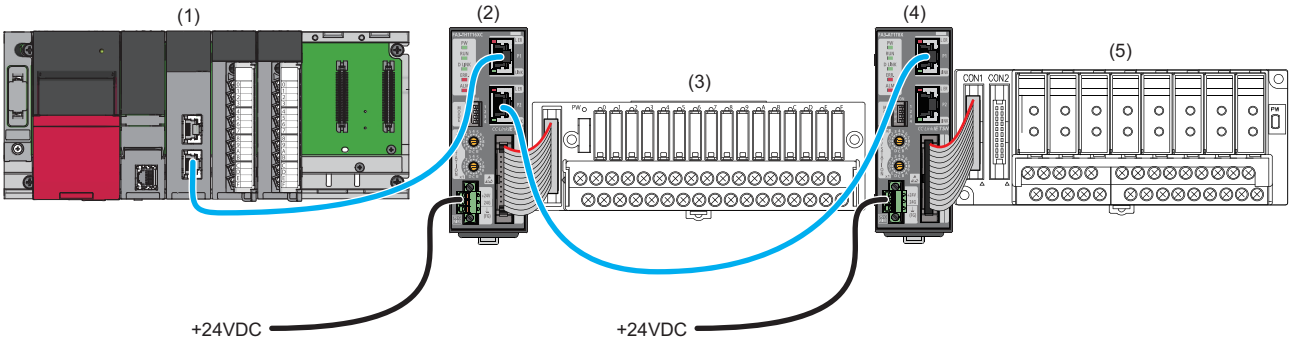
6 COMMUNICATIONS USING CC-LINK IE TSN

CC-Link IE TSN communications can be used by setting the network setting switches of the network interface module to CC-Link IE TSN. (☞ Page 77 Network mode setting)

6.1 CC-Link IE TSN System



(1) Master station (master module for CC-Link IE TSN)
(2), (4) Remote station (network interface module)
(3), (5) Converter (☞ Page 16 Connectable Devices)

For details on the system configuration of CC-Link IE TSN, refer to the user's manual for the master module to be used.

6.2 Parameter Setting

The following methods are available for setting parameters of the network interface module.

- ☞ Page 142 Slave station parameter automatic setting
- ☞ Page 148 Slave station parameter processing

Point

Before setting the parameters of the slave station using an engineering tool, refer to the manuals for the master station and the engineering tool.

Restrictions when parameters are set

There are some restrictions when parameters for the network interface module are set in the master station.

Basic settings

Set the items shown below according to the setting details.

Item		Setting details
Network configuration setting	Network synchronous communication setting	Asynchronous
	Communication period setting	Basic cycle
Network topology setting		Line topology, star topology, or mixture of star topology and line topology
Communication cycle setting	Communication cycle interval setting (Not set in units of 1μs)	Either 250μs, 500μs, 1000μs, 2000μs, 4000μs, or 8000μs
	Communication cycle interval setting (Set in units of 1μs)	250.00μs or more and 8000.00μs or less

Application settings

Set the items shown below according to the setting details.

Item	Setting details
Communication mode	Unicast or multicast

Slave station parameter automatic setting

The parameters are automatically set in the network interface module from the master station when the network interface module joins the network.
Write the parameters of the network interface module, which are used for the slave station parameter automatic setting, to the CPU module and save them in the CPU built-in memory or SD memory card.
The network interface module starts data link with the master station after slave station parameters are automatically set.
Even if parameters enabled by turning on Initial data setting request flag (RY9) are included, the operating is not required.

Point

To use parameters saved in an SD memory card for the CPU module, in "Setting of File/Data Use or Not in Memory Card" of "Memory Card Parameter" of the CPU module, set "Slave Station Parameter" to "Use".
MELSEC iQ-R CPU Module User's Manual (Application)

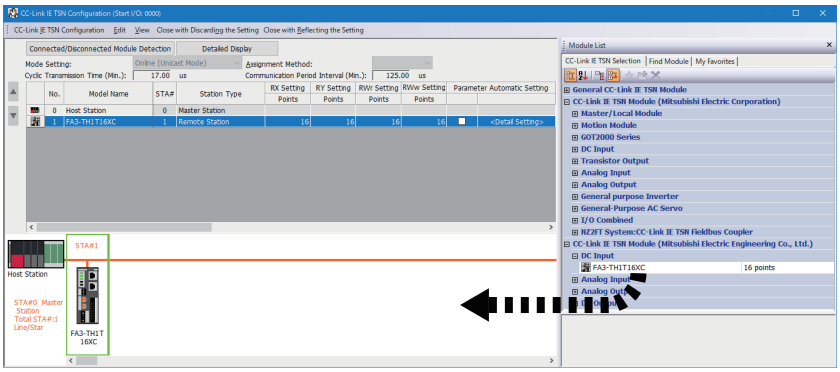
Network configuration setting

Operating procedure

1. Open the "CC-Link IE TSN Configuration" window in the engineering tool of the master station.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Network Configuration Settings]. Double-click "Detail Setting".

2. Select the network interface module in "Module List" and drag and drop it to the list of stations or the network map.



3. Select the "Parameter Automatic Setting" checkbox.

	No.	Model Name	STA#	Station Type	RX Setting Points	RY Setting Points	RWr Setting Points	RWw Setting Points	Parameter Automatic Setting	
	0	Host Station	0	Master Station						
	1	FA3-TH1T16XC	1	Remote Station	16	16	16	16	☑	<Detail Setting>

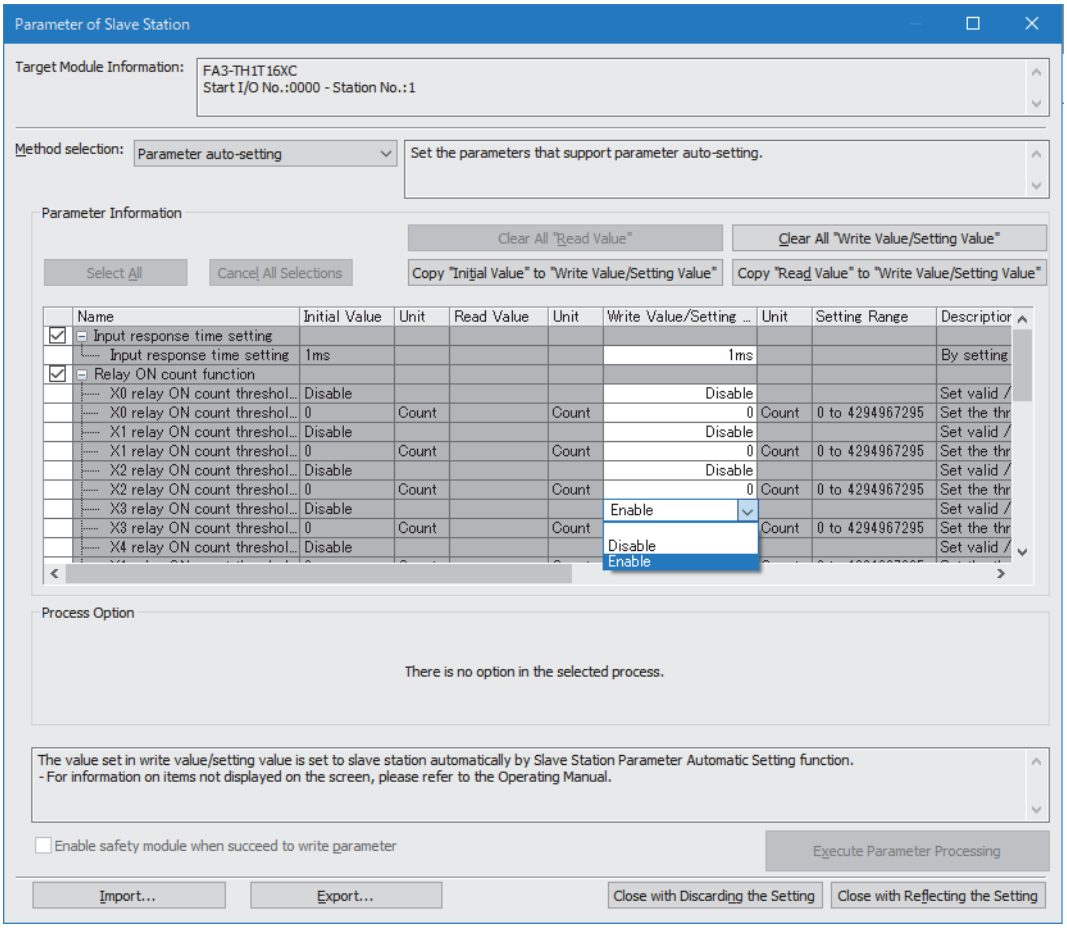
4. Double-click "Detail Setting" beside the "Parameter Automatic Setting" checkbox to open the "Parameter of Slave Station" window. (☞ Page 152 "Parameter of Slave Station" window)

5. Check that "Method selection" is set to "Parameter auto-setting".

6. Double-click the item to be set, and enter the setting value.

To save the parameter setting values in a CSV file, click the [Export] button.

To read the parameter setting values from a CSV file, click the [Import] button.



7. Click the [Close with Reflecting the Setting] button to close the "Parameter of Slave Station" window.

8. Select [Close with Reflecting the Setting] to close the "CC-Link IE TSN Configuration" window.

9. Set the refresh parameters in "Refresh Settings".

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Refresh Settings]. Double-click "Detail Setting".

10. Click the [Apply] button.

11. Display the "Online Data Operation" window.

[Online] ⇨ [Write to PLC]

12. Select the checkbox for "Slave Device Setting" in "CC-Link IE TSN Configuration".

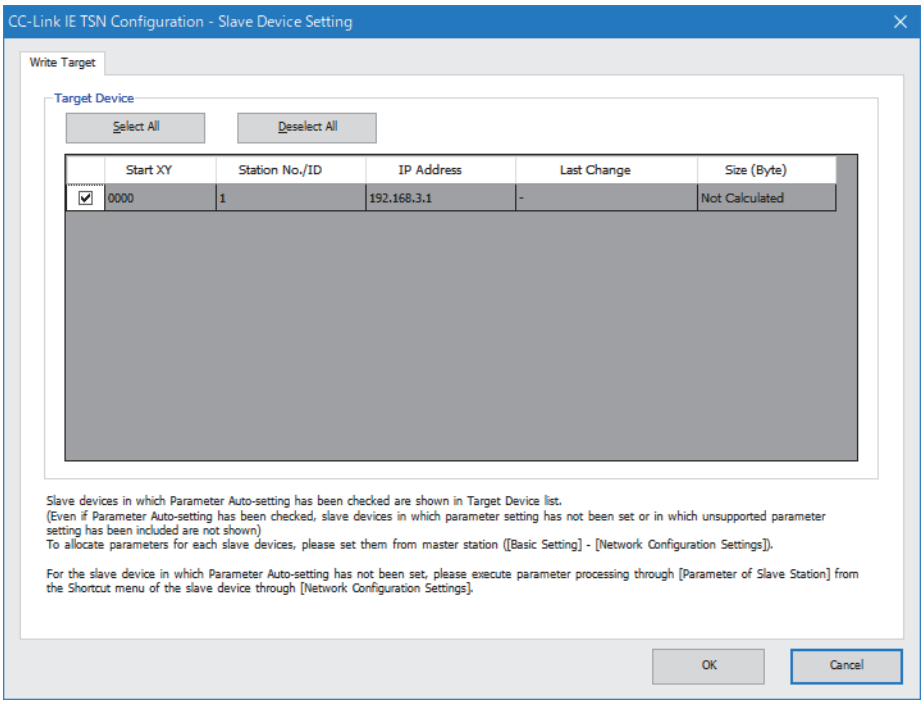
Precautions

- Check that the "Parameter Automatic Setting" checkbox for the slave station is selected in the "CC-Link IE TSN Configuration" window.
- Check that the IP address of the slave station set in the "CC-Link IE TSN Configuration" window matches the IP address of the actual slave station.
- If the communication speed differs between the master station and the station for which slave station parameter automatic setting is configured, the setting may result in an error. In this case, check if the communication speed matches.

13. Click the [Detail] button for "Slave Device Setting" to display the "CC-Link IE TSN Configuration - Slave Device Setting" window.

14. Check that the checkbox for the write target network interface module is selected.

Select the checkbox if not selected.



Point

In the "CC-Link IE TSN Configuration - Slave Device Setting" window, only the slave stations whose "Parameter Automatic Setting" checkbox is selected are displayed.

15. Click the [OK] button to close the "CC-Link IE TSN Configuration - Slave Device Setting" window.

16. Write the set parameters to the CPU module of the master station and reset the CPU module of the master station, or turn off and on the power supply of the programmable controller.

17. Set the CPU module of the master station to RUN, and check that the D LINK LED of the network interface module is turned on.

Point

The parameter automatic setting status can be checked in Parameter automatic setting status monitor (remote buffer memory: 3B90H).

Precautions

- Set all the items for the parameter. If any item is left blank, the "Parameter of Slave Station" window cannot be closed.
- Set parameters in the "Parameter of Slave Station" window for each slave station whose "Parameter Automatic Setting" checkbox is selected.
- When the slave station parameter automatic setting is completed with an error, data link is not started. For stations whose slave station parameter automatic setting is completed with an error, Slave station parameter automatic setting function execution result (SW0160 to SW0167) of the master station turns on. To start a data link, check Slave station parameter automatic setting execution result details (SW0194) and the event history of the master/local module, and take the corrective actions corresponding to the stored error code.
- When the slave station parameter processing is executed with the slave station parameter automatic setting enabled, the network interface module operates with the parameters set by the slave station parameter processing. However, if the network interface module is powered on or reset, the module parameter settings are changed by the slave station parameter automatic setting function. Then the module operates with the changed parameters.

When changing the parameters

Operating procedure

1. Display the "Online Data Operation" window.

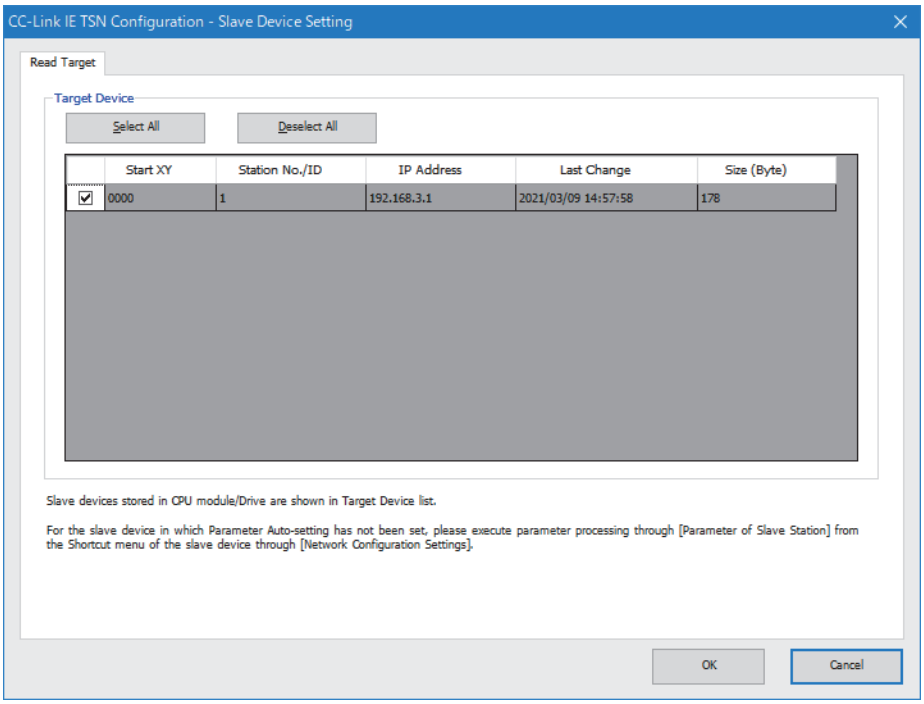
[Online] ⇨ [Read from PLC]

2. Select the read source "Slave Device Setting" checkbox.

3. Click the [Detail] button for "Slave Device Setting" to display the "CC-Link IE TSN Configuration - Slave Device Setting" window.

4. Check that the checkbox for the read target network interface module is selected.

Select the checkbox if not selected. All checkboxes are selected by default.



5. Click the [OK] button to close the "CC-Link IE TSN Configuration - Slave Device Setting" window.

6. Click the [Execute] button to read the parameters from the CPU module.

7. Open the "CC-Link IE TSN Configuration" window.

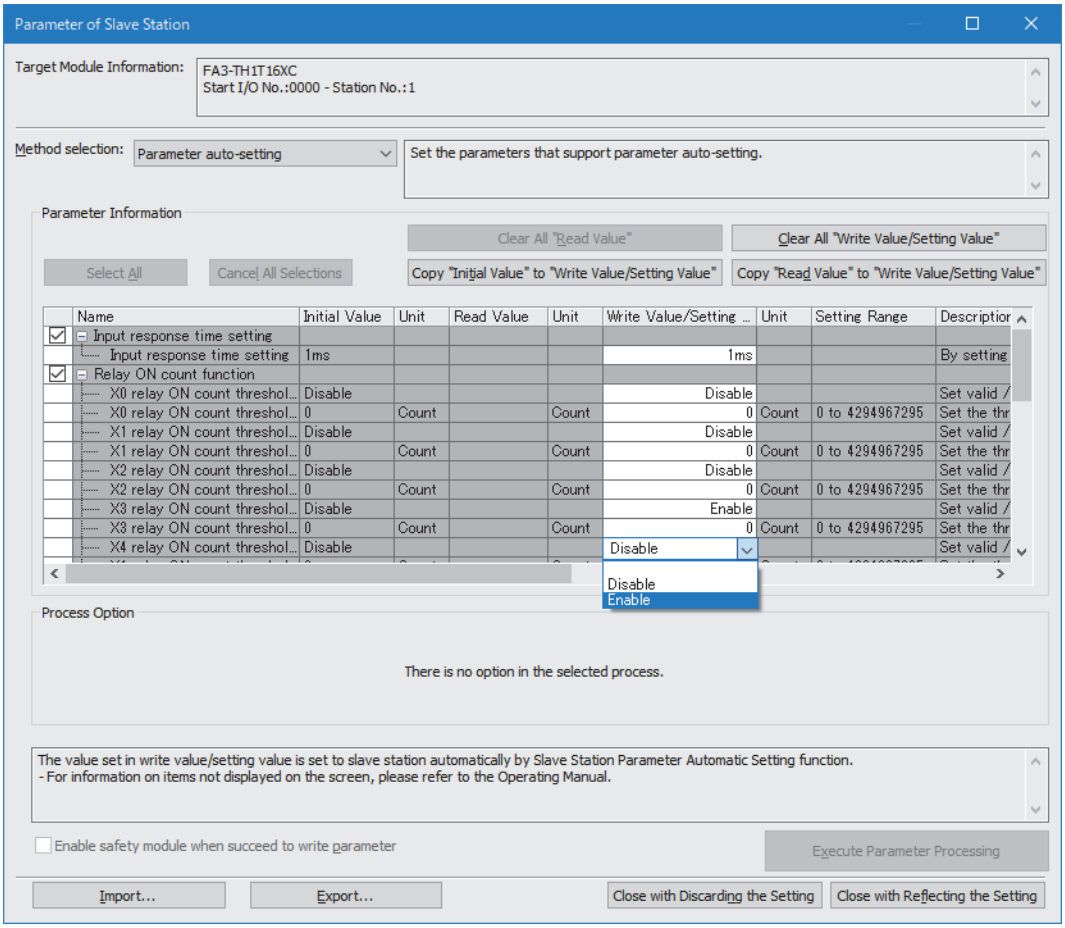
[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Network Configuration Settings]. Double-click "Detail Setting".

8. Double-click "Detail Setting" beside the "Parameter Automatic Setting" checkbox to open the "Parameter of Slave Station" window.

	No.	Model Name	STA#	Station Type	RX Setting	RY Setting	RWr Setting	RWw Setting	Parameter Automatic Setting	
					Points	Points	Points	Points		
	0	Host Station	0	Master Station						
	1	FA3-TH1T16XC	1	Remote Station	16	16	16	16	☑	<Detail Setting>

9. Check that "Method selection" is set to "Parameter auto-setting".

10. Select the items to be changed, and set new values.



11. Click the [Close with Reflecting the Setting] button to close the "Parameter of Slave Station" window.

12. Select [Close with Reflecting the Setting] to close the "CC-Link IE TSN Configuration" window.

13. Click the [Apply] button.

14. Display the "Online Data Operation" window.

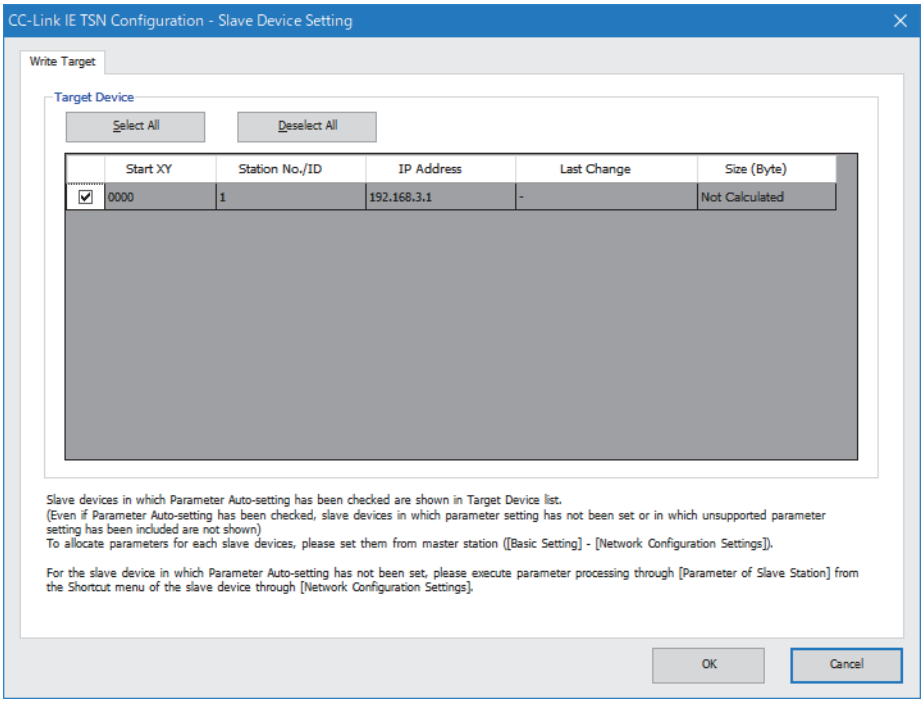
[Online] ⇨ [Write to PLC]

15. Select the checkbox for "Slave Device Setting" in "CC-Link IE TSN Configuration".

CC-Link IE TSN Configuration	☑			
Slave Device Setting	☑			Detail

16. Click the [Detail] button for "Slave Device Setting" to display the "CC-Link IE TSN Configuration - Slave Device Setting" window.

17. Check that the checkbox for the write target network interface module is selected.
Select the checkbox if not selected.



18. Click the [OK] button to close the "CC-Link IE TSN Configuration - Slave Device Setting" window.

19. Write the set parameters to the CPU module of the master station and reset the CPU module of the master station, or power on the programmable controller.

20. Set the CPU module of the master station to the RUN state, and check that the D LINK LED of the network interface module is turned on.

Precautions

The parameters of a slave station not existing in the network map on the "CC-Link IE TSN Configuration" window or a slave station whose "Parameter Automatic Setting" is not selected cannot be read.
When an attempt is made to read parameters, an error message is displayed.

Slave station parameter processing

This processing writes the network interface module parameters to the network interface module directly from the engineering tool of the master station.

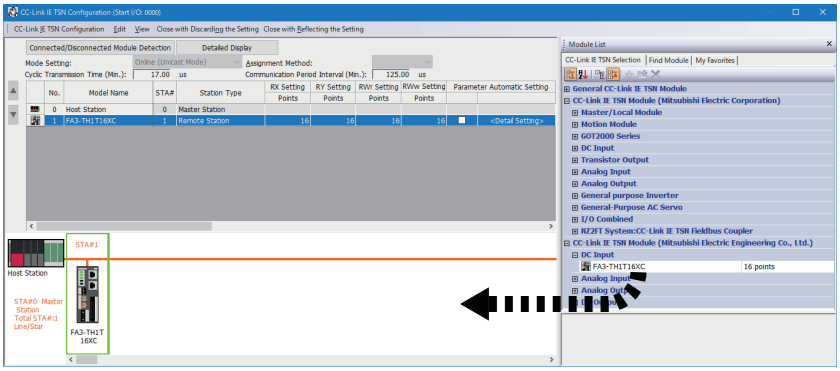
Network configuration setting

Operating procedure

1. Open the "CC-Link IE TSN Configuration" window in the engineering tool of the master station.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Network Configuration Settings]. Double-click "Detail Setting".

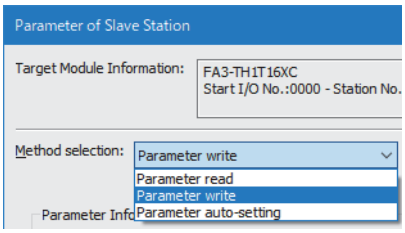
2. Select the network interface module in "Module List" and drag and drop it to the list of stations or the network map.



3. Select the network interface module to set parameters for, and open the "Parameter of Slave Station" window. (☞ Page 152 "Parameter of Slave Station" window)

Right-click the network interface module. Select [Parameter of Slave Station].

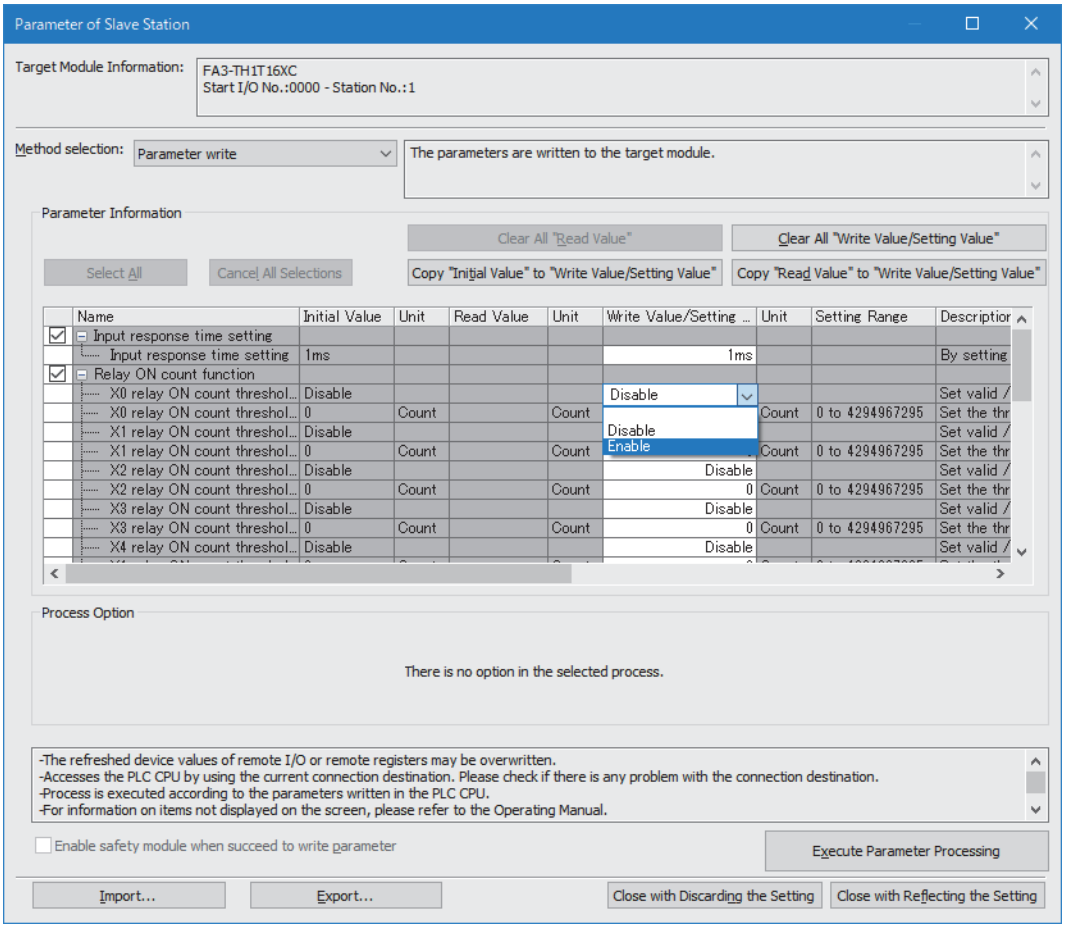
4. Set "Method selection" in the "Parameter of Slave Station" window to "Parameter write".



5. Double-click the item to be set, and enter the setting value.

To save the parameter setting values in a CSV file, click the [Export] button.

To read the parameter setting values from a CSV file, click the [Import] button.



6. Click the [Execute Parameter Processing] button.

7. Follow the on-screen instructions and click the [Yes] button.

8. Select [Close with Reflecting the Setting], and close the "Parameter of Slave Station" window.

9. Select [Close with Reflecting the Setting] to close the "CC-Link IE TSN Configuration" window.

Point

- FA3-TH: The parameters are enabled right after the above procedure is complete.
- FA3-AT: The parameters are enabled by turning on Initial data setting request flag (RY9) after the above procedure is complete.

When changing the parameters

Operating procedure

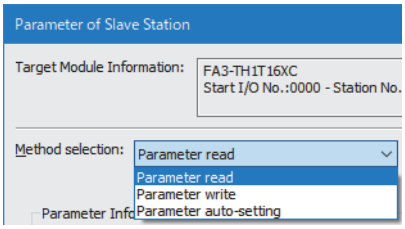
1. Open the "CC-Link IE TSN Configuration" window.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Network Configuration Settings]. Double-click "Detail Setting".

2. Open the "Parameter of Slave Station" window.

Select a network interface module from the station list, right-click, and select [Parameter of Slave Station].

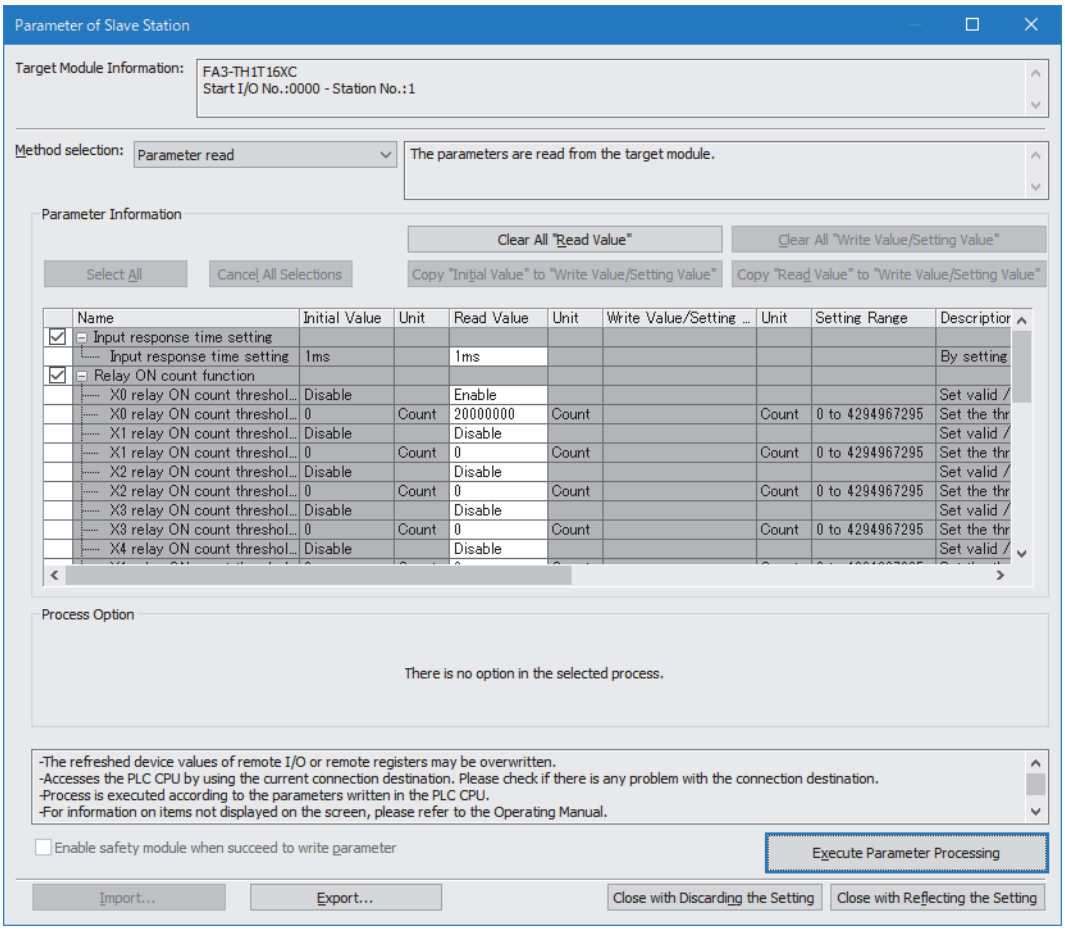
3. Set "Method selection" to "Parameter read".



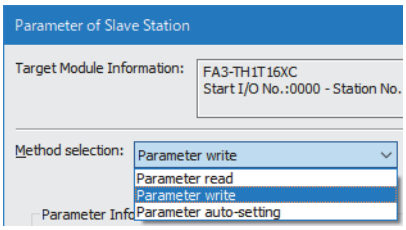
4. Click the [Execute Parameter Processing] button.

5. Click the [Yes] button.

6. The parameters are read from the network interface module.

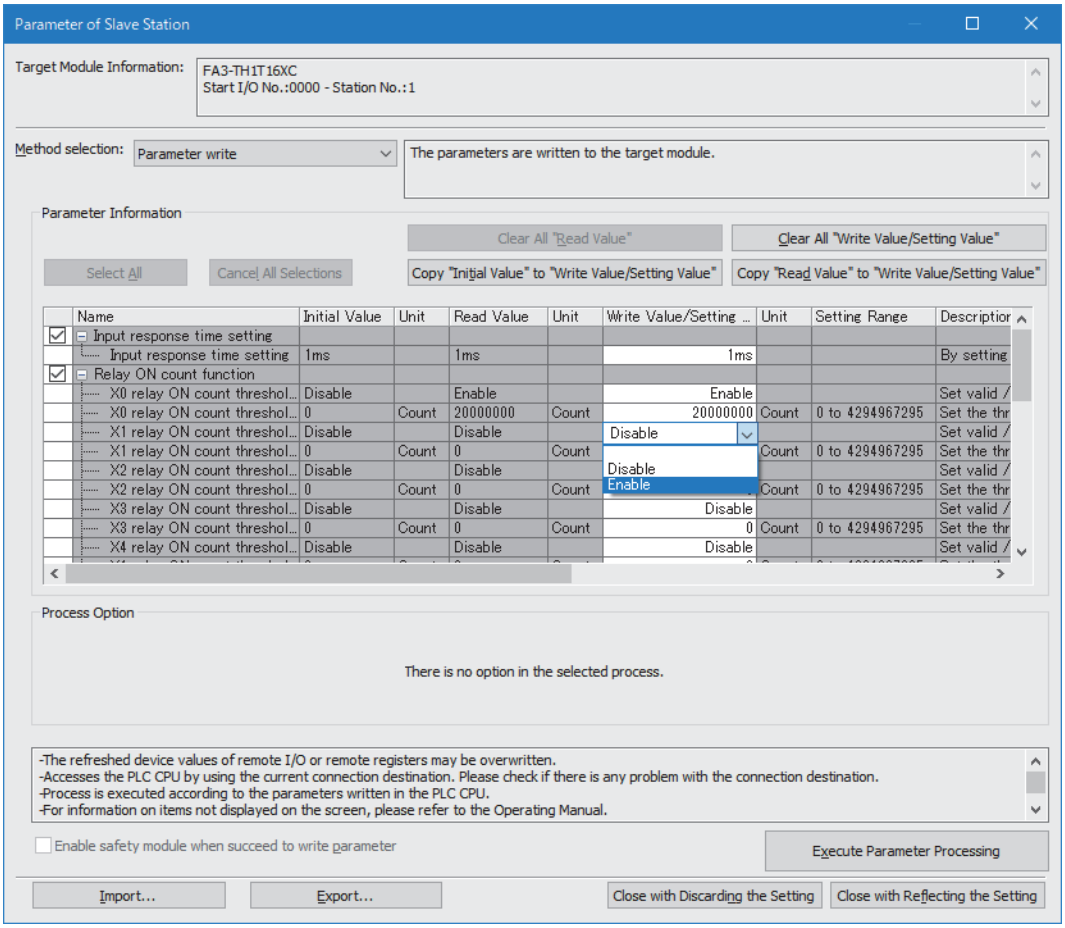


7. Set "Method selection" to "Parameter write".



8. Select the items to be changed, and set new values.

- Click [Copy "Read Value" to "Write Value/Setting Value"] button and paste the value.
- Select the items to be changed, and set new values.



9. Click the [Execute Parameter Processing] button.

10. Follow the on-screen instructions and click the [Yes] button.

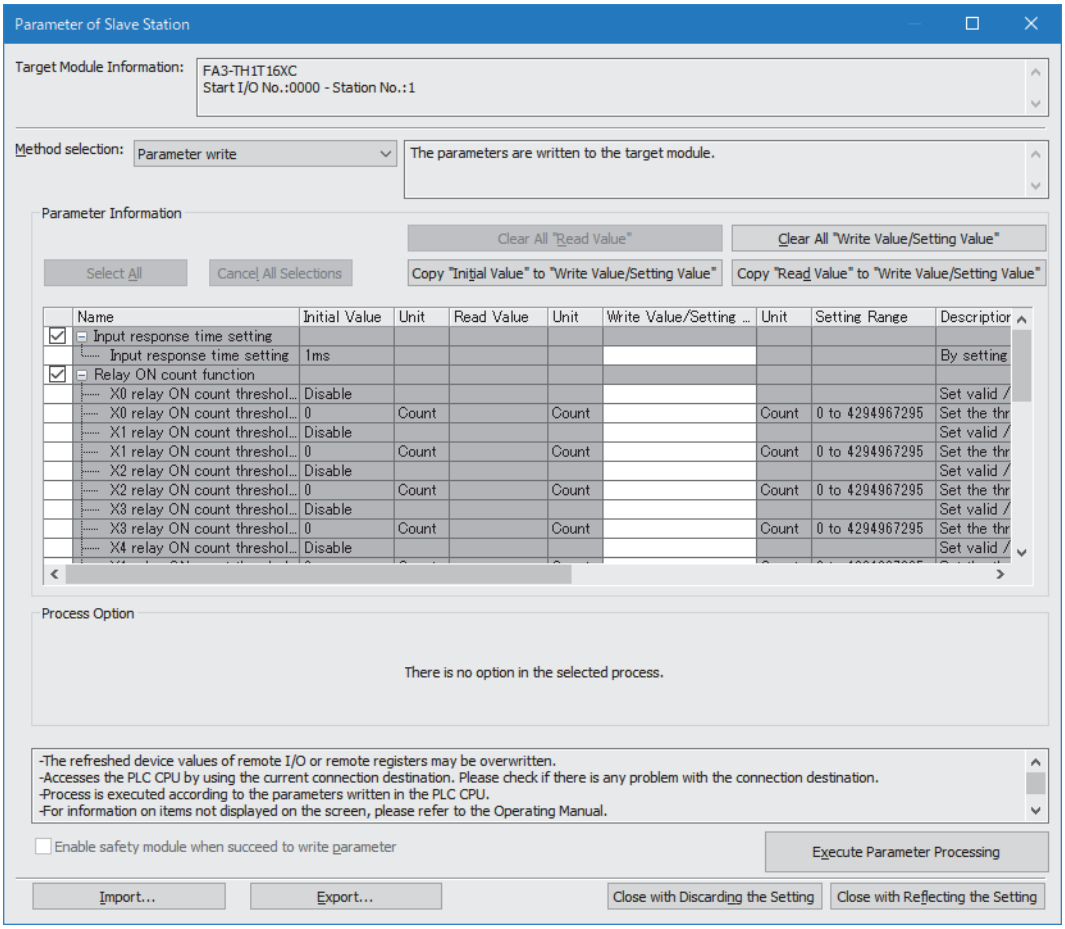
11. The parameters are written to the network interface module.

"Parameter of Slave Station" window

This section shows the details on the "Parameter Processing of Slave Station" window to set parameters of the network interface module.

Window

The "Parameter of Slave Station" window for the FA3-TH1T16XC is shown as an example.



FA3-TH1T16XC, FA3-TH1M16XC

Displayed items

Item		Description	Setting range	Reference
Input response time setting		Setting the response time required for the module to recognize an actual input as the X signal prevents an incorrect input due to noise.	• 0ms • 0.2ms • 1ms (default) • 1.5ms • 5ms • 10ms • 20ms • 70ms	☞ Page 114 Input response time setting function
Relay ON count threshold setting	X☐ relay ON count threshold valid/invalid setting	Set whether the relay ON count of the maintenance alarm function is valid or invalid.	• Invalid (default) • Valid	☞ Page 110 Relay ON count threshold (FA3-TH)
	X☐ relay ON count threshold setting	Set the threshold of relay ON count of the maintenance alarm function. When Relay ON count threshold valid/invalid setting (4120H) is set to be valid, this threshold is compared with the count value.	0 to 4294967295 (Default: 0)	
Elapsed operation time threshold setting		Set the threshold of the elapsed operation time of the maintenance alarm function. Note that, when the setting value is 0, an alarm for the elapsed operation time does not occur.	0 to 4294967295 (Default: 0)	☞ Page 110 Elapsed operation time threshold

FA3-TH1T16Y, FA3-TH1T16YE, FA3-TH1M16Y, FA3-TH1M16YE

Displayed items

Item		Description	Setting range	Reference
Output HOLD/CLEAR setting		Set whether to hold or clear the last output value for the case when the module is disconnected from data link, when the CPU module operating status is STOP or RESET, or when the CPU module operation is suspended by an error.	• CLEAR (default) • HOLD	☞ Page 115 Output HOLD/CLEAR setting function
Relay ON count threshold setting	Y☐ relay ON count threshold valid/invalid setting	Set whether the relay ON count of the maintenance alarm function is valid or invalid.	• Invalid (default) • Valid	☞ Page 110 Relay ON count threshold (FA3-TH)
	X☐ relay ON count threshold setting	Set the threshold of relay ON count of the maintenance alarm function. When Relay ON count threshold valid/invalid setting (4120H) is set to be valid, this threshold is compared with the count value.	0 to 4294967295 (Default: 0)	
Elapsed operation time threshold setting		Set the threshold of the elapsed operation time of the maintenance alarm function. Note that, when the setting value is 0, an alarm for the elapsed operation time does not occur.	0 to 4294967295 (Default: 0)	☞ Page 110 Elapsed operation time threshold

FA3-AT1T8X, FA3-AT1M8X

Displayed items

Item		Description	Setting range	Reference
A/D conversion enable/disable setting	CH☐ A/D conversion enable/disable setting	Set whether to enable or disable A/D conversion for each channel.	• Enable (default) • Disable	☞ Page 119 A/D conversion enable/disable function
Averaging process setting	CH☐ Averaging processing setting	Set sampling processing or averaging processing for each channel.	• Sampling processing (default) • Time average • Count average • Moving average	☞ Page 119 A/D conversion method
	CH☐ Time average/Count average/Moving average	Set the time (for averaging), count (for averaging), and moving average count for each channel to which Averaging processing setting is specified.	• Time average: 2 to 10000ms • Count average: 4 to 65000 times • Moving average: 2 to 128 times (Default: 0)	
Input signal error detection function	CH☐ Input signal error detection setting	Set the condition ("Disable"/"Input signal error detection") to detect an error.	• Invalid (default) • Input signal error detection	☞ Page 122 Input signal error detection function
Warning output function (process alarm)	CH☐ Warning output setting	Set whether to enable or disable process alarm warning output for each channel.	• Enable • Disable (default)	☞ Page 124 Warning output function (process alarm)
	CH☐ Process alarm upper upper limit value	Set any one of Process alarm upper upper limit value, Process alarm upper lower limit value, Process alarm lower upper limit value, and Process alarm lower lower limit value.	-32768 to 32767 (Default: 0)	
	CH☐ Process alarm upper lower limit value		-32768 to 32767 (Default: 0)	
	CH☐ Process alarm lower upper limit value		-32768 to 32767 (Default: 0)	
	CH☐ Process alarm lower lower limit value		-32768 to 32767 (Default: 0)	
Digital clipping function	CH☐ Digital clipping enable/disable setting	Set whether to enable or disable digital clipping for each channel.	• Invalid (default) • Valid	☞ Page 126 Digital clipping function
Scaling function	CH☐ Scaling enable/disable setting	Set whether to enable or disable scaling for each channel.	• Invalid (default) • Enable	☞ Page 127 Scaling function
	CH☐ Scaling upper limit value	Set the range of values to be scale-converted for each channel.	-32000 to 32000 (Default: 0)	
	CH☐ Scaling lower limit value		-32000 to 32000 (Default: 0)	
Logging cycle setting	CH☐ Logging cycle unit setting	Set the unit to be used for setting the logging cycle.	• ms (default) • s	☞ Page 106 Logging function (FA3-AT)
	CH☐ Logging cycle setting	Set the logging cycle.	• ms: 1 to 32767 • s: 1 to 3600 (Default: 1)	
Logging data setting	CH☐ Logging data setting	Set whether a digital output value or scaling value is collected.	• Digital output value (default) • Scaling value	
Elapsed operation time threshold setting		Set the threshold of the elapsed operation time of the maintenance alarm function. Note that, when the setting value is 0, an alarm for the elapsed operation time does not occur.	0 to 4294967295 (Default: 0)	☞ Page 110 Elapsed operation time threshold

FA3-AT1T8Y, FA3-AT1M8Y

Displayed items

Item		Description	Setting range	Reference
D/A conversion enable/disable setting	CH□ D/A conversion enable/disable setting	Set whether to enable or disable D/A conversion for each channel.	• Enable • Disable (default)	☞ Page 134 D/A conversion enable/disable function
Analog output HOLD/CLEAR setting	CH□ Analog output HOLD/CLEAR setting	Set whether to hold or clear the last analog value for the case when the module is disconnected from data link, when the CPU module operating status is STOP or RESET, or when the CPU module operation is suspended by an error.	• CLEAR (default) • HOLD	☞ Page 135 Analog output HOLD/CLEAR setting function
Warning output function	CH□ Warning output setting	Set whether to enable or disable warning output for each channel.	• Enable • Disable (default)	☞ Page 136 Warning output function
	CH□ Warning output upper limit value	Set the range of digital operation values to output a warning for each channel.	-32768 to 32767 (Default: 0)	
	CH□ Warning output lower limit value		-32768 to 32767 (Default: 0)	
Scaling function	CH□ Scaling enable/disable setting	Set whether to enable or disable scaling for each channel.	• Invalid (default) • Enable	☞ Page 138 Scaling function
	CH□ Scaling upper limit value	Set the range of values to be scale-converted for each channel.	-32000 to 32000 (Default: 0)	
	CH□ Scaling lower limit value		-32000 to 32000 (Default: 0)	
Logging data setting	CH□ Logging data setting	Set whether a digital input value or scaling value is collected.	• Digital output value (default) • Scaling value	☞ Page 106 Logging function (FA3-AT)
Elapsed operation time threshold setting		Set the threshold of the elapsed operation time of the maintenance alarm function. Note that, when the setting value is 0, an alarm for the elapsed operation time does not occur.	0 to 4294967295 (Default: 0)	☞ Page 110 Elapsed operation time threshold

6.3 Programming

This chapter describes the programming procedure of the network interface module.
When applying the program example provided in this section to an actual system, ensure the applicability and confirm that it will not cause system control problems.
This section describes an example of program in which the GX Works3 is used. For the programs in which engineering tools other than GX Works3, refer to the user's manual for the master module to be used.

Programming precautions

This section describes the precautions for creating programs.

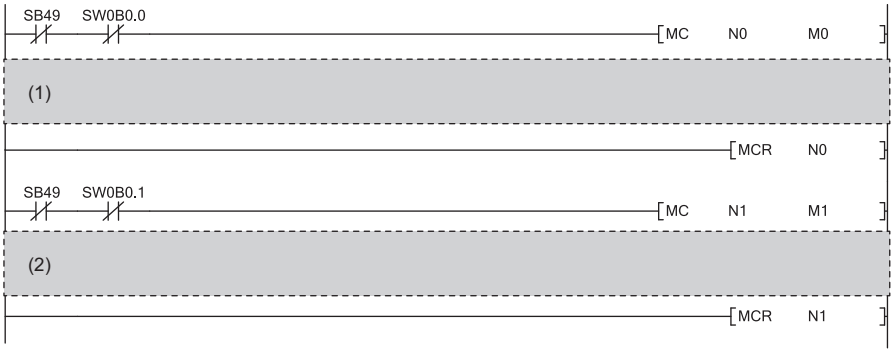
Cyclic transmission programs

For a cyclic transmission program, interlock with the following link special relay (SB) and link special register (SW).

- Data link error status of the own station (master station) (SB0049)
- Data link status (each station) (SW00B0 to SW00B7)

User's manual for the master station used

Ex.
Interlock example

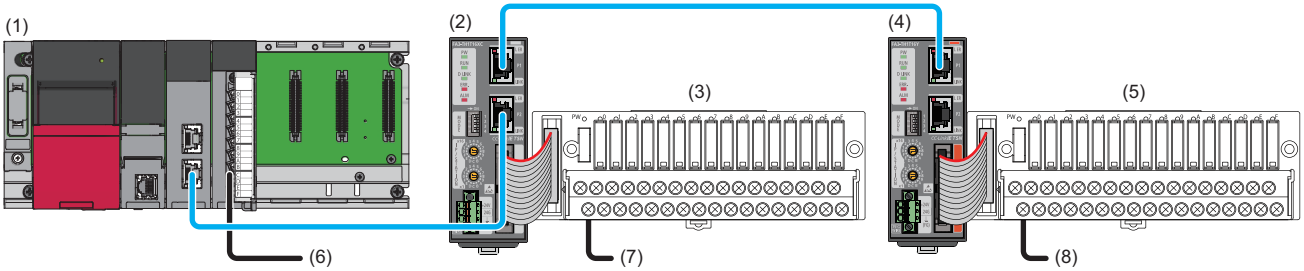


(1) Program for communications with station number 1
(2) Program for communications with station number 2

Example of digital I/O

This section shows an example of the program to perform the digital input and output using the FA3-TH1T16XC and FA3-TH1T16Y.

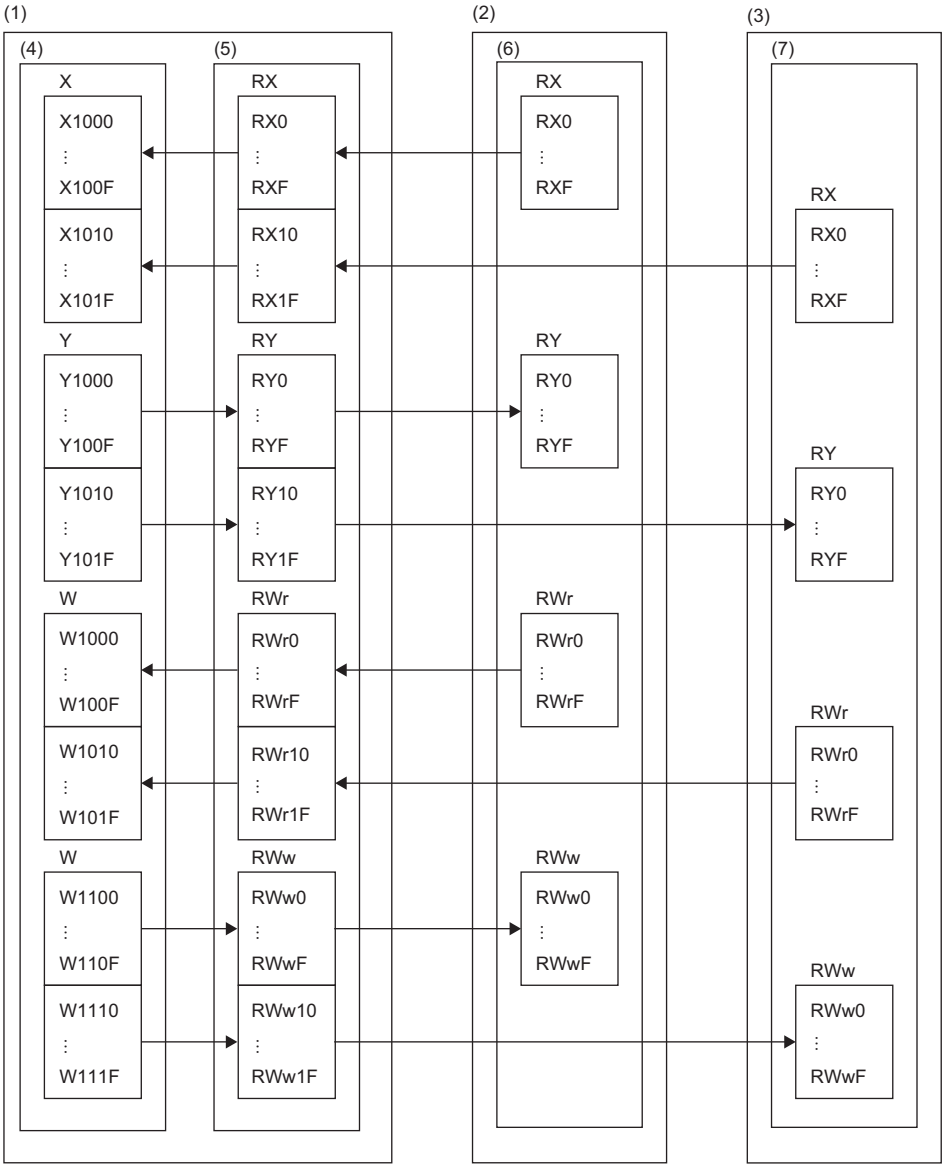
System configuration



No.	Description		
(1)	Master station	R62P	Power supply module
		R04CPU	CPU module
		RJ71GN11-T2	Master/local module (start I/O number: 0000H to 001FH)
		RX40C7	Input module (start I/O number: 0020H to 002FH)
(2)	Remote station	FA3-TH1T16XC	Network interface module (digital input) (IP address/station number setting switches: 1)
(3)	Digital signal converter including the FA-TH16XRA20S (input type)*1		
(4)	Remote station	FA3-TH1T16Y	Network interface module (digital output) (IP address/station number setting switches: 2)
(5)	Digital signal converter including the FA-TH16YRA11 (output type)*1		
(6)	X20		Error clear switch
(7)	X1000		Push button switch
(8)	Y1010		Light

*1 For the devices connectable to the network interface module, refer to the following.
☞ Page 16 Connectable Devices

Assignment of devices



(1) Master station
(2) Remote station (station number 1)
(3) Remote station (station number 2)
(4) CPU module
(5) Master/local module
(6) Network interface module (digital input)
(7) Network interface module (digital output)

Programming conditions

When RX0 of the remote station (station number 1) turns on, RY0 of the remote station (station number 2) is turned on.

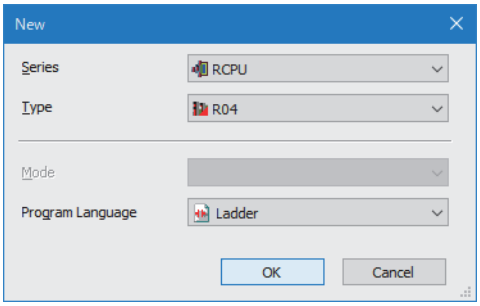
Devices to be used

Device	Description	
X1000	RX0 input signal (push button) of the remote station (station number 1)	FA3-TH1T16XC (RX0 to RXF)
Y1010	RY0 output signal (lamp) of the remote station (station number 2)	FA3-TH1T16Y (RY0 to RYF)
X20	Error clear switch	Input module (X20 to X2F)
D100	Latest error code (station number 1)	
D101	Latest alarm code (station number 1)	
D102	Latest error code (station number 2)	
D103	Latest alarm code (station number 2)	
M0	Master control contacts	
N0	Nesting	
SB49	Data link error status of the own station (master station)	
SM400	Always ON	
SW0B0.0	Data link status of the remote station (station number 1)	
SW0B0.1	Data link status of the remote station (station number 2)	
W1000	Latest error code (station number 1) (device to be written by link refresh)	
W1001	Latest alarm code (station number 1) (device to be written by link refresh)	
W1010	Latest error code (station number 2) (device to be written by link refresh)	
W1011	Latest alarm code (station number 2) (device to be written by link refresh)	
W1100.A	Error clear request flag (station number 1)	
W1110.A	Error clear request flag (station number 2)	

Parameter setting

1. Create a project.

[Project] ⇨ [New]



2. For "CPU Parameter" in "Link Direct Device Setting", set "Extended Mode (iQ-R Series Mode)".

[CPU Parameter] ⇨ [Memory/Device Setting] ⇨ [Link Direct Device Setting] ⇨ [Link Direct Device Setting]

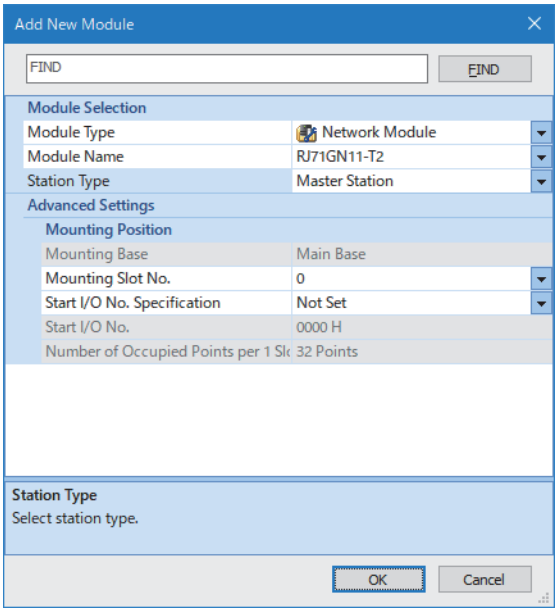
Item	Setting
Link Direct Device Setting	
Link Direct Device Setting	Extended Mode (iQ-R Series Mode)

Restriction

When writing the module parameters of the RJ71GN11-T2 to the CPU module with the engineering tool, set "Extended Mode (iQ-R Series Mode)" for "Link Direct Device Setting".
When "Q Series Compatible Mode" is set for "Link Direct Device Setting", "Write to PLC" cannot be executed.

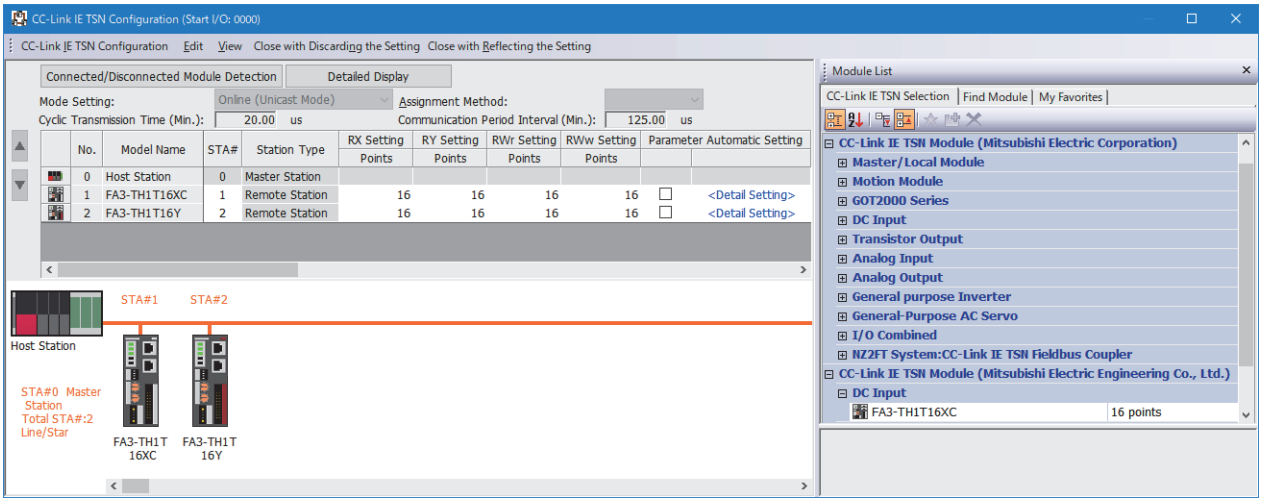
3. Set the master/local module in the following window.

[Navigation window] ⇨ [Parameter] ⇨ Right-click [Module Information] ⇨ [Add New Module]



4. Open the "CC-Link IE TSN Configuration" window and set parameters as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Network Configuration Settings]. Double-click "Detail Setting".



5. Check that the "Parameter Automatic Setting" checkbox is unchecked as the FA3-TH parameters are not changed in this program example.

6. Select [Close with Reflecting the Setting] to close the "CC-Link IE TSN Configuration" window.

7. Open the refresh parameter setting window and set as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Refresh Settings]

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF		Specify Device	SB	512	00000	001FF
-	SW	512	00000	001FF		Specify Device	SW	512	00000	001FF
1	RX	32	00000	0001F		Specify Device	X	32	01000	0101F
2	RY	32	00000	0001F		Specify Device	Y	32	01000	0101F
3	RWr	32	00000	0001F		Specify Device	W	32	01000	0101F
4	RWw	32	00000	0001F		Specify Device	W	32	01100	0111F

8. Click the [Apply] button.

9. Write the set parameters to the CPU module of the master station and reset the CPU module of the master station, or power on the programmable controller.

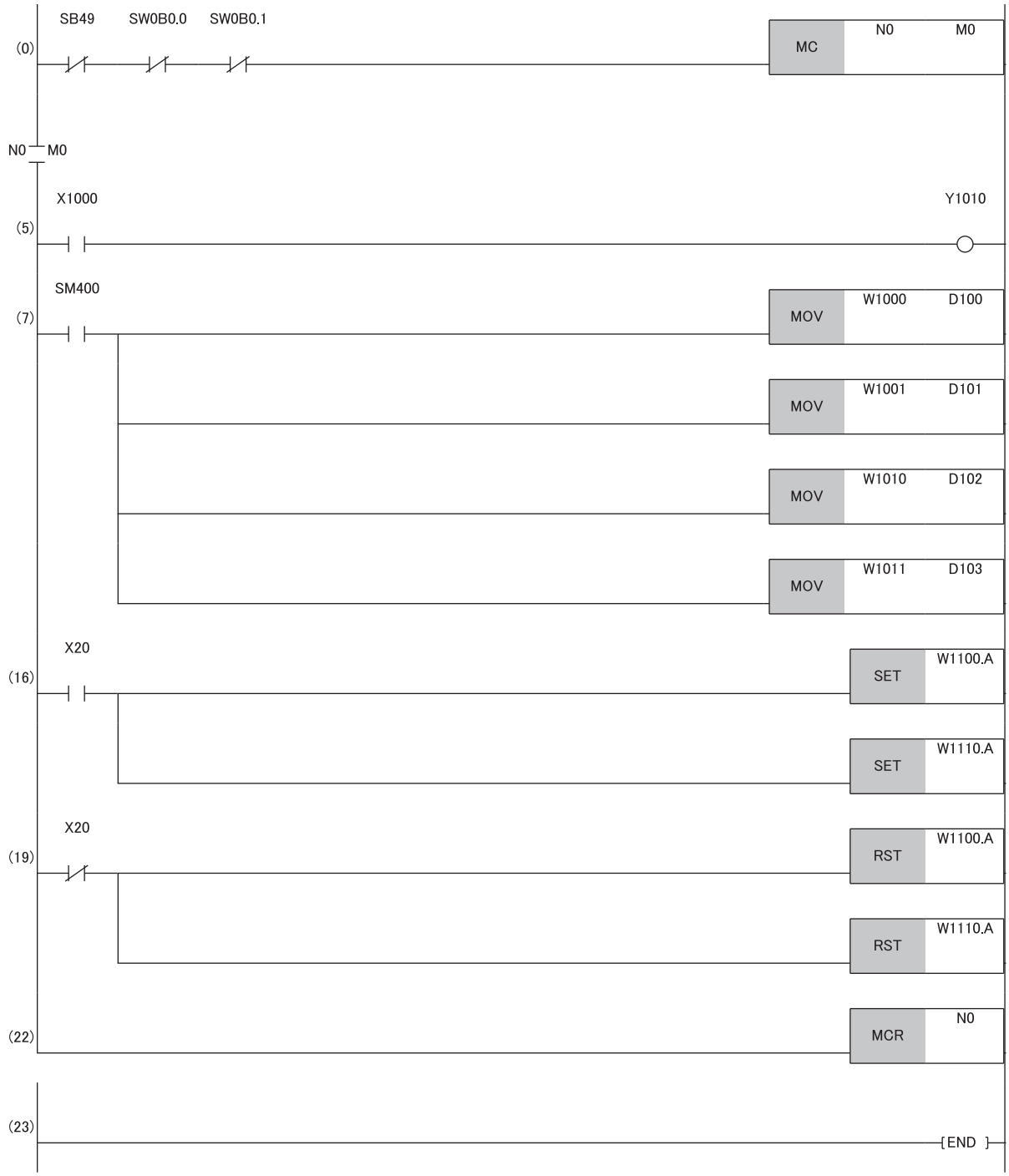
[Online] ⇨ [Write to PLC]

10. Set the CPU module of the master station to RUN, and check that the D LINK LED of the network interface module is turned on.

Point

In the program example, the default settings are used for parameters other than the above.

Program example

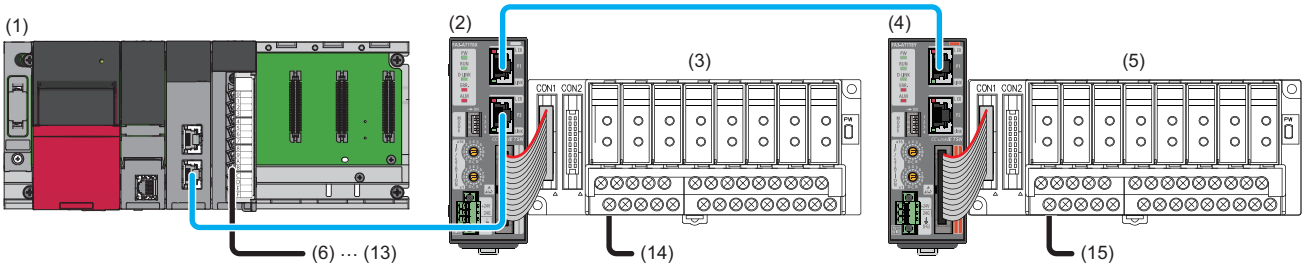


(0) Data link status of the remote station (station number 1 and 2) is checked.
(5) When RX0 of the remote station (station number 1) is on, RY0 of the remote station (station number 2) is turned on.
(7) The latest error code and latest alarm code are read.
(16), (19) The latest error code and latest alarm code are cleared.

Program example for A/D conversion

This section shows an example of the program to perform A/D conversion using the FA3-AT1T8X and FA3-AT1T8Y.

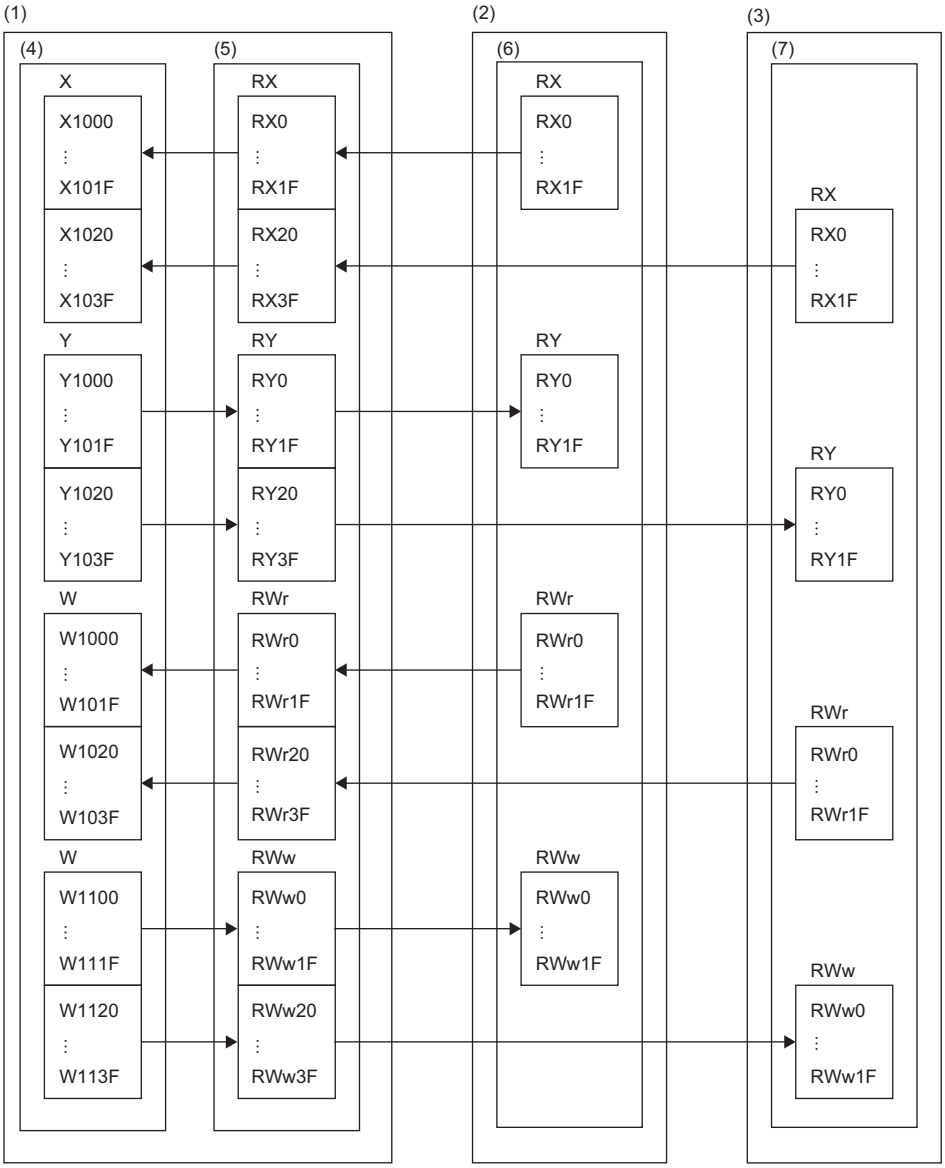
System configuration



No.	Description		
(1)	Master station	R62P	Power supply module
		R04CPU	CPU module
		RJ71GN11-T2	Master/local module (start I/O number: 0000H to 001FH)
		RX40C7	Input module (start I/O number: 0020H to 002FH)
(2)	Remote station	FA3-AT1T8X	Network interface module (analog input) (IP address/station number setting switches: 1)
(3)	Analog signal converter (input type) including the FA-ATSVM1XV05*1		
(4)	Remote station	FA3-AT1T8Y	Network interface module (analog output) (IP address/station number setting switches: 2)
(5)	Analog signal converter (output type) including the FA-ATSVM1YV010*1		
(6)	X20		Remote station (station number 1) digital operation value read command
(7)	X21		Remote station (station number 1) error clear command
(8)	X22		Remote station (station number 1) maximum value/minimum value read command
(9)	X23		Remote station (station number 1) maximum value/minimum value reset command
(10)	X24		Remote station (station number 2) digital value write command
(11)	X25		Remote station (station number 2) batch analog output enable command
(12)	X26		Remote station (station number 2) warning output clear command
(13)	X27		Remote station (station number 2) error clear command
(14)	AD		Thermocouple
(15)	DA		Motor controller

*1 For the devices connectable to the network interface module, refer to the following.
☞ Page 16 Connectable Devices

Assignment of devices



(1) Master station
(2) Remote station (station number 1)
(3) Remote station (station number 2)
(4) CPU module
(5) Master/local module
(6) Network interface module (analog input)
(7) Network interface module (analog output)

Programming conditions

An example of program is created under the following conditions.

■Initial setting description

Remote station	Setting item	Setting details
FA3-AT1T8X (station number 1)	CH□ A/D conversion enable/disable setting	• CH1 to 4: Enable • CH7 to 8: Enable
	Input signal error detection setting	CH1, 3: Input signal error detection
	Warning output setting	CH2: Enable • CH2 Process alarm upper upper limit value: 15000 • CH2 Process alarm upper lower limit value: 14000 • CH2 Process alarm lower upper limit value: 2000 • CH2 Process alarm lower lower limit value: -10
FA3-AT1T8Y (station number 2)	CH□ D/A conversion enable/disable setting	• CH1 to 4: Enable • CH7 to 8: Enable
	Warning output setting	CH2: Enable • CH2 Warning output upper limit value: 15000 • CH2 Warning output lower limit value: -10

Devices to be used

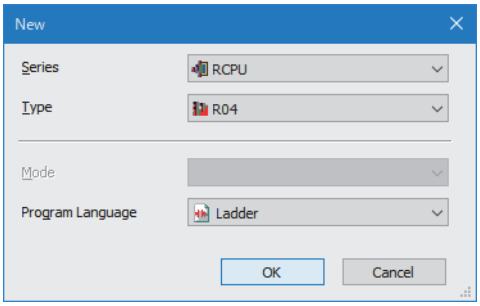
Device	Description	
X20	Digital operation value read command	RX40C7 (X20 to X2F)
X21	Error clear command	
X22	Maximum value/minimum value read command	
X23	Maximum value/minimum value reset command	
X1009	Initial data setting completion flag	FA3-AT1T8X (RX0 to RX1F)
X100A	Error status flag	
X100B	Remote READY	
X1010	CH1 A/D conversion completion flag	
X1011	CH2 A/D conversion completion flag	
X1012	CH3 A/D conversion completion flag	
X1013	CH4 A/D conversion completion flag	
X1016	CH7 A/D conversion completion flag	
X1017	CH8 A/D conversion completion flag	
X1018	Warning output signal	
X101C	Input signal error detection signal	
X101D	Maximum value/minimum value reset completed flag	
Y100A	Error clear request flag	FA3-AT1T8X (RY0 to RY1F)
Y101D	Maximum value/minimum value reset request	
W1000	Latest error code	FA3-AT1T8X (RWr0 to RWr1F)
W1001	Latest alarm code	
W1002	CH1 Digital operation value	
W1003	CH2 Digital operation value	
W1004	CH3 Digital operation value	
W1005	CH4 Digital operation value	
W1008	CH7 Digital operation value	
W1009	CH8 Digital operation value	
W100A	Input signal error detection flag	
W100B	Warning output flag	
D2002	CH1 Device for storing digital operation value	
D2003	CH2 Device for storing digital operation value	
D2004	CH3 Device for storing digital operation value	
D2005	CH4 Device for storing digital operation value	
D2008	CH7 Device for storing digital operation value	
D2009	CH8 Device for storing digital operation value	

Device	Description
D2010	CH1 Device for storing maximum value
D2011	CH1 Device for storing minimum value
D2012	CH2 Device for storing maximum value
D2013	CH2 Device for storing minimum value
D2014	CH3 Device for storing maximum value
D2015	CH3 Device for storing minimum value
D2016	CH4 Device for storing maximum value
D2017	CH4 Device for storing minimum value
D2022	CH7 Device for storing maximum value
D2023	CH7 Device for storing minimum value
D2024	CH8 Device for storing maximum value
D2025	CH8 Device for storing minimum value
D2030	Device for storing the latest error code
D2031	Device for storing the latest alarm code
D2032	Device for storing Input signal error detection flag
D2033	Device for storing Warning output flag
M0	Communication ready flag
M300	Maximum value/minimum value read flag
M310	REMFR instruction completion flag
M311	REMFR instruction abnormal completion flag
F1	CH2 Warning output upper limit occurrence
F2	CH2 Warning output lower limit occurrence
F3	CH1 Disconnection occurrence
F4	CH3 Disconnection occurrence
F5	Maximum value/minimum value read failure
SM400	Always ON
SB49	Data link error status of the own station (master station)
SW0B0.0	Data link status of the remote station (station number 1)
N0	Nesting

Parameter setting

1. Create a project.

[Project] ⇨ [New]



2. For "CPU Parameter" in "Link Direct Device Setting", set "Extended Mode (iQ-R Series Mode)".

[CPU Parameter] ⇨ [Memory/Device Setting] ⇨ [Link Direct Device Setting] ⇨ [Link Direct Device Setting]

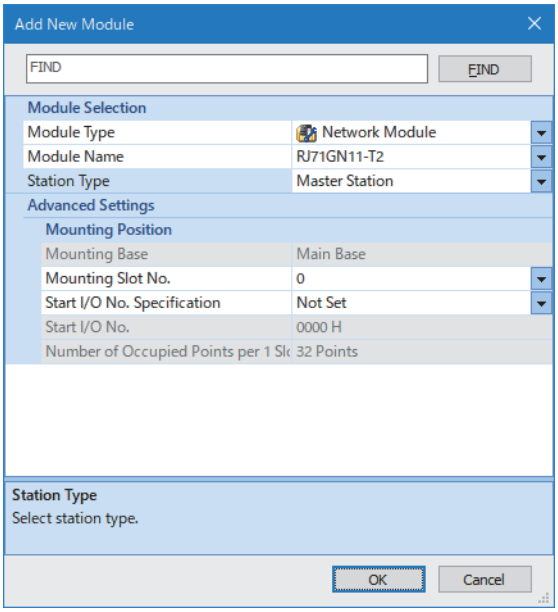
Item	Setting
Link Direct Device Setting	
Link Direct Device Setting	Extended Mode (iQ-R Series Mode)

Restriction

When writing the module parameters of the RJ71GN11-T2 to the CPU module with the engineering tool, set "Extended Mode (iQ-R Series Mode)" for "Link Direct Device Setting".
When "Q Series Compatible Mode" is set for "Link Direct Device Setting", "Write to PLC" cannot be executed.

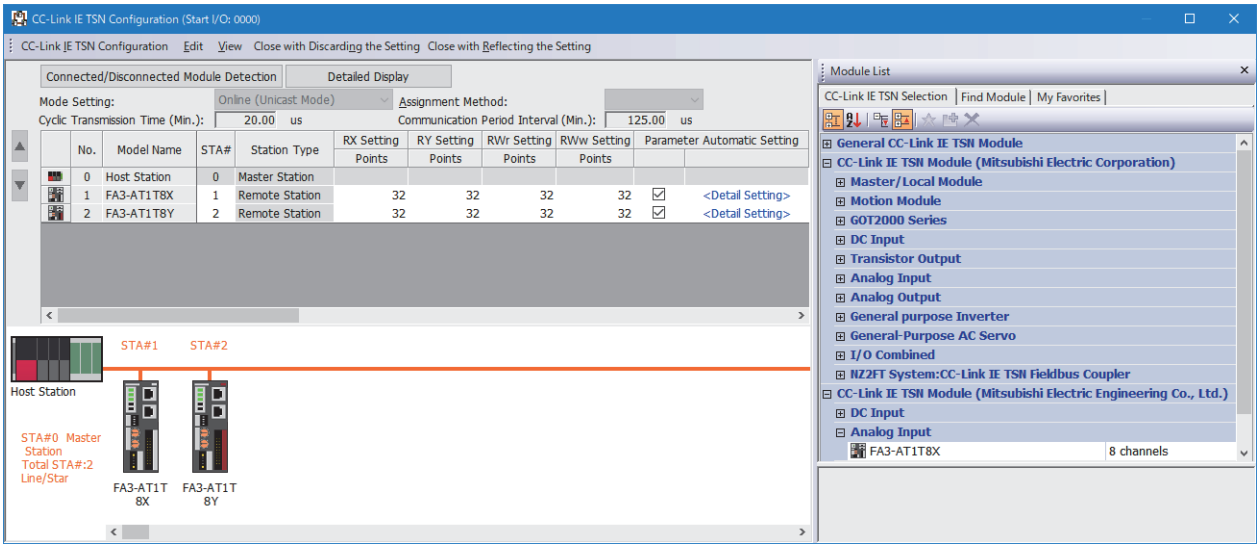
3. Set the master/local module in the following window.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Right-click ⇨ [Add New Module]

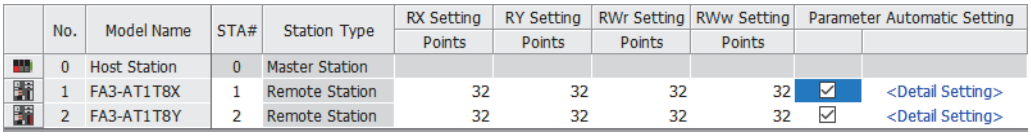


4. Open the "CC-Link IE TSN Configuration" window and set parameters as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Network Configuration Settings]. Double-click "Detail Setting".



5. Select the "Parameter Automatic Setting" checkbox.

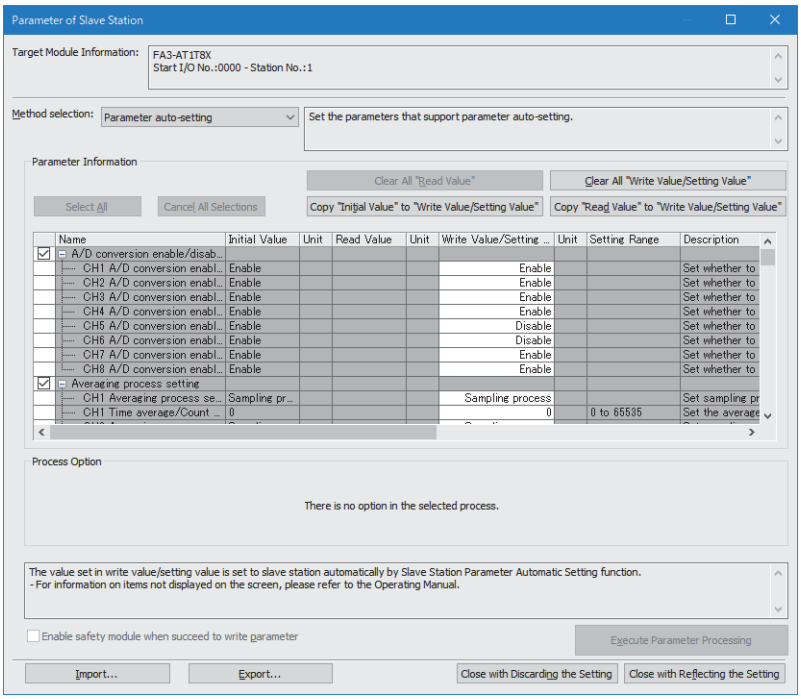


6. Double-click "Detail Setting" beside the "Parameter Automatic Setting" checkbox to open the "Parameter of Slave Station" window.

7. Check that "Method selection" is set to "Parameter auto-setting".

8. Click [Copy "Initial Value" to "Write Value/Setting Value"] button to initialize parameters.

9. In the "Parameter of Slave Station" window, set the items as described in Initial settings. (☞ Page 165 Initial setting description) Enter initial values to other parameters.



10. Click the [Close with Reflecting the Setting] button to close the "Parameter of Slave Station" window.

11. Select [Close with Reflecting the Setting] to close the "CC-Link IE TSN Configuration" window.

12. Open the refresh parameter setting window and set as follows.

[Navigation window] ⇨ [Parameter] ⇨ [Module Information] ⇨ Model ⇨ [Basic Settings] ⇨ [Refresh Settings]

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
-	SB	512	00000	001FF		Specify Device	SB	512	00000	001FF
-	SW	512	00000	001FF		Specify Device	SW	512	00000	001FF
1	RX	64	00000	0003F		Specify Device	X	64	01000	0103F
2	RY	64	00000	0003F		Specify Device	Y	64	01000	0103F
3	RWr	64	00000	0003F		Specify Device	W	64	01000	0103F
4	RWw	64	00000	0003F		Specify Device	W	64	01100	0113F

13. Click the [Apply] button.

14. Write the set parameters to the CPU module of the master station and reset the CPU module of the master station, or power on the programmable controller.

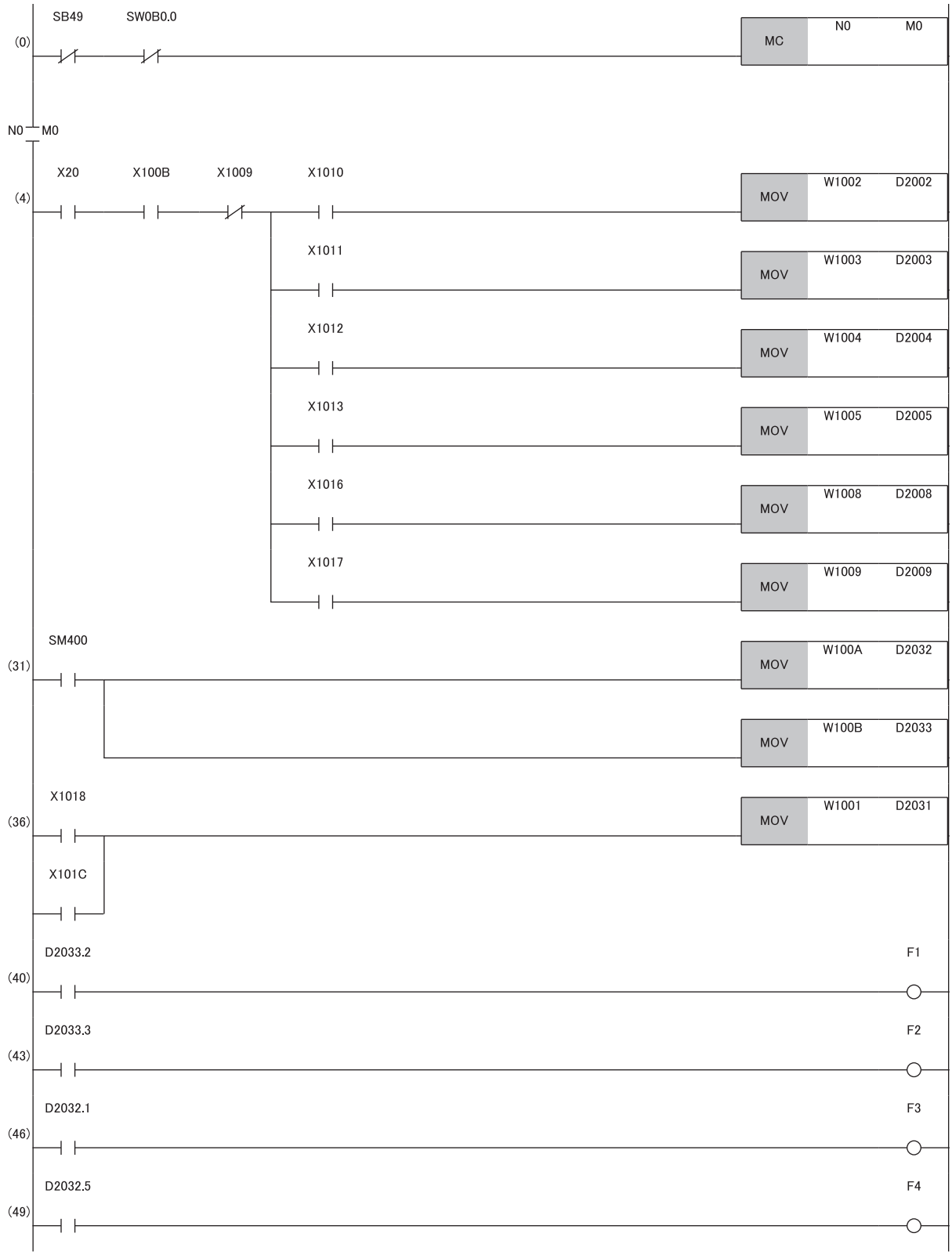
[Online] ⇨ [Write to PLC]

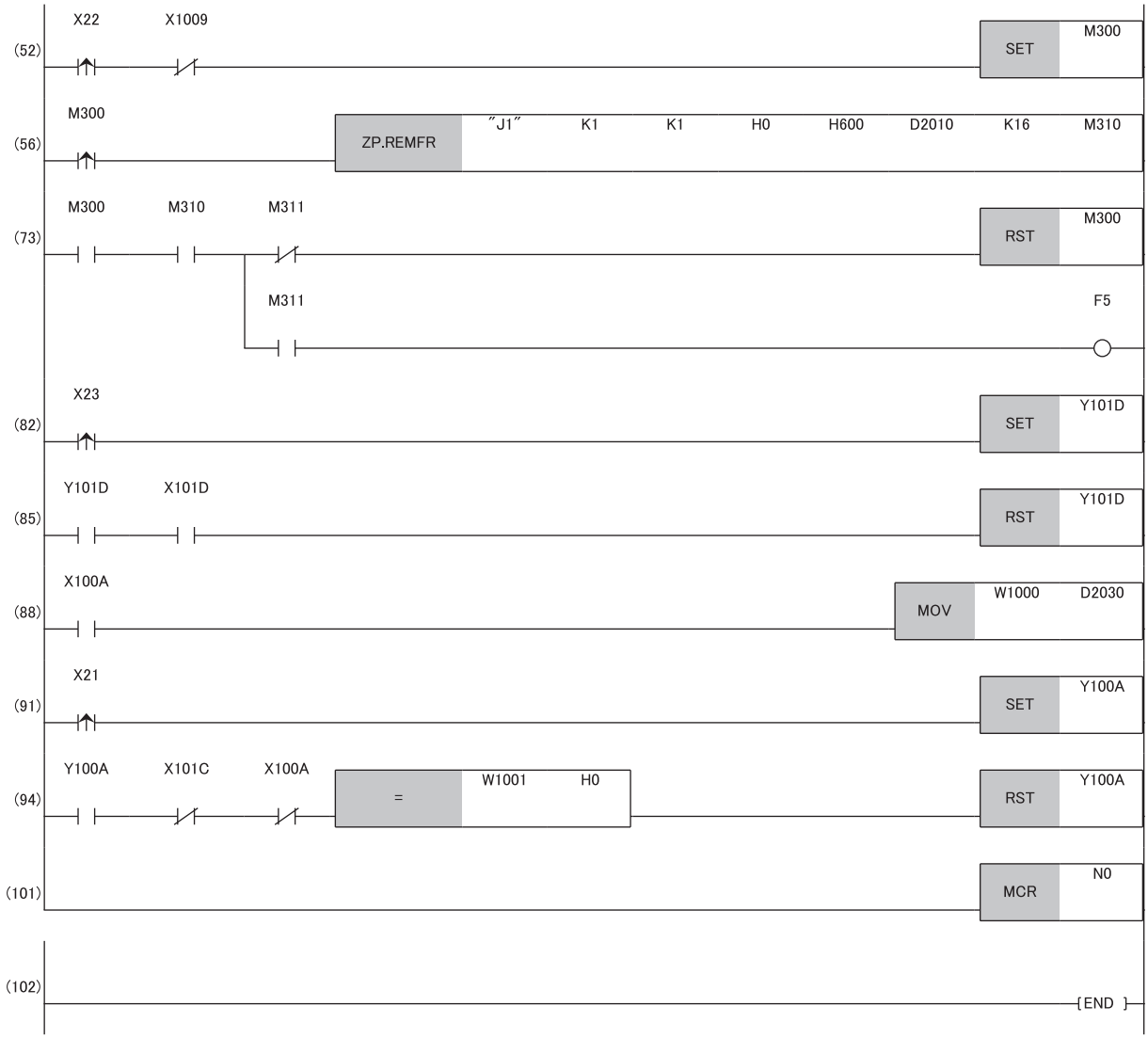
15. Set the CPU module of the master station to RUN, and check that the D LINK LED of the network interface module is turned on.

Point

In the program example, the default settings are used for parameters other than the above.

Program example





(0) Data link status of the remote station (station number 1) is checked.
(4) The digital operation value is read.
(31) Input signal error detection flag and Warning output flag are detected.
(36) The latest alarm code is read.
(40), (43) Processing at warning occurrence
(46), (49) Processing at input signal error occurrence
(52), (56), (73) The maximum and minimum values are read.
(82), (85) The maximum and minimum values are reset.
(88) The latest error code is read.
(91), (94) The latest error code and latest alarm code are cleared.

Program example for D/A Conversion

This section shows an example of the program to perform D/A conversion using the FA3-AT1T8X and FA3-AT1T8Y.

System configuration

For details, refer to the following.

☞ Page 163 System configuration

Assignment of devices

For details, refer to the following.

☞ Page 164 Assignment of devices

Programming conditions

For details, refer to the following.

☞ Page 165 Programming conditions

Devices to be used

Device	Description	Module
X24	Digital value write command	RX40C7 (X20 to X2F)
X25	Batch analog output enable command	
X26	Warning output clear command	
X27	Error clear command	
X1029	Initial data setting completion flag	FA3-AT1T8Y (RX0 to RX1F)
X102A	Error status flag	
X102B	Remote READY	
X103E	Warning output signal	
Y102A	Error clear request flag	FA3-AT1T8Y (RY0 to RY1F)
Y1030	CH1 Output enable/disable flag	
Y1031	CH2 Output enable/disable flag	
Y1032	CH3 Output enable/disable flag	
Y1033	CH4 Output enable/disable flag	
Y1036	CH7 Output enable/disable flag	
Y1037	CH8 Output enable/disable flag	
W1122	CH1 Digital value	FA3-AT1T8Y (RWw0 to RWw1F)
W1123	CH2 Digital value	
W1124	CH3 Digital value	
W1125	CH4 Digital value	
W1128	CH7 Digital value	
W1129	CH8 Digital value	
W1020	Latest error code	FA3-AT1T8Y (RWr0 to RWr1F)
W1021	Latest alarm code	
W1022	CH1 Set value check code	
W1023	CH2 Set value check code	
W1024	CH3 Set value check code	
W1025	CH4 Set value check code	
W1028	CH7 Set value check code	
W1029	CH8 Set value check code	
W102A	Warning output flag	
D3002	CH1 Device for storing digital value	
D3003	CH2 Device for storing digital value	
D3004	CH3 Device for storing digital value	
D3005	CH4 Device for storing digital value	

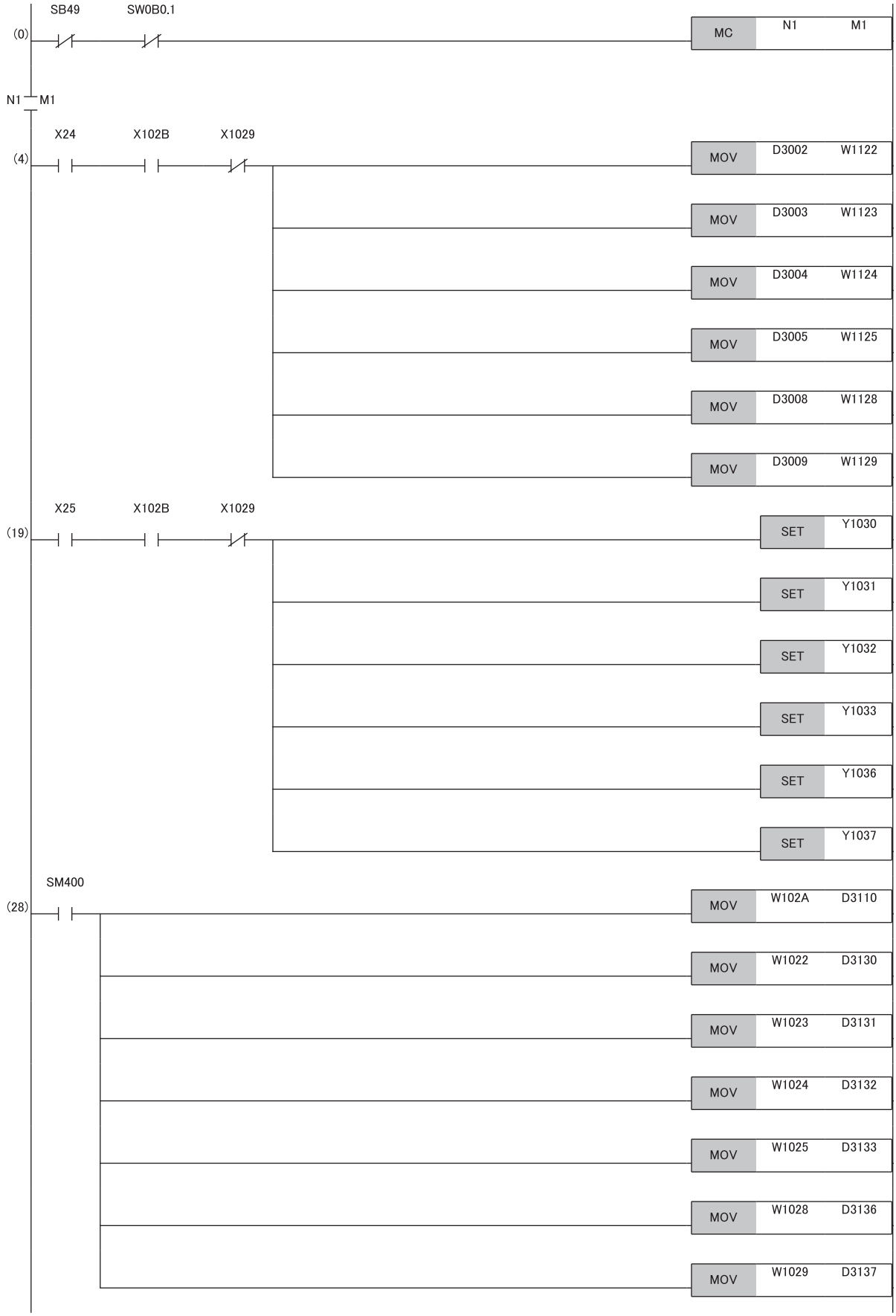
Device	Description	Module
D3008	CH7 Device for storing digital value	
D3009	CH8 Device for storing digital value	
D3100	Device for storing the latest error code	
D3110	Device for storing Warning output flag	
D3120	Device for storing the latest alarm code	
D3130	CH1 Device for storing set value check code	
D3131	CH2 Device for storing set value check code	
D3132	CH3 Device for storing set value check code	
D3133	CH4 Device for storing set value check code	
D3136	CH7 Device for storing set value check code	
D3137	CH8 Device for storing set value check code	
F10	CH2 Upper limit warning occurrence	
F11	CH2 Lower limit warning occurrence	
SM400	Always ON	
SB49	Data link error status of the own station (master station)	
SW0B0.1	Data link status of the remote station (station number 2)	
M1	Communication ready flag	
N1	Nesting	

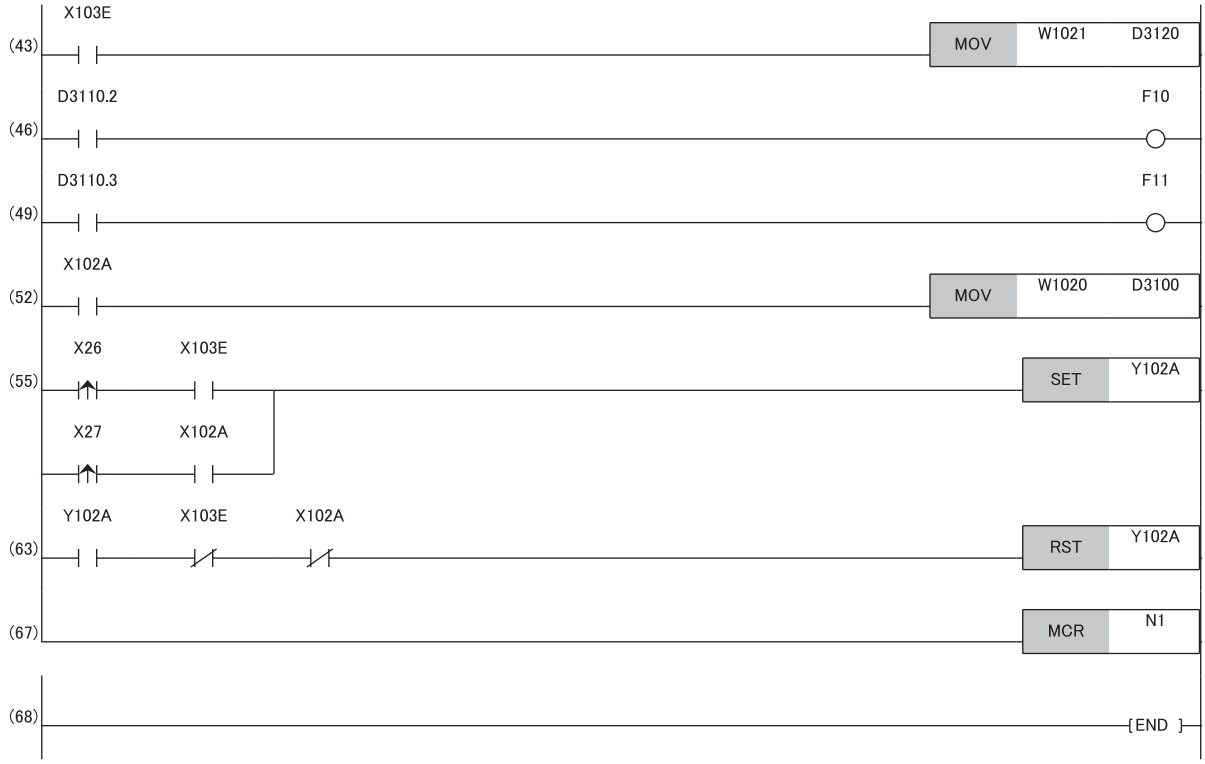
Parameter setting

For details, refer to the following.

☞ Page 167 Parameter setting

Program example





(0) Data link status of the remote station (station number 2) is checked.
(4) A digital value is written.
(19) The output of the D/A conversion value is allowed.
(28) Detection processing for Warning output flag and Set value check code is performed.
(43) The latest alarm code is read.
(46), (49) The processing to be performed when a CH2 warning occurs is performed.
(52) The latest error code is read.
(55), (63) The latest error code and latest alarm code are cleared.