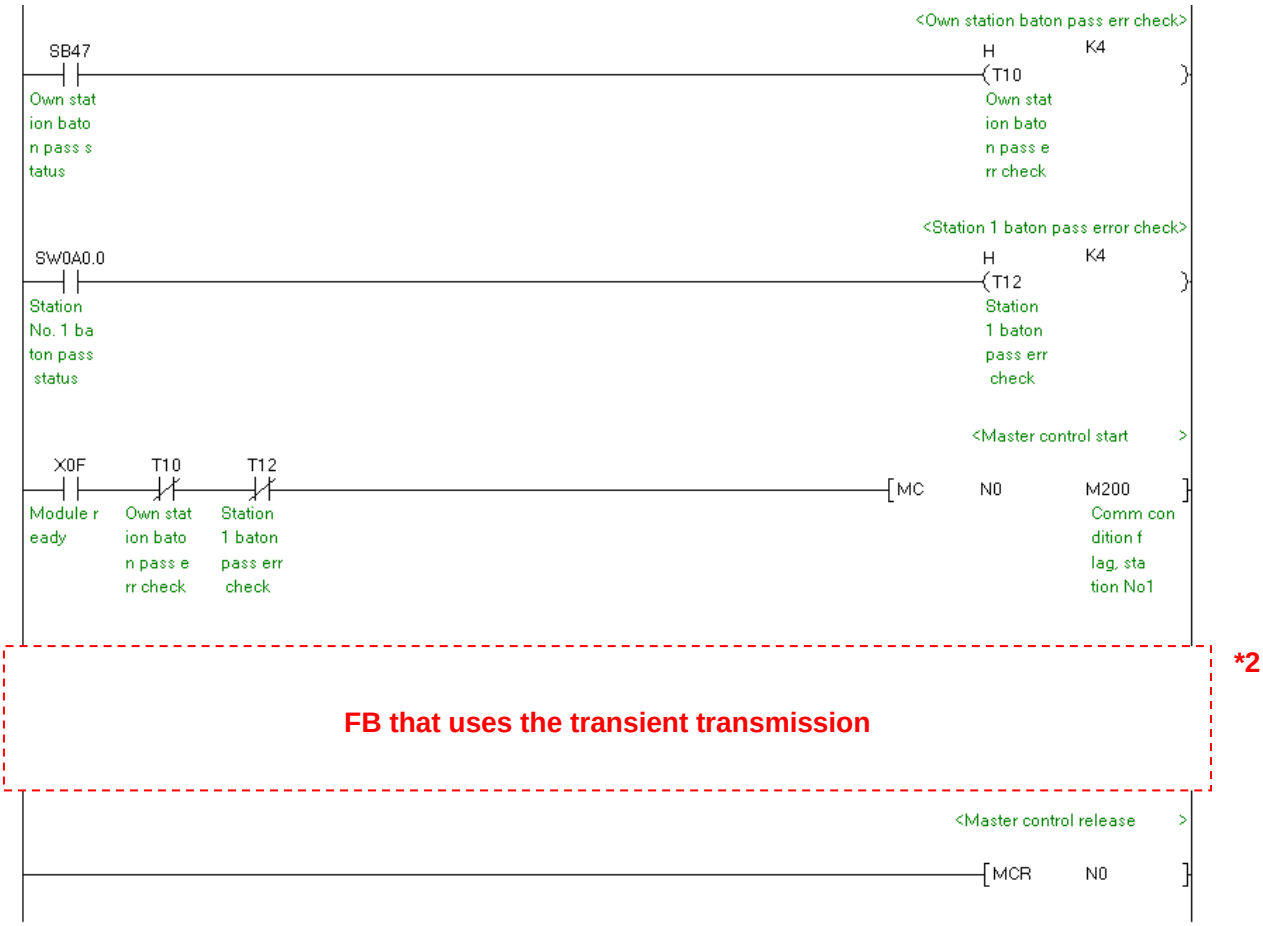
Interlock program

The following is an example of an interlock program for the cyclic transmission.



*1 For the FBs that use the cyclic transmission, refer to "1.6.3 List of Transmissions Used by the FBs".

The following is an example of an interlock program for the transient transmission.



*2 For the FBs that use the transient transmission, refer to "1.6.3 List of Transmissions Used by the FBs".

2) List of devices

a) External input (commands)

Device	FB name	Application (ON details)
M0	M+NZ2GF2B60TC4_SetInitData	Initial data setting FB start
M10	M+NZ2GF2B60TC4_SetOperationData	During OP set change FB start
M20	M+NZ2GF2B60TC4_CorrectOnePSensor	Sensor 1-point correct FB start
D20		Correction value setting(offset)
M21		Setting value write request
M30	M+NZ2GF2B60TC4_CorrectTwoPSensor	Sensor 2-point correct FB start
D30		2point correct offset(corrected)
D31		2point correct gain(corrected)
M31		2point correct offset latch req.
M32		2point correct gain latch req.
M33		Setting value write request
M40	M+NZ2GF2B60TC4_Autotuning	Auto tuning FB start
M41		Auto tuning execution

b) External output (checks)

Device	FB name	Application (ON details)
M1	M+NZ2GF2B60TC4_SetInitData	Initial data setting FB ready
M2		Initial data setting FB comp.
F0		Initial data setting FB error
D0		Initial data setting FB err code
M11	M+NZ2GF2B60TC4_SetOperationData	During OP set change FB ready
M12		During OP set change FB complete
F10		During OP set change FB error
D10		During OP set change FB err code
M22	M+NZ2GF2B60TC4_CorrectOnePSensor	Sensor 1-point correct FB ready
M23		Sensor 1-point correct FB comp.
D21		Temperature process value (PV)
F20		Sensor 1-point correct FB error
D22		Sensor 1point correct FB err cod

Device	FB name	Application (ON details)
M34	M+NZ2GF2B60TC4_CorrectTwoPSensor	Sensor 2-point correct FB ready
M35		Sensor 2-point correct FB comp.
D32		Temperature process value (PV)
M36		2point correct offset latch comp
M37		2point correct gain latch comp.
D33		2point correct offset(measured)
D34		2point correct gain(measured)
F30		Sensor 2-point correct FB error
D35		Sensor 2point correct FB err cod
M42	M+NZ2GF2B60TC4_Autotuning	Auto tuning FB ready
M43		Auto tuning FB completed
M44		Parameter write completion
D40		Temperature process value (PV)
D41		Prop band/heat prop band setting
D42		Cooling proportional band set.
D43		Integral time (I) setting
D44		Derivative time (D) setting
D45		Simul. temp. rise gradient data
D46		Simultaneous temp rise dead time
F40		Auto tuning FB error
D47		Auto tuning FB error code

3) Global label setting

a) Common setting

Class	Label name	Data type	Device
VAR_GLOBAL	M_F_RX	Bit	M1024Z9
VAR_GLOBAL	M_F_RY	Bit	M2048Z8
VAR_GLOBAL	M_F_RWr	Word [signed]	W1000Z7

4) Programs

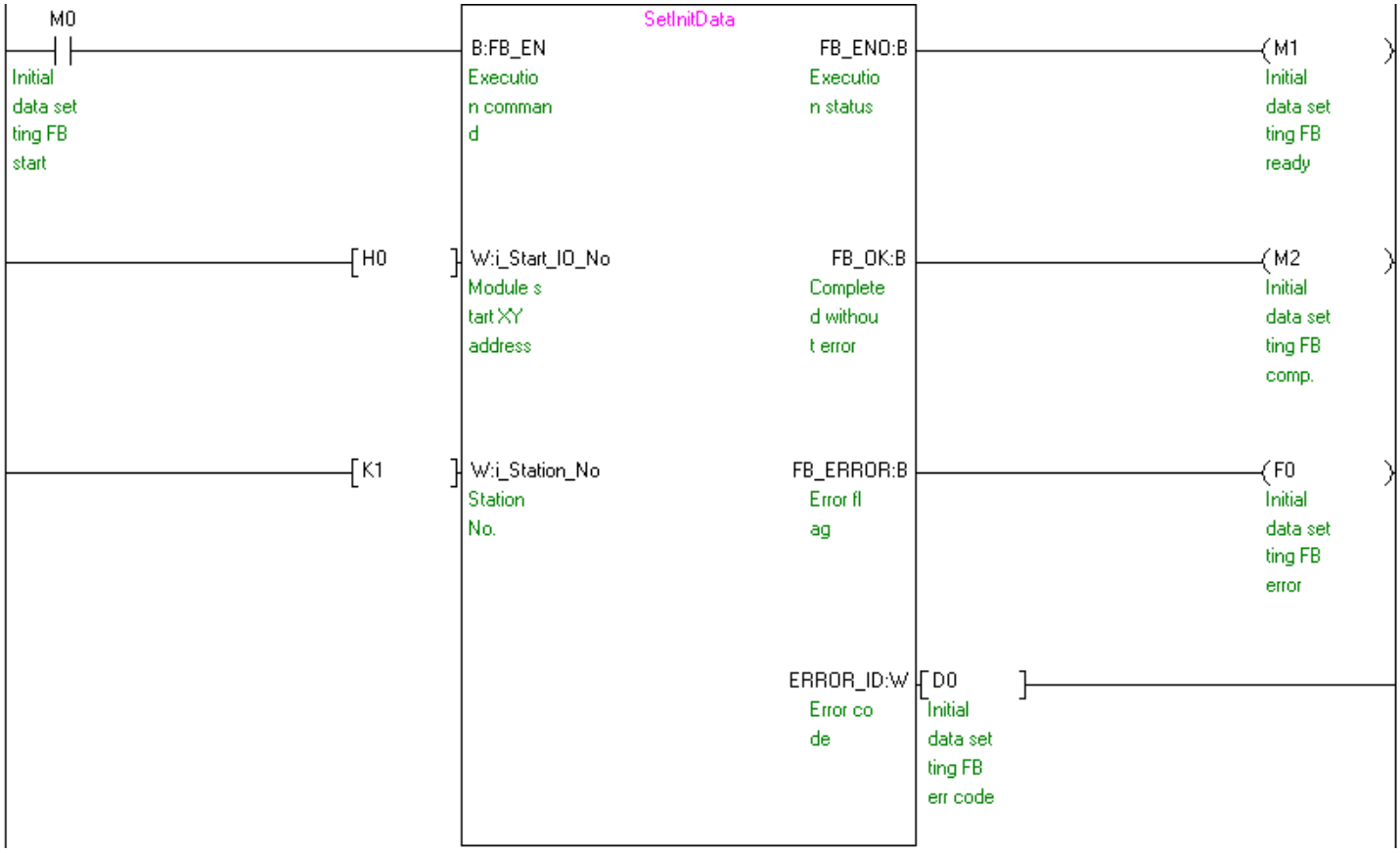
M+NZ2GF2B60TC4_SetInitData (Initial data setting)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the CC-Link IE Field Network master/local module is mounted or connected to 0H.
i_Station_No	K1	Set the target station number to 1.

Check CH□ Operation monitor (RX(n+1)1 to RX(n+1)4) for all the channels are set to "OFF: Stopped".

By turning ON M0, the initial data setting request flag (RYn9) is processed.

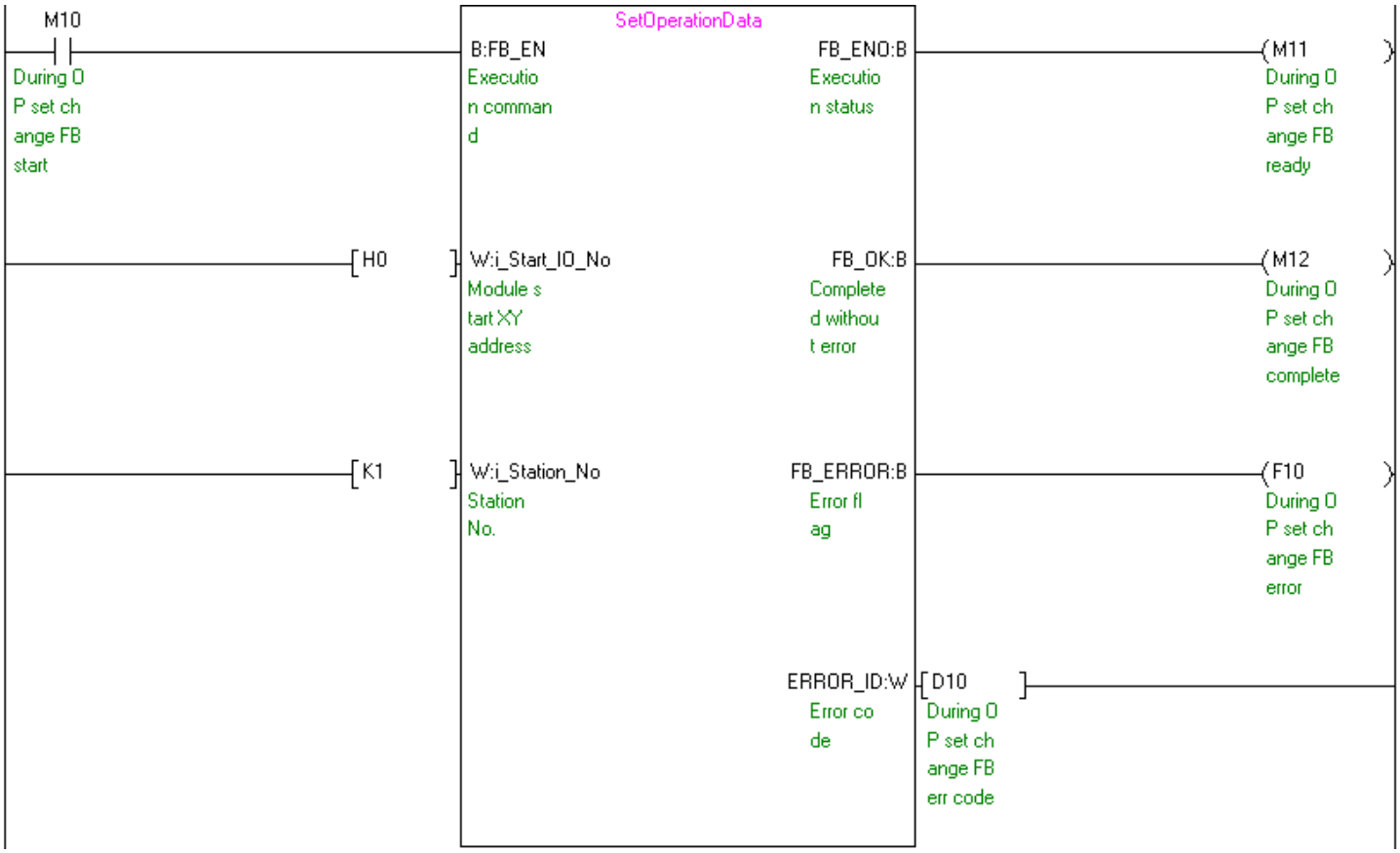


M+NZ2GF2B60TC4_SetOperationData (During operation setting change)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the CC-Link IE Field Network master/local module is mounted or connected to 0H.
i_Station_No	K1	Set the target station number to 1.

By turning ON M10, the during operation setting change instruction (RY(n+1)0) is processed.



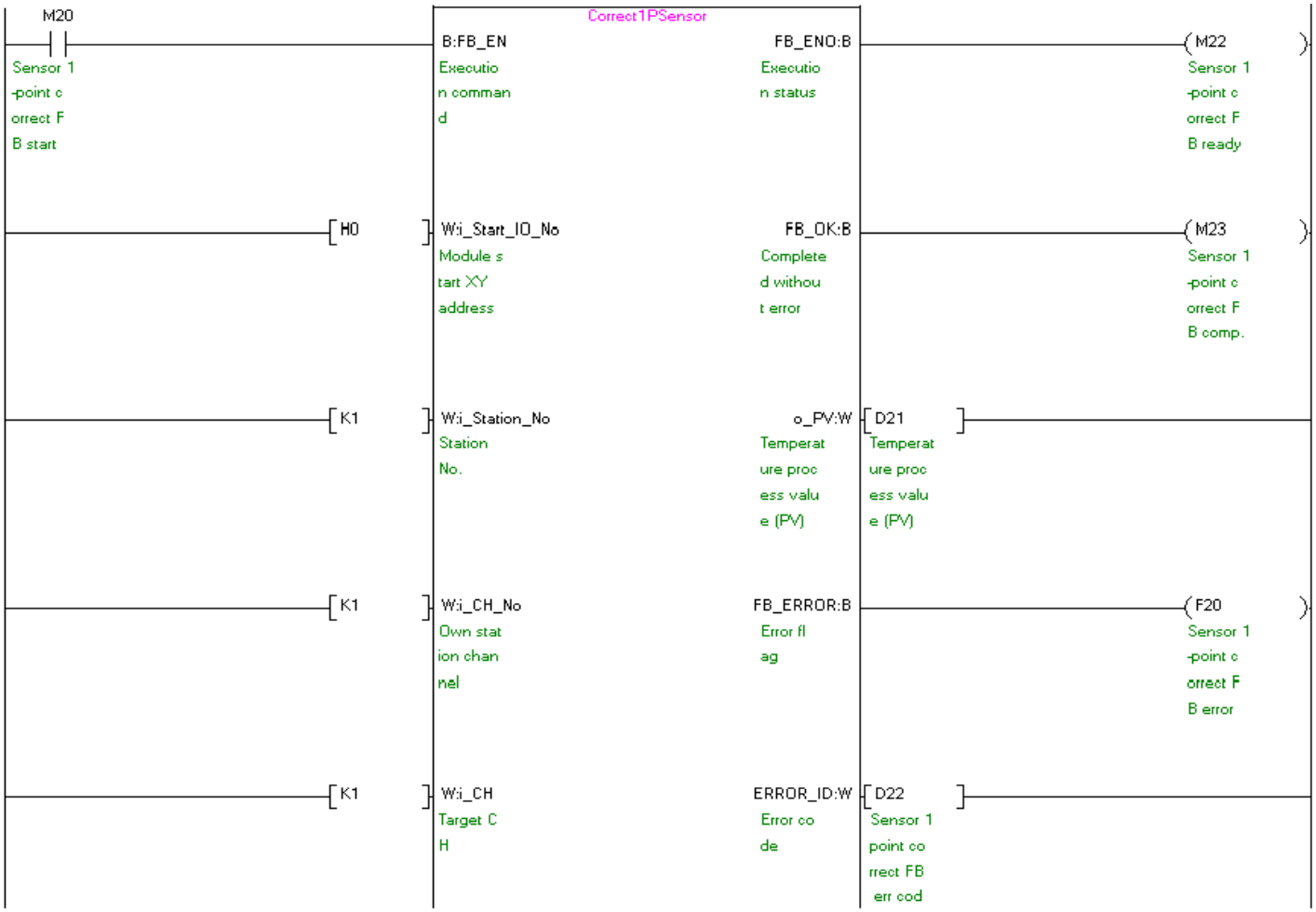
M+NZ2GF2B60TC4_CorrectOnePSensor (Sensor one-point correction)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the CC-Link IE Field Network master/local module is mounted or connected to 0H.
i_Station_No	K1	Set the target station number to 1.
i_CH_No	K1	Specify the channel used by the own station to 1.
i_CH	K1	Set the target channel to channel 1.
i_OffsetValue	D20	Stores the offset value of the sensor one-point correction.
i_SetInitDataReq	ON, OFF	By turning ON this parameter, the during operation setting change instruction (RY(n+1)0) is processed.

By turning ON M20, the correction value of the sensor one-point correction is stored in the remote buffer memory.

By turning ON M21, the during operation setting change instruction (RY(n+1)0) is processed.



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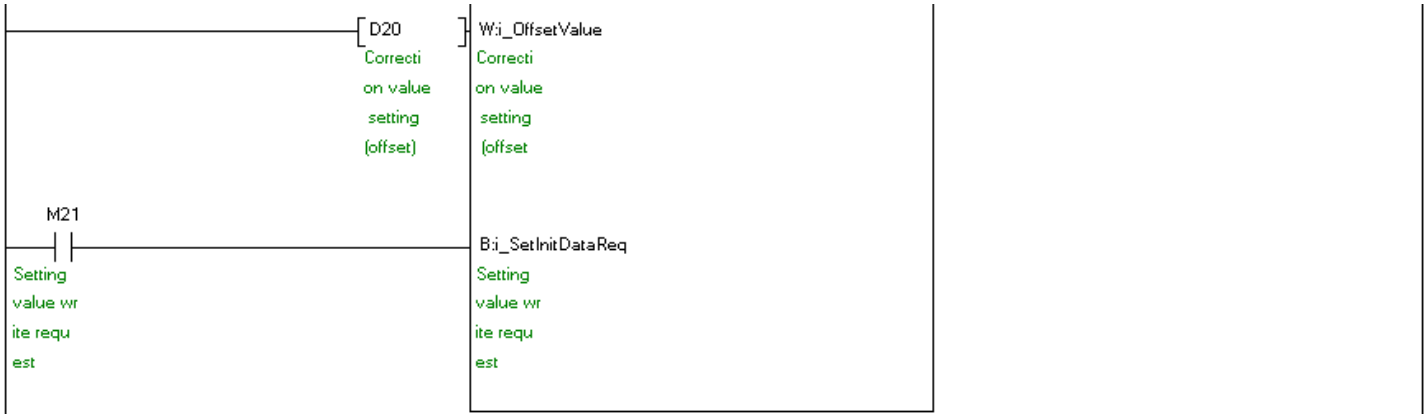
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M+NZ2GF2B60TC4_CorrectTwoPSensor (Sensor two-point correction)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the CC-Link IE Field Network master/local module is mounted or connected to 0H.
i_Station_No	K1	Set the target station number to 1.
i_CH_No	K1	Specify the channel used by the own station to 1.
i_CH	K1	Set the target channel to channel 1.
i_OffsetValue	D30	Stores the offset value of the sensor two-point correction.
i_GainValue	D31	Stores the gain value of the sensor two-point correction.
i_OffsetLatch	ON, OFF	By turning ON this parameter, the offset value of the sensor two-point correction is set.
i_GainLatch	ON, OFF	By turning ON this parameter, the gain value of the sensor two-point correction is set.
i_SetInitDataReq	ON, OFF	Processes the initial data setting request flag (RYn9).

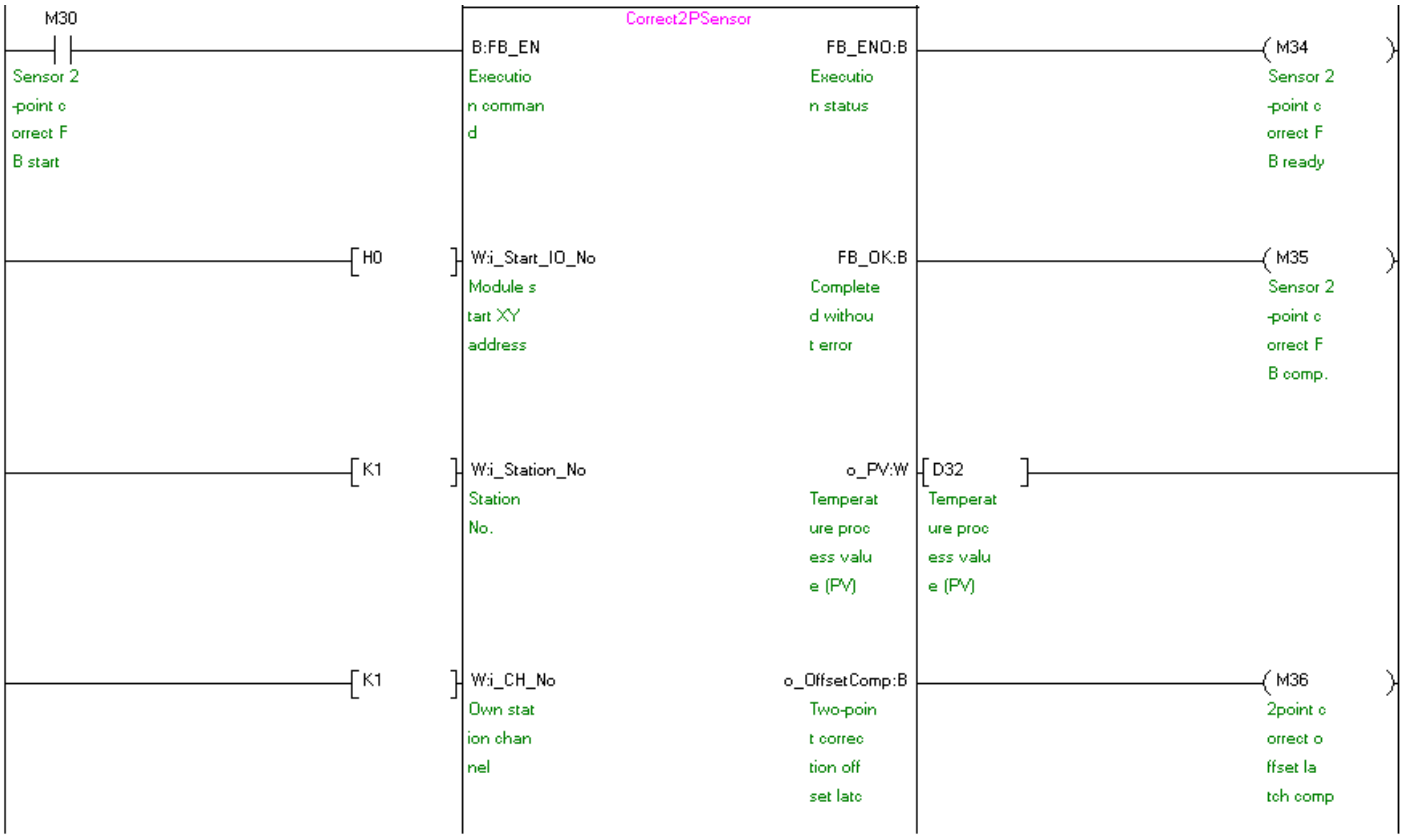
Check CH□ Operation monitor (RX(n+1)1 to RX(n+1)4) for all the channels are set to "OFF: Stopped".

By turning ON M30 the temperature process value (PV) is refreshed.

By turning ON M31, the temperature process value (PV) of i_CH (Target CH) is latched and the temperature process value is stored in o_OffsetMeasure (Two-point correction offset value (measured value)).

By turning ON M32, the temperature process value (PV) of i_CH (Target CH) is latched and the temperature process value is stored in o_GainMeasure (Two-point correction gain value (measured value)).

By turning ON M33, the initial data setting request flag (RYn9) is processed.



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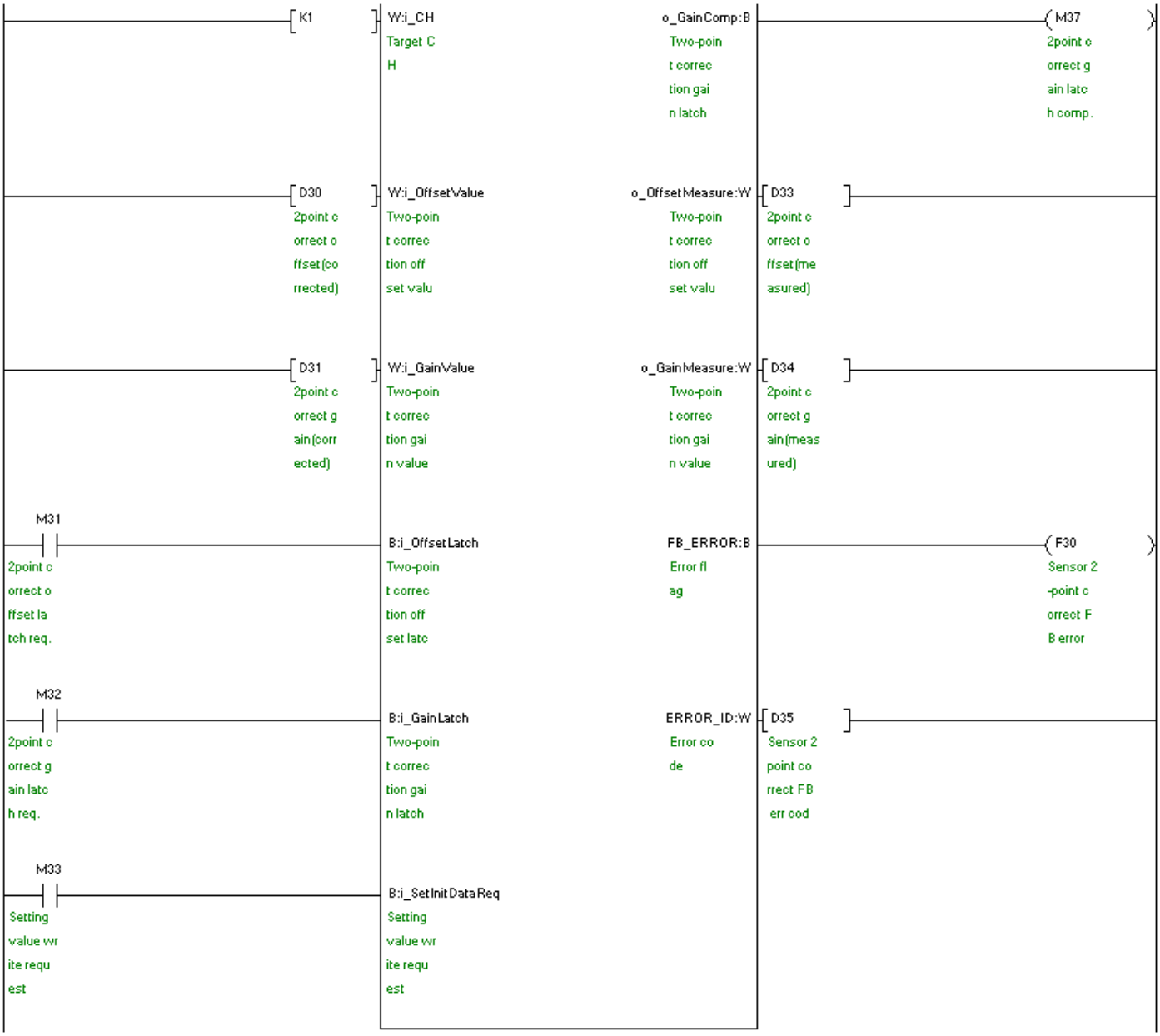
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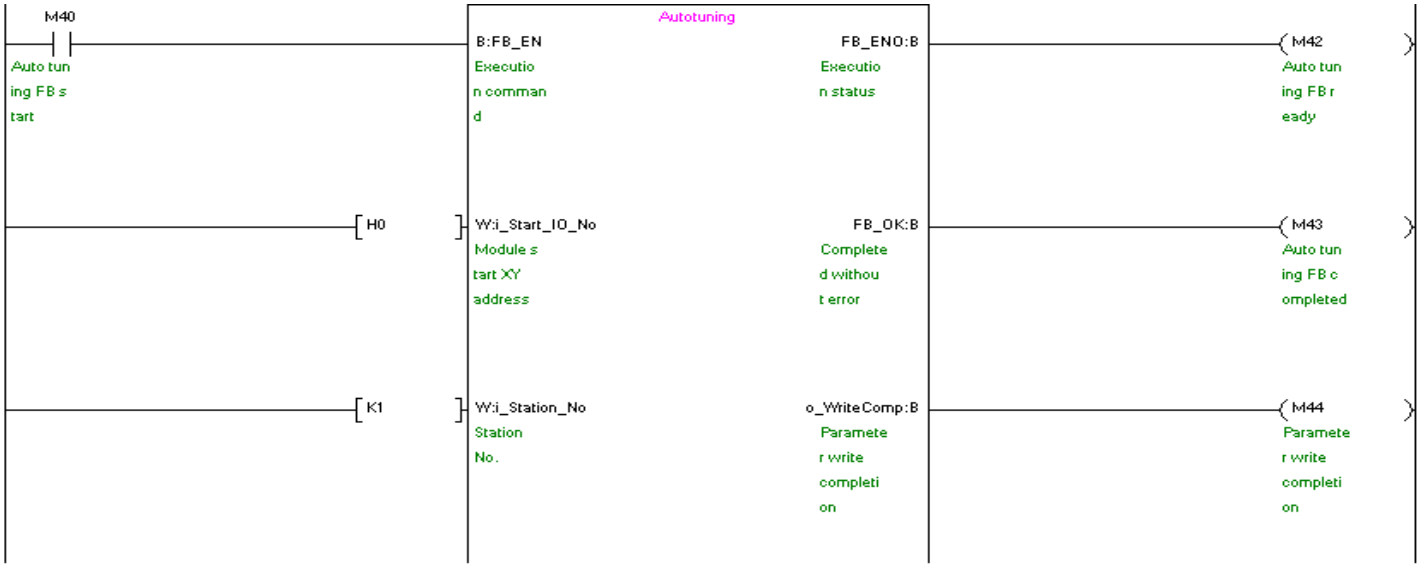
M+NZ2GF2B60TC4_Autotuning (Auto tuning)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the CC-Link IE Field Network master/local module is mounted or connected to 0H.
i_Station_No	K1	Set the target station number to 1.
i_CH_No	K1	Specify the channel used by the own station to 1.
i_CH	K1	Set the target channel to channel 1.
i_AT	ON, OFF	By turning ON, auto tuning is executed.
i_SV	K70	Set 70°C. (Within the input range.)
i_UpSetLimiter	K1050	Set the upper limit value for outputting to an external device to 105.0%.
i_LowSetLimiter	K0	Set the lower limit value for outputting to an external device to 0.0%.
i_OutVariation	K1000	Set the output variation limiter to 100%/s.
i_ATbias	K5	Set the AT bias setting to 5.
i_AutoBackup	K1	Set the automatic backup setting after auto tuning to "Enable".
i_ATModeSelect	K1	Set the auto tuning mode to "High response mode".
i_SimTempATMode	K1	Set the simultaneous temperature rise AT.

By turning ON M40, each parameter for i_CH (Target CH) is set and the during operation setting change instruction (RY(n+1)0) is processed.

By turning ON M41 after o_WriteComp (Parameter write completion) is turned ON, the auto tuning is executed. (When CH□ Operation monitor (RX(n+1)1 to RX(n+1)4) of i_CH (Target CH) is "OFF: Stopped", the setting is changed to "ON: Operating" by the module.)



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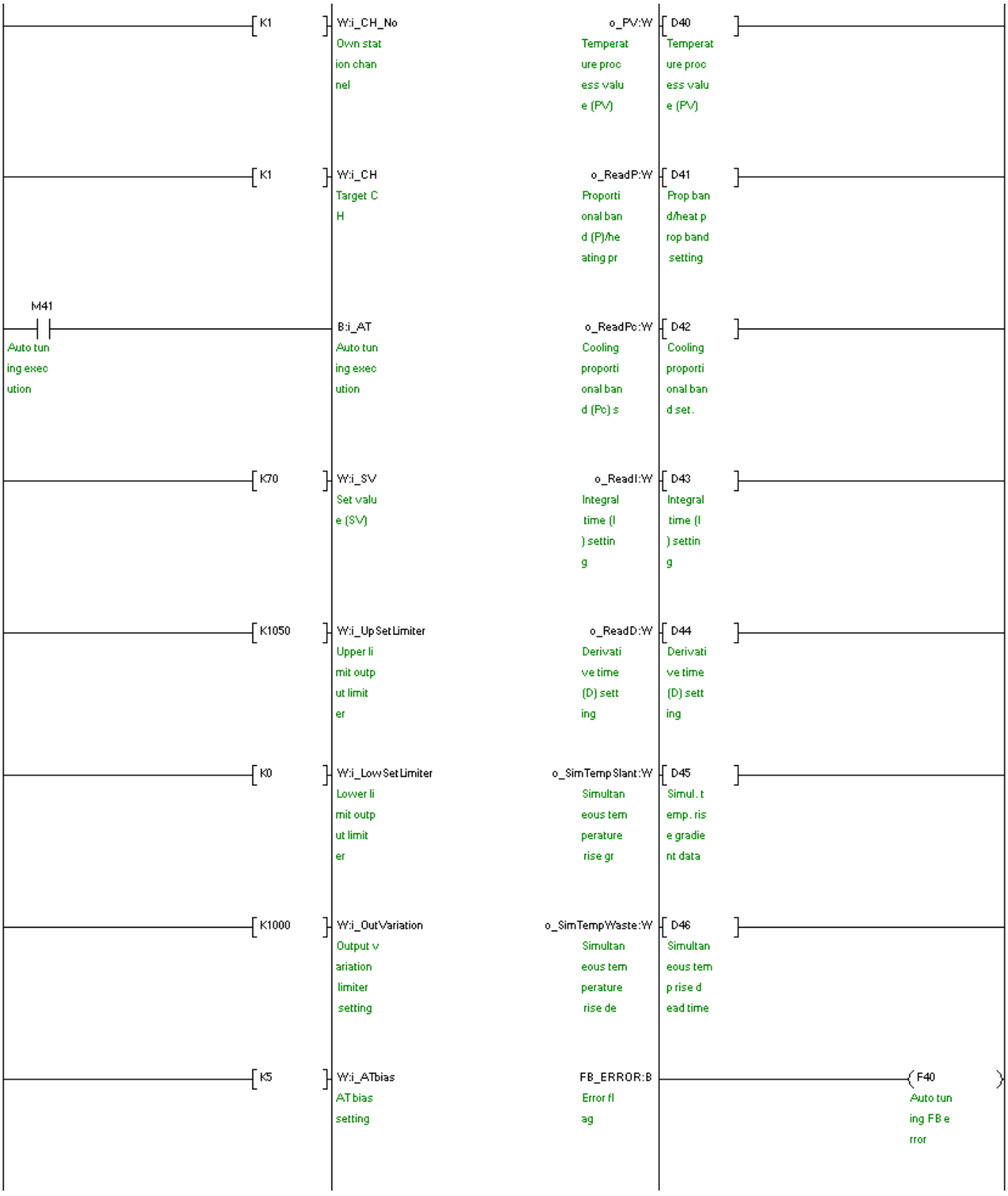

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K1
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