MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow

FATEC

Mitsubishi Programmable Controllers
Training Manual
CC-Link IE Controller Network
(for GX Works2)

● SAFETY PRECAUTION ●

(Always read these instructions before using the products.)

When designing the system, always read the relevant manuals and give sufficient consideration to safety.
During the exercise, pay full attention to the following points and handle the product correctly.

[EXERCISE PRECAUTIONS]

⚠ WARNING

- Do not touch the terminals while the power is on to prevent electric shock.
- Before opening the safety cover, make sure to turn off the power or ensure the safety.
- Do not touch the movable portion.

⚠ CAUTION

- Follow the instructor's directions during the exercise.
- Do not remove the module of the demonstration machine or change wirings without permission.
  Doing so may cause failures, malfunctions, personal injuries and/or a fire.
- Turn off the power before installing or removing the module.
  Failure to do so may result in malfunctions of the module or electric shock.
- When the demonstration machine (such as X/Y table) emits abnormal odor/sound, press "Power switch" or "Emergency switch" to turn it off.
- When a problem occurs, notify the instructor as soon as possible.

REVISIONS

*The textbook number is written at the bottom left of the back cover.

Print date	*Textbook number	Revision
Mar., 2014	SH-081375ENG-A	First edition

CONTENTS

INTRODUCTION ..... (4)
Generic terms and abbreviations ..... (5)

CHAPTER 1 OVERVIEW 1- 1 to 1-14

1.1 CC-Link IE 1- 1
1.2 Overview 1- 2
1.3 Features 1- 3
1.3.1 Function list 1- 9
1.4 Abbreviations 1-10
1.5 System configuration of CC-Link IE Controller Network 1-11
1.5.1 Single network system 1-11
1.5.2 Multiple network system 1-12
1.6 Applicable systems 1-13

CHAPTER 2 PRACTICAL EXERCISES, PARAMETER TYPES, AND SETTINGS AND PROCEDURES BEFORE OPERATION 2- 1 to 2- 6

2.1 Practical exercises 2- 1
2.2 Parameter types 2- 2
2.3 Procedures and settings before operation 2- 6

CHAPTER 3 EXERCISE 1 (CYCLIC TRANSMISSION) 3- 1 to 3- 68

3.1 System configuration for the training 3- 1
3.2 Name of CC-Link IE Controller Network module (QJ71GP21-SX) 3- 3
3.3 Testing the CC-Link IE Controller Network Module (QJ71GP21-SX) 3- 5
3.3.1 Hardware test 3- 6
3.3.2 Self-loopback test 3- 9
3.4 Cable connection 3-12
3.5 Cabling status check 3-13
3.5.1 Circuit test 3-13
3.5.2 Station-to-station test 3-16
3.6 Writing to the CPU module 3-19
3.6.1 Starting GX Works2 3-19
3.6.2 Sequence program reading 3-20
3.6.3 Specify connection to the PLC 3-21
3.6.4 Writing of the sequence program and the CPU parameter 3-22
3.7 Setting parameters 3-23
3.7.1 Set parameters with GX Works2 3-24
3.8 Sequence program 3-27
3.8.1 Cyclic transmission (Configuration with 2 stations) 3-27
3.9 Diagnosing CC-Link IE Controller Network from GX Works2 (Online test) 3-30
3.9.1 Network information display 3-31
3.9.2 Select station network device status display 3-34
3.9.3 Logging 3-36
3.9.4 System monitor 3-38
3.9.5 Remote operation 3-42
3.10 Access directly to link devices of Network module (Direct Access) 3-43
3.10.1 Direct access operation 3-45
3.10.2 Using direct access in system configuration with 2 stations 3-47

3.11 Additional exercise with cyclic transmission function ····· 3-50
3.11.1 Cyclic transmission (Configuration with 3 stations) ····· 3-50
3.11.2 Cyclic transmission Practice of 5 modules configuration ····· 3-55

CHAPTER 4 EXERCISE 2 (TRANSIENT TRANSMISSION) 4- 1 to 4-18

4.1 Transient transmission function ····· 4- 1
4.1.1 Link dedicated instruction types and description ····· 4- 1
4.1.2 Instruction format ····· 4- 2
4.1.3 Confirm the possibility of communication using dedicated instructions ····· 4-10
4.2 Other station access operation ····· 4-16

CHAPTER 5 EXERCISE 3 (ROUTING FUNCTION) 5- 1 to 5-20

5.1 Routing function ····· 5- 1
5.2 Demonstration machine system ····· 5- 2
5.3 Routing parameter ····· 5- 3
5.4 Communication test ····· 5- 5
5.5 Confirm the operation using PLC program ····· 5- 8
5.5.1 Other station word device Read/Write ····· 5- 8
5.5.2 Parameter settings ····· 5-10
5.5.3 Sequence program ····· 5-14
5.6 Multiple network (Interlink transmission) ····· 5-16
5.6.1 Performing interlink transmission of multiple network ····· 5-16

APPENDIX App.- 1 to App.-64

Appendix 1 Comparison of network module specifications and compatibility ····· App.- 1
Appendix 1.1 List of the comparison of specifications between CC-Link IE and MELSECNET/H ····· App.- 1
Appendix 2 Differences between QJ71GP21-SX/QJ71GP21S-SX and QJ71LP21/QJ71LP21-25/QJ71LP21S-25/QJ71BR11 ····· App.- 2
Appendix 2.1 Differences in LED display and switch settings ····· App.- 2
Appendix 2.2 Precautions for replacing QJ71LP21/QJ71LP21-25/QJ71LP21S-25/QJ71BR11 with QJ71GP21-SX/QJ71GP21S-SX ····· App.- 3
Appendix 3 Link special relay (SB) list ····· App.- 4
Appendix 4 Link special register (SW) list ····· App.-10
Appendix 5 Error codes ····· App.-21
Appendix 5.1 Error code of controller network ····· App.-21
Appendix 6 Overview of interrupt program start ····· App.-30
Appendix 6.1 Interrupt setting parameter ····· App.-31
Appendix 6.2 Interrupt by the RECVS instruction ····· App.-33
Appendix 6.3 Interrupt by cyclic transmission link device (LB/LW/LX) ····· App.-34
Appendix 6.4 Interrupt by link special device (SB/SW) ····· App.-36
Appendix 6.5 Message received "Scan completed" instruction (RECVS instruction) ····· App.-37
Appendix 6.6 Example of use ····· App.-40
Appendix 6.7 Additional practice 1 (Interrupt processing) ····· App.-42
Appendix 7 Programming ····· App.-50
Appendix 7.1 Precautions on programming ····· App.-50
Appendix 7.1.1 Interlock related signals ····· App.-50
Appendix 7.1.2 Example of interlock program ····· App.-52
Appendix 7.2 Cyclic transmission ····· App.-53
Appendix 7.2.1 32-bit data assurance ····· App.-53
Appendix 7.2.2 Block data assurance per station setting ····· App.-54
Appendix 7.2.3 Example of interlock program ····· App.-56
Appendix 7.3 Transient transmission ····· App.-57
Appendix 8 Additional task 2 (Communication using LX, LY) ····· App.-58

INTRODUCTION

This textbook describes the basic usage and the programming of CC-Link IE Controller Network System for MELSEC-Q Series.

Related Manuals

- MELSEQ-Q CC-Link IE Controller Network Reference Manual ····· SH-080668ENG
- Before Using the Product ····· BCN-P5790E
- QCPU User's Manual (Hardware Design, Maintenance and Inspection) ····· SH-080483ENG
- QCPU User's Manual (Function Explanation, Program Fundamentals)····· SH-080807ENG
- GX Works2 Version1
  Operating Manual (Common) ····· SH-080779ENG
- GX Works2 Version1
  Operating Manual (Simple Project) ····· SH-080780ENG

Generic terms and abbreviations

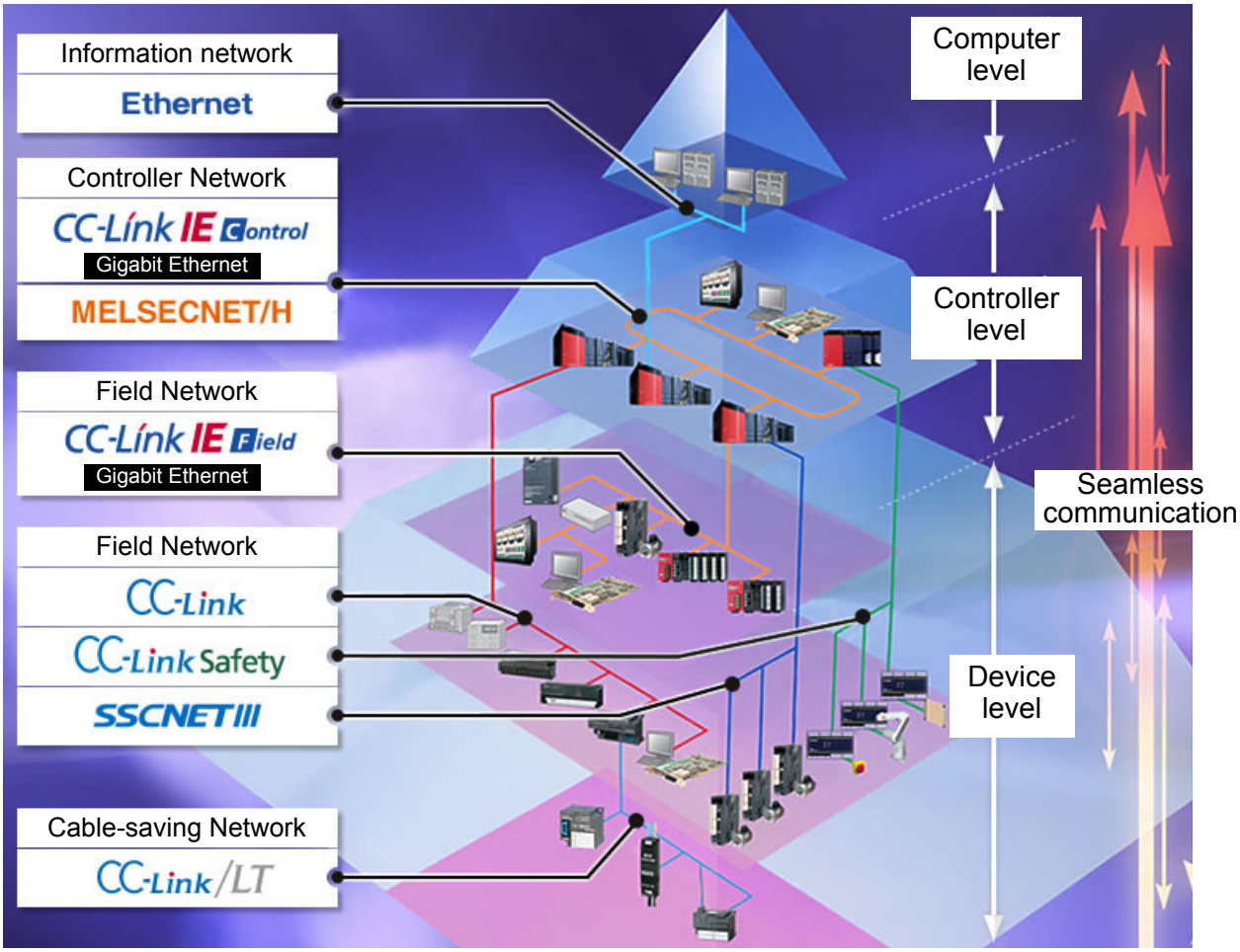
Generic term/abbreviation	Description
QJ71GP21	Abbreviation for the QJ71GP21-SX and QJ71GP21S-SX CC-Link IE Controller Network module
QJ71BR11	Abbreviation for the QJ71BR11 MELSECNET/H network module
QJ72LP25	Abbreviation for the QJ72LP25-25 MELSECNET/H network module
QJ72BR15	Abbreviation for the QJ72BR15 MELSECNET/H network module
Master module	Abbreviation for the QJ71LP21, QJ71BR11
Network module	Generic term for the master module, remote I/O module
CC-Link IE Controller Network	Abbreviation for the Q Corresponding CC-Link IE Controller Network
MELSECNET/H	Abbreviation for the Q Corresponding MELSECNET/H
MELSECNET/10	Abbreviation for the AnU and QnA/Q4AR Corresponding MELSECNET/10
High Performance model QCPU	Generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU modules
Universal model QCPU	Generic term for the Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UD(E)CPU, Q04UD(E)HCPU, Q06UD(E)HCPU, Q10UD(E)HCPU, Q13UD(E)HCPU, Q20UD(E)HCPU, Q26U(E)DHCPU, Q50UDEHCPU, Q100UDEHCPU CPU mpdules
GX Works2	Abbreviation for the GX Works2 software package

Memo

CHAPTER 1 OVERVIEW

1.1 CC-Link IE

CC-Link IE is an integrated network for realizing seamless data transmission from the information system to the production site. In addition to the existing control information transmission, it realizes the coexistence of the instrumental information maintenance, prevention, and device settings.



CC-Link IE

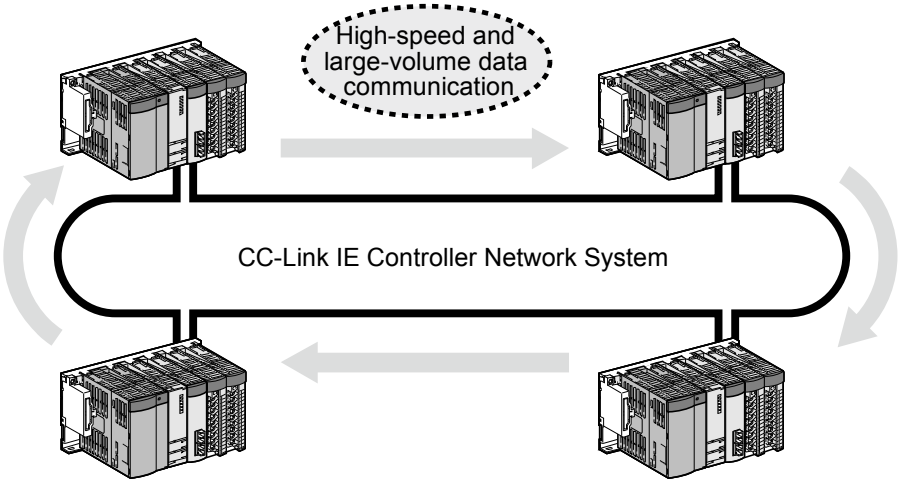
IE : Industrial Ethernet

CC-Link IE is an Ethernet-based controller network for industry.

1.2 Overview

The CC-Link IE Controller Network system is an improved system that has higher performances, a higher processing speed, and a larger data capacity than the MELSECNET/H network system (PLC to PLC network).
Also, the simplicity of use of CC-Link IE Controller Network system has been improved and it is possible to realize easily the network of FA system with combination with GX Works2.

Also, in this textbook, the Q series CC-Link IE Controller Network is abbreviated in "CC-Link IE" and MELSECNET/H Network System is abbreviated in "MELSECNET/H".



POINT

(1) For the PLC for the CC-Link IE Controller Network, select a High Performance model QCPU or a Universal Model QCPU.
(2) CC-Link IE modules and MELSECNET/H modules cannot co-exist in the same network (different network numbers must be used).
(3) CC-Link IE Controller Network does not have the same functions as the remote I/O network of MELSECNET/H.

1.3 Features

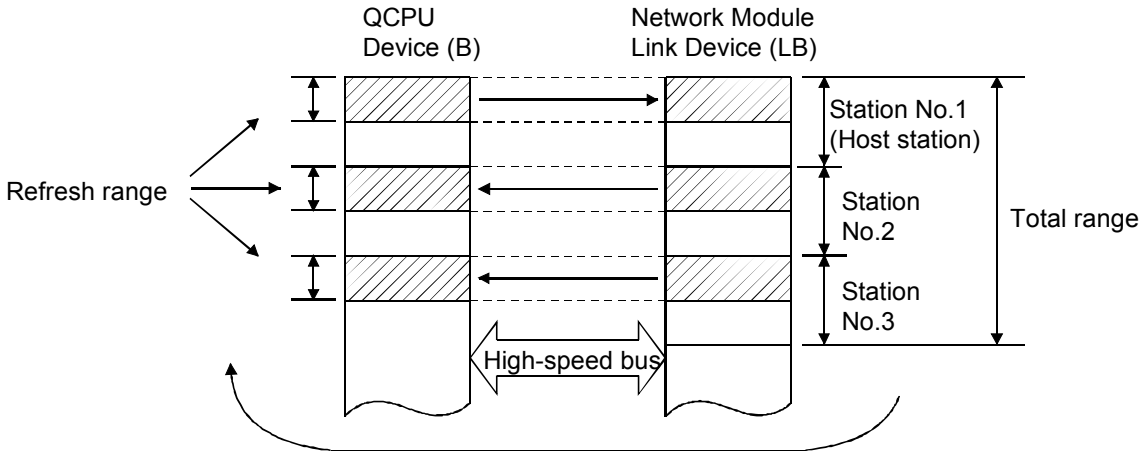
The CC-Link IE Controller Network has the following features comparing to MELSECNET/H (PLC to PLC network).

(1) Realization of high-speed communication system

(a) CC-Link IE Controller Network can operate high-speed data communication at 1Gbps.

(b) High-speed data update of cyclic communication
The performance of the cyclic data update has been improved.
The transmission delay time becomes shorter and the total operation cycle can be reduced.

(c) Reduce the number of points of the link refresh that are not used in the sequence program by segmentalization of refresh parameters (256 divisions per module (Exclude SB and SW)). Refresh time can be then reduced.
* Universal model QCPU: 256 divisions per module
* High Performance model QCPU: 64 divisions per module



(2) Large-scale and flexible system configuration

(a) The link device has a larger capacity: 32768 points (4 Kbyte) for the link relay (LB), and 131072 points (256 Kbyte) for the link register (LW).

(b) Using link devices of the CC-Link IE Controller Network module allows periodical exchange of large volume data between stations in the same network.
• Number of link points per station: Max. 16k points (both of LB/LW)

(c) The number of link points per station can now be set to a maximum of 32k bytes (16k points).

(d) Up to 960 words can be transmitted with the dedicated instructions (SEND, RECV, RECVS, READ, SREAD, WRITE, SWRITE) that send and receive data from other stations on the CC-Link IE Controller Network (same as in case of MELSECNET/H).

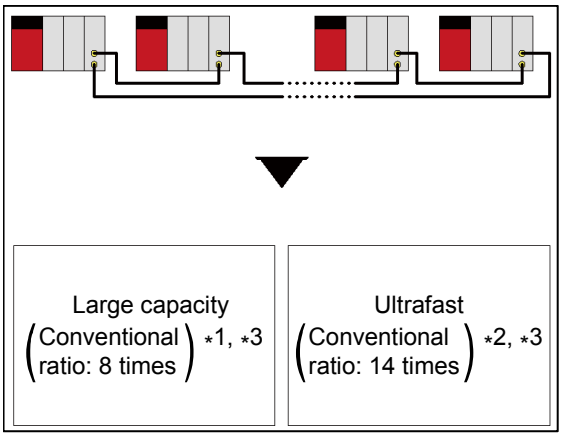
(e) It is possible to communicate with a programmable controller on other station by the transient transmission function.

(f) The system can be expanded to a maximum of 239 networks.

(g) Increased data volume for cyclic transmission

The network type shared memory (cyclic data) with 256 Kbyte is realized in the same network.

The same network No. can be used, and systems to handle large volume data can be easily achieved.



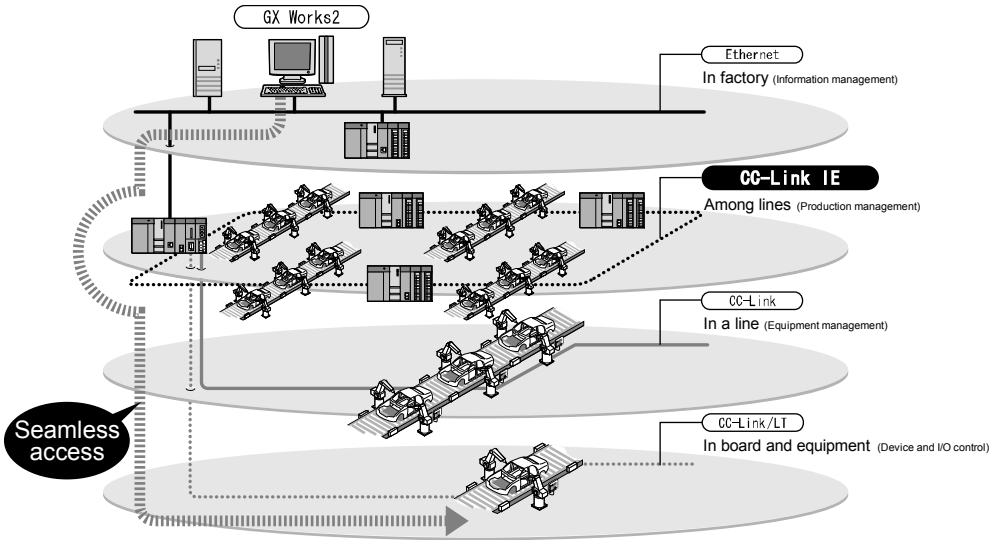
*1: Shared memory size comparison (with MELSECNET/H)

*2: Cyclic data update speed comparison (with MELSECNET/H)

*3: Comparison according to the following conditions.

- 32 modules in network configuration
- Each station has 2k points of LW area specified by equal assignment
- No disconnected station and returned stations

(h) The system which consists of Ethernet, CC-Link IE, MELSECNET/H, MELSECNET/10, and CC-Link can be accessed seamlessly.

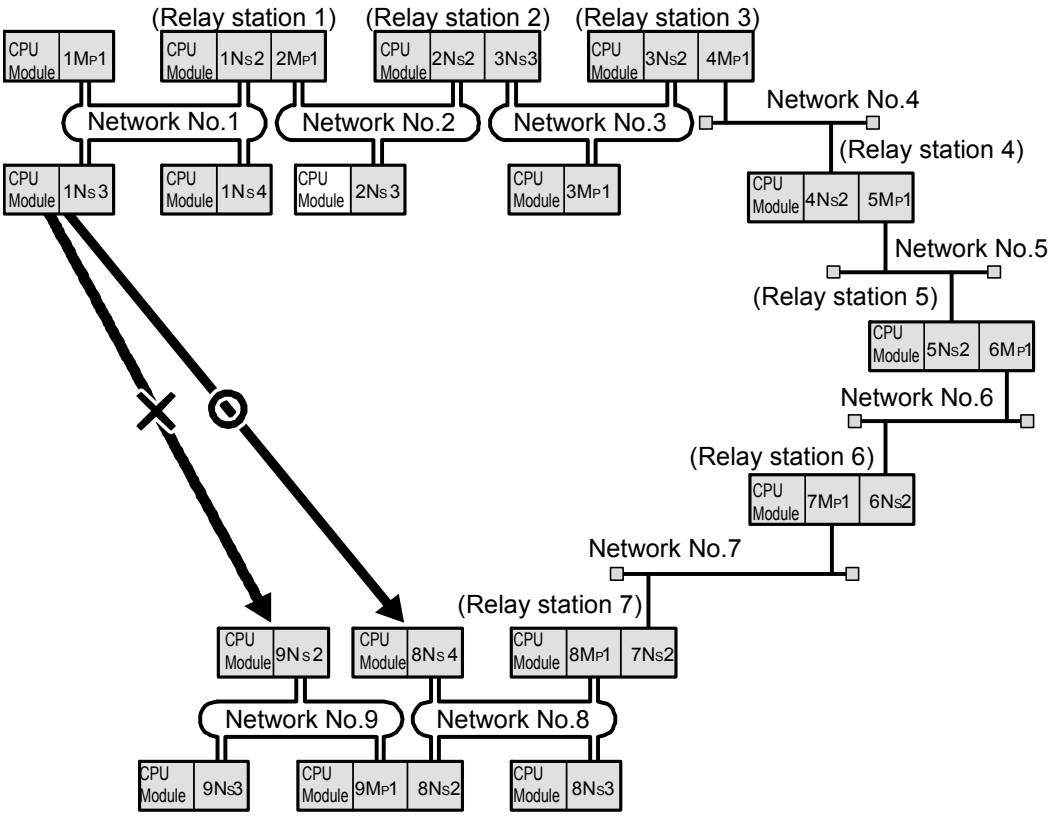


(i) During the transient transmission, it is possible to guarantee the punctuality of cyclic transmission.

(Cyclic transmission punctuality assurance)

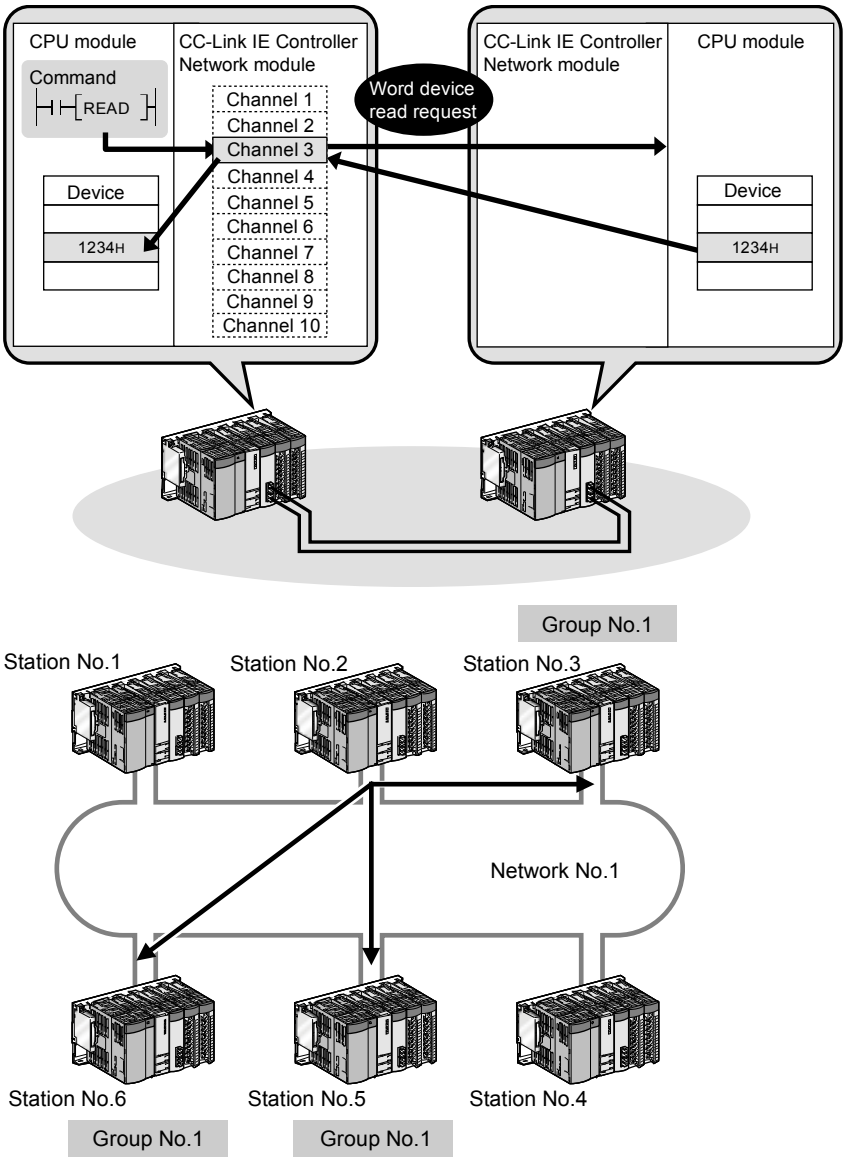
It is possible to build an application without considering the influence of transient transmission to the link scan time.

(j) By using routing function, N:N communication (Transient transmission) can be performed to stations up to eight networks apart.
The transient transmission with the routing function works not just with CC-Link IE network system only, but also with system including MELSECNET/H.



(k) A noise-resistant optical loop system that provides long station-to-station distance and overall cable length up to 66 km is adopted.

(3) A wide variety of communication services/possibilities/options
The transient transmission allows communication with another station using dedicated instructions or with GX Works2. The group function allows data to be sent to all stations of the same group number (transient transmission target stations are specified as a group).



(4) Enhanced RAS functions

(a) Thanks to the control station switching function, even if the control station goes down, a normal station (sub-control station) takes over the control to continue data link

(b) Thanks to the automatic return function, when a faulty station recovers from the error, the station is automatically reconnected to the network and restarts the data communication.

(c) Because of the cable fault detection function, a cable fault can be detected as a cause of a communication error.

(d) Because of the cable insertion error detection function, an incorrect cable connection between OUT and IN can be detected as a cause of loopback or disconnection from the network.

(e) Thanks to the loopback function, any disconnected cable or faulty station is isolated from the network and the data communication can be continued among normally operating stations.

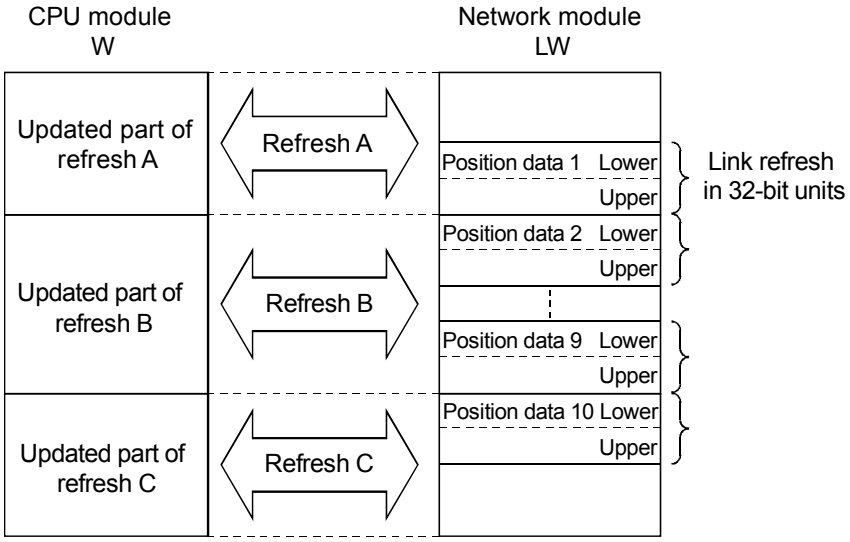
(f) Because of the detection of duplicated control station or station number function, a duplication of the control station or station No. can be detected as a cause of loopback or disconnection from the network.

(g) The network module can continue transient transmissions even if an error that stops the CPU module occurred.

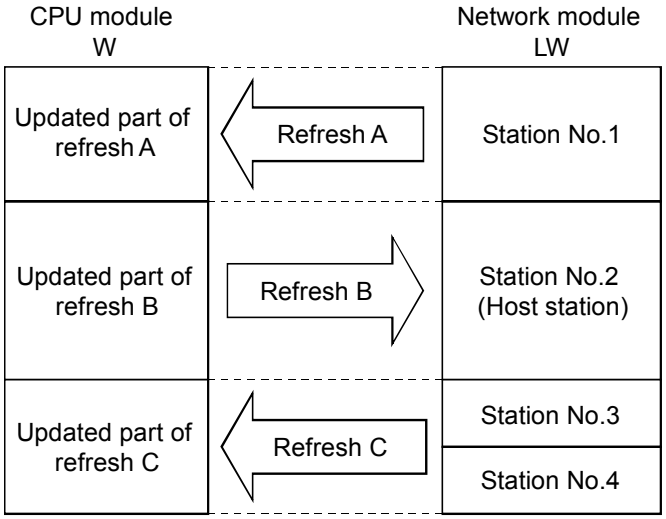
(h) Thanks to the external power supply function, the external power can be directly supplied to the CC-Link IE Controller Network module.
Even if a CPU module power goes down in a network, data link will continue among normally operating stations
without being disrupted at the power-down station. (Loopback does not occur.).
Data link is also continued between more than one station where CPU module power has gone down.

(5) Enhancements and compatibility of network functions

(a) Because of the 32-bit data assurance, the integrity of data can be assured in unit of 2 points (32-bits) without using program interlock.



(b) Using station-based block data assurance, multiple points of cyclic data can be assured without a program interlock.

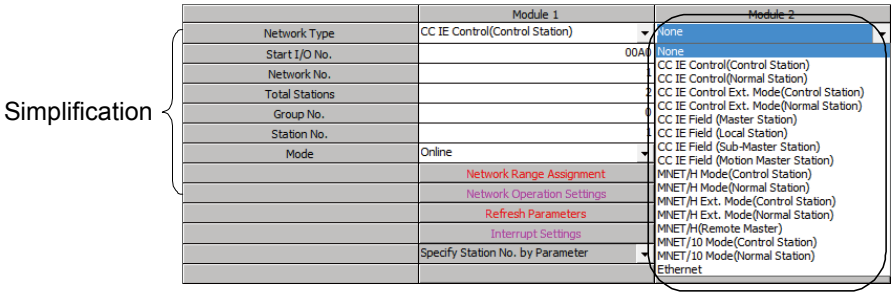


(6) Improved network configuration with GX Works2

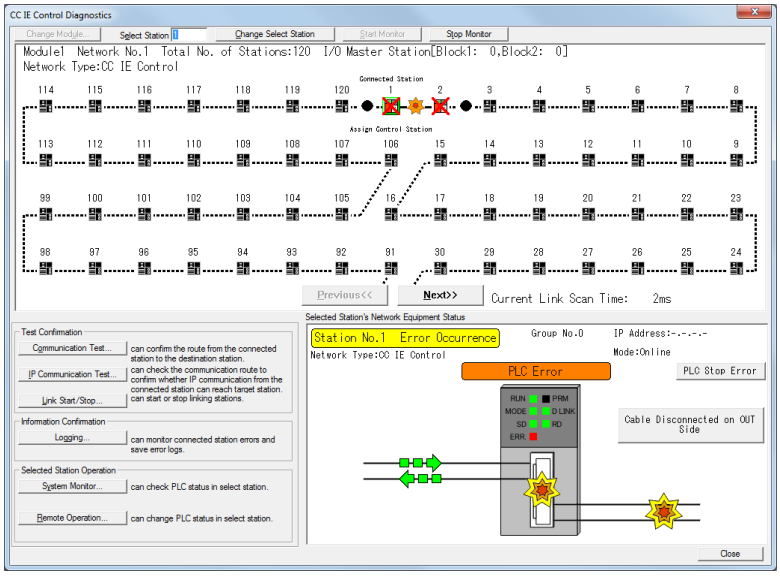
(a) Network parameter settings can be easily set using pulldown menus or dialog boxes.

(b) The settings of network No., group No., and the operation mode (station number) are configured only in the software.

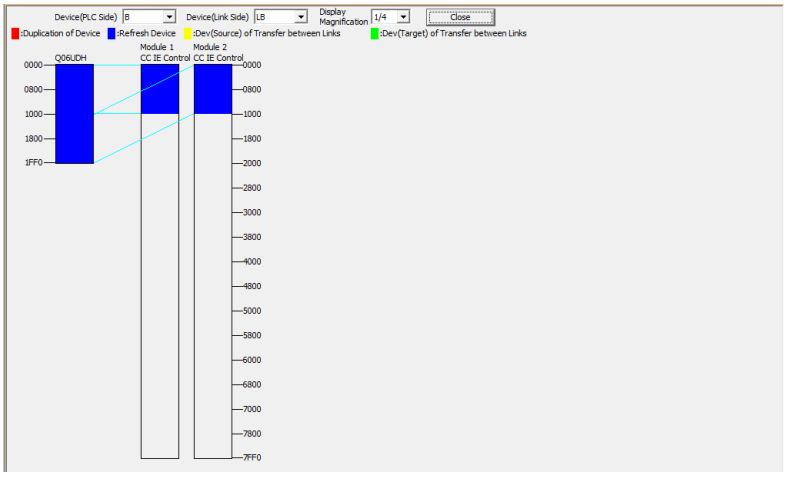
(Network parameters)



(c) Simplicity of troubleshooting has been improved thanks to [CC-Link IE Controller Network diagnostics].



(d) [Assignment image] is available. When multiple network modules are mounted to a network system, whether the same device is set more than once can be checked after assigning refresh parameters and interlink transmission devices to the network system.



1.3.1 Function list

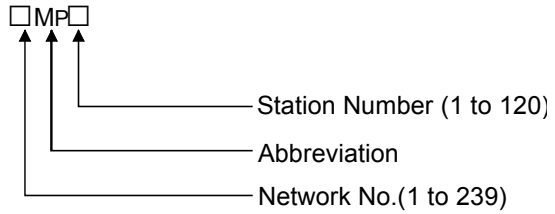
Item		CC-Link IE Controller Network Module/PC interface board
Data communication function	Cyclic transmission	• Refreshes the link relay and the link register assigned by the network common parameters to all the stations in a same network periodically. • 32 bit data assurance for link register • Station-based block data assurance (Assure data the transmission data in 1 station unit) • Group cylic
	Transient transmission	• N:N communication (Monitor, program upload or download) • Various dedicated instructions from the sequence program (READ, SREAD, WRITE, SWRITE, REQ, SEND, RECV, RECVS, ZNRD, ZNWR, RRUN, RSTOP, RTMRD, RTMWR)and CC-Link dedicated instructions (RIRD/RIWT) • Group function (Simultaneous broadcast of transient transmission) • Routing function (Data can be transmitted to the stations of other networks where the own station is not connected directly)
	Others	• Interrupt program (Interruption by data reception of other station) • Interlink transmission (When there is multiple networks, cyclic data are automatically transmitted to the other network)
Maintenance function		• Offline test (hardware test, Self-loopback test) • Network diagnostics by GX Works2 (Network status, monitor of other station status) • Network diagnostics by SB/SW • Control station switching function (Alternative administration station function for an faulty control station) • Loopback function • External power supplied function is supported • Optical fiber cable check function enhancement (Connector insertion error, fault detection)

1.4 Abbreviations

(1) Abbreviation

Abbreviation	Name
MP	Control station
NS	Normal station

(2) Symbol format



(Example)

(1) Network No.3, control station, station No. 6 ····· 3MP6

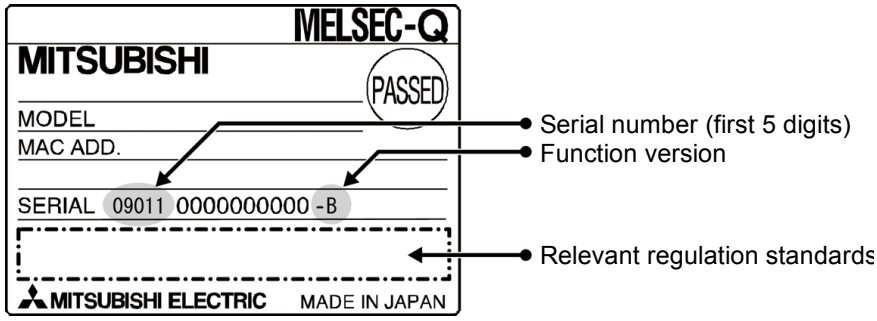
(2) Network No.5, normal station, station No. 3 ····· 5NS3

1.5 System configuration of CC-Link IE Controller Network

This section describes the system that can be configured with the CC-Link IE Controller Network.

REMARK

The serial No. and function version of the Network module can be confirmed on the rating plate (situated on the side face of the module).



1.5.1 Single network system

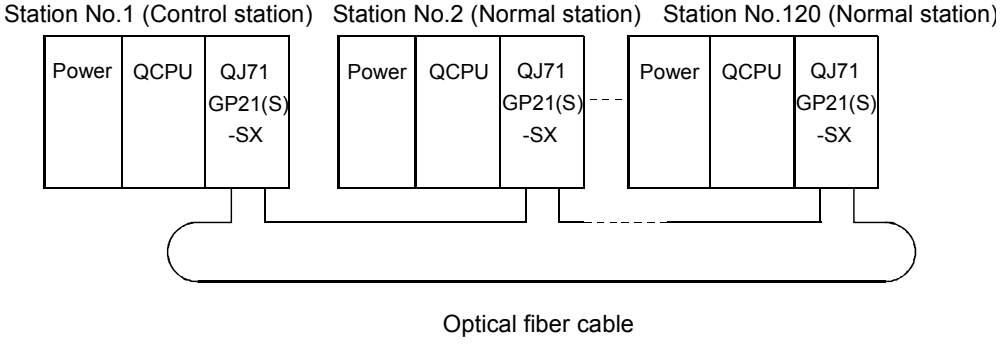
The transmission in the CC-Link IE Controller Network is performed in the optical loop system only.

(1) Optical loop system

(a) When a Universal model QCPU is used for a control station
Up to 120 stations including one control station and 119 normal stations can be connected.

(b) When a high performance QCPU is used for a control station
Up to 64 stations including one control station and 63 normal stations can be connected.

Any station number can be set as a control station. However, the control station must be only one station in one network
In the system below, the station No. 1 is set as a control station.

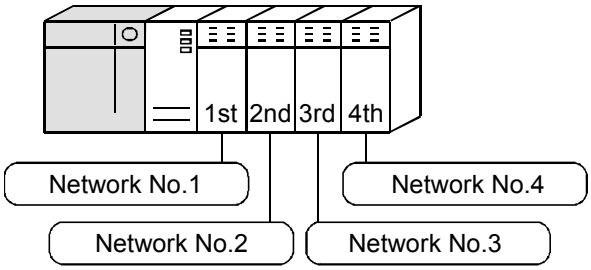


1.5.2 Multiple network system

The multiple network system is a system in which multiple networks are connected by relay stations.

(1) Any network No. can be set from range 1 to 239.

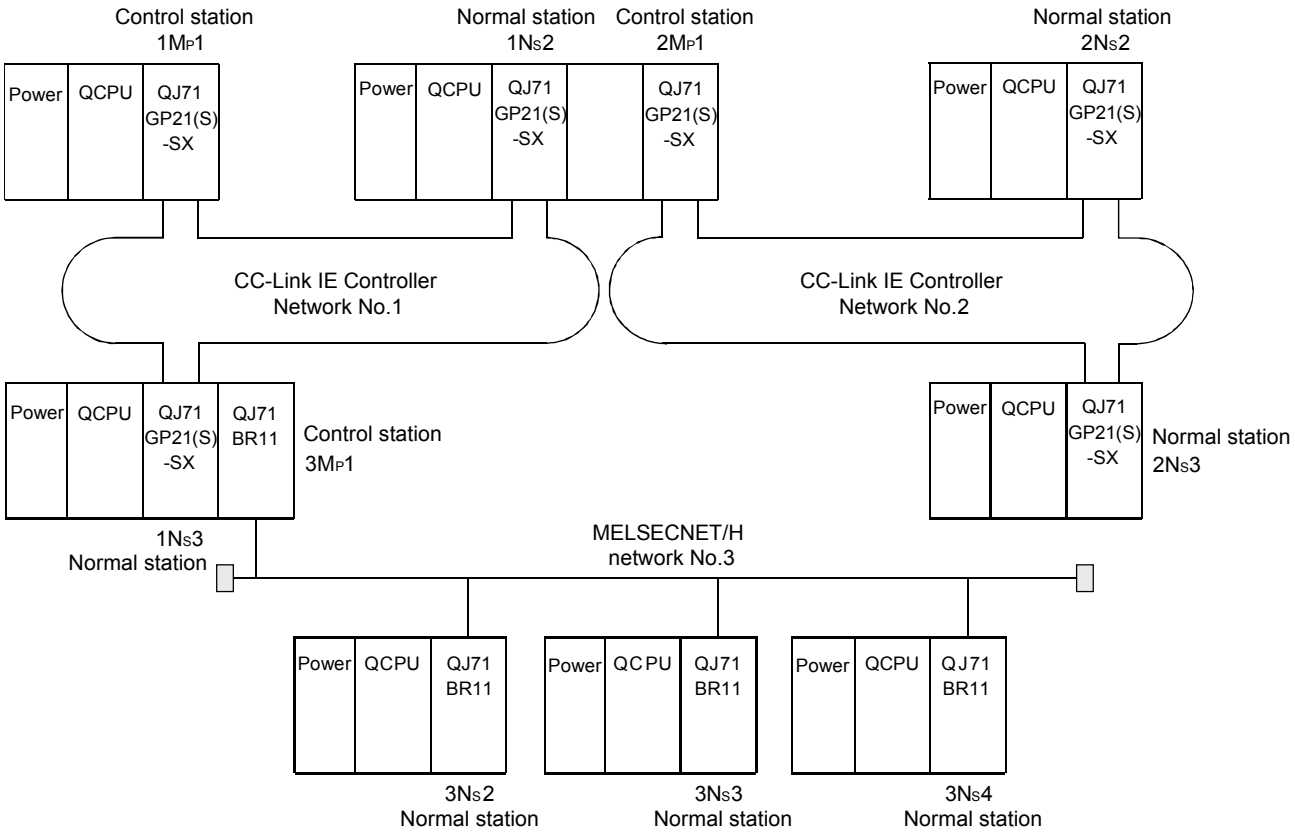
(2) It is possible to mount a maximum of 4*1 network modules to one PLC.



*1: High Performance model QCPU: Max. 2 modules (Max. 4 modules including MELSECNET/H)
Universal model QCPU
- Q02UCPU: Max. 4 modules (Max. 2 modules including MELSECNET/H)
- Other than Q02U: Max. 2 modules (Max. 4 modules including MELSECNET/H)
- In case of Q00UJ, Q00U and Q01U it is not possible to mount multiple modules.

(1) Configuration

The following shows an example with 3 networks connected.



1.6 Applicable systems

This section describes the applicable systems.
The number of mountable modules represents the maximum number of CC-Link IE Controller Network modules that can be used together with MELSECNET/H modules.

(1) Applicable modules and base units, and number of modules

(a) When mounted with a CPU module

The table below lists the CPU modules and base units applicable to the CC-Link IE Controller Network module and quantities for each CPU model.
Depending on the combination with other modules or the number of mounted modules, power supply capacity may be insufficient.
Pay attention to the power supply capacity before mounting modules, and if the power supply capacity is insufficient, change the combination of the modules.

Applicable CPU module				No. of modules*1	Base unit*2	
CPU type		CPU Model	CPU module version		Main base unit	Extension base unit
Programmable controller CPU	Basic model QCPU	Q00JCPU	Function version B or later	Max. 1*3	○	○
		Q00CPU				
		Q01CPU				
	High Performance model QCPU	Q02CPU	First 5 digits of Serial No. is 09012 or later.	Max. 2*4	○	○
		Q02HCPU				
		Q06HCPU				
		Q12HCPU				
		Q25HCPU				
	Process CPU	Q02PHCPU	From the first product	Max. 2*4	○	○
		Q06PHCPU				
		Q12PHCPU	First 5 digits of Serial No. is 10042 or later.			
		Q25PHCPU				
	Redundant CPU	Q12PRHCPU	First 5 digits of Serial No. is 10042 or later.	Max. 2*5	○	×
		Q25PRHCPU				
	Universal model QCPU	Q00UJCPU	From the first product	Max. 1*6	○	○
		Q00UCPU				
		Q01UCPU				
		Q02UCPU	First 5 digits of Serial No. is 09042 or later.	Max. 2*6	○	○
		Q03UDCPU	First 5 digits of Serial No. is 09042 or later.	Max. 4*6	○	○
		Q04UDHCPU				
		Q06UDHCPU				
		Q10UDHCPU	From the first product			
		Q13UDHCPU				
		Q20UDHCPU				
		Q26UDHCPU				
		Q03UDECPU				
		Q04UDEHCPU				
		Q06UDEHCPU				
		Q10UDEHCPU				
		Q13UDEHCPU				
		Q20UDEHCPU				
		Q26UDEHCPU				
		Q50UDEHCPU				
		Q100UDEHCPU				

○: Applicable, ×: N/A

Applicable CPU module				No. of modules*1	Base unit*2	
CPU type		Model name	CPU module version		Main base unit	Extension base unit
Programmable controller CPU	Safety CPU	QS001CPU	First 5 digits of Serial No. is 10032 or later.	Max. 1*3	○	×*7
C Controller module		Q06CCPU-V-H01	×	N/A	×	×
		Q06CCPU-V	First 5 digits of Serial No. is 10012 or later.	Max. 4*6	○	○
		Q06CCPU-V-B	×	N/A	×	×
		Q12DCCPU-V	From the first product	Max. 4*6	○	○

○: Applicable, ×: N/A

*1: Limited within the range of I/O points for the CPU module.
*2: Can be installed to any I/O slot of a base unit.
*3: For use with a Basic model QCPU or safety CPU:
Use a CC-Link IE Controller Network module of function version D or later.
*4: For use with a High Performance model QCPU or Process CPU when total number of stations in a network is 65 or more:
Use a CC-Link IE Controller Network module whose serial No. (first five digits) is 09042 or later.
*5: For use with redundant CPUs:
It shows the number of modules that can be mounted to one of the two systems.
Use a CC-Link IE Controller Network modules of function version D or later.
*6: For use with a Universal model QCPU or C Controller module:
Use a CC-Link IE Controller Network module whose serial No. (first five digits) is 09042 or later.
*7: Connection of extension base units is not available with any safety CPU.

REMARK

For details on C Controller modules, refer to the C Controller module User's manual (Detailed).

(b) Mounting to a MELSECNET/H remote I/O station
The CC-Link IE Controller Network module cannot be mounted to any MELSECNET/H remote I/O station.
Mount it to a remote master station.

(2) Support of the multiple CPU system
When using the CC-Link IE Controller Network module in the multiple CPU system, refer to the QCPU User's Manual (Multiple CPU System) first.

(a) Applicable CC-Link IE Controller Network module
The function version of the CC-Link IE Controller Network module has been "B" from the first release and it supports the multiple CPU system.

(b) Network parameters
Network parameters must be set to the control CPU of the CC-Link IE Controller Network module.

CHAPTER 2 PRACTICAL EXERCISES, PARAMETER TYPES, AND SETTINGS AND PROCEDURES BEFORE OPERATION

2.1 Practical exercises

Following table shows the content of practical exercises.

Item		Check item
Task I (Cyclic transmission)	Common parameters	Confirm that the data link can be performed by setting parameters with peripheral devices.
	Monitor/test of peripheral devices	Confirm the data link status with the monitor and test of peripheral devices.
	Direct access	Confirm that the link devices (LB, LW, LX, LY, SB, SW) of network module can be read and written directly.
Task II (Transient transmission)	Link dedicated instructions	Confirm that the transient transmission can be performed by the SEND/RECV instruction.
	Other station access operation	Confirm that when accessing other station, the same functions can be used as during the own station access.
Task III (Routing function)	Routing parameters	Confirm that a PLC that is in another network can be accessed via multiple networks.

2.2 Parameter types

To operate the CC-Link IE Controller Network, it is required to set the parameters of network module mounted to PLC CPU by GX Works2.
The parameter setting starts from the CC-Link IE Controller Network No. selection to detailed functional settings.
Each parameter setting screen is shown below. (The setting descriptions are examples.)

(1) Number of modules setting (Network type)
Set the network type and station type for each module.
In the CC-Link IE Controller Network module, up to four modules*1, or up to eight modules when including Ethernet, can be selected.
In the CC-Link IE Controller Network system, select from the control station or normal station.

*1: High Performance model QCPU: Up to two modules
(up to four modules including MELSECNET/H)
Universal model QCPU
- Q02UCPU: Up to two modules (up to two modules including MELSECNET/H)
- Other than Q02UCPU: Up to four modules (up to four modules including MELSECNET/H)
- In case of Q00UJ, Q00U and Q01U it is not possible to mount multiple modules.

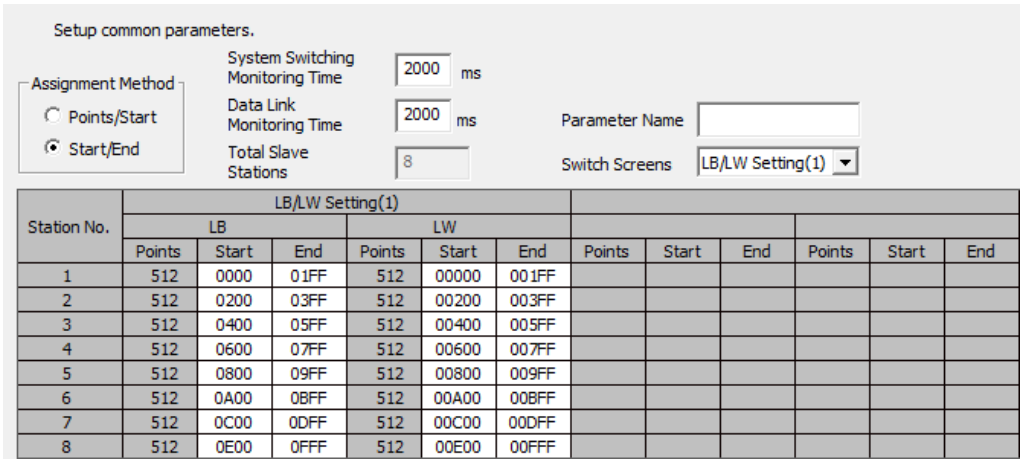
	Module 1	Module 2	Module 3	Module 4
Network Type	CC IE Control(Control Station)	CC IE Control(Normal Station)	MNET/H Mode(Normal Station)	MNET/H(Remote Master)
Start I/O No.				
Network No.				
Total Stations				
Group No.	0	0	0	
Station No.				
Mode	Online	Online	Online	Online
	Network Range Assignment			Network Range Assignment
	Network Operation Settings		Station Inherent Parameters	
	Refresh Parameters	Refresh Parameters	Refresh Parameters	Refresh Parameters
	Interrupt Settings	Interrupt Settings	Interrupt Settings	Interrupt Settings
	Specify Station No. by Parameter	Specify Station No. by Parameter		

(2) Network setting
Set the Start I/O No., Network No., Total Stations, Group No., Station No., and Mode for each module.

	Module 1	Module 2	Module 3	Module 4
Network Type	CC IE Control(Control Station)	CC IE Control(Normal Station)	MNET/H Mode(Normal Station)	MNET/H(Remote Master)
Start I/O No.	0000	0020	0040	0060
Network No.	1	2	3	4
Total Stations	8			4
Group No.	1	10	10	
Station No.				
Mode	Online	Online	Online	Online
	Network Range Assignment			Network Range Assignment
	Network Operation Settings		Station Inherent Parameters	
	Refresh Parameters	Refresh Parameters	Refresh Parameters	Refresh Parameters
	Interrupt Settings	Interrupt Settings	Interrupt Settings	Interrupt Settings
	Specify Station No. by Parameter	Specify Station No. by Parameter		

(3) Common parameter (Network range assignment)

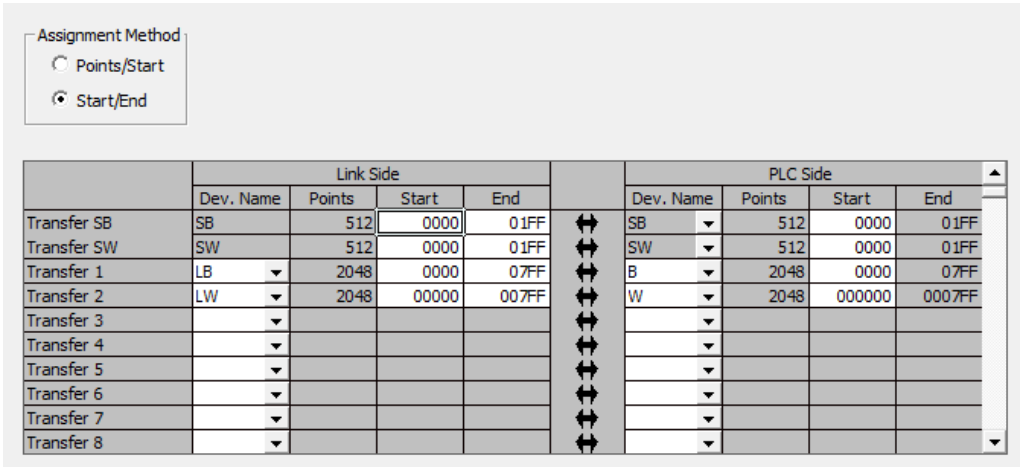
Set the cyclic transmission ranges of link devices (LB, LW, LX, and LY) that can be sent by each station in the network. The common parameter settings are required only for the control station. The common parameters are sent from the control station to normal stations at startup of the network.



Station No.	LB/LW Setting(1)											
	LB			LW								
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
1	512	0000	01FF	512	00000	001FF						
2	512	0200	03FF	512	00200	003FF						
3	512	0400	05FF	512	00400	005FF						
4	512	0600	07FF	512	00600	007FF						
5	512	0800	09FF	512	00800	009FF						
6	512	0A00	0BFF	512	00A00	00BFF						
7	512	0C00	0DFF	512	00C00	00DFF						
8	512	0E00	0FFF	512	00E00	00FFF						

(4) Network refresh parameter

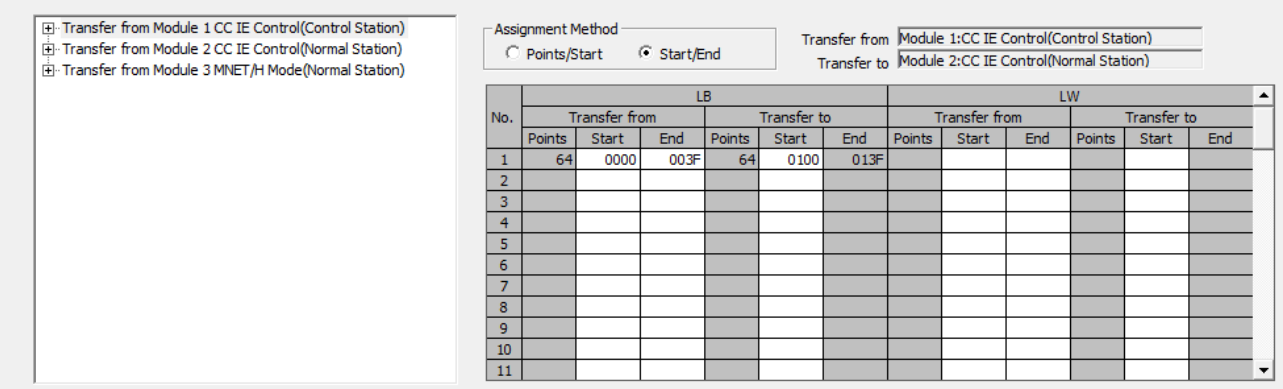
Set the range of the transfer between the link devices (LB, LW, LX, LY) of the CC-Link IE Controller Network module and CPU module devices (X, Y, M, L, T, B, C, ST, D, W, R, ZR).



	Link Side					PLC Side			
	Dev. Name	Points	Start	End		Dev. Name	Points	Start	End
Transfer SB	SB	512	0000	01FF		SB	512	0000	01FF
Transfer SW	SW	512	0000	01FF		SW	512	0000	01FF
Transfer 1	LB	2048	0000	07FF		B	2048	0000	07FF
Transfer 2	LW	2048	00000	007FF		W	2048	000000	0007FF
Transfer 3									
Transfer 4									
Transfer 5									
Transfer 6									
Transfer 7									
Transfer 8									

(5) Interlink transmission parameters

Set this parameter when multiple networks are connected to a PLC and the link data is transferred to other networks.



No.	LB						LW					
	Transfer from			Transfer to			Transfer from			Transfer to		
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
1	64	0000	003F	64	0100	013F						
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												

(6) Routing parameters

Set a "root" that is necessary for executing a transient transmission to other network No. stations in the multiple network system.

	Target Network No.	Relay Network No.	Relay Station No.
1	3	1	1
2	4	1	5
3	5	2	12
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

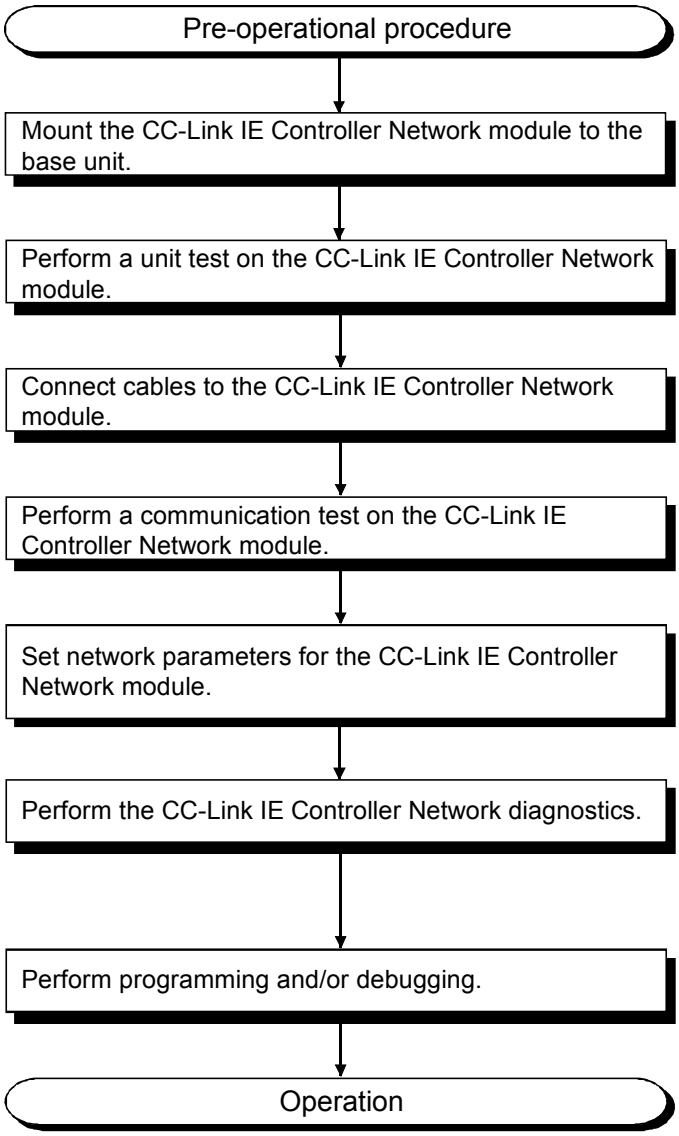
(7) Interrupt settings

When receiving data from other stations, interrupt condition check is performed. When the interrupt condition is met, an interrupt is requested to the CPU from the network module. Set the interrupt condition to start the interrupt program of own station's CPU.

	Device Code	Device No.	Detection Method	Interrupt Condition	Word Device Setting Value	Channel No./ Connection No.	Interrupt (SI) No.
1	LB	0000	Edge Detect	ON			0
2	LX	0100	Level Detect	OFF			1
3	SB	0147	Level Detect	ON			2
4	LW	00200	Edge Detect	Equal	500		3
5	SW	0074	Edge Detect	Unequal	0		4
6	RECVS Instruction		Edge Detect	Scan Completed		3	5
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

2.3 Procedures and settings before operation

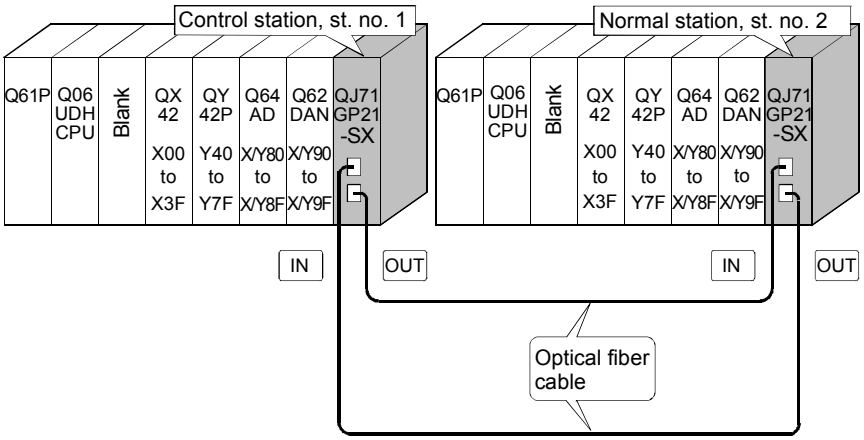
The following shows the procedures to be taken before operation.

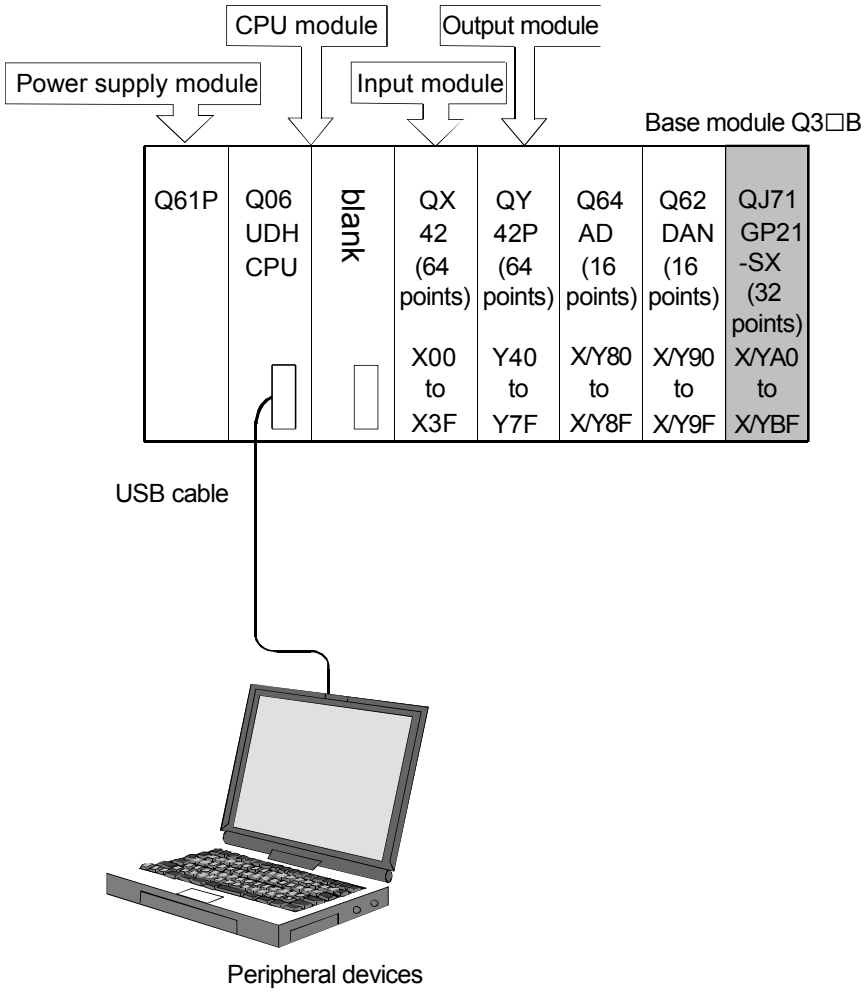


CHAPTER 3 EXERCISE 1 (CYCLIC TRANSMISSION)

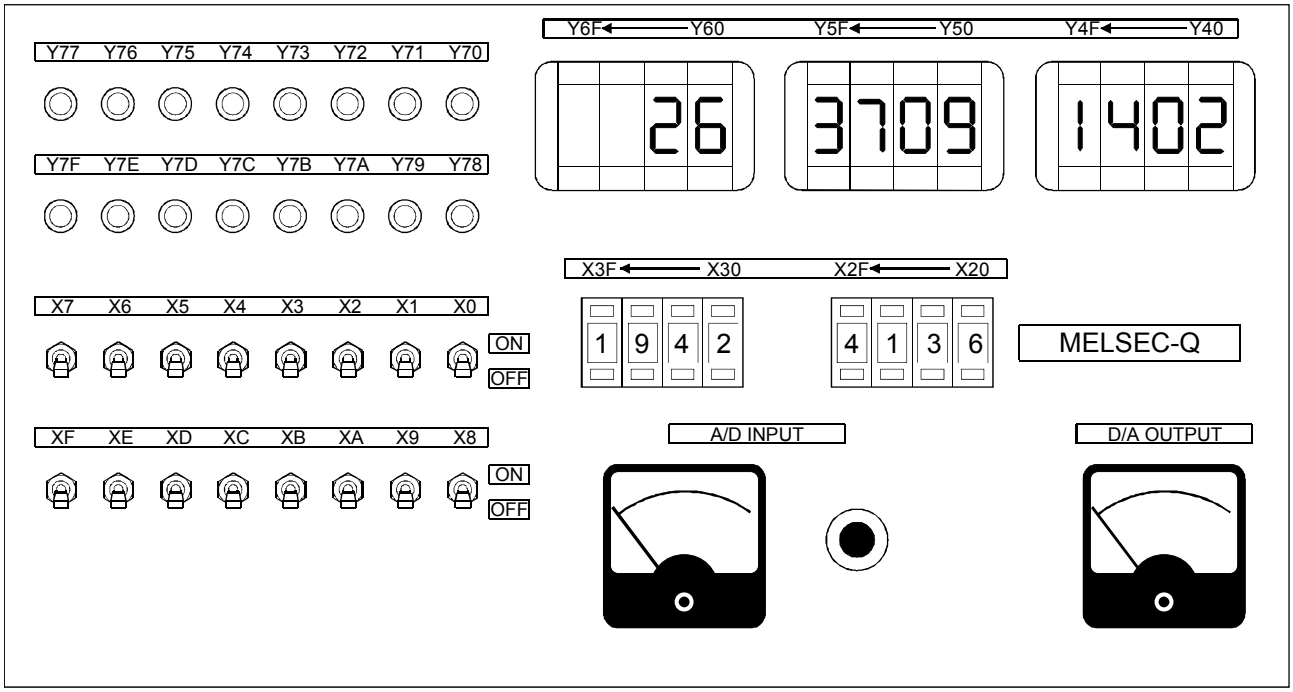
3.1 System configuration for the training

Content of the Exercise 1 (Chapter 3) is based on the following system configuration.
Same configuration is used also with the Exercise 2 (Chapter 4).

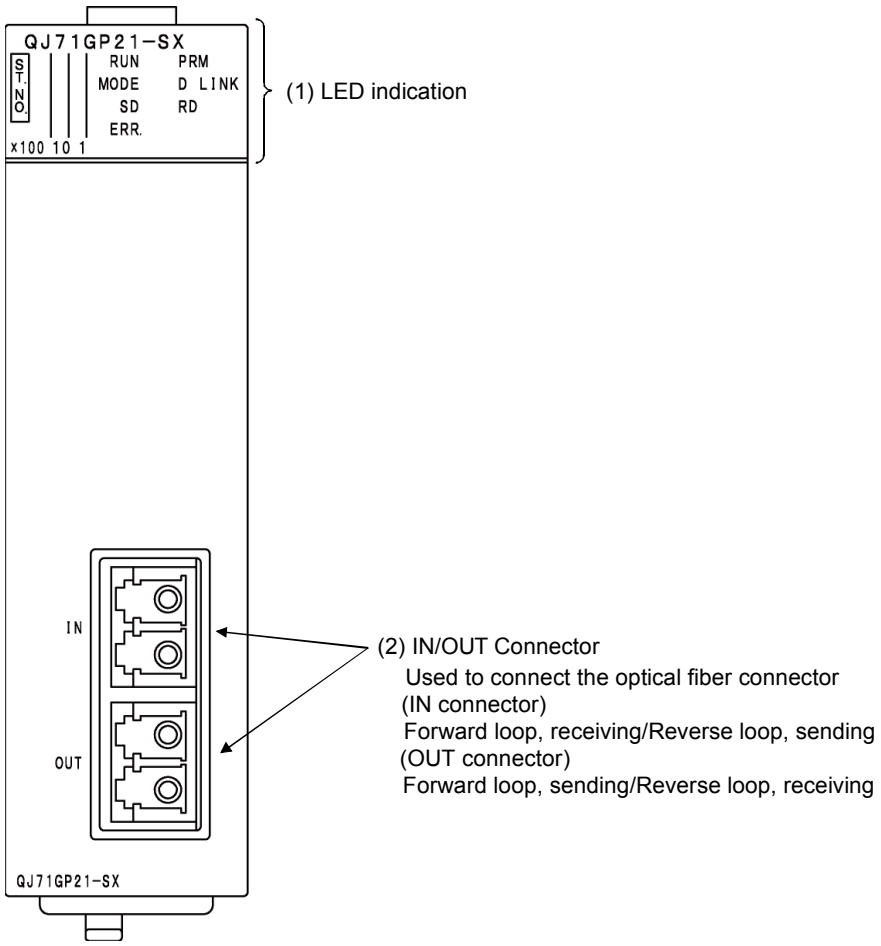



CPU module
Output module
Power supply module
Input module
Base module Q3□B
Q61P
Q06 UDH CPU
blank
QX 42 (64 points) X00 to X3F
QY 42P (64 points) Y40 to Y7F
Q64 AD (16 points) X/Y80 to X/Y8F
Q62 DAN (16 points) X/Y90 to X/Y9F
QJ71 GP21 -SX (32 points) X/YA0 to X/YBF
USB cable
Peripheral devices

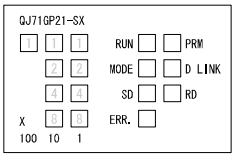
I/O panel


Y6F Y60
Y5F Y50
Y4F Y40
Y77 Y76 Y75 Y74 Y73 Y72 Y71 Y70
Y7F Y7E Y7D Y7C Y7B Y7A Y79 Y78
X3F X30
X2F X20
X7 X6 X5 X4 X3 X2 X1 X0
ON
OFF
1942
4136
MELSEC-Q
XF XE XD XC XB XA X9 X8
A/D INPUT
D/A OUTPUT

3.2 Name of CC-Link IE Controller Network module (QJ71GP21-SX)



(1) Indicator LEDs

<table>
<tr><th>No.</th><th>Name</th><th colspan="4">Description</th></tr>
<tr><td>1)</td><td> 
</td><td colspan="4"><table>
<tr><th>No.</th><th>Name</th><th>LED status</th><th>Description</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">RUN</td><td>ON, green</td><td>Operating normally</td></tr>
<tr><td>OFF</td><td>Hardware fault or watchdog timer error</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">PRM</td><td>ON, green</td><td>Operating as a Control station</td></tr>
<tr><td>OFF</td><td>Operating as a Normal station</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">MODE</td><td>ON, green</td><td>Online mode</td></tr>
<tr><td>Flashing, green</td><td>Test mode</td></tr>
<tr><td>OFF</td><td>Offline mode</td></tr>
<tr><td rowspan="3">4</td><td rowspan="3">D LINK</td><td>ON, green</td><td>Data link in operation (Cyclic transmission operated)</td></tr>
<tr><td>Flashing, green</td><td>Data link in operation (Cyclic transmission stopped)</td></tr>
<tr><td>OFF</td><td>Data link not in operation (Parameter reception not completed, own station CPU error, data link stop instruction)</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">SD</td><td>ON, green</td><td>Sending data</td></tr>
<tr><td>OFF</td><td>Not sending data</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">RD</td><td>ON, green</td><td>Receiving data</td></tr>
<tr><td>OFF</td><td>Not receiving data</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">ERR.</td><td>ON, red</td><td>The following errors occur.
• Received data are erroneous. (Receive frame error)
• A frame error above a certain level has occurred between stations.
• The Control station or a station number is duplicated.
• Cable disconnection, or incorrect cable connection between OUT and IN
• Network parameters are corrupted, or some settings (Reserved station specification, Total number of stations, Network No.) are inconsistent between the Control and Normal stations.</td></tr>
<tr><td>OFF</td><td>Normal status</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">1 × 100
1, 2, 4, 8 × 10
1, 2, 4, 8 × 1</td><td>ON, green (Numeric display)</td><td>The station No. is set.</td></tr>
<tr><td>OFF</td><td>No station No. is set.</td></tr>
</table></td></tr>
</table>

3.3 Testing the CC-Link IE Controller Network Module (QJ71GP21-SX)

Before starting up the data link, perform the check of the network module and cables. Select the type of test in the mode selection in the network parameter.

(1) Hardware test
Checks the hardware inside the CC-Link IE Controller Network module.

(2) Self-loopback test
Checks the internal circuit including the communication circuit of the network module and the hardware of the cable.

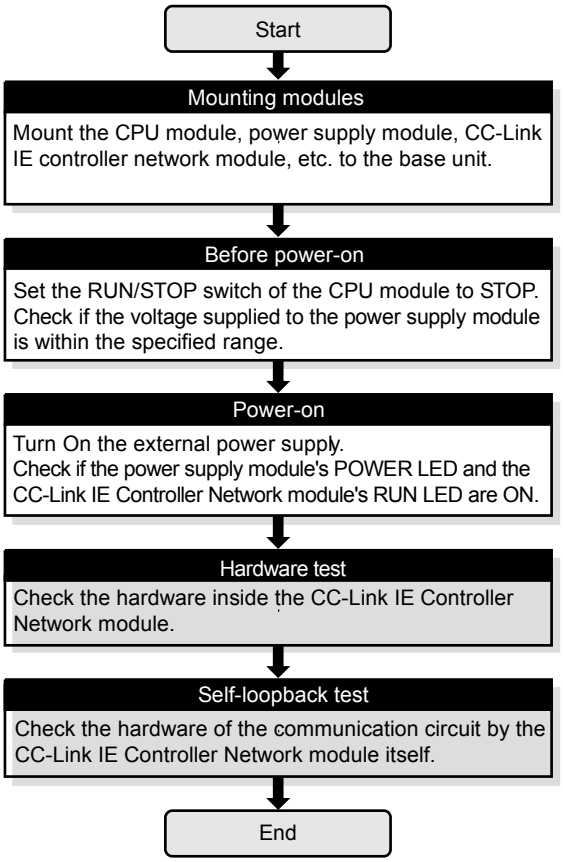
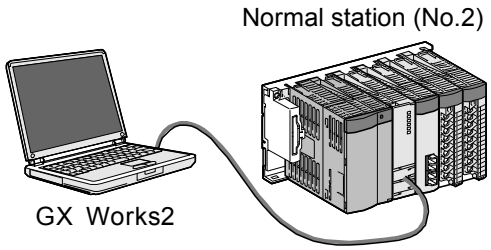


Figure 3.1 Offline test flow (Unit test)

3.3.1 Hardware test

Check the hardware inside the CC-Link IE Controller Network module.

(1) Connect GX Works2 to the CPU module.
Do not connect optical fiber cables to the CC-Link IE Controller Network module.



(2) After setting the following network parameters in GX Works2, write them to the programmable controller.

(Control station)

	Module 1
Network Type	CC IE Control(Control Station)
Start I/O No.	00A0
Network No.	1
Total Stations	2
Group No.	0
Station No.	1
Mode	Online

(Normal station)

	Module 1
Network Type	CC IE Control(Normal Station)
Start I/O No.	00A0
Network No.	1
Total Stations	
Group No.	0
Station No.	2
Mode	H/W Test

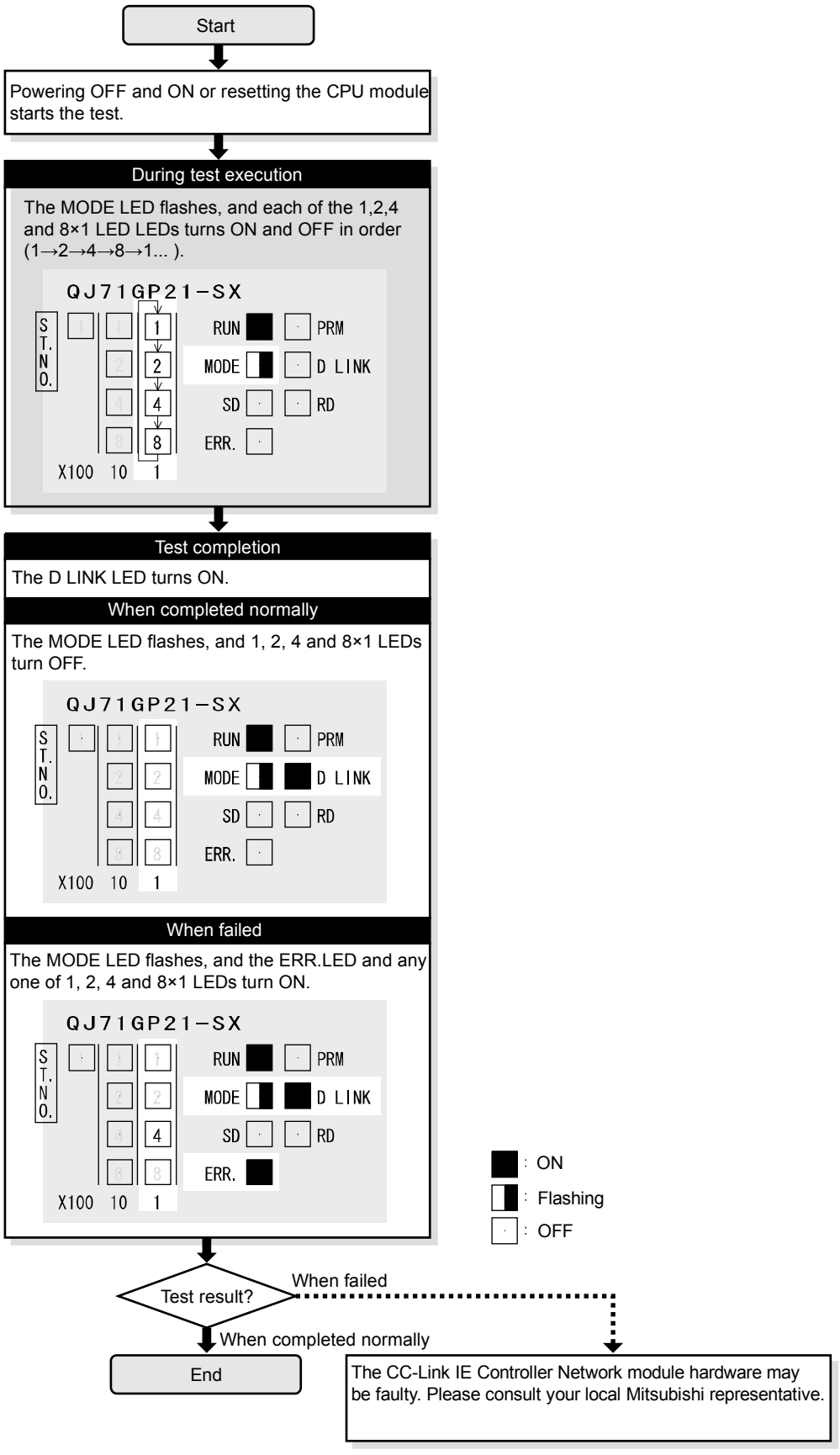


Figure 3.2 Hardware test flow

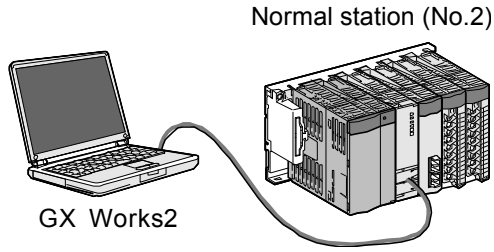
REMARK

In case of CC-Link IE Controller Network, because the link refresh is performed even if the module is offline, users can check the status and results of the test with link special relay (using peripheral device or sequence program).
The hardware test result can be confirmed with the link special relay (SB0090, SB0091).

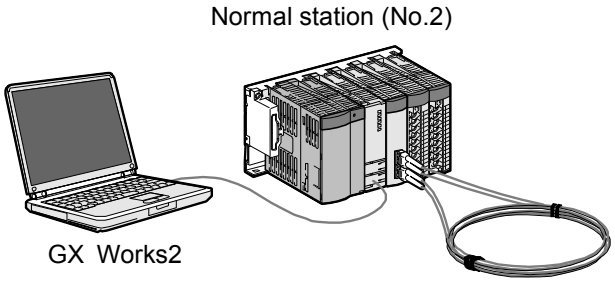
3.3.2 Self-loopback test

Check the hardware of the communication circuit by Network module itself.
Use a normal optical fiber cable when conducting the self-loopback test.

(1) Connect GX Works2 to the CPU module.



(2) Connect the IN and OUT of the QJ71GP21-SX network module using optical fiber cable.



(3) After setting the following network parameters in GX Works2, write them to the programmable controller.

(Control station)

	Module 1
Network Type	CC IE Control(Control Station)
Start I/O No.	00A0
Network No.	1
Total Stations	2
Group No.	0
Station No.	1
Mode	Online

(Normal station)

	Module 1
Network Type	CC IE Control(Normal Station)
Start I/O No.	00A0
Network No.	1
Total Stations	
Group No.	0
Station No.	2
Mode	Self-Loopback Test

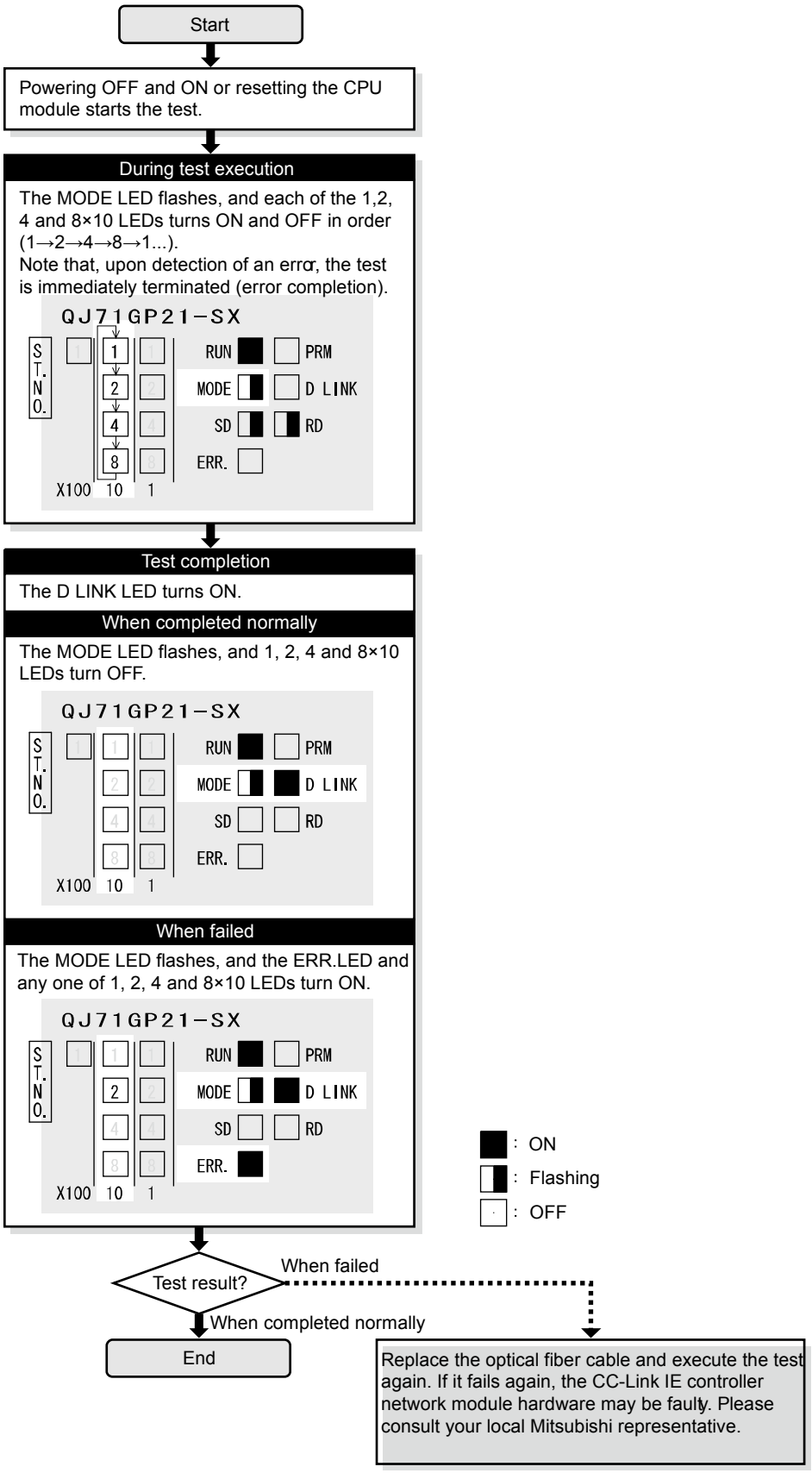


Figure 3.3 Self-loopback test flow

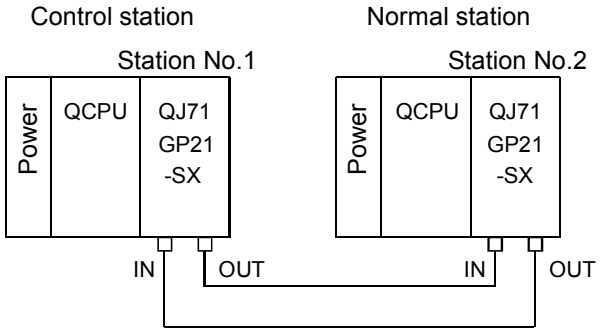
REMARK

In case of CC-Link IE Controller Network, because the link refresh is performed even if the module is offline, users can check the status and results of the test with link special relay (using peripheral device or sequence program).
The self-loopback result can be confirmed with the link special relay (SB0092, SB0093).

3.4 Cable connection

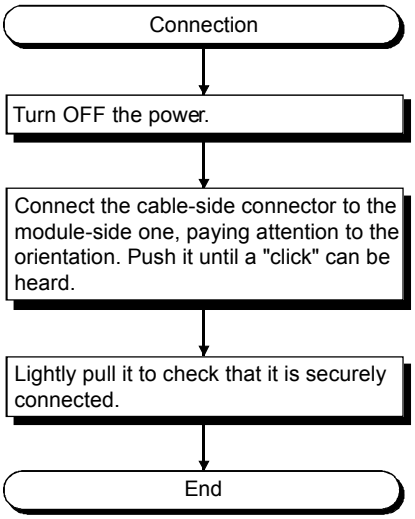
(1) Connection method

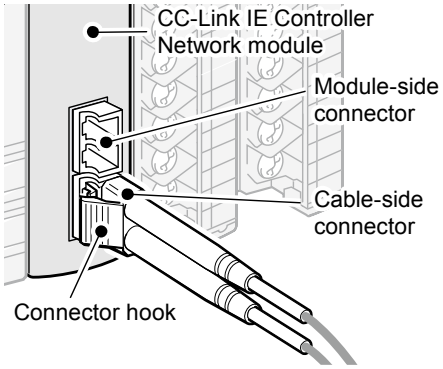
Connect an optical fiber cable between OUT and IN as shown below.
Note that there is no need to connect the cables in the order of station numbers.
Any number can be assigned to a control station.



(2) Connecting an optical fiber cable

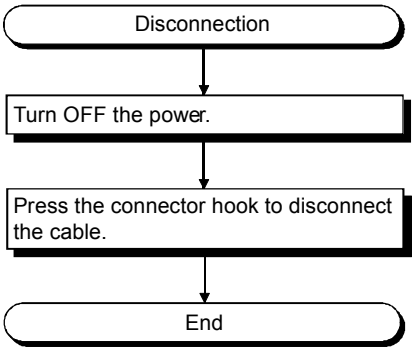
The following shows how to connect an optical fiber cable.

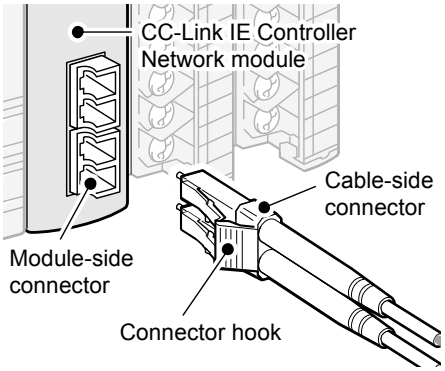




(3) Disconnecting the optical fiber cable

The following shows how to disconnect the optical fiber cable.





3.5 Cabling status check

Check the cabling status by using the network parameter of GX Works2.

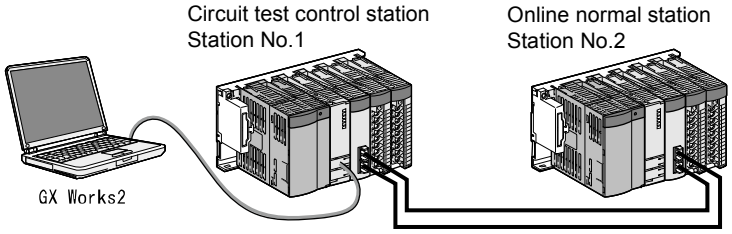
3.5.1 Circuit test

Circuit test checks the network cable connection status, line status, and each station's parameter setting status from the control station.

Item	Description
Detection of duplicated control station or station No.	Detects duplication of the control station or station No.
Detection of out-of-range stations	Detects whether normal stations more than the total number set in the control station are connected or not.
Detection of reserved stations	Detects whether reserved setting stations are actually connected or not.
Cable disconnection detection	Detects cable disconnection.
Cable insertion error detection	Detects incorrect cable connection between OUT and IN.
Cable fault detection	Detects a cable fault.

(1) Cable connection

The IN and OUT of the network module are connected by an optical fiber cable.



(2) Test mode setting

After setting the control station to the Loop Test mode and the normal station to the Online mode, write the data to the respective CPU modules.

Executing station (station No.n)

	Module 1
Network Type	CC IE Control(Control Station)
Start I/O No.	00A0
Network No.	1
Total Stations	2
Group No.	0
Station No.	1
Mode	Loop Test
	Network Range Assignment

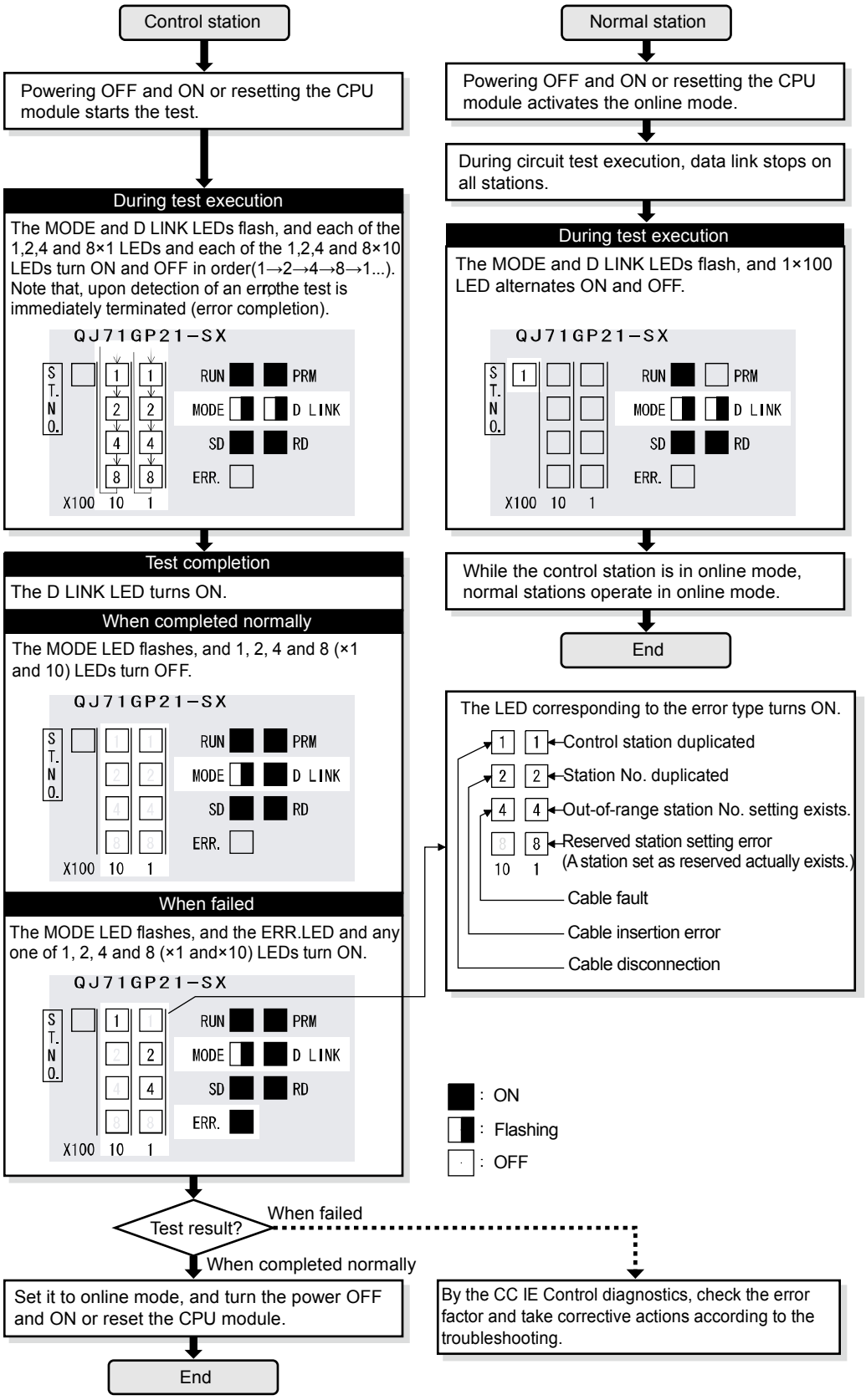
Setting

Target station (station No.n+1)

Module 2
CC IE Control(Normal Station)
00A0
1
0
2
Online

Setting

(3) Executing the circuit test



POINT

(1) When executing the circuit test, connect each cable properly between OUT and IN.
Also, do not insert or remove a cable during test execution.
(Doing so will result in error completion.)

(2) The circuit test result can be confirmed with the link special relay (SB0094, SB0095).

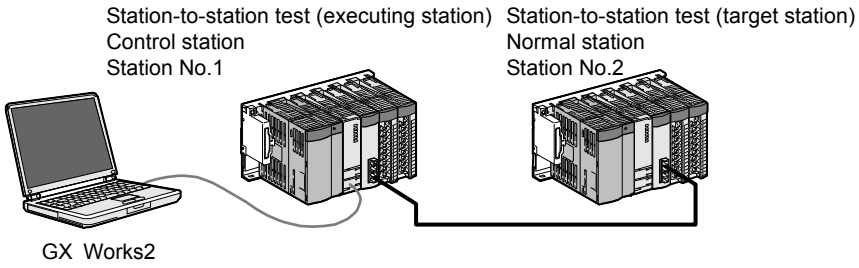
(3) For re-execution of the circuit test after circuit test completion, power OFF the control station and then ON, or reset the CPU module.

3.5.2 Station-to-station test

Check the condition of the cable connected between two stations (from OUT of the executing station to IN of the other station.)

(1) Cable connection

The IN and OUT of the network module are connected by an optical fiber cable.



(2) Test mode setting

After setting the [Loop Test] mode for the executing station (CC IE Control (Control Station)) and the [Online] mode for the target station (CC IE Control (Normal Station)), write the data to the respective CPU modules.

Executing station

	Module 1
Network Type	CC IE Control(Control Station)
Start I/O No.	00A0
Network No.	1
Total Stations	2
Group No.	0
Station No.	1
Mode	Loop Test
	Network Range Assignment

Setting

Target station

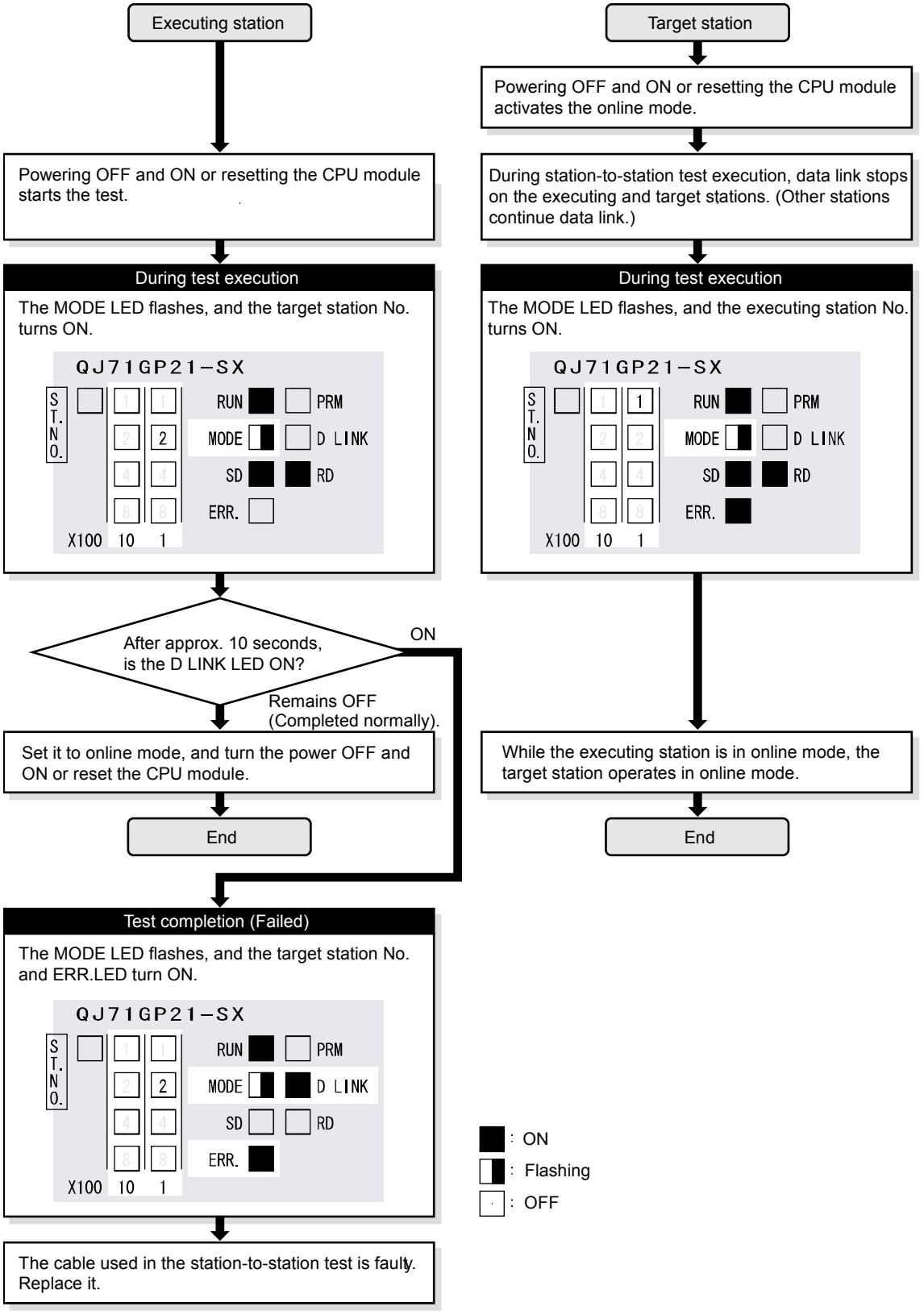
Module 2
CC IE Control(Normal Station)
00A0
1
0
2
Online

Setting

(3) Executing the station-to-station test

Reset with the RUN/STOP/RESET switch.

Perform this operation in order from the target station to the executing station.



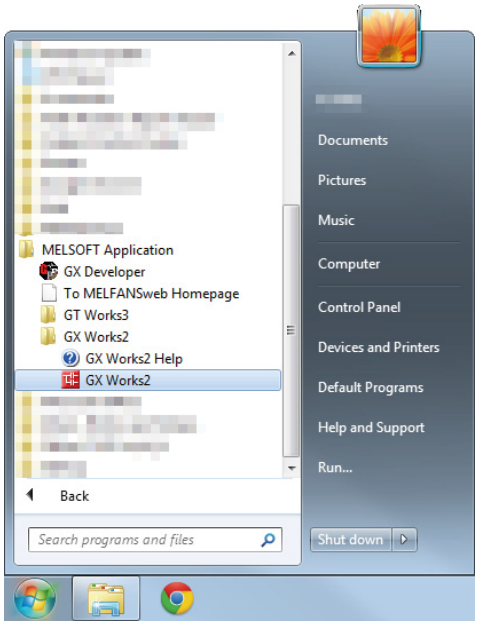
POINT

(1) When executing the station-to-station test, connect the cable properly between OUT and IN.
Also, do not insert or remove a cable during test execution.
(Doing so will result in error completion.)

(2) The station-to-station test result can be checked with the link special relay (SB0097).

3.6 Writing to the CPU module

3.6.1 Starting GX Works2



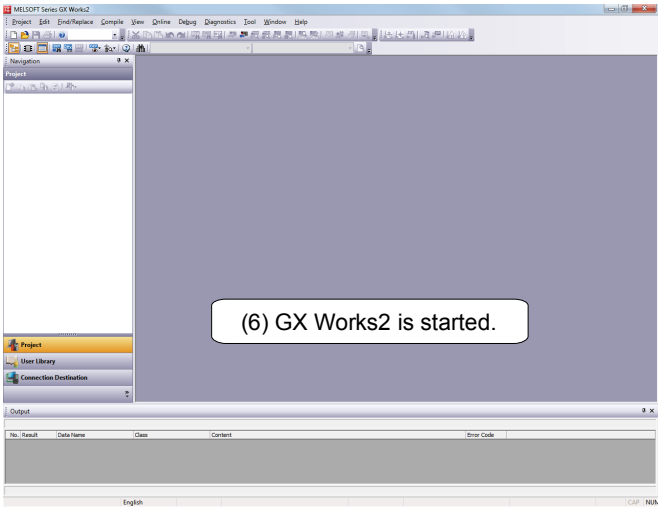
(1) Click the Start button.

(2) Select the [MELSOFT Application].

(3) Select the [GX Works2].

It is possible to operate the selection only by moving the mouse cursor.
(Click and double click are not necessary.)

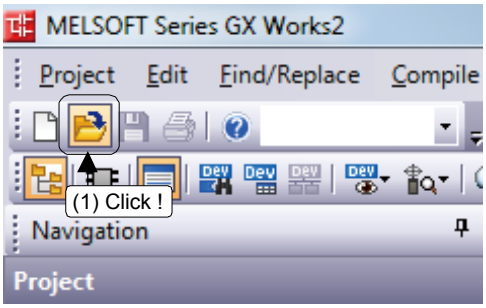
(4) Click the [GX Works2].



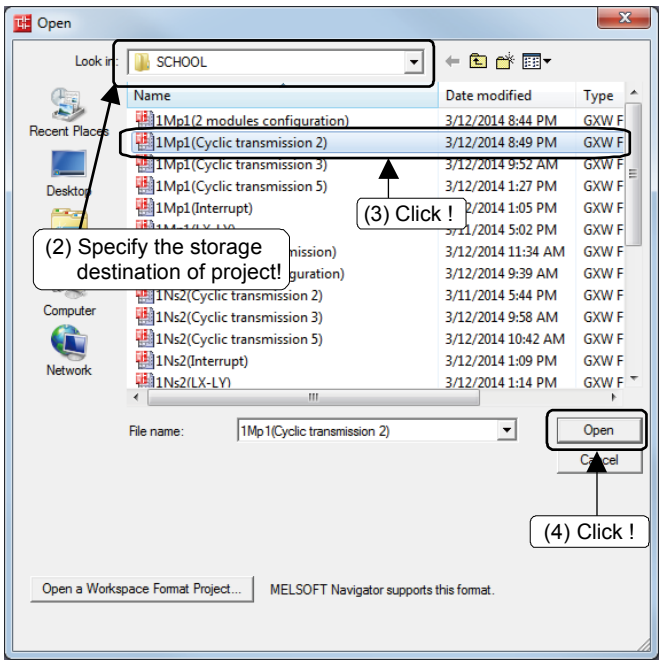
(5) GX Works2 starts up.

3.6.2 Sequence program reading

Read the control program "1MP1".



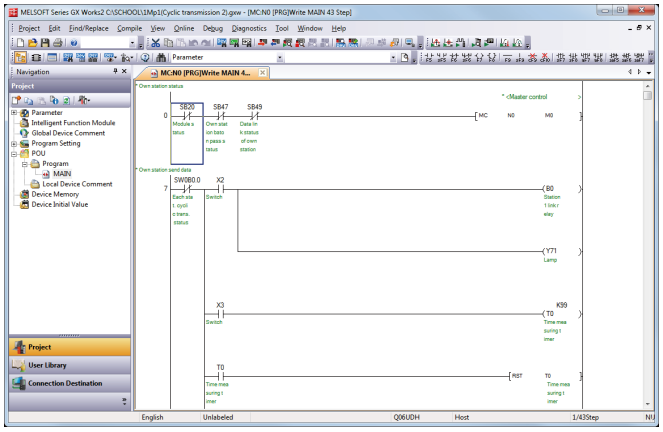
(1) In the Toolbar, click the or [Project] → [Open] (Ctrl + O) from the menu.



(2) Specify the destination where the project to read is stored.

(3) Click the project to read.

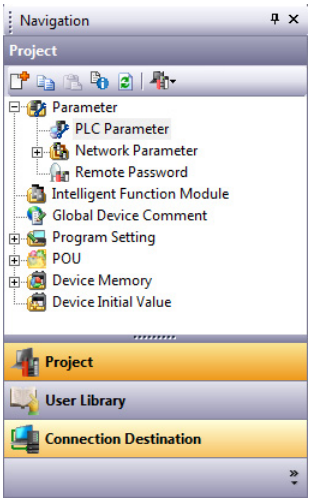
(4) Read the project that has been clicked and specified.



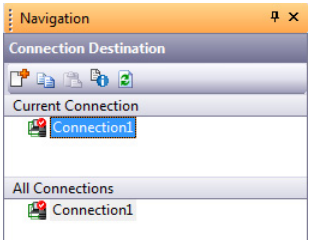
(5) The read ladder is displayed.

3.6.3 Specify connection to the PLC

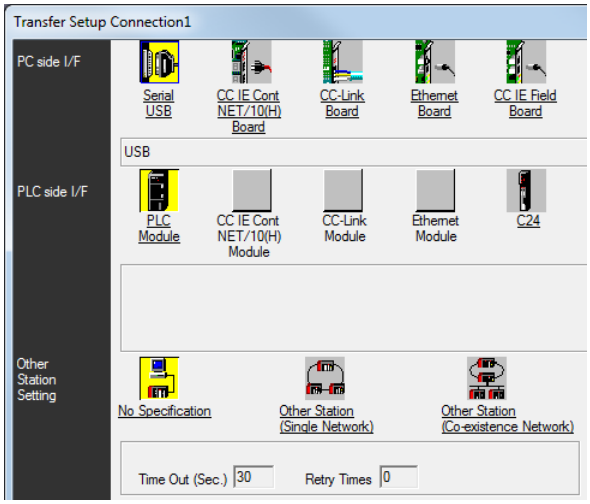
Specify the connection destination interface of peripheral device and CPU module.



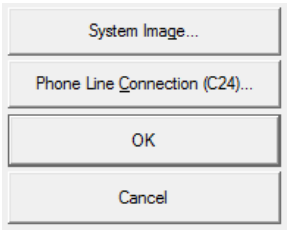
(1) In the Navigation window, click Connection Destination.



(2) In "Current Connection", click "Connection1" in "Current Connection".



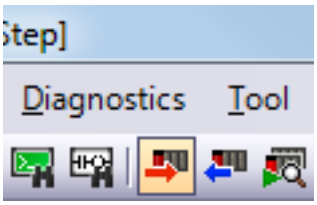
(3) Check the following settings in the Transfer Setup screen.
[PC side I/F]: "Serial USB"
[PLC side I/F]: "PLC Module"
[Other Station Setting]: "No Specification"



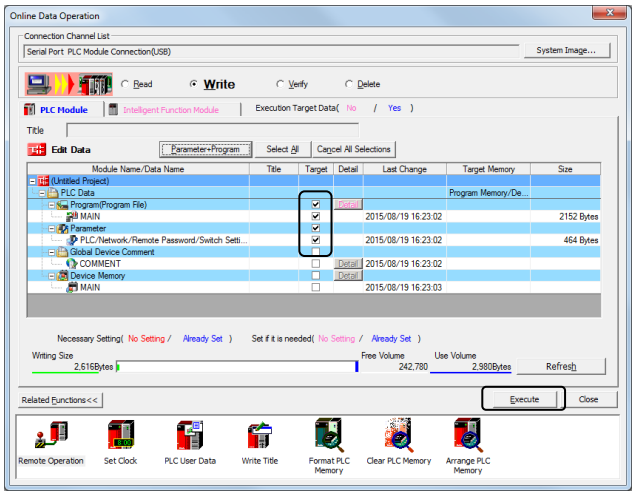
(4) Click the OK button.
Settings are finished.

3.6.4 Writing of the sequence program and the CPU parameter

Write the control program to the CPU module.

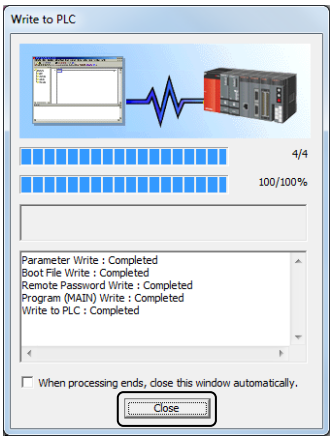


(1) In the Toolbar click on the or [Online] → [Write to PLC].

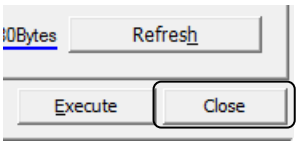


(2) In the Online Data Operation screen, click the Parameter+Program button and select "MAIN" in Program(Program File) and "PLC/Network" in Parameter.

(3) Click the Execute button.



(4) When the writing is finished, a dialog box on the left will appear. Click the Close button.



(5) Click the [Close] button and the dialog box will disappear.

3.7 Setting parameters

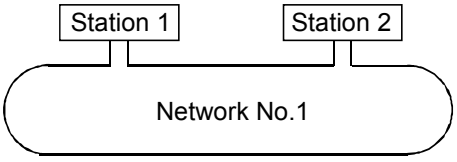
To operate the CC-Link IE Controller Network module, it is required to set the parameters of network module mounted to PLC CPU with GX Works2.

(1) Differences of the parameter setting items for each type of station

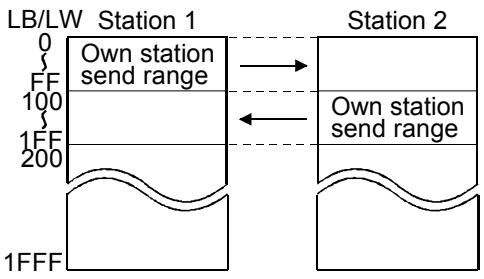
Parameter setting items		Necessity of system	
		Control station	Normal station
Network setting	Network types	●	●
	Starting I/O No.	●	●
	Network No.	●	●
	Total stations	●	×
	Group No.	△	△
	Station No.	●	●
	Mode	●	●
	Station No. setting method	×	●
Network range assignment	Monitoring time	●	×
	LB/LW (1) setting	●	
	LB/LW (2) setting		
	LX/LY (1) setting	△	
	LX/LY (2) setting		
	I/O master station specification		
	Reserved station specification	△	
	Supplementary setting	△	
Refresh parameter		●	●
Interrupt setting		△	△
Interlink transmission parameter		△	△
Routing parameter		△	△

●: Setting required
△: Set it if required
×: Setting not required

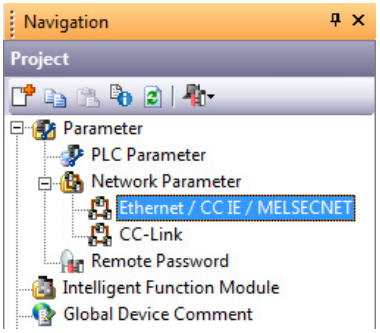
(2) Each Station send range (LB/LW setting)
Set the send range for each station to 256 points as shown below.



Common parameter each station send range



3.7.1 Set parameters with GX Works2



(1) Double click on [Ethernet/CC IE/MELSECNET] in [Network Parameter] of the Project View.

(2) The MELSECNET/CC IE/Ethernet Module Configuration screen is displayed. Configure the settings as below.

Control station

	Module 1	
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	2	
Group No.	0	
Station No.	1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

Set the CC IE Control (Control station)

Set the start I/O number which is assigned to the module

Set the network number (1 to 239)

Set the total number of stations for link

Norman station

	Module 1	
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

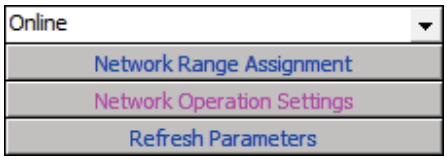
Set the CC IE Control (Normal station)

Set the start I/O number which is assigned to the module

Set the network number (1 to 239)

To the next page

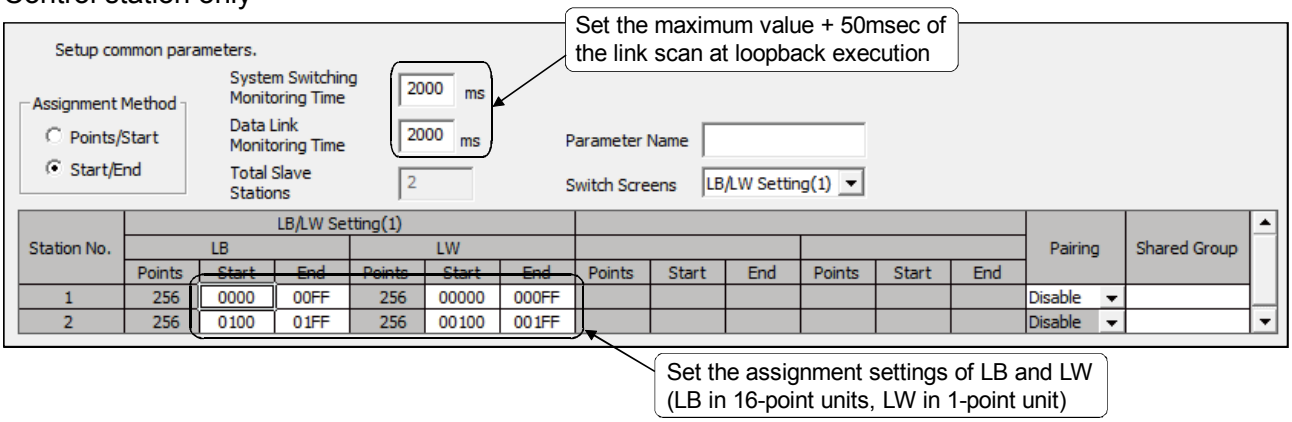
From the previous page

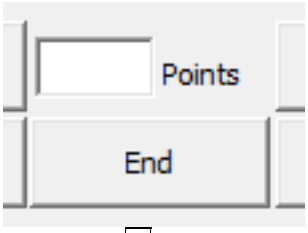


(3) Click the Network Range Assignment button.
(Control station only)

(4) The Network Range Assignment screen is displayed. Configure the settings as shown below.

Control station only

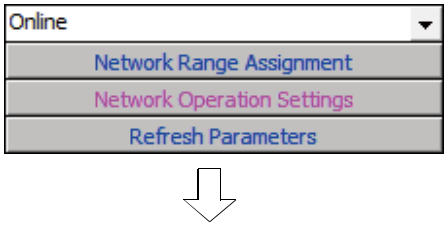




(5) Click the End button to close the screen.

To the next page

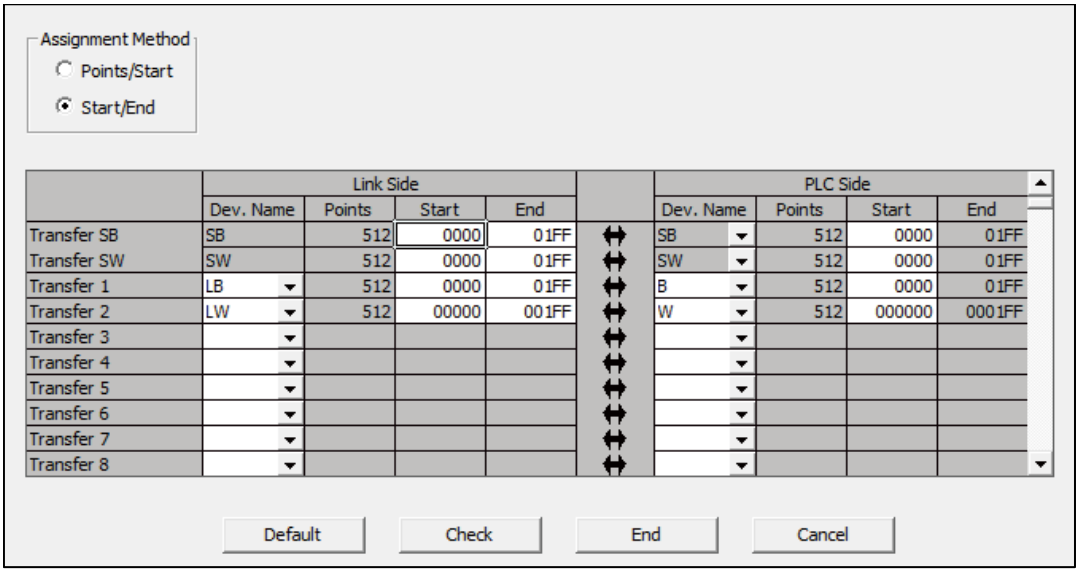
From the previous page



(6) Click the Refresh Parameters button.

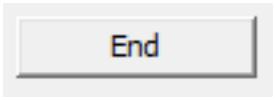
(7) Set the range of the transfer between the link devices (LB, LW, LX, LY) of the CC-Link IE Controller Network module and CPU module devices (X, Y, M, L, T, B, C, ST, D, W, R, ZR).

(Common for all stations)



POINT

Setting range can be divided into 256 lines.
The link-side device start number can be shifted.



(8) Click the End button in the Network Range Assignment screen.
The network parameter settings are finished.

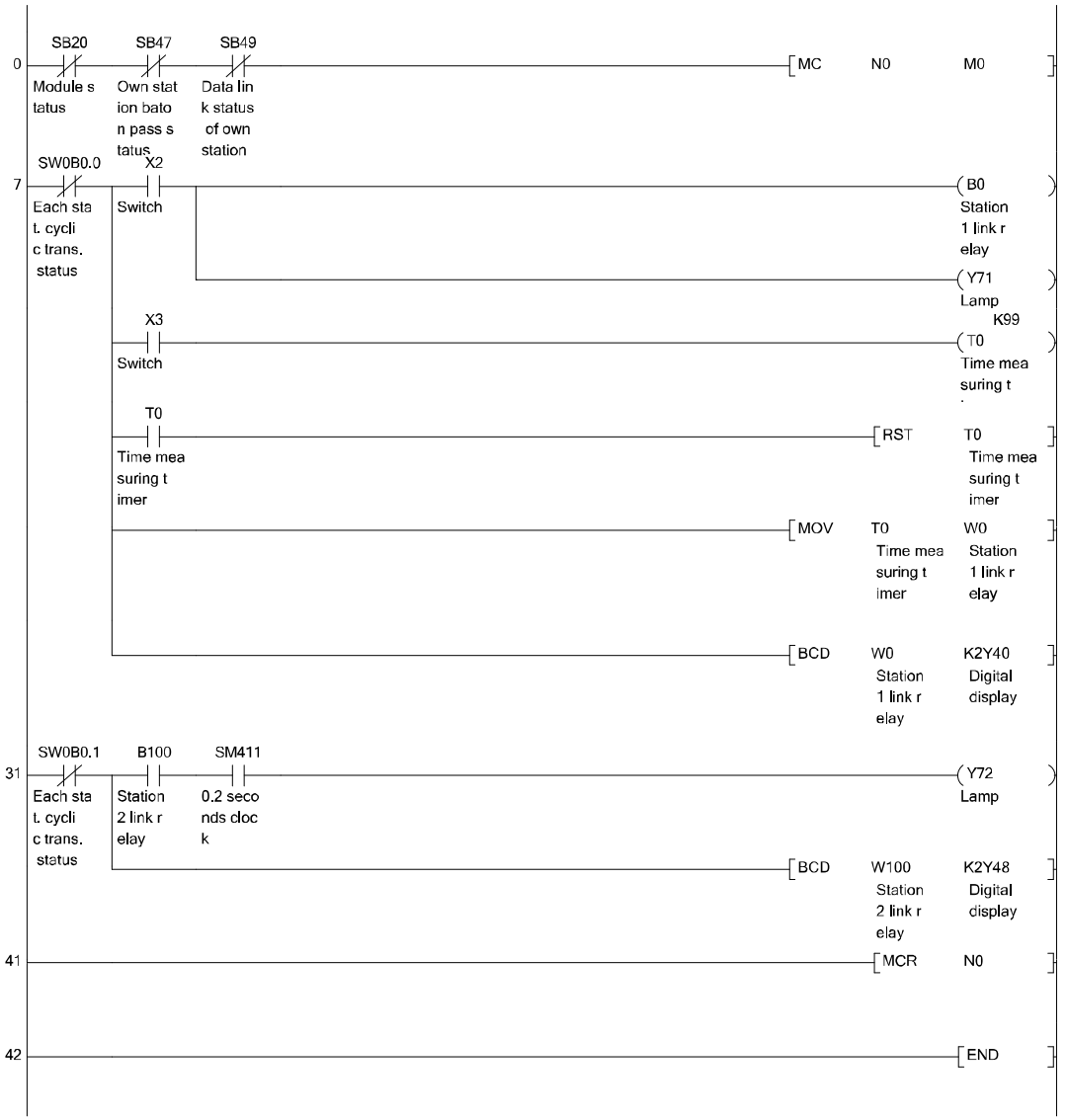
3.8 Sequence program

3.8.1 Cyclic transmission (Configuration with 2 stations)

(1) Program for station No. 1

When X2 of the control station (Station No. 1) is turned on, Y71 of the control station (Station No. 1) lights, and Y71 of the normal station (Station No. 2) flashes. When X3 of the control station (Station No. 1) is turned on, the measurement value of the timer T0 is displayed on Y40 to Y47 of the control station (Station No. 1), and Y40 to Y47 of the normal station (Station No. 2).

Path	Cyclic transmission: 2 modules
Program name	1MP1

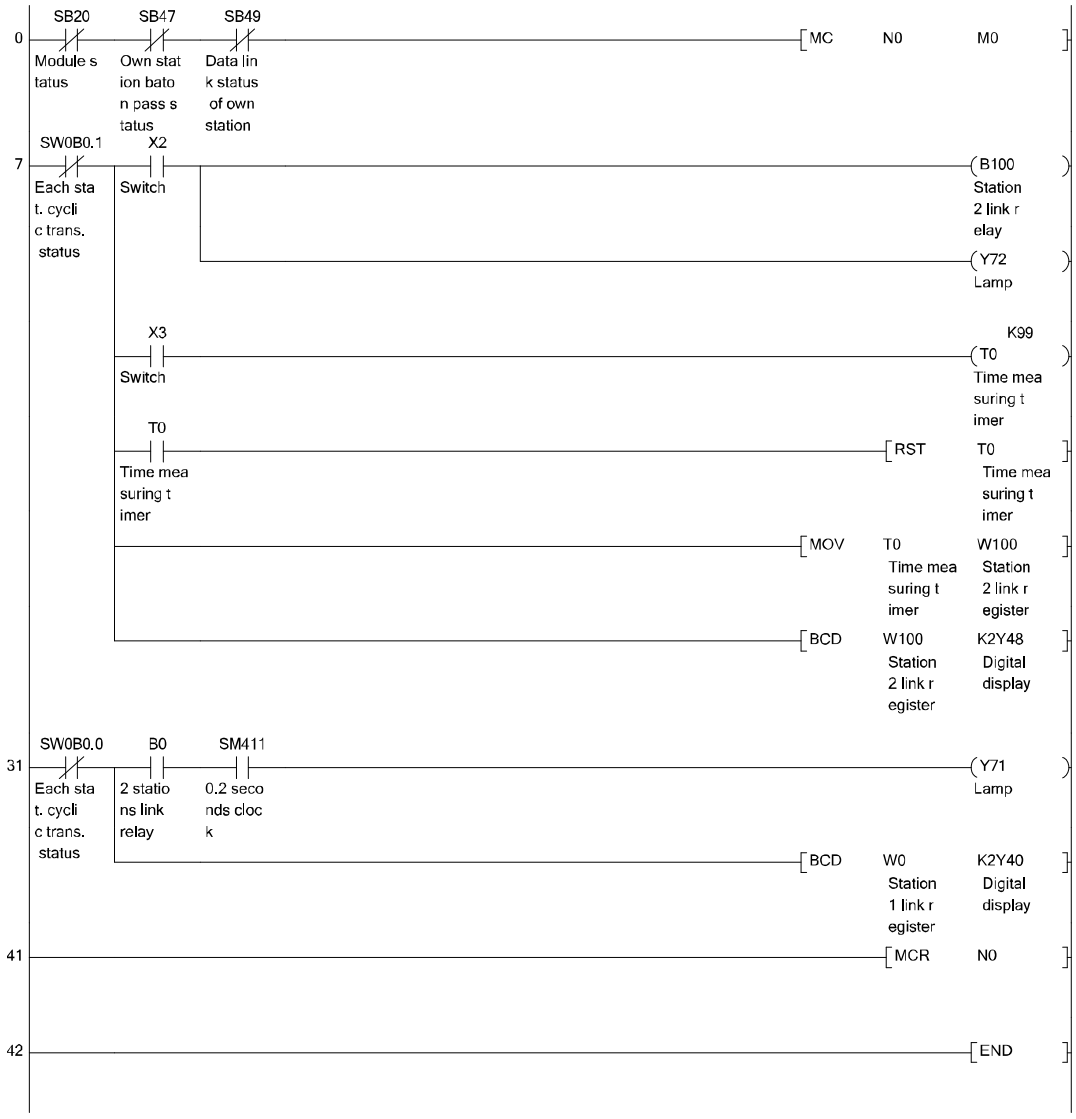


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(2) Program for station No. 2

When X2 of the control station (Station No. 2) is turned on, Y72 of the control station (Station No. 2) lights, and Y72 of the normal station (Station No. 1) flashes. When X3 of the control station (Station No. 2) is turned on, the measurement value of the timer T0 is displayed on Y48 to Y4F of the control station (Station No. 1), and Y48 to Y4F of the normal station (Station No. 2).

Path	Cyclic transmission: 2 modules
Program name	1Ns2



* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

POINT

Change of transfer target CPU-side device

When LB/LW transfer data exceeds the B/W capacity (8K points) of the CPU module, changing the B/W capacity or changing the transfer target CPU-side device to any other than B/W is needed.
The following is an example of CPU-side device setting for 32K-point LB and 128K-point LW data transfer.

- When using the extended link register (W) as a transfer target of LW (only the Universal model QCPU other than the Q00UJCPU)

Link-side device	CPU-side device	CPU-side device setting method
LW0 to 1FFFF	W0 to 1FFFF	* Register a 128K-point extended link register (W) to the standard RAM or a memory card (RAM).*1 *2 *3 *4 • Change the link register (W) points from 8K to 0K.
LB0 to 7FFF	B0 to 7FFF	• Change the link relay (B) points from 8K to 32K.

*1 The extended link register (W) is a device using the file register area.

*2 The file register capacity differs for each CPU module.

*3 Check the serial No. and software version for applicability.

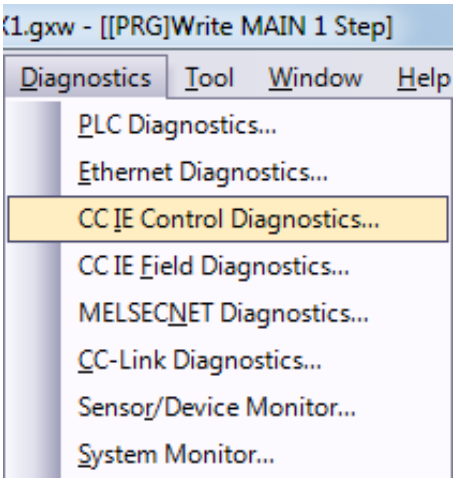
*4 Processing time differs depending on the storage location.
A large number of processing points will cause a longer sequence scan time.

It is convenient to use the following devices as target CPU-side devices of transfer from LW.

- When the transfer range value is 8K (1FFF$_H$) or less:
  Link register (W)
- When the transfer range value is more than 8K (1FFFH):
  Extended link register (W)

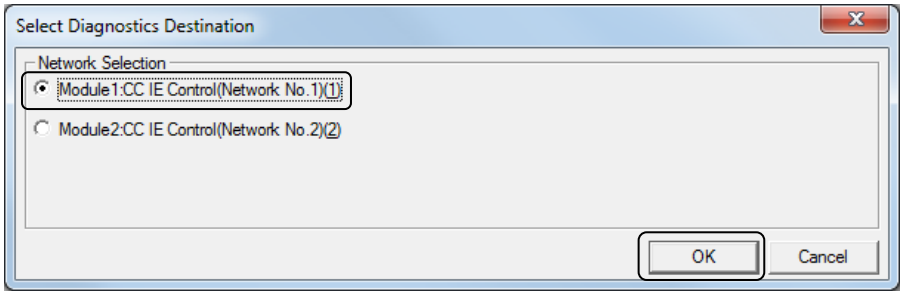
3.9 Diagnosing CC-Link IE Controller Network from GX Works2 (Online test)

With the network diagnostic function, the line status check and diagnostics can be performed easily.
For details on operations of each function, see the GX Works2 Operating Manual.

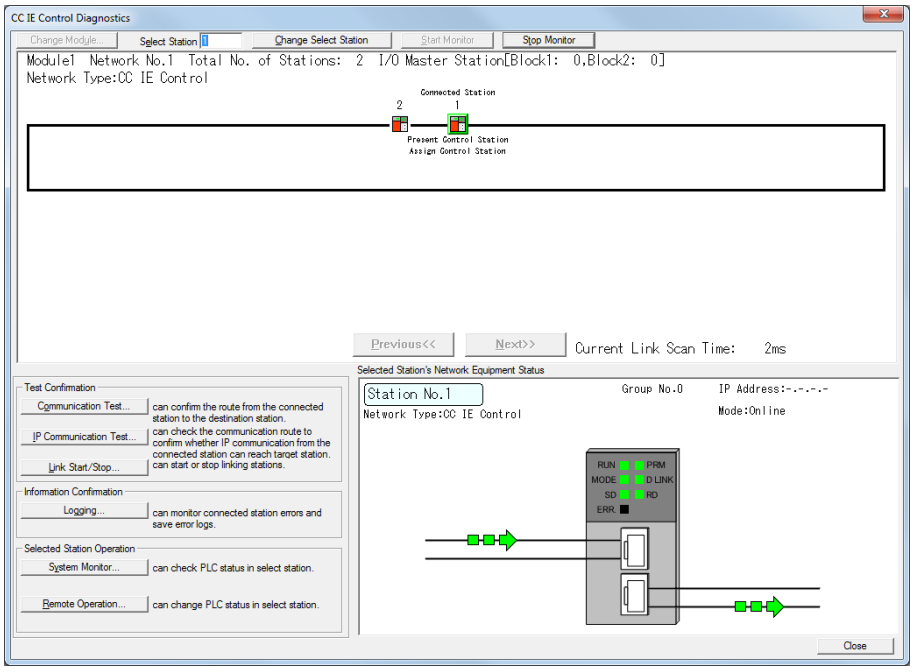


(1) Select [Diagnostics] → [CC IE Control Diagnostics].

(2) When two or more CC-Link IE Controller Network modules are mounted, the "Select Diagnostics Destination" dialog box appears. Select an applicable network and click the OK button.

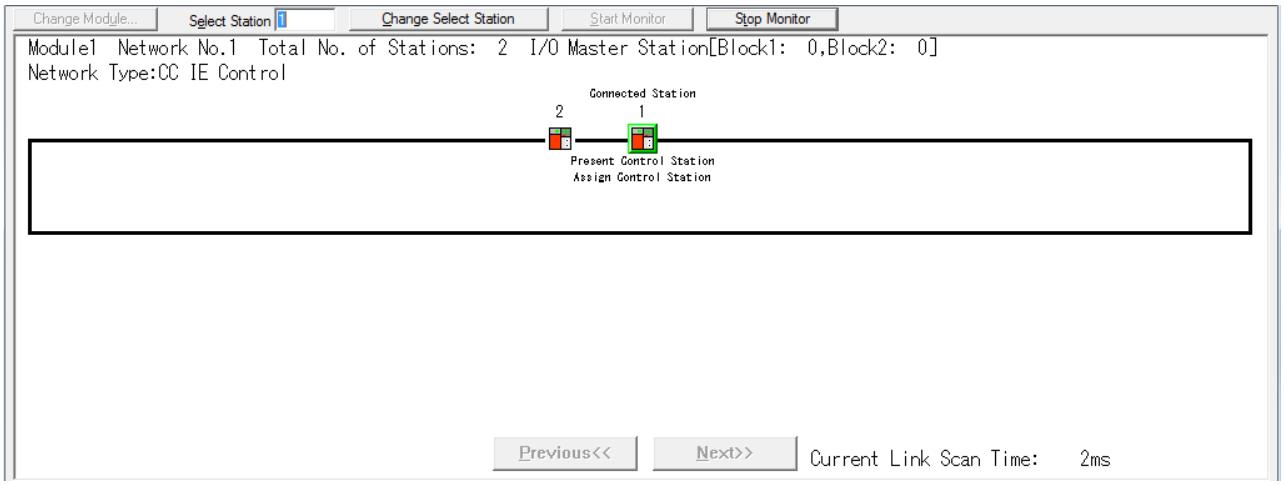


(3) The "CC-Link IE Control Diagnostics" dialog box is displayed.



3.9.1 Network information display

The result of checking the line status and parameter setting status is displayed.

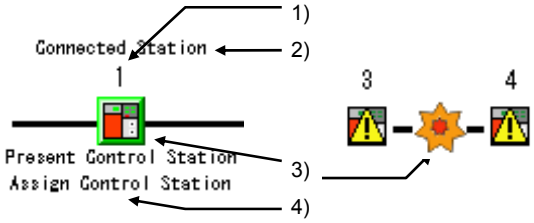


(1) Description of network information display

Item	Description
Module□	Displays the module No. of network which is being diagnosed.
Network No.	Displays the network No. of network which is being diagnosed.
Total number of Stations	Displays the total number of stations in a network.
I/O Master Station	Displays the station No. of I/O master station.
Current Link Scan Time	Displays the current link scan time.
Icon	Displays the status of each station and status between stations.
Previous<<	When the total number of stations is 61 or more, the window prior to network information display is displayed by clicking this Previous<< button.
Next>>	When the total number of stations is 61 or more, the window next to network information display is displayed by clicking this Next>> button.

(2) Icon

The status of each station and status between stations are displayed.



1) Station number — 1 to 120: Displays the station No. of the CC-Link IE Controller Network module.
Undef.: Displayed for the station for which station No. is not assigned.

2) Connected Station — This is displayed for the station connected (own station) to GX Works2.

3) Icon Double-clicking the station icon displays the "System Monitor" window.

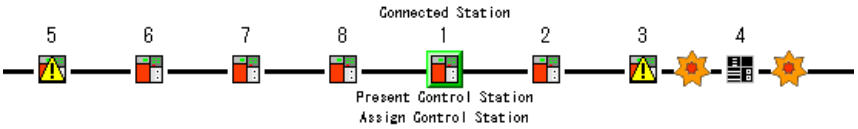
Icon		Station status
Module	Board	
		Normally operating station
		Focusing (icon enclosed by dotted line)
		Selected station
		Faulty station (Cyclic transmission is stopped.)
		Warning (Although cyclic transmission is executed, an error occurred with a module and a cable)
		Station in a different shared group
	–	Reserved station (gray)
	–	Disconnected station (black)
Connected Station 	–	Current connected station, specified in the connection destination setting
Undef. 	–	Number unspecified station (Although "Specify Station No. by Program" is selected in parameter (normal station only), a station number is not set in the program.)

4) Present Control and Assign Control
Present Control: Displayed to the station actually operating as control station.
Assign Control: Displayed to the station set by network parameters.

(3) Display position of a disconnected station

(a) When normal connection information has been obtained

The disconnected station is displayed in the position where it was connected when normal.



1) Conditions for normal connection information obtaining and timing

When all of the following conditions are met, the normal connection information is stored in the CC-Link IE Controller Network module.

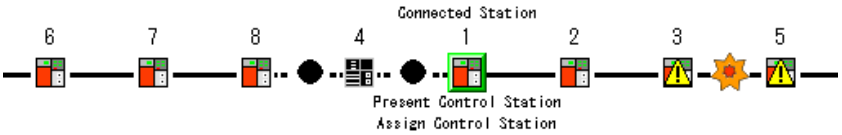
- All stations are in data link status (Cyclic transmission status of each station (SB00B0) is OFF.)
- No loopback station (Loopback status (SB0065) is OFF.)
- No station has a parameter error. (Parameter status of each station (SB00E0) is OFF.)
- The number of actually connected stations is the same as the total of stations that is set for the control station (except reserved stations).

If any of the above conditions is not met, the normal connection information will be updated after all the conditions are met again.

POINT
(1) After acquisition of the normal connection information, if the network configuration is changed with a cable or station disconnected, the changed network configuration cannot be displayed correctly. Update the normal connection information by the following. (However, if the normal connection information cannot be obtained due to a network error, the status when the normal connection information has not been obtained is displayed.) • Turn ON Normal connection information refresh instruction (SB000C). • Power OFF and then ON reset the station connected to GX Works2. • Take corrective actions to set all stations into normal state. (2) If a station that is not included in the normal connection information is added, the station is displayed on the IN side of the GX Works2 connected station.

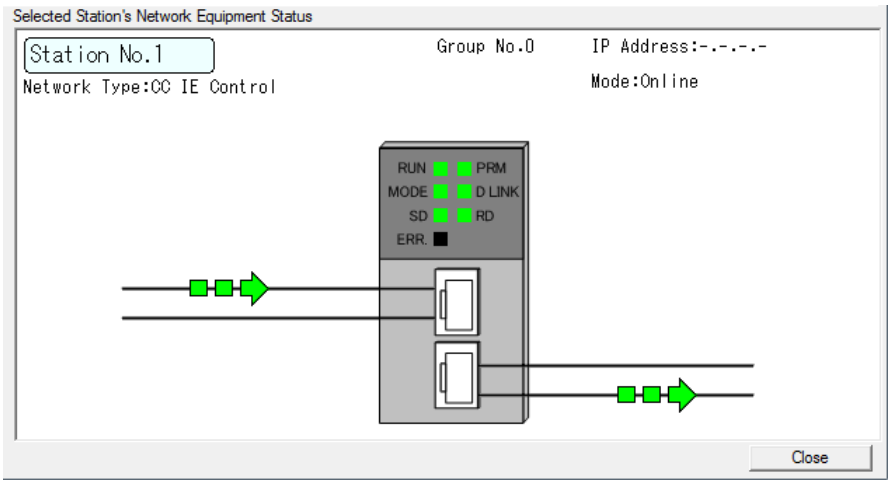
(b) When normal connection information has not been obtained

The disconnected station is displayed on the IN side of the GX Works2 connected station.



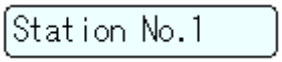
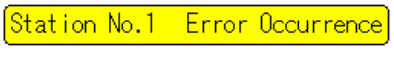
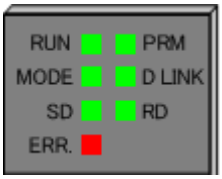
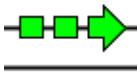
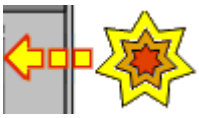
3.9.2 Select station network device status display

The detailed information of the CC-Link IE Controller Network module and the connection cable of the selected station are displayed.



(1) Description of network device status display

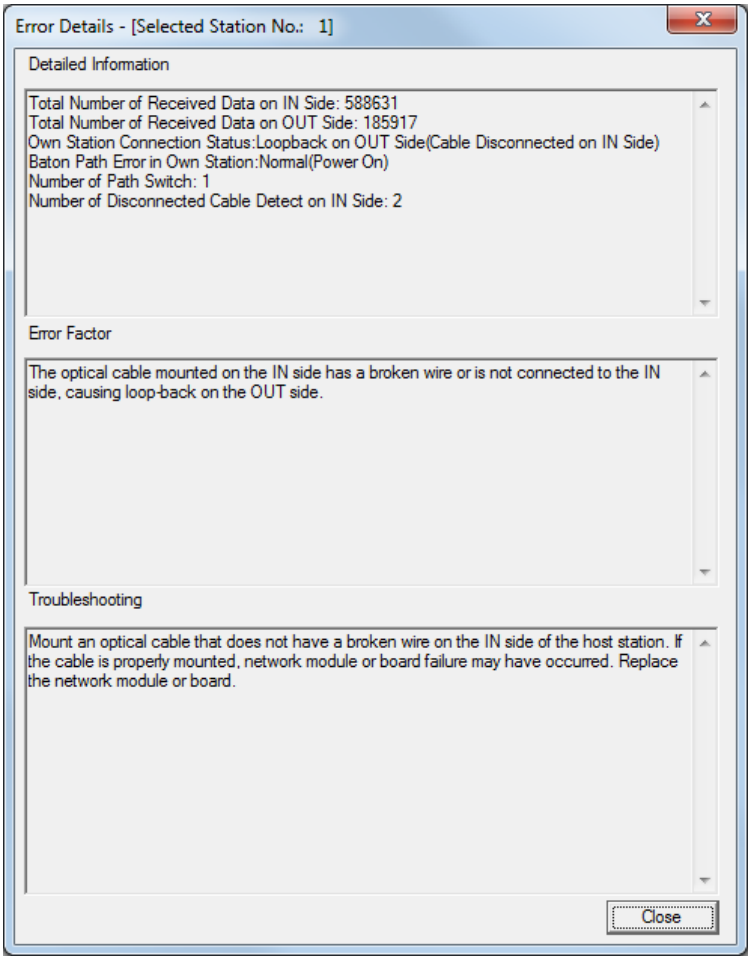
There are operating status, LED status, communication status, error details button.

Item	Display	Description
Operating status		Normal operation
		Operation error (data link continued) (yellow)
		Operation error (data link stopped) (red)
LED status		
Communication status		Data linking
		Cable disconnection
		Communication error
		Module error
Error details button	 etc.	Displayed at faulty parts.

(2) Error details

When clicking on the "Module Error" button etc., the "Error Details" dialog box is displayed.

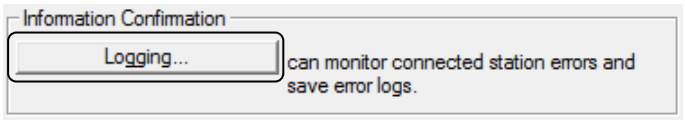
Take corrective actions according to troubleshooting.

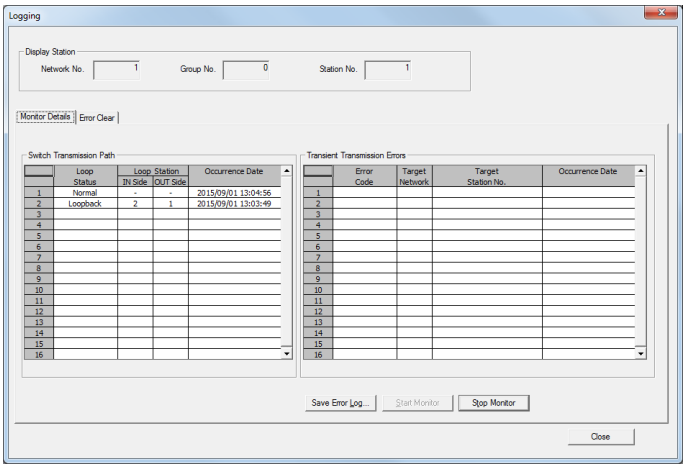


3.9.3 Logging

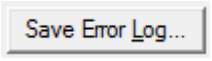
The history for the communication path switching and transient transmission error can be monitored and the error information can be cleared.
Note that these operations are not available in circuit test mode.

(1) How to display the logging dialog box
In the "CC-Link IE Controller Diagnostics" dialog box, click "Logging" to display the logging dialog box.



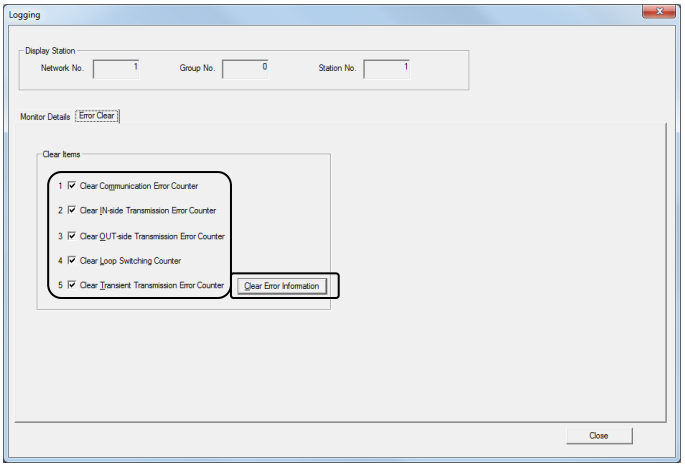


(2) "Monitor Details" tab description
The history for the communication path switching and transient transmission error is displayed.

Item		Description
Display Station		Displays the network No., group No., and station No. of the connected station.
Switch Transmission Path	Loop Status	Displays the status of a loop.
	Loop station	Displays a station where loopback occurs at IN-side and OUT-side at loopback.
	Occurrence Date	Displays a time when a communication path is switched.
Transient Transmission Errors	Error Code	Displays error codes.
	Target Network	Displays network No. of the station where an error was detected.
	Target Station No.	Displays station No. of the station where an error was detected.
	Occurrence Date	Displays a time when a transient transmission error is detected.
		Saves the description of monitor detail in CSV file.  • Drive/Path: Specify a save location of the CSV file. • File name: Specify the CSV file name to be saved. (*.csv)

(3) Clear error information

Click the "Error Clear" tab, check the communication error counter, IN/OUT-side transmission error counter, loop switching counter, and transient transmission error, and click the "Clear Error Information" button to clear the error information.

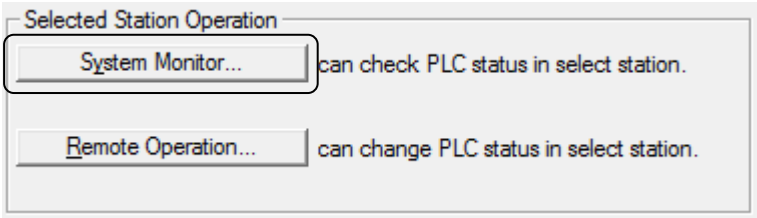


3.9.4 System monitor

The module status of the CC-Link IE Controller Network module can be checked.

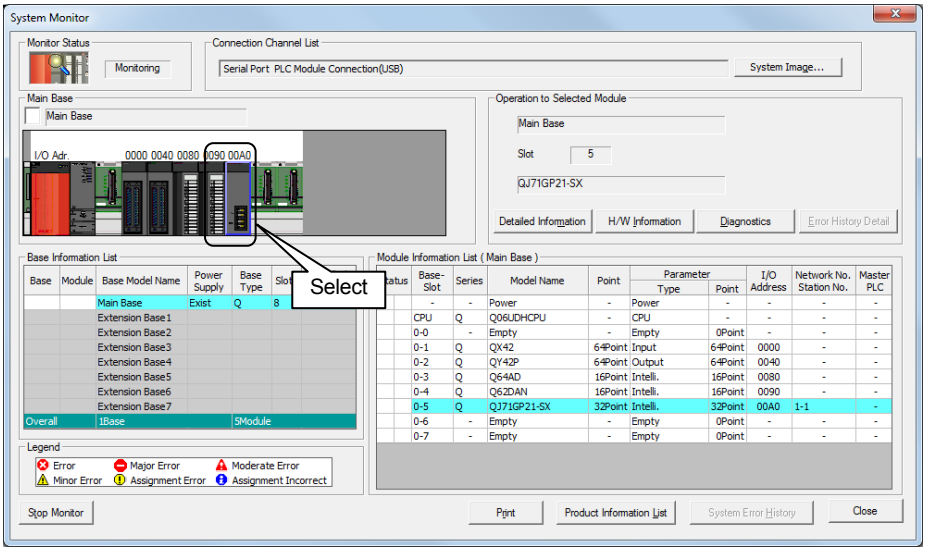
(1) How to display the system monitor dialog box

In the "CC-Link IE Controller Diagnostics" dialog box, double-click  , or click the "System Monitor", to display the system monitor dialog box.



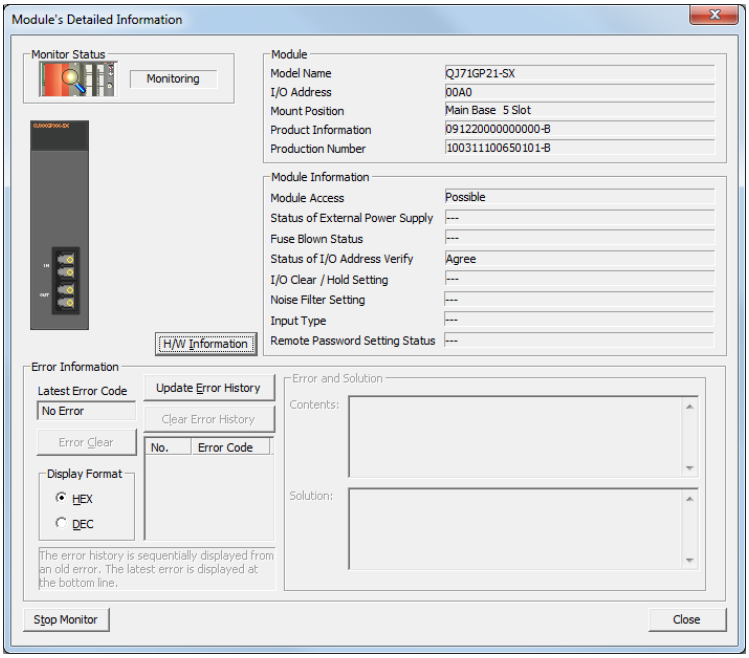
(2) Select a module to confirm

Select "QJ71GP21-SX", the forth module of [Main Base], and click "Detail Information". The Module's Detailed Information dialog box is displayed.



(3) Module's Detailed Information dialog box

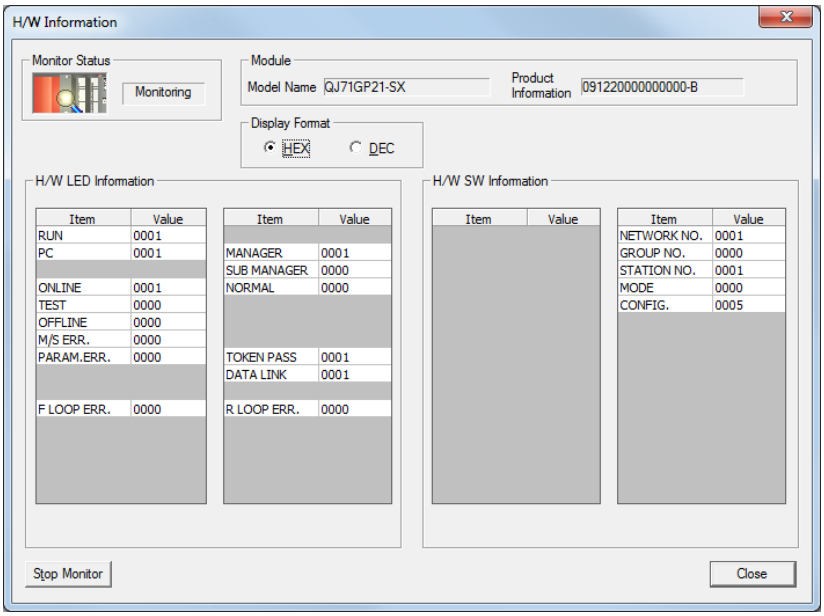
The module name, start I/O address, mount position, product information, module access, status of I/O address verify, error code, and the LED information and switch information of the module can be checked.



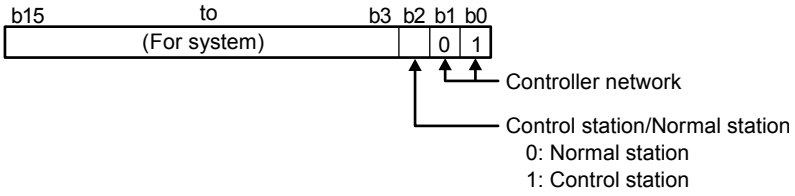
Item		Description
Module	Module Name	Displays the name of a module.
	I/O Address	Displays the start I/O number of a module.
	Mount Position	Displays the slot position where a module is mounted.
	Product Information	Displays product information. • The end of the product information indicates function version of the module. • When the end is "B", it indicates the module of function version B.
	Production Number	The production number is displayed.
Module Information	Module Access	"Possible" is displayed when a watchdog timer error does not occur.
	Status of I/O Address Verify	The parameter setting and the verification result of the mounted module are displayed.
Error Information	Latest Error Code	Displays the latest error code.
	Update Error History	The history of error codes is updated by clicking this Update Error History button.
	Error Clear	The errors displayed in the "Latest Error Code" are cleared by clicking this Error Clear button.
	Error and Solution	The description and corrective action of an error code selected in the error information are displayed.
H/W Information		The LED information and switch information of the module can be checked.

(4) H/W LED information dialog box

Display the H/W Information dialog box by selecting "H/W Information" of the Module's Detailed Information dialog box. The LED information and switch information of the module can be checked.



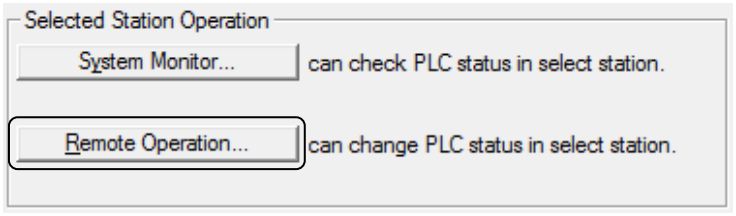
Item	Description
RUN	Displays the operating status of a module. 0001: Operating normally 0000: Hardware fault or watchdog timer error
PC	Displays the network type. 0001: Controller network
ONLINE	Displays the operation mode of the CC-Link IE Controller Network module. 0001: Online mode 0000: Other than online mode
TEST	Displays the operation mode of the CC-Link IE Controller Network module. 0001: Test mode 0000: Other than test mode
OFFLINE	Displays the operation mode of the CC-Link IE Controller Network module. 0001: Offline mode 0000: Other than offline mode
M/S. ERR.	Displays the detection status of duplicated control station or station No. Check the network status in the CC-Link IE Controller Network diagnostics. 0001: Duplicated control station or station No. detected 0000: Undetected
PARAM.ERR.	Displays the parameter error detection status. Check the network status in the CC-Link IE Controller diagnostics. 0001: Parameter error detected 0000: Undetected
F LOOP ERR.	Displays the IN-side error detection of the CC-Link IE Controller Network module. 0001: IN-side error detected 0000: Undetected
MANAGER	Displays the IN-side error detection of the CC-Link IE Controller Network module. 0001: Control station is operating 0000: Other than control station is operating

Item	Description
SUB MANAGER	Displays the IN-side error detection of the CC-Link IE Controller Network module. 0001: Sub-control station is operating 0000: Other than sub-control station is operating
NORMAL	Displays the station type of the CC-Link IE Controller Network module. 0001: Normal station is operating 0000: Other than normal station is operating
TOKEN PASS	Displays the baton pass status of the CC-Link IE Controller Network module. 0001: Baton pass being executed 0000: Baton pass unexecuted
DATA LINK	Displays the data link status of the CC-Link IE Controller Network module. 0001: Data link being executed 0000: Data link not executed
R LOOP ERR.	Displays the OUT-side error detection of the CC-Link IE Controller Network module. Check the network status by CC IE Control diagnostics. 0001: OUT-side error detected 0000: Undetected
EXT.POWER	Displays the external power supply status, of the CC-Link IE Controller Network module with external power supply function. 0001: External power supplied 0000: No external power supplied
NETWORK NO.	Displays the network No. of the CC-Link IE Controller Network module. (Range: 1 to 239)
GROUP NO.	Displays the group No. of the CC-Link IE Controller Network module. (Range: 1 to 32)
STATION NO.	Displays the station No. of the CC-Link IE Controller Network module. (Range: 1 to 120)
MODE	Displays the operation mode of the CC-Link IE Controller Network module. 0: Online 2: Offline 5: Station-to-station test 6: Circuit test 7: Self-loopback test 9: Hardware test
CONFIG.	Displays the network type of the CC-Link IE Controller Network module. 

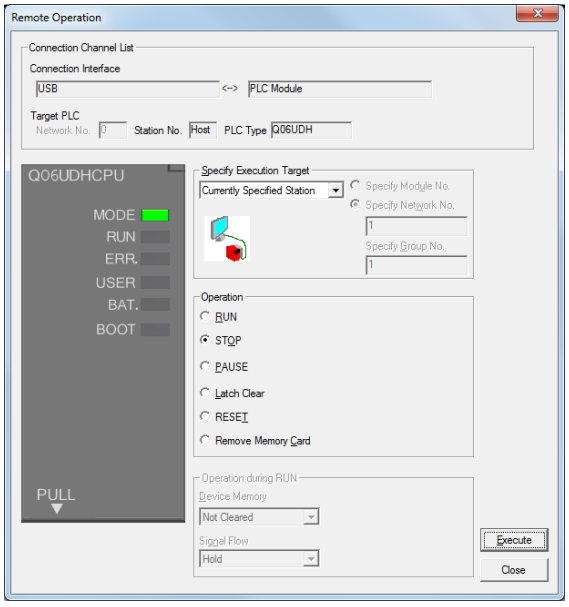
3.9.5 Remote operation

The operating status of the CPU module that is connected to a network can be changed.

(1) How to display the Remote Operation dialog box
In the "CC-Link IE Controller Diagnostics" dialog box, click "Remote Operation" to display the Logging dialog box.



(2) Remote Operation dialog box



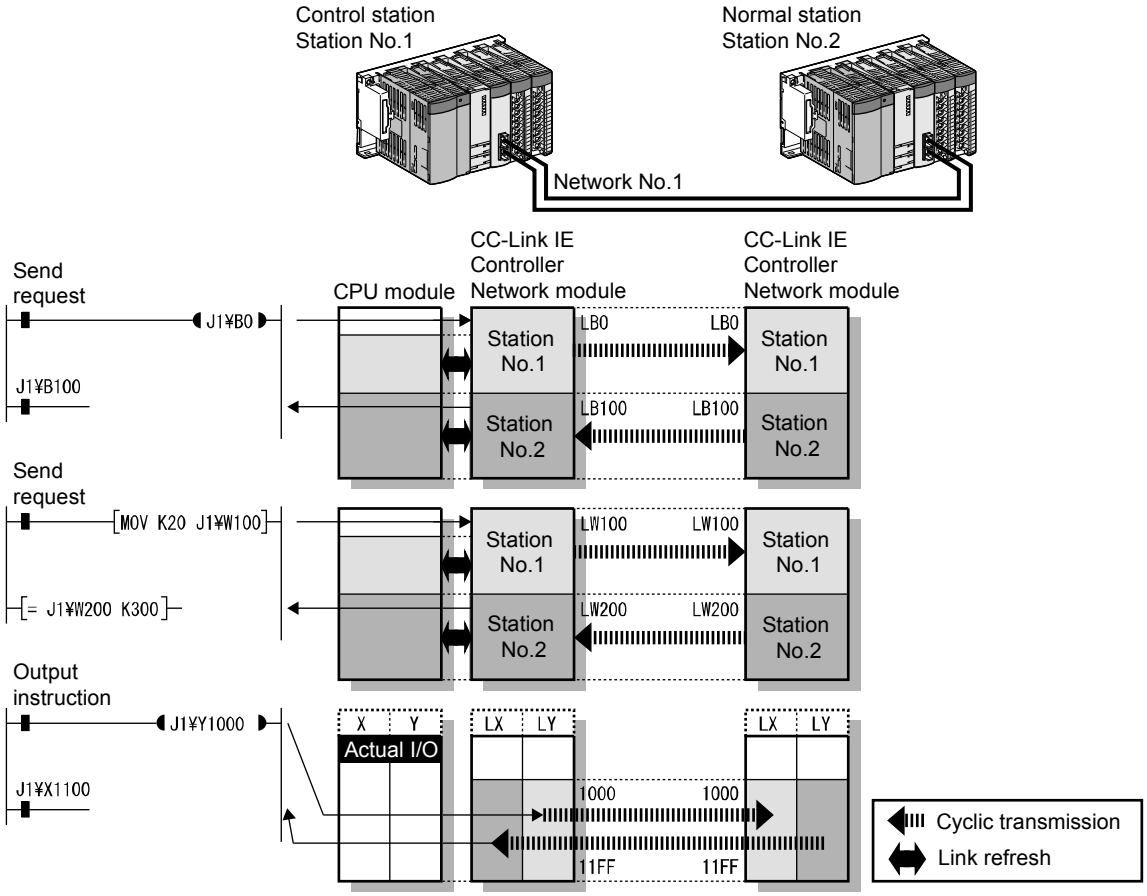
Item	Description
Connection Channel List	The connection target information is displayed.
Specify Execution Target	Set a target station of remote operation. • Currently Specified Station: Remote operation is executed to the displayed "Target PLC". • All Stations: Remote operation is executed to all stations in the network specified in "Specify Execution Module". • Specified Group: Remote operation is executed to the specified group No. in the network specified in "Specify Execution Module".
Operation	Select the operating status to be changed.
Operation during RUN	Set the operation of the device memory and signal flow during RUN.

(3) Remote Operation
Select the [Operation] in the Remote Operation dialog box.
Change from [RUN] to [STOP] and select [Specify Execution Target] - [Currently Specified Station].
Clicking the [Execute] turns OFF the green LED in the RUN display of the actual PLC CPU.

After changing from [STOP] to [RUN], click the [Operation] to turn ON the green LED in the RUN display of the actual PLC CPU.

3.10 Access directly to link devices of Network module (Direct Access)

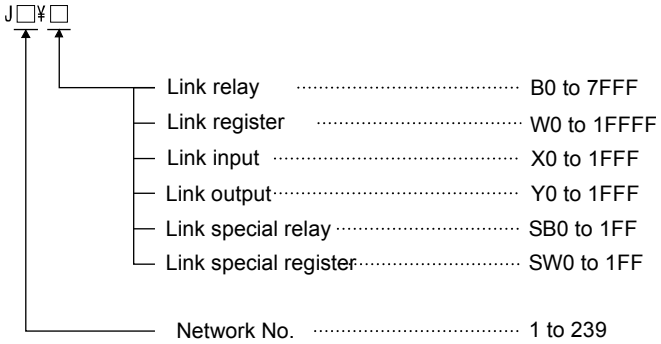
Data can be directly read from or written to link devices (LB/LW/LX/LY/SB/SW) of the CC-Link IE Controller Network module using the sequence program. Specify a link device in the link direct device (J□¥□) for direct access.



POINT
(1) When a shorter link refresh time is desired Remove any infrequently used link devices from the link refresh range, and directly read or write them using link direct devices. This reduces the points of the link refresh to the CPU module, resulting in a shorter link refresh time. (2) When a shorter transmission delay time is desired Since the link direct device reads or writes data directly to the link devices of the CC-Link IE Controller Network module at the time of the instruction execution, the transmission delay time can be reduced. Link refresh is performed in "END processing" of the sequence scan of the CPU module.

(1) How to specify the link direct device

Specify a network No. and a link device of the target CC-Link IE Controller Network module.



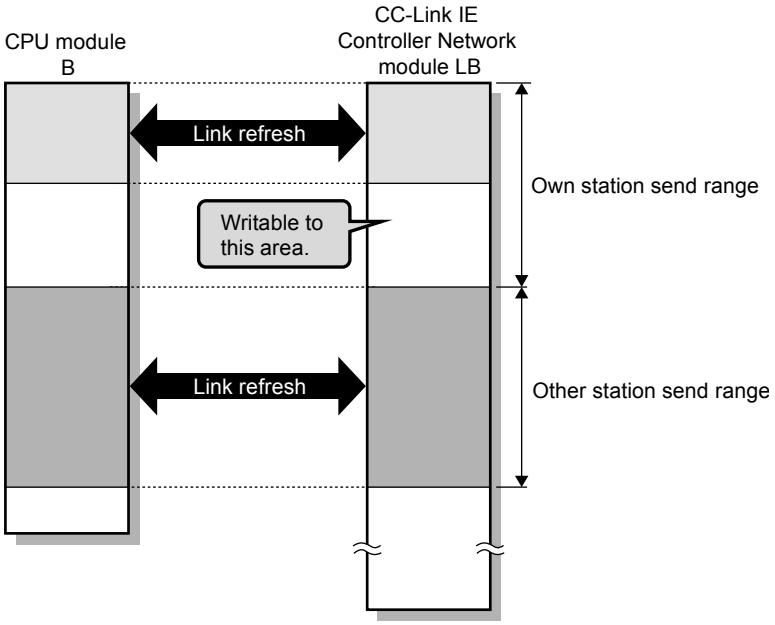
(2) Link device address specification range

(a) Reading form a link device

All of the link device address specification range can be specified.

(b) Writing to a link device

An area within the link device address specification range and within the own station send range and outside the link refresh range can be specified.



3.10.1 Direct access operation

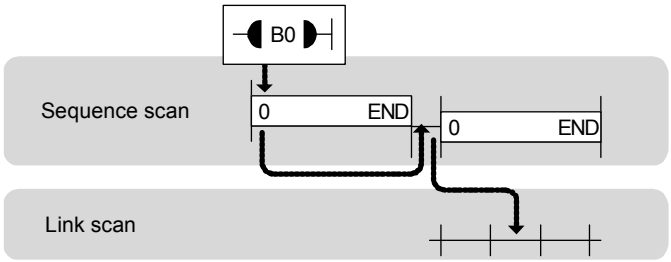
Near step 0 and near END, the access time is different.

(1) Direct access on the sending side

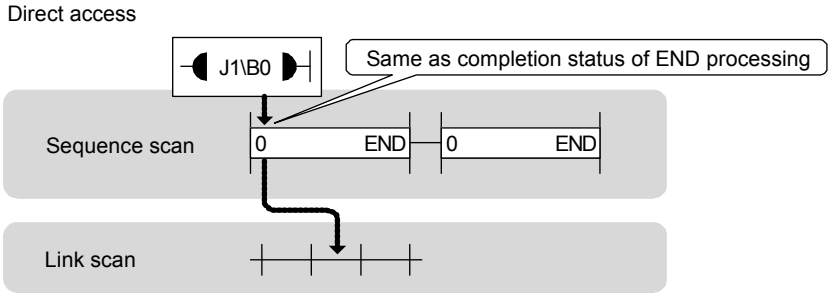
(a) When near step 0

Access time between the CPU module and CC-Link IE Controller Network module using direct access is faster by up to one sequence scan time when compared to using link refresh, .

Link refresh



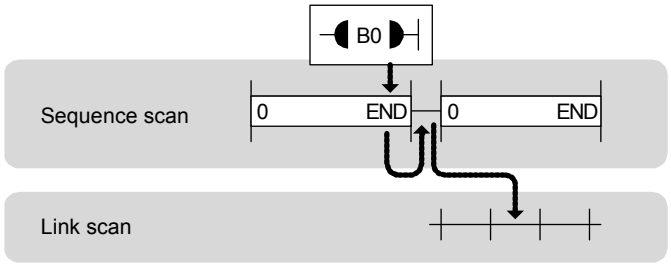
Direct access



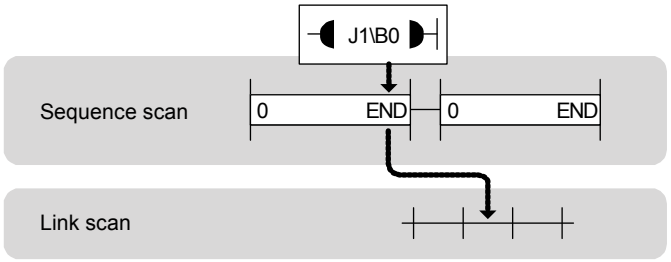
(b) When near END

Access time between the CPU module and CC-Link IE Controller Network module is almost the same between link refresh and direct access.

Link refresh



Direct access

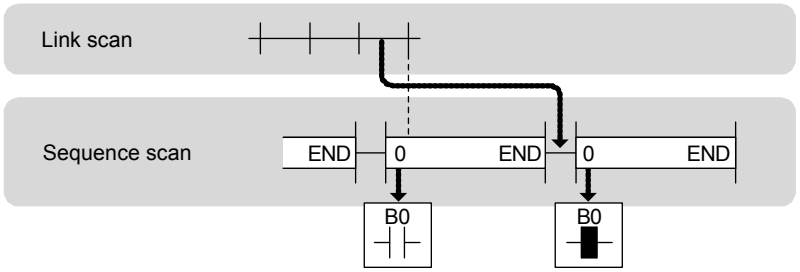


(2) Direct access on the receiving side

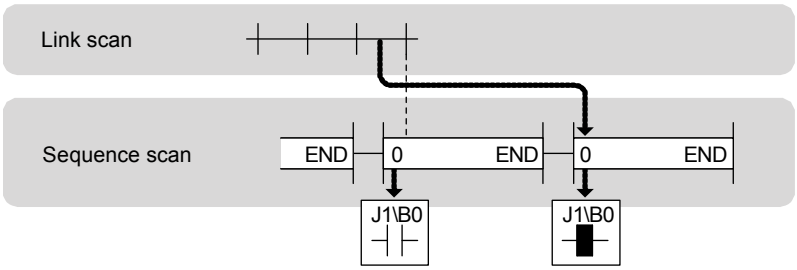
(a) When near step 0

Access time between the CPU module and CC-Link IE Controller Network module is almost the same between link refresh and direct access.

Link refresh



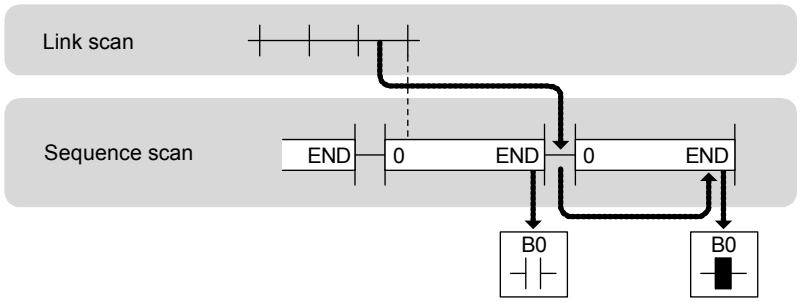
Direct access



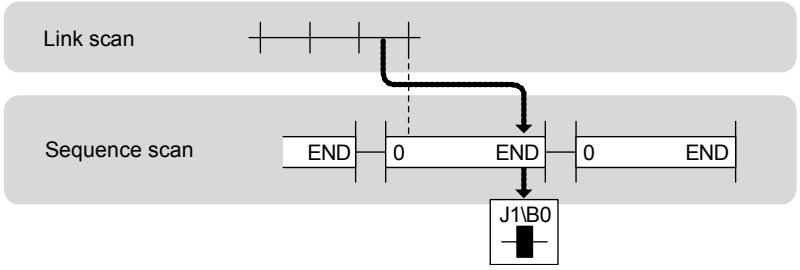
(b) When near END

Access time between the CPU module and CC-Link IE Controller Network module using direct access is, when compared to using link refresh, faster by up to one sequence scan time.

Link refresh



Direct access

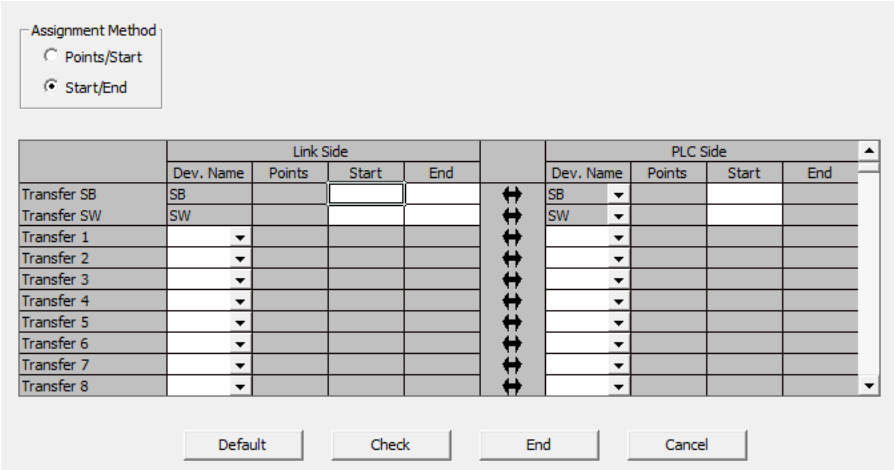


3.10.2 Using direct access in system configuration with 2 stations

In this task, execute the direct access.
Confirm that communication can be performed after changing the parameters and the sequence program of "Cyclic transmission (Configuration with 2 stations)" in 3.8.1.

(1) Parameters (common for Station No. 1 and No. 2)

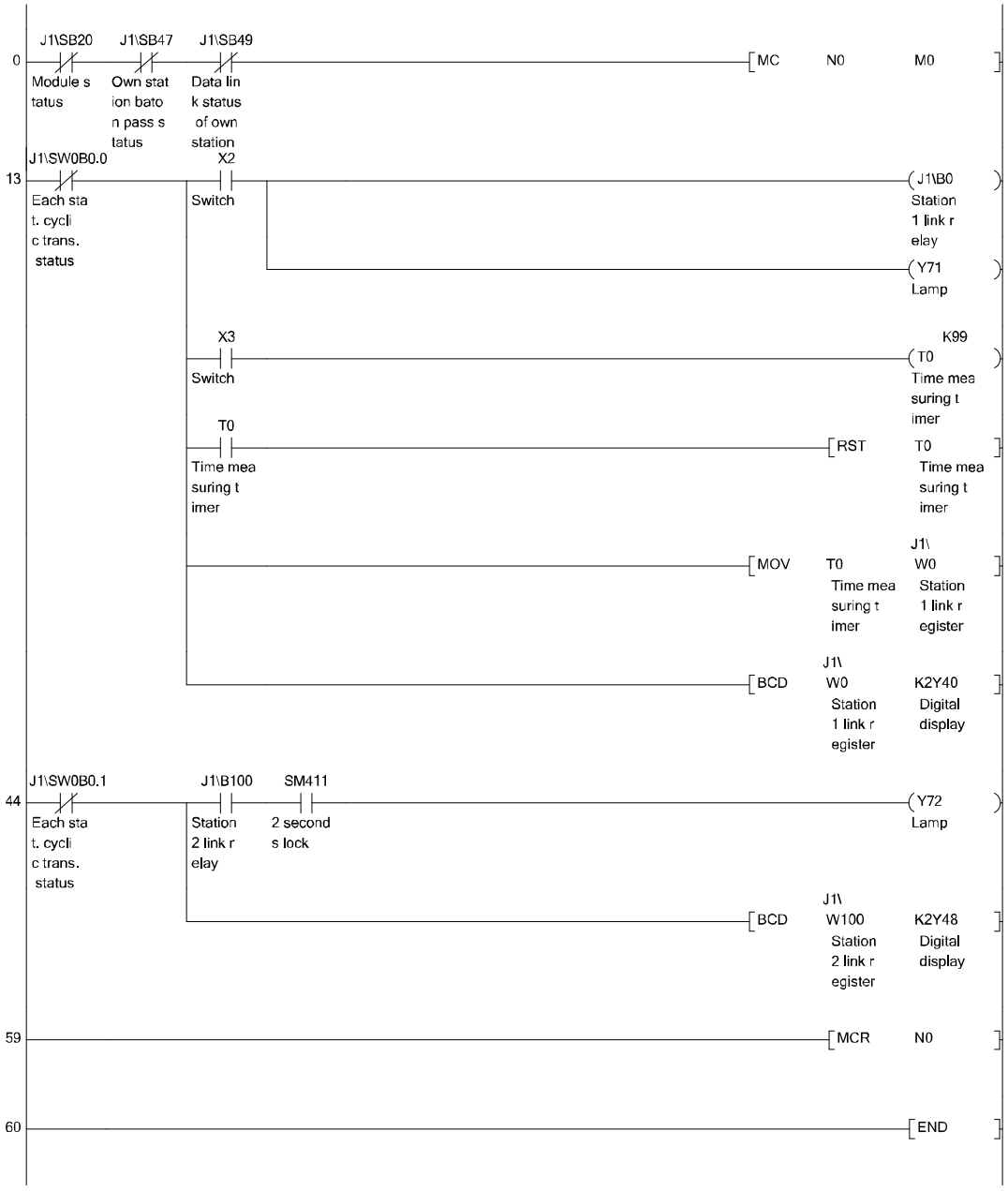
Delete all the values of "Refresh Parameter" in the Network Parameter settings.



(2) Program for station No.1

When X2 of the control station (Station No. 1) is turned on, Y71 of the control station (Station No. 1) lights, and Y71 of the normal station (Station No. 2) flashes. When X3 of the control station (Station No. 1) is turned on, the measurement value of the timer T0 is displayed on Y40 to Y47 of the control station (Station No. 1), and Y40 to Y47 of the normal station (Station No. 2).

Path	2 modules configuration
Program name	1MP1

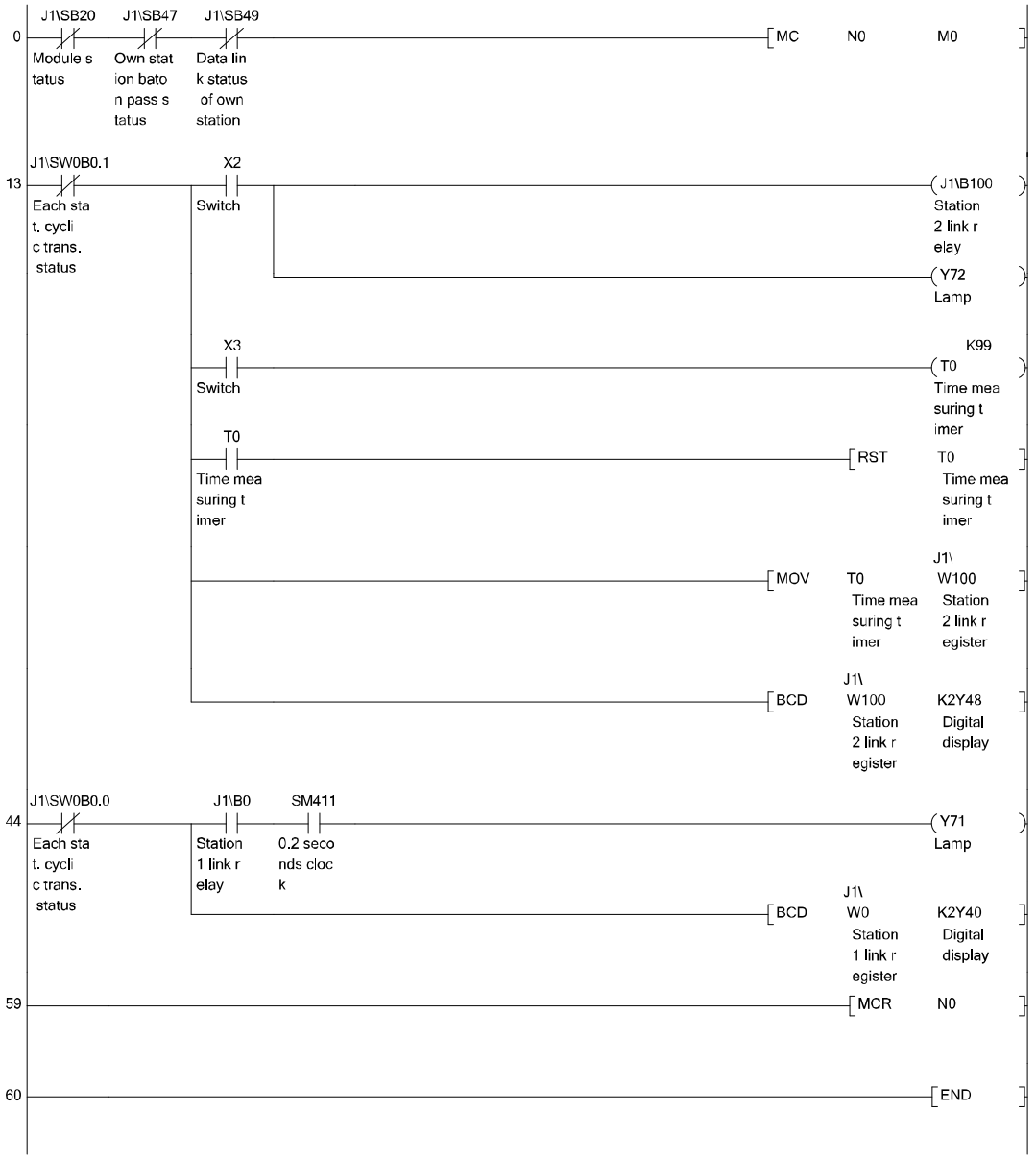


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(3) Program for station No. 2

When X2 of the control station (Station No. 2) is turned on, Y72 of the control station (Station No. 2) lights, and Y72 of the normal station (Station No. 1) flashes. When X3 of the control station (Station No. 2) is turned on, the measurement value of the timer T0 is displayed on Y48 to Y4F of the control station (Station No. 1), and Y48 to Y4F of the normal station (Station No. 2).

Path	2 modules configuration
Program name	1NS2

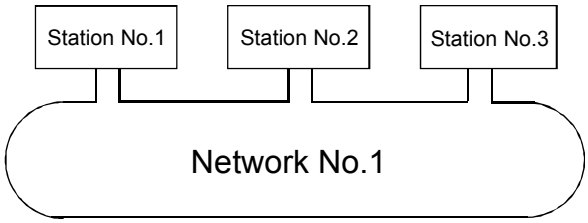


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

3.11 Additional exercise with cyclic transmission function

3.11.1 Cyclic transmission (Configuration with 3 stations)

Modify the demonstration machine configuration as follows and write the parameters and the sequence program to each station to check the operation.
In this program, the link error detection program is omitted.



(1) Set parameters with GX Works2
Double-click [Ethernet/CC IE/MELSECNET] in [Network Parameter] of the Project View and configure settings as described below.

(a) Number of modules setting

In case of control station (station No.1)

	Module 1	Module 2
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	3 ← Total number of stations for link: 3	
Group No.	0	
Station No.	1 ← Station No.: 1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

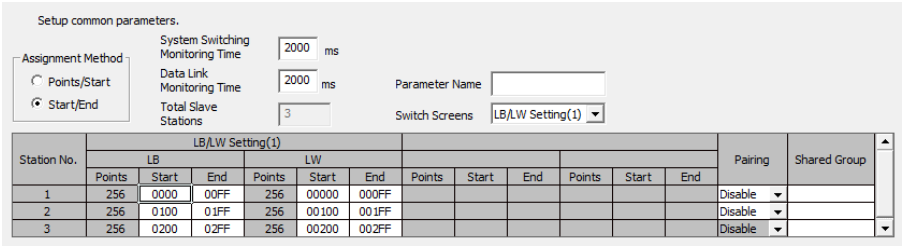
In case of normal station (station No.2)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	2 ← Station No.: 2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

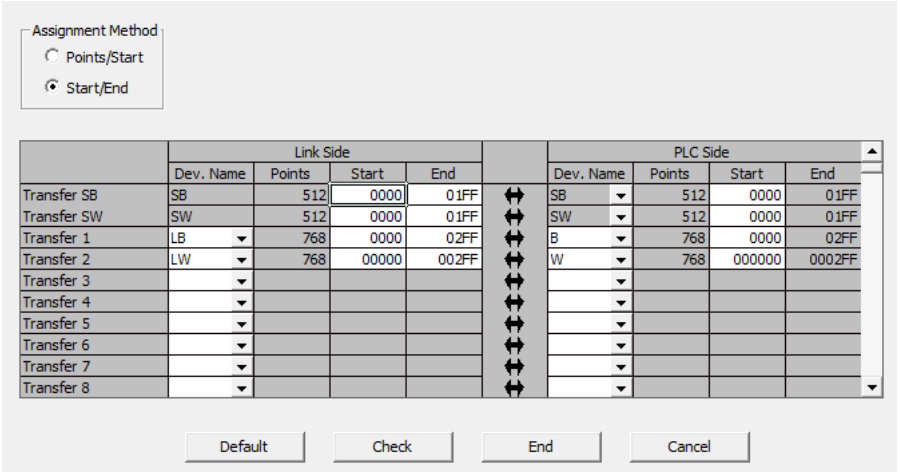
In case of normal station (station No.3)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	3 ← Station No.: 3	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

(b) Network range assignment (Control station only)



(c) Refresh parameter (common for all stations)

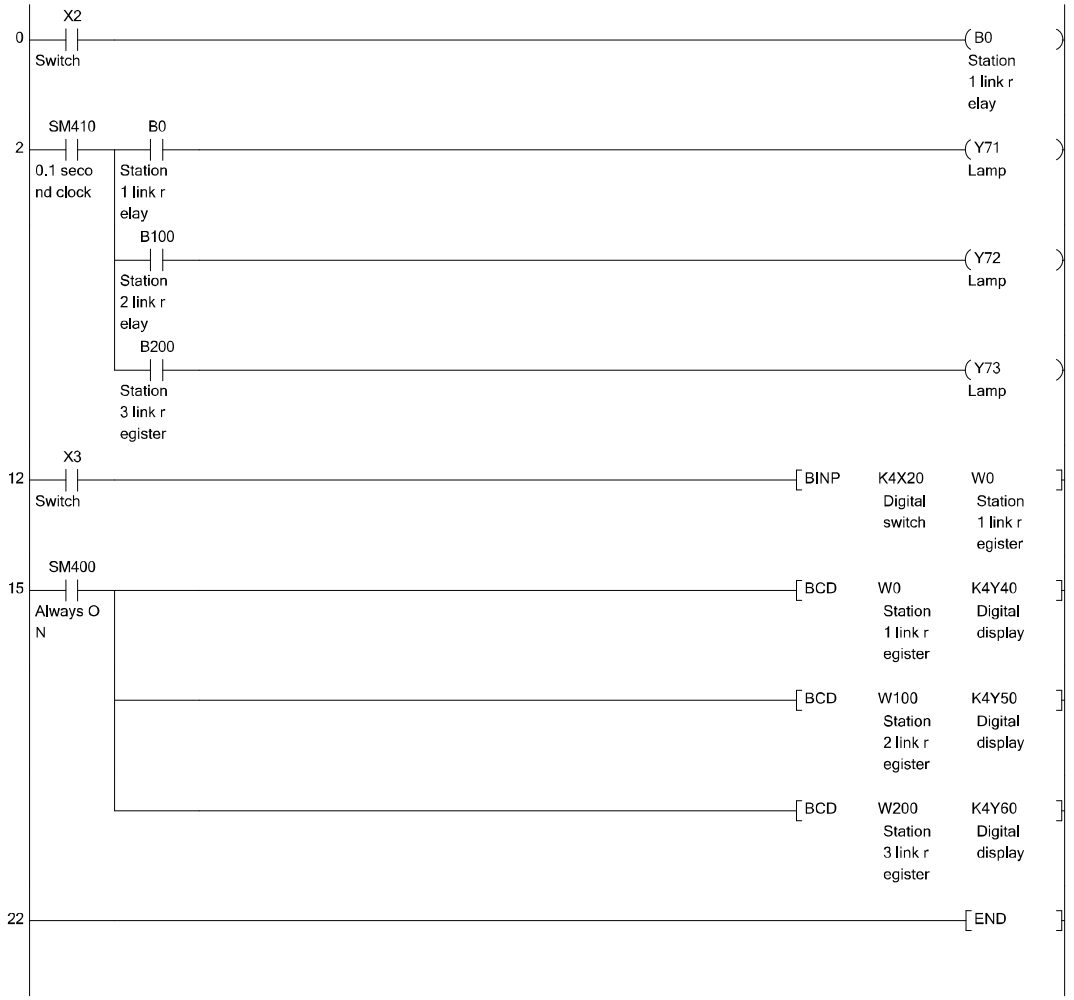


(2) Sequence program

The programs of each station are shown below.

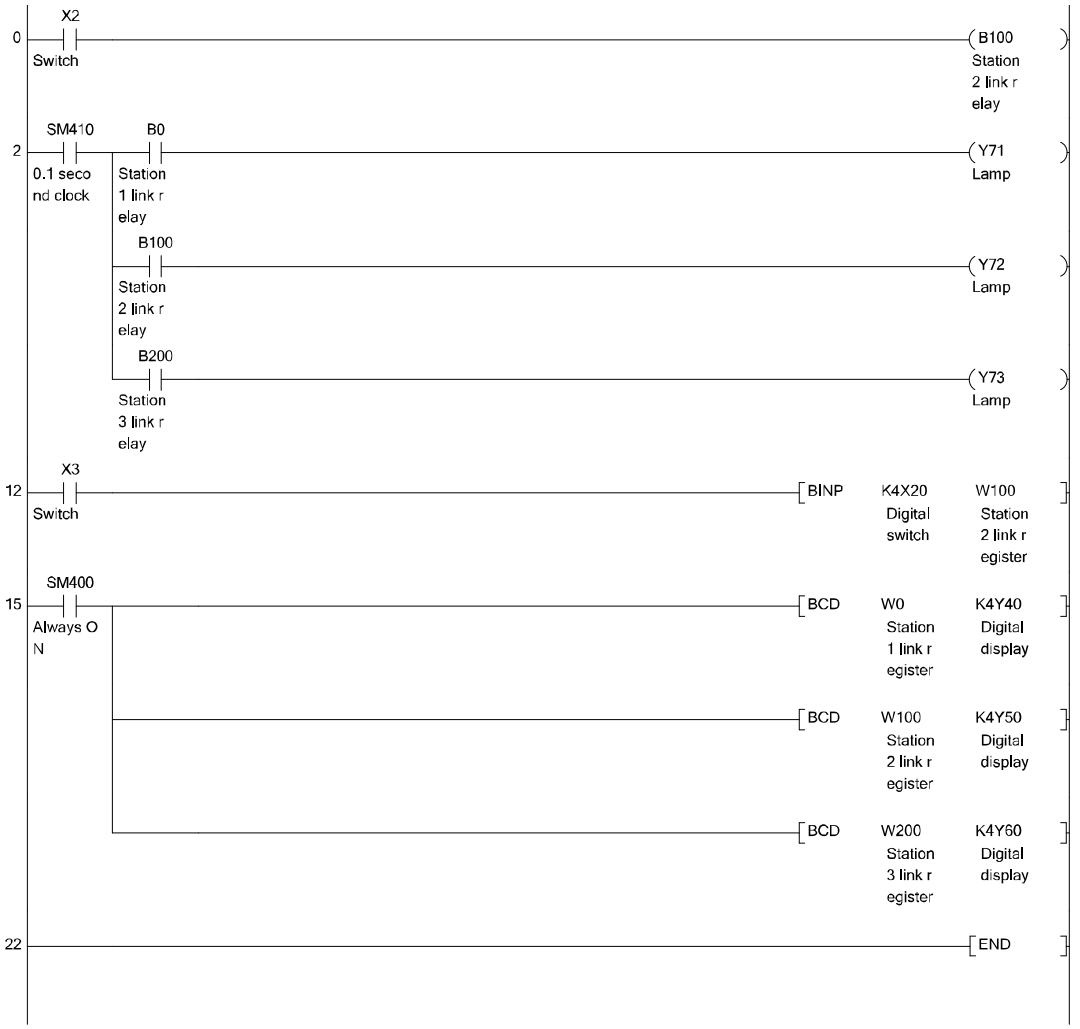
(a) Program for control station (Station No. 1)

Path	Cyclic transmission: 3 modules
Program name	1MP1



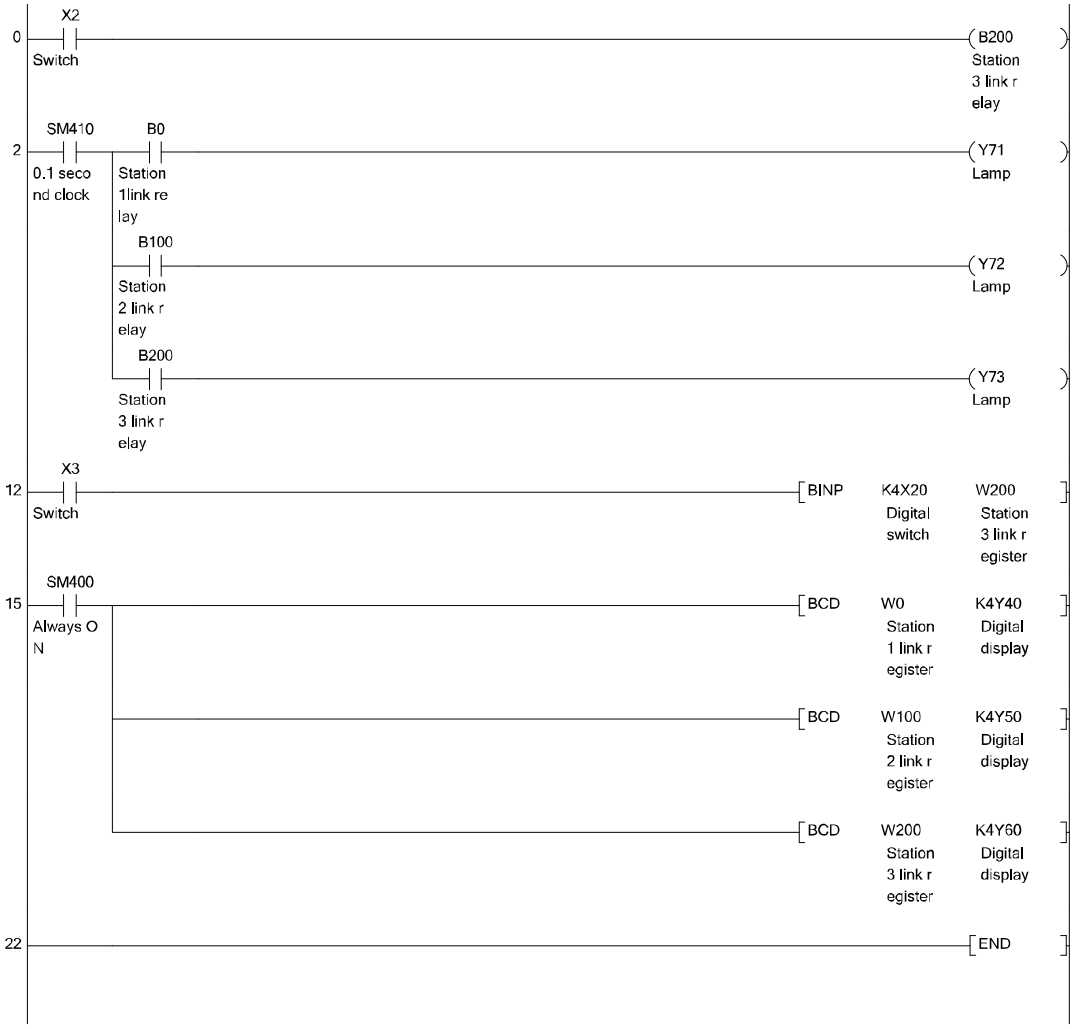
(b) Program for normal station (Station No. 2)

Path	Cyclic transmission: 3 modules
Program name	1Ns2



(c) Program for normal station (Station No. 3)

Path	Cyclic transmission: 3 modules
Program name	1Ns3



(3) Operation method (Each station common)

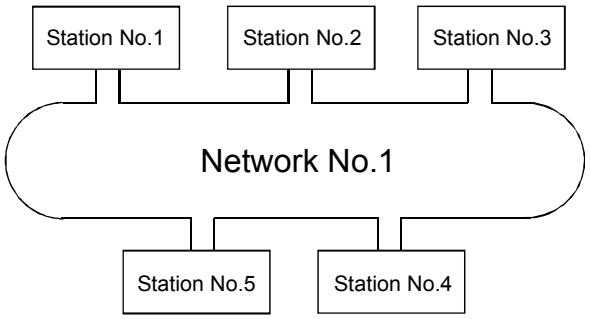
1) Turn ON X2
The LED corresponding to the operated station flashes.
Station No. 1: Y71 Station No. 2: Y72 Station No. 3: Y73

2) Turn ON X3
Data set on the digital switch X20 to X2F of own station are displayed on the digital display corresponding to each station.
Station No. 1: Y40 to Y47 Station No. 2: Y48 to Y4F Station No. 3: Y50 to Y57

3.11.2 Cyclic transmission Practice of 5 modules configuration

Modify the demonstration machine configuration as follows and write the parameters and sequence program to each station to check the operation.

In this program, the link error detection program is omitted.



(1) Set parameters with GX Works2

Double-click [Ethernet/CC IE/MELSECNET] in [Network Parameter] of the Project View and configure settings as described below.

(a) Number of modules setting

In case of control station (station No.1)

	Module 1	Module 2
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	5	
Group No.	0	
Station No.	1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

Total number of stations for link: 5

Station No.: 1

In case of normal station (station No.2)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

Station No.: 2

In case of normal station (station No.3)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	3	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

Station No.: 3

In case of normal station (station No.4)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	4	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

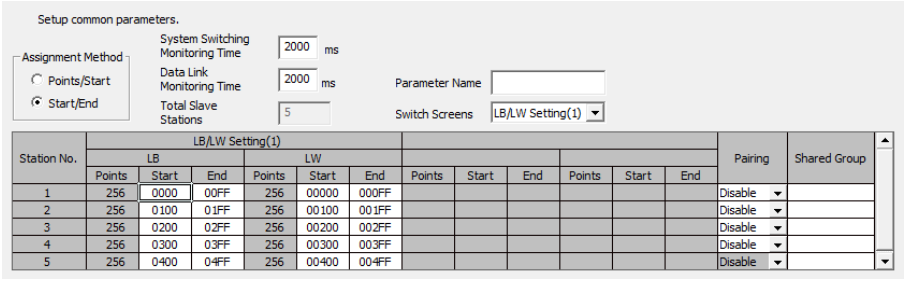
Station No.4

In case of normal station (station No.5)

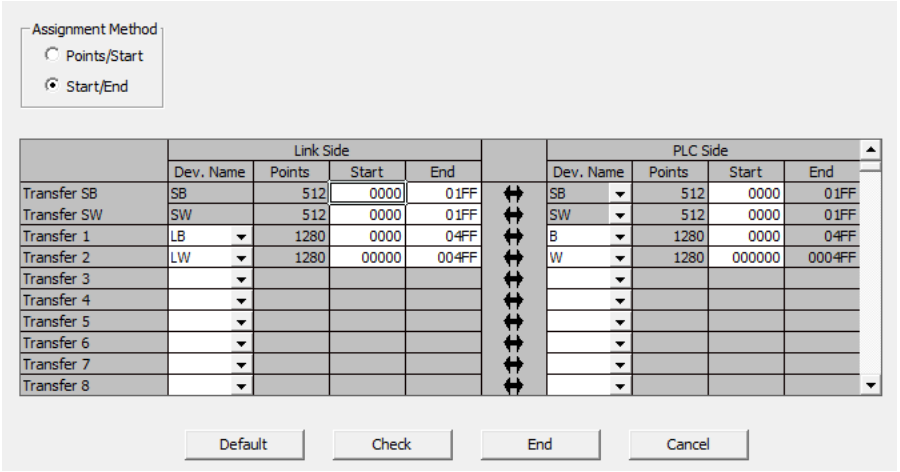
	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	5	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

Station No.5

(b) Network range assignment (Control station only)



(c) Refresh parameter (Each station common)

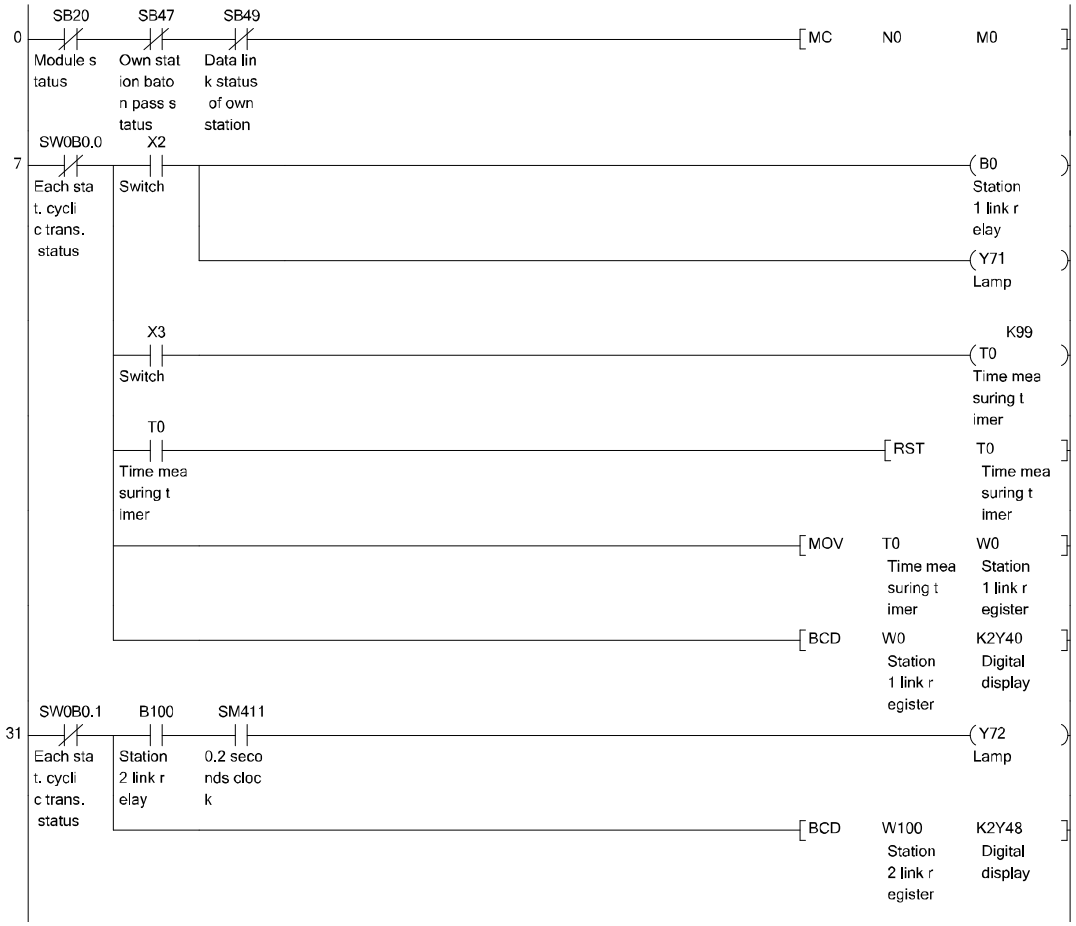


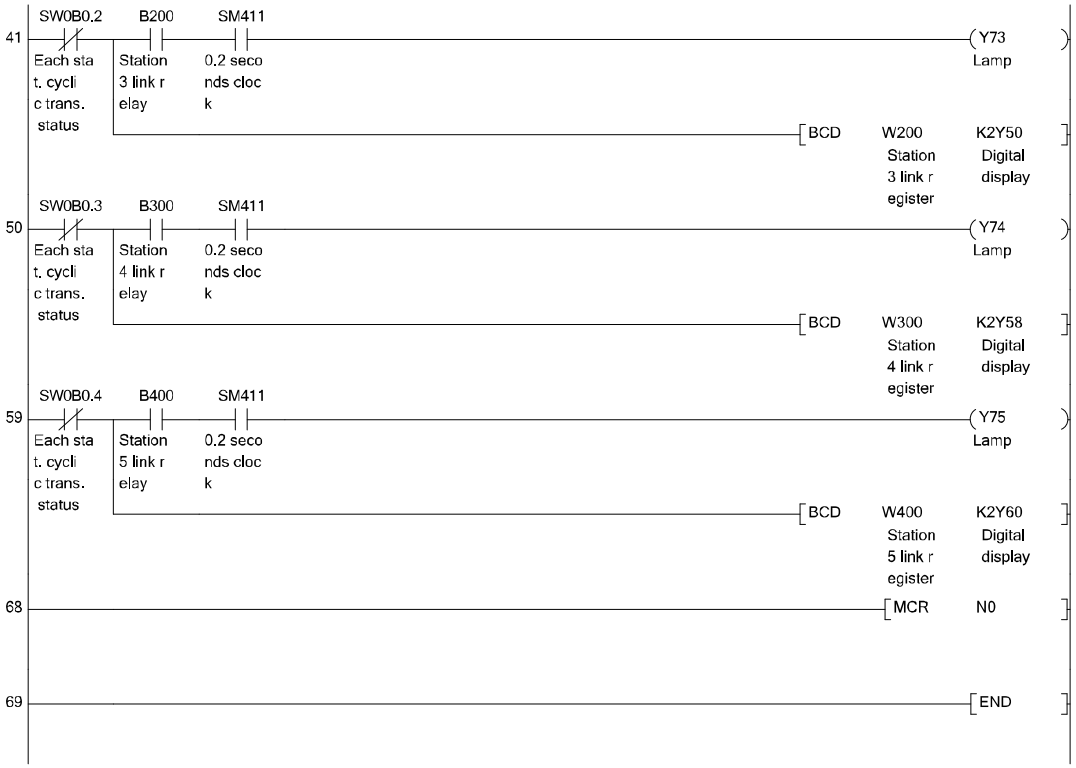
(2) Sequence program

The programs of each station are shown below.

(a) Program for control station (Station No. 1)

Path	Cyclic transmission: 5 modules
Program name	1MP1

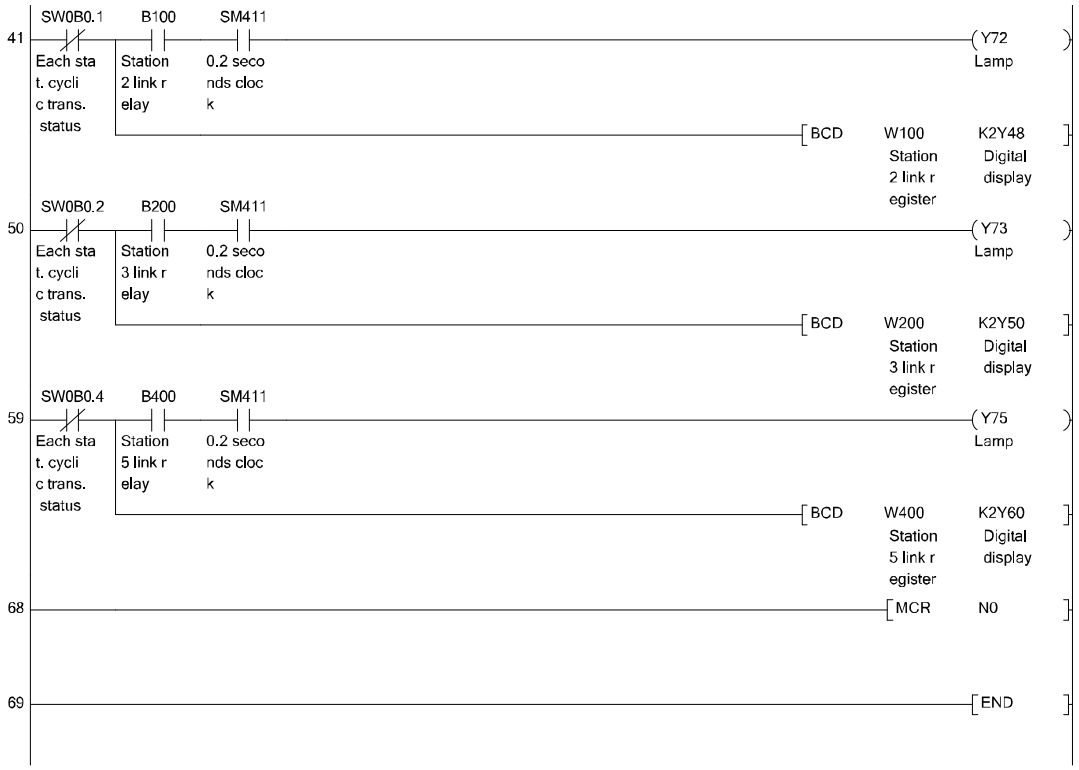


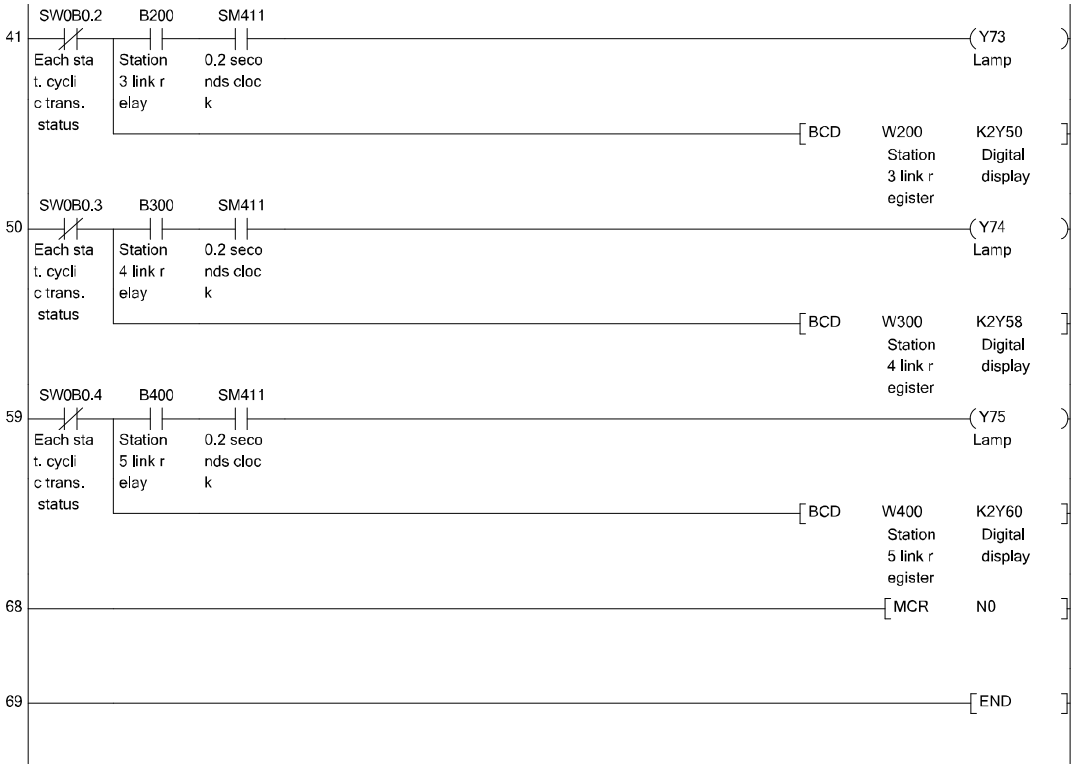


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(b) Program for normal station (Station No. 2)

Path	Cyclic transmission: 5 modules
Program name	1Ns2

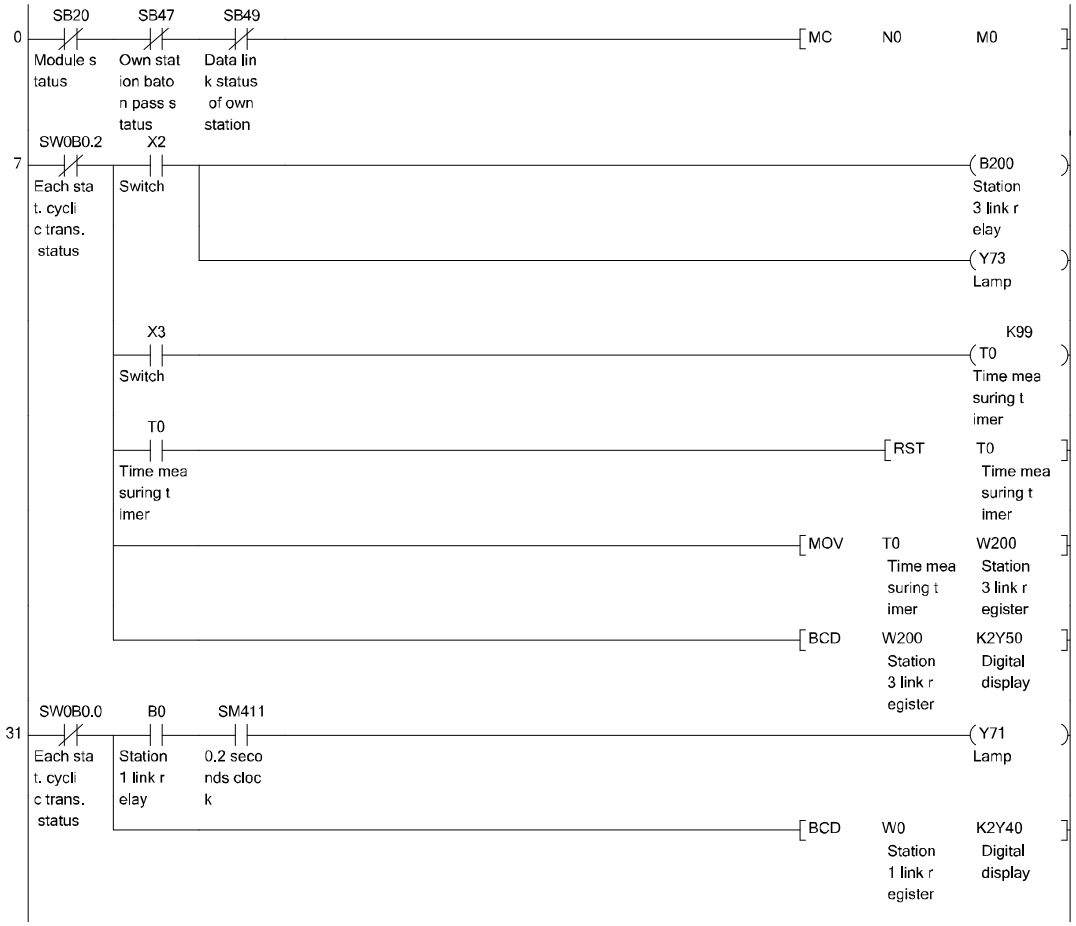


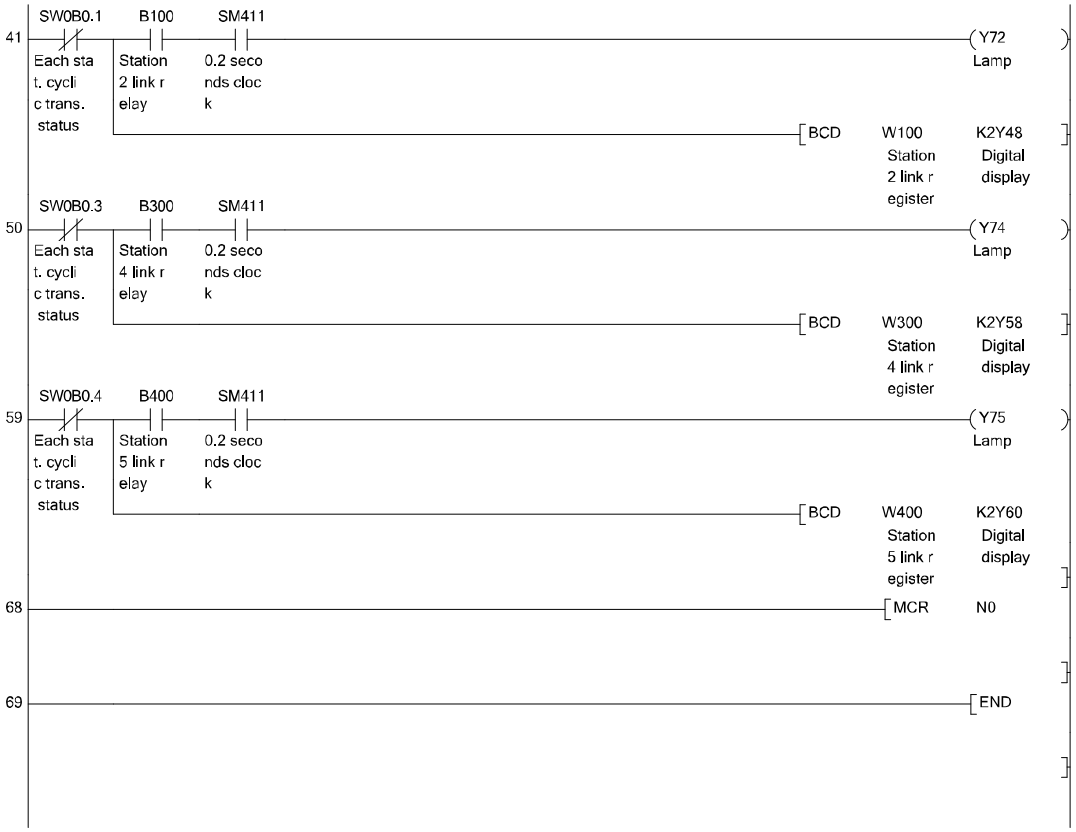


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(c) Program for normal station (Station No. 3)

Path	Cyclic transmission: 5 modules
Program name	1Ns3

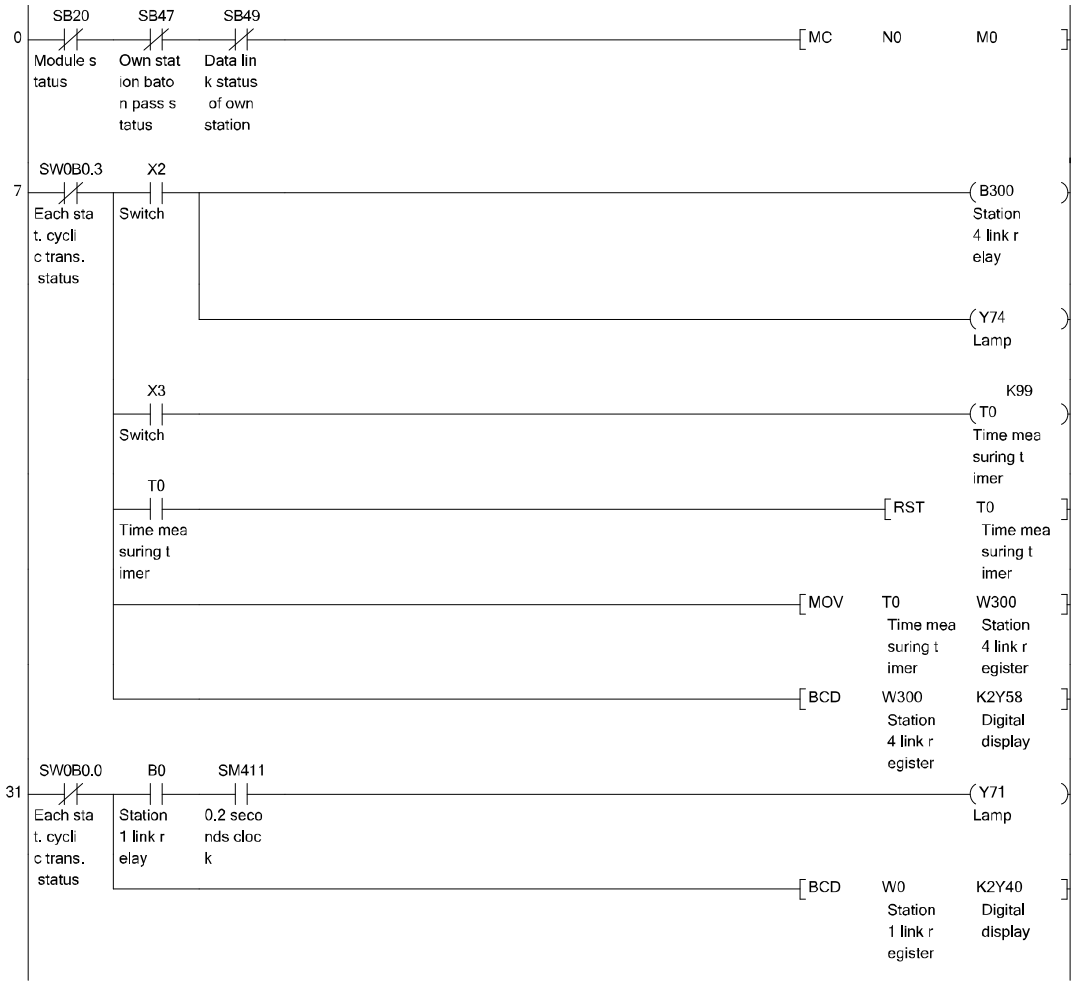


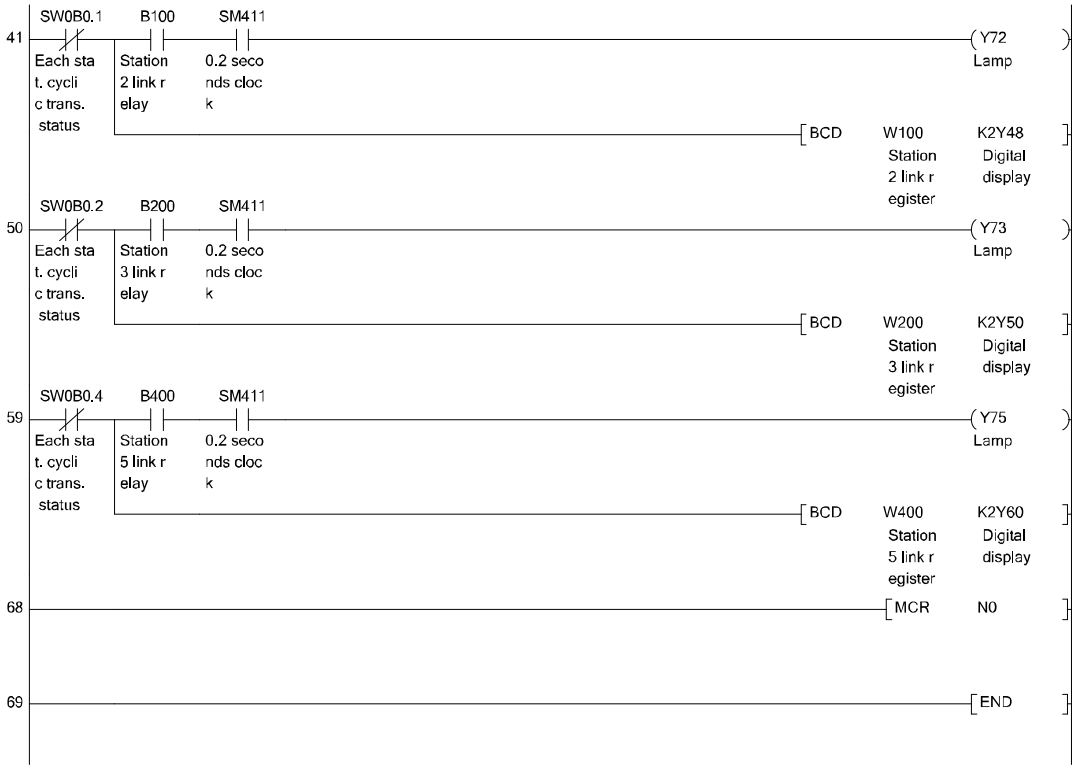


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(d) Program for normal station (Station No. 4)

Path	Cyclic transmission: 5 modules
Program name	1Ns4

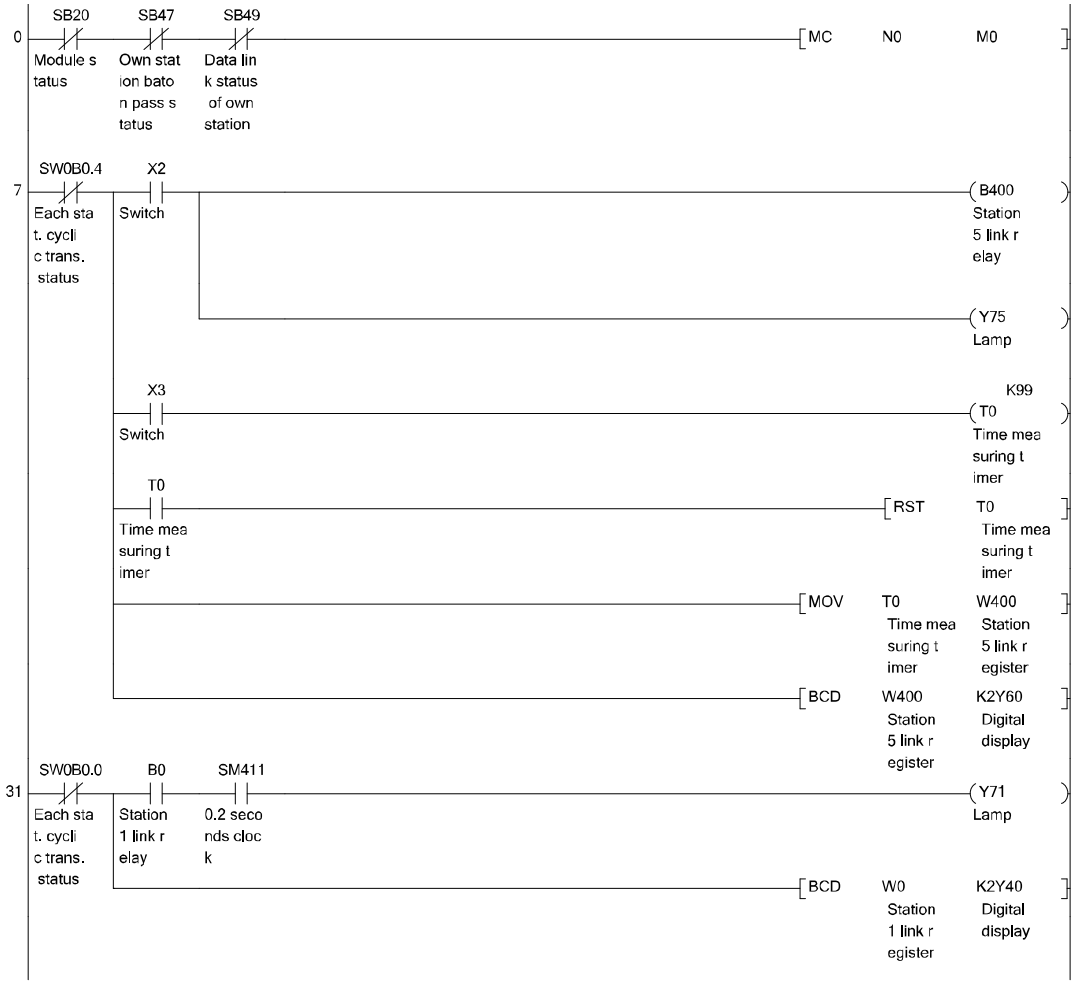


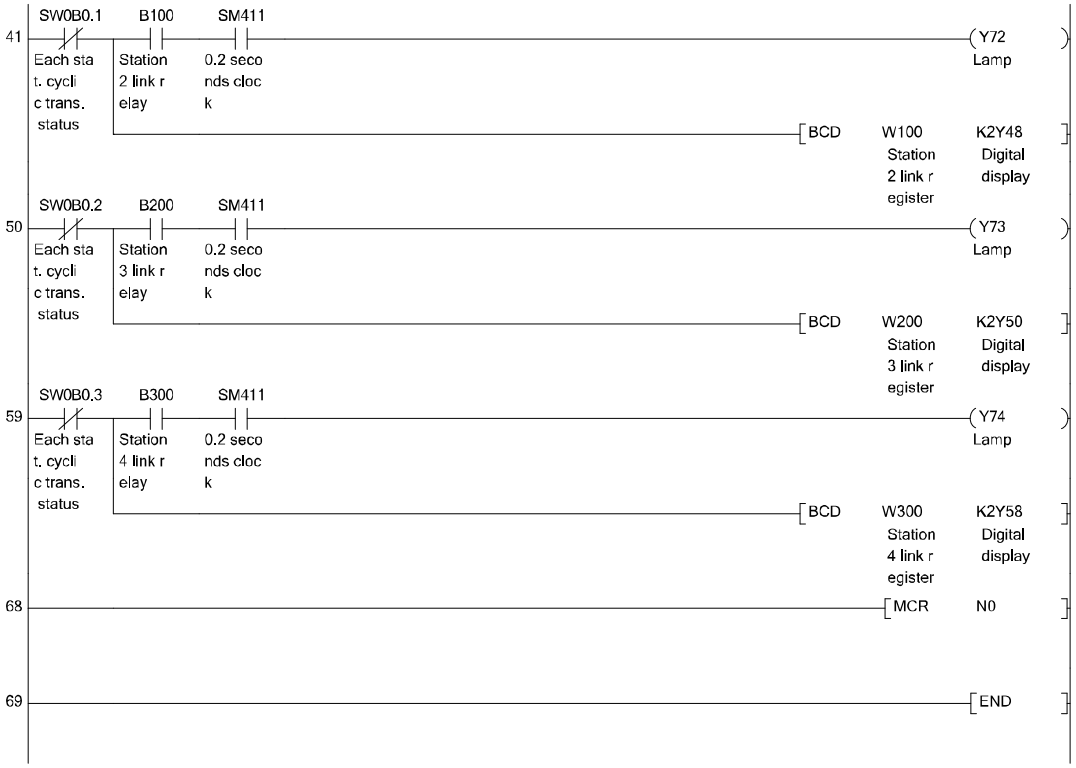


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(e) Program for normal station (Station No. 5)

Path	Cyclic transmission: 5 modules
Program name	1Ns5





* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(3) Operation method (Each station common)

1) Turn ON X2

The LED corresponding to the operated station turns ON (the LEDs corresponding to the other stations flash).

Station No. 1: Y71 Station No. 2: Y72 Station No. 3: Y73

Station No. 4: Y74 Station No. 5: Y75

2) Turn ON X3

The measured value of the timer T0 of own station is displayed on the digital display corresponding to each station.

Station No. 1: Y40 to Y47 Station No. 2: Y48 to Y4F Station No. 3: Y50 to Y57

Station No. 4: Y58 to Y5F Station No. 5: Y60 to Y67

Memo

CHAPTER 4 EXERCISE 2 (TRANSIENT TRANSMISSION)

The system configuration for the exercise is the same as in exercise 1.

4.1 Transient transmission function

Transient transmission function allows communications when a request is made among stations.
The transient transmission request can be sent from GX Works2, intelligent function module, or with link dedicated instruction (SEND, RECV, READ, WRITE, REQ, ZNRD, ZNWR, RECV).
In the CC-Link IE Controller Network, data communication can be performed with other stations on the same network (where the own station is connected), as well as with stations in other networks.

4.1.1 Link dedicated instruction types and description

The following shows an overview of the available instructions for CC-Link IE controller network.
Refer to the corresponding section for the format of each instruction and the program example.

List of link dedicated instructions

Application	Link dedicated instructions	Description
Write/read data to/from devices on another station (for Q/QnA series)	READ	Reads data from devices of a programmable controller on another station. (In units of words)
	SREAD	Reads data from devices of a programmable controller on another station. (In units of words) With the SREAD instruction, a device on another station turns ON when data reading is completed. (It can be recognized that data of the other stations has been read by the SREAD instruction.)
	WRITE	Writes data to devices of a programmable controller on another station. (In units of words)
	SWRITE	Writes data to devices of a programmable controller on another station. (In units of words) With the SWRITE instruction, a device on another station turns ON when data reading is completed. (It can be recognized that data of the other stations has been read by the SWRITE instruction.)
Transient request to another station (for Q/QnA series)	REQ	Requests remote RUN/STOP to a programmable controller on another station.
		Reads clock data from or writes it to a programmable controller on another station.
Data send/receive (for Q/QnA series)	SEND	Sends data to a programmable controller on another station.
	RECV	Reads data received from a programmable controller on another station. (For main program)
	RECVS	Reads data received from a programmable controller on another station. (For interrupt program)
Read from/write to other station devices (For A series)	ZNRD	Reads data from devices of a programmable controller on another station. (In units of words)
	ZNWR	Writes data to devices of a programmable controller on another station. (In units of words)
Remote RUN/STOP (for Q series)	RRUN	Instructs a programmable controller on another station to perform remote RUN.
	RSTOP	Instructs a programmable controller on another station to perform remote STOP.
Write/read clock data on another station (for Q series)	RTMRD	Reads clock data from a programmable controller on another station.
	RTMWR	Writes clock data to a programmable controller on another station.

List of dedicated instructions

Application	Dedicated instruction	Description
Setting station No.	UINI	For Universal model QCPUs, the station No. of a normal station (own station) can be set.

List of CC-link dedicated instructions

Application	Dedicated instruction	Description
Read/Write of another station's data	RIRD	Reads the specified points of data from the target station's devices.
	RIWT	Writes the specified points of data to the target station's devices.

POINT

The CC-Link IE Controller Network module cannot receive data sent with a logical channel specified. (Logical channel setting is not available.)

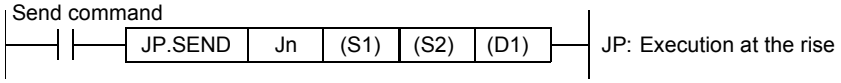
4.1.2 Instruction format

This section describes a SEND/RECV instruction format.

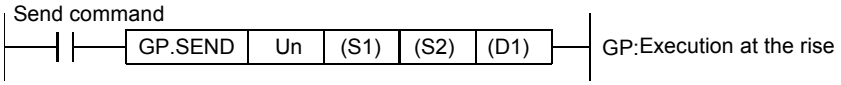
(1) SEND instruction

The SEND instruction sends data to a programmable controller on another station.

(Specified Network No.)



(Specified start I/O number of network module)



	Setting description	Range
Jn	Network No. of the own station	1 to 239 254: The network specified in valid module during other station access
Un	Start I/O number of the own station's network module The higher two digits of the 3-digit I/O number.	0 to FE$_H$
(S1)	Start device that stores control data Specify the start device of the own station that stores control data.	Word device*2
(S2)	Start device that stores the send data Specify the start device of the own station that stores send data.	Word device*2
(D1)	Send completion device The own station's device that is turned on for one scan upon send completion. (D1) ·····OFF: Not complete ON: Complete (D1) + 1 ·····OFF: Normal ON: Abnormal	Bit device*1 Specified bits of word device *3

*1: Bit device ····· X, Y, M, L, F, V, B

*2: Word device····· T, C, D, W, ST, R, ZR (Q00JCPU can not use R, ZR.)

*3: Specified bits of word device ····· Word device, bit No.

(Control data configuration (S1))

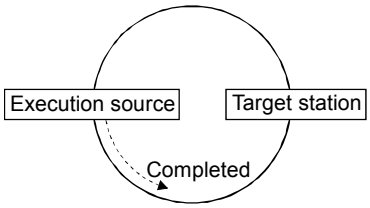
For the detailed description, refer to the next page.

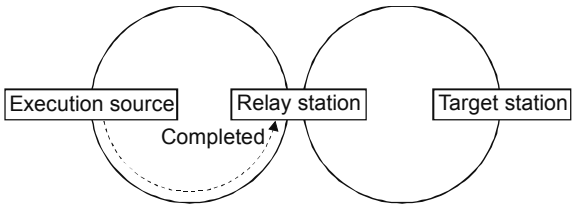
Device	Item	Data set		
		User (Execution time)*1	System (Completion time)*2	
(S1) + 0	Execution/Error completion type	○		
(S1) + 1	Completion status		○	
(S1) + 2	Channel used by own station	○		
(S1) + 3	Target station channel	○		
(S1) + 4	Target station network No.	○		
(S1) + 5	Target station No.	○		
(S1) + 6	Unused	–	–	
(S1) + 7	Number of resends	○	○	
(S1) + 8	Arrival monitoring time	○		
(S1) + 9	Send data length	○		
(S1) + 10	Unused	–	–	
(S1) + 11	Clock set flag		○	These are used only when Error completion type is "Set clock data".
(S1) + 12	Year (last two digits)/month on error completion		○	
(S1) + 13	Day/hour on error completion		○	
(S1) + 14	Minute/second on error completion		○	
(S1) + 15	Year (first two digits)/day of week on error completion		○	
(S1) + 16	Error-detected network No.		○	
(S1) + 17	Error-detected station No.		○	

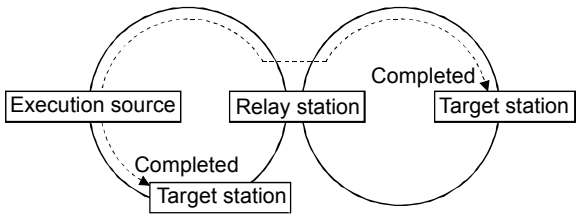
*1: Set by the sequence program

*2: Stored when instruction complete

Control data detailed description

<table>
<tr><th>Device</th><th>Item</th><th>Description</th><th>Setting side*1</th></tr>
<tr><td>(S1) + 0</td><td>Execution/Error completion type</td><td>
<table>
<tr><td>b15 to b7</td><td>to b0</td></tr>
<tr><td>0</td><td>(2)</td><td>0</td><td>(1)</td></tr>
</table>
(1) Execution type (bit 0)
0: No arrival confirmation
When the target station is on the same network ····· Completed when data are sent from the own station.


When the target station is on another network ····· Completed when data reach a relay station on the same network.


1: With arrival confirmation
Completed when data are stored in the specified channel of the target station.


When "0: No arrival confirmation" is specified, even if transmission to the target station is terminated abnormally in the following cases, it is normal completion on the own station.
• Communication itself was completed normally, although the data sent were erroneous.
• Data could not be stored in the target station because instructions from multiple stations were sent to the same station. (An error code (E006H or E205H) is detected on the target station.)
(2) Error completion type (bit 7)
Specify the clock data setup status for error completion.
0: Do not set clock data ····· Clock data at the time of error completion is not set in (S1) + 11 to (S1) + 17.
1: Set clock data ····· Clock data at the time of error completion is set in (S1) + 17.
</td><td>User</td></tr>
<tr><td>(S1) + 1</td><td>Completion status</td><td>The instruction completion status is stored.
0: Normal
Other than 0: Error (For error codes, refer to APPENDIX of this textbook)</td><td>System</td></tr>
</table>

(To the next page)

*1 The setting side is as shown below.
User: Before execution of the link dedicated instruction, data must be set by the user.
System: The PLC CPU stores the execution result of the link dedicated instruction.
*2 Data is stored only when the bit 7 of the error completion type ((S1)+0) is set to 1.
*3 Logical channel setting is not available for the CC-Link IE Controller Network module.

Control data detailed description

Device	Item	Description	Setting side*1
(S1) + 2	Channel used by own station	Specify the channel used by the own station. 1 to 8 (Channel)	User
(S1) + 3	Target station channel	Specify a channel of the target station for storing data. *3 1 to 8 (Channel)	User
(S1) + 4	Target network No.	Specify the network No. of the target station. 1 to 239 : Network No. 254 : When 254 has been set in Jn, specify this by "Valid module during other station access" setting in the parameter settings.	User
(S1) + 5	Target station No.	Specify the station No. of the target station. (1) Station No. specification When own station is Universal model QCPU: 1 to 120 When own station is other than Universal model QCPUs: 1 to 64 To increase the reliability of data, it is recommended to execute the instruction with the Execution/Error completion type ((S1)+0) set to "1: With arrival confirmation". (2) Group specification 81H to A0H: All stations in group No.1 to 32 (Setting is available when the execution type is set to "0: No arrival confirmation" in (S1)+0.) Group No.1 ...81H Group No.2 ...82H to Group No.32...A0H (3) All stations FFH: All stations of the target network No. (Except the own station) (Setting is available when the execution type is set to "0: No arrival confirmation" in (S1)+0.)	User
(S1) + 6	–	Unused	User
(S1) + 7	Number of resends	1) For instruction execution Valid when the execution type specified in (S1) is "1: With arrival confirmation". For the case where the instruction is not completed within the monitoring time specified by (S1)+8, specify the number of times the instruction is resent. 0 to 15 (time) 2) At instruction completion Valid when the execution type specified in ((S1) + 0) is "1: With arrival confirmation". The number of resends (result) is stored.	User system
(S1) + 8	Arrival monitoring time	Valid when the execution type specified in (S1) is "1: With arrival confirmation". Specify the monitoring time until instruction completion. If an instruction is not completed within this time, it will be resent the number of times specified in (S1)+7. 0 : 10 seconds 1 to 32767 : 1 to 32767 seconds	User
(S1) + 9	Send data length	Specify the send data size of (S2) to (S2)+n. When the target station is QCPU: 1 to 960 words When the target station is QnACPU: 1 to 480 words When the target station has a QCPU, check the version of the network module on the target station. The size of receive data is restricted depending on the version. 1 to 960 (words)	User
(S1) + 10	–	Unused	User
(S1) + 11	Clock set flag*2	The valid/invalid status of the data of (S1) + 12 to (S1) + 17 is stored. 0: Invalid 1: Valid	System

(To the next page)

*1 The setting side is as shown below.
User: Before execution of the link dedicated instruction, data must be set by the user.
System: The CPU stores the execution result of the link dedicated instruction.
*2 Data is stored only when the bit 7 of the error completion type ((S1)+0) is set to 1.
*3 Logical channel setting is not available for the CC-Link IE Controller Network module.

Control data detailed description

Device	Item	Description	Setting side*1
(S1) + 12	Year (last two digits)/month on error completion*2	The year (last two digits) and month are stored in BCD format. b15 to b8 b7 to b0 Month (01H to 12H) | Year (00H to 99H) When the target station is QnACPU, "00H" is stored in the Year field (first two digits of the year).	System
(S1) + 13	Day/hour on error completion*2	Day and hour are stored with a BCD code. b15 to b8 b7 to b0 Hour (00H to 23H) | Day (01H to 31H)	System
(S1) + 14	Minute/second on error completion*2	Minute and second are stored with a BCD code. b15 to b8 b7 to b0 Second (00H to 59H) | Minute (00H to 59H)	System
(S1) + 15	Year (first two digits)/day of week on error completion*2	The year (first two digits) and day of week are stored with a BCD code. b15 to b8 b7 to b0 Year (00H to 99H) | Day of week (00H to 06H) 00H (Sun.) to 06H (Sat.)	System
(S1) + 16	Error-detected network No.*2	Network No. of the station, where an error was detected, is stored. (However, it is not stored when an error is detected in own station.)) 1 to 239: (Network No.)	System
(S1) + 17	Error-detected station No.*2	Station No. of the station, where an error was detected, is stored. (However, it is not stored when an error is detected in own station.)) 1 to 120 (Station No.)	System

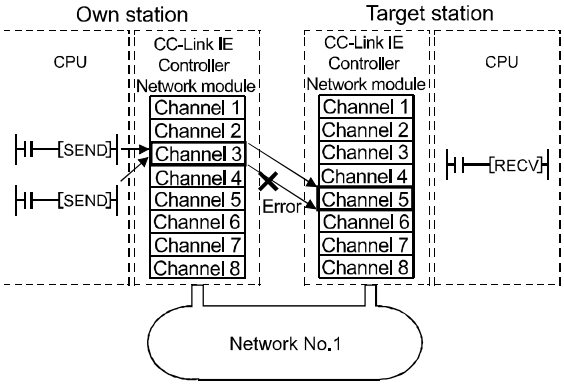
*1: The setting side is as shown below.
User: Before execution of the link dedicated instruction, data must be set by the user.
System: The CPU stores the execution result of the link dedicated instruction.
*2: Data is not stored when Completion status ((S1)+1) is "Channel busy".
*3: Logical channel setting is not available for the CC-Link IE Controller Network module.

POINT

(1) To increase the reliability of data, it is recommended to execute the instruction with the "With arrival confirmation" type.

(2) When "No arrival confirmation" is specified, even if the data sent are erroneous, it is normal completion on the sending station while communication itself is completed normally.
Also, even if communication itself is completed normally, when instructions from multiple stations are sent to the same station, an error "Receive buffer full" (F222H) occurs on the target station. However, it is normal completion on the sending station.

(3) When sending data to the same channel of the target station, execute the SEND instruction after the target station has read out the data with the RECV instruction.
A SEND instruction execution to the same channel on the target station before that will cause an error. When an error is detected, send the data again after 1 or 2 seconds.

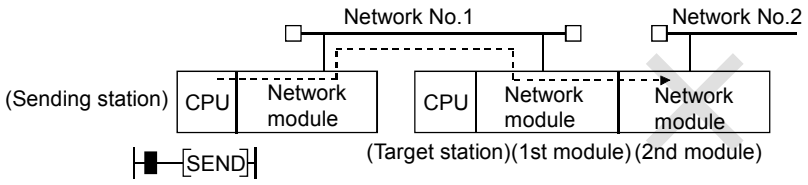


(4) To specify a target station to send data, use the network number and station number of the network module or the Ethernet module that receives requests from the sending station.

* For the example shown below, specify the network number and station number of the 1st network module.

Only the network module or the Ethernet module that receives requests from the sending station can be selected for executing the SEND instruction.

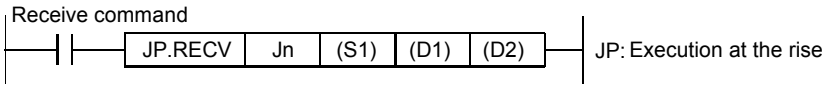
* For the example shown below, the SEND instruction cannot be executed when the network number and station number of the 2nd network module are specified.



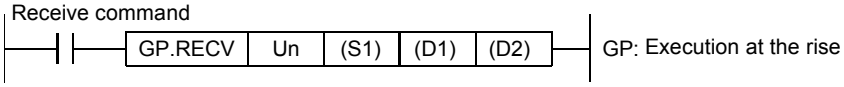
(2) RECV instruction

The RECV instruction reads data received from a programmable controller on another station.

(Specified Network No.)



(Specified start I/O number of network module)



	Setting description	Range
Jn	Network No. of the own station	1 to 239 254: The network specified in Valid module during other station access
Un	Start I/O number of the own station's Network module Specify the 3- digit I/O number with the 2 two higher digits.	0 to FE_H
(S1)	Start device that stores control data. Specify start device of the own station that stores control data.	Word device*2
(D1)	Start device that stores the received data Specify the start device of the own station that stores received data.	Word device*2
(D2)	Received completion device The own station's device that is turned on for one scan upon completion of receiving. (D2)····· OFF: Uncompleted ON: Complete (D2) + 1 ···· OFF: Normal ON: Abnormal	Bit device*1 Specified bits of word device *3

*1: Bit device ····· X, Y, M, L, F, V, B

*2: Word device ····· T, C, D, W, ST, R, ZR (Q00JCPU can not use R, ZR.)

*3: Specified bits of word device··· Word device, bit No.

(Control data configuration (S1))

For the detailed description refer next page.

Device	Item	Data set	
		User (Execution time)*1	System (Completion time)*2
(S1) + 0	Execution/Error completion type	○	
(S1) + 1	Completion status		○
(S1) + 2	Own station channel	○	
(S1) + 3	Channel used by sending station		○
(S1) + 4	Network No. of sending station		○
(S1) + 5	Sending station No.		○
(S1) + 6	Unused	–	–
(S1) + 7	Unused		
(S1) + 8	Arrival monitoring time	○	
(S1) + 9	Receive data length		○
(S1) + 10	Unused	–	–
(S1) + 11	Clock set flag		○
(S1) + 12	Year (last two digits)/month on error completion		○
(S1) + 13	Day/hour on error completion		○
(S1) + 14	Minute/second on error completion		○
(S1) + 15	Year (first two digits)/day of week on error completion		○
(S1) + 16	Error-detected network No.		○
(S1) + 17	Error-detected station No.		○

These are used only when Error completion type is "Set clock data".

*1: Set by sequence program

*2: Stored when instruction complete

Control data detailed description

Device	Item	Description	Setting side*1
(S1) + 0	Error completion type	b15 to b8 b7 b6 to b0 0 to 0 (1) 0 to 0 (1) Error completion type (bit 7) Specify the clock data setup status for error completion. 0: Do not set clock data ····· Clock data at the time of error completion is not set in (S1) + 11 to (S1) + 17. 1: Set clock data ····· Clock data at the time of error completion is set in (S1) + 17.	User
(S1) + 1	Completion status	The instruction completion status is stored. 0 : Normal Other than 0 : Error (About error code, refer to APPENDIX 5 of this textbook)	System
(S1) + 2	Own station channel	Specify the channel where data to be read are stored. 1 to 8 (Channel)	User
(S1) + 3	Channel used by sending station	Stores the channel used by the sending station. 1 to 8 (Channel)	System
(S1) + 4	Network No. of sending station	Stores network No. of the sending station. 1 to 239: Network No.	System
(S1) + 5	Sending station No.	Stores station No. of the sending station. 1 to 120 (Station No.)	System
(S1) + 6	—	Unused	User
(S1) + 7	—	Unused	User
(S1) + 8	Arrival monitoring time	Specify the monitoring time required for instruction completion. If not completed within the monitoring time, the instruction is terminated with an error. 0 : 10 seconds 1 to 32767 : 1 to 32767 seconds	User
(S1) + 9	Receive data length	Stores the receive data size stored in (D1) to (D1)+n. 1 to 960 (words)	System
(S1) + 10	—	Unused	User
(S1) + 11	Clock set flag*2	The valid/invalid status of the data of (S1) + 12 to (S1) + 15 is stored. 0: Invalid 1: Valid	System
(S1) + 12	Month/year (last two digits) on error completion*2	The month and year (last two digits) are stored with a BCD code. b15 to b8 b7 to b0 Month (01H to 12H) Year (00H to 99H)	System
(S1) + 13	Hour/day on error completion*2	Hour and day are stored with a BCD code. b15 to b8 b7 to b0 Hour (00H to 23H) Day (01H to 31H)	System
(S1) + 14	Second/minute on error completion*2	Second and minute are stored with a BCD code. b15 to b8 b7 to b0 Second (00H to 59H) Minute (00H to 59H)	System
(S1) + 15	Year (first two digits)/day of week on error completion*2	The year (first two digits) and day of week are stored with a BCD code. b15 to b8 b7 to b0 Year (00H to 99H) Day of week (00H to 06H) 00H (Sun.) to 06H (Sat.)	System

(To the next page)

*1: The setting side is as shown below.
User: Before execution of the link dedicated instruction, data must be set by the user.
System: The CPU stores the execution result of the link dedicated instruction.

*2: Data is stored only when the bit 7 of the error completion type ((S1)+0) is set to 1.

Control data detailed description

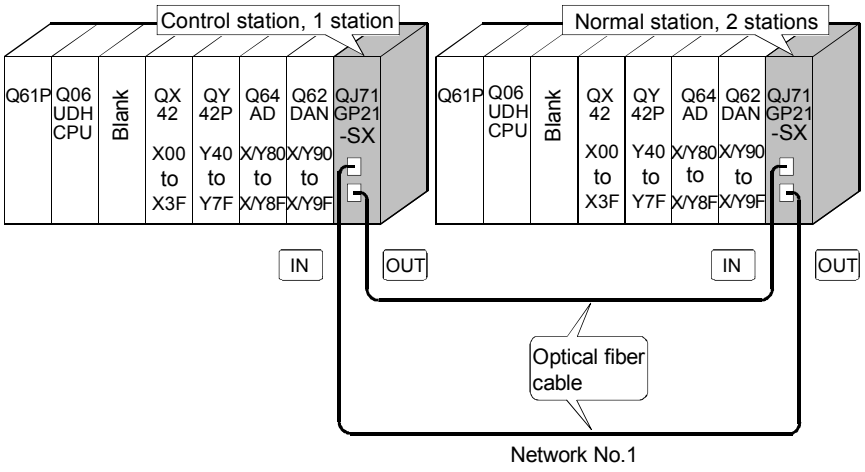
Device	Item	Description	Setting side*1
(S1) + 16	Error-detected network No.*2	Network No. of the station, where an error was detected, is stored. (However, it is not stored when an error is detected in own station.) 1 to 239: (Network No.)	System
(S1) + 17	Error-detected station No.*2	Station No. of the station, where an error was detected, is stored. (However, it is not stored when an error is detected in own station.) 1 to 120 (Station No.)	System

*1: The setting side is as shown below.
User: Before execution of the link dedicated instruction, data must be set by the user.
System: The CPU stores the execution result of the link dedicated instruction.

*2: Data is stored only when the bit 7 of the error completion type ((S1)+0) is set to 1.

4.1.3 Confirm the possibility of communication using dedicated instructions

In this task, execute the transient transmission.
Confirm that data can be sent (1MP1) and received (1NS2) by the link dedicated instructions (SEND/RECV). Modify the practice machine configuration as follows, write the parameters and the sequence program to each station to check the operation.



(1) Set parameters with GX Works2
Double-click [Ethernet/CC IE/MELSECNET] in [Network Parameter] of the Project View and configure settings as described below.

(a) Number of modules setting

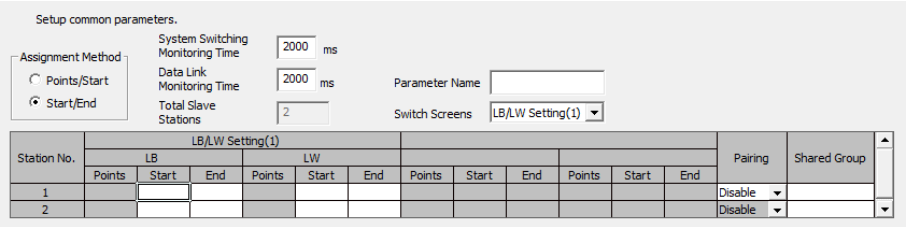
In case of control station

	Module 1	Module 2
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	2 ← Total number of stations for link: 2	
Group No.	0	
Station No.	1 ← Station No.: 1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

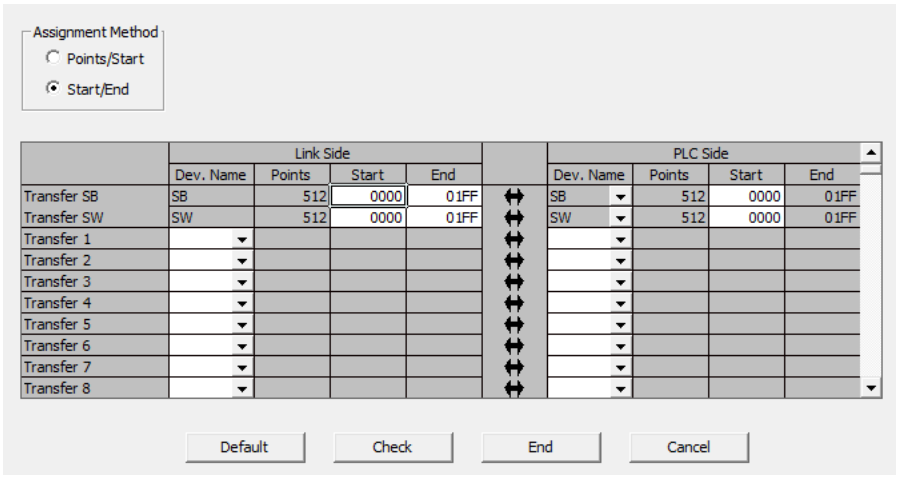
In case of normal station

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	2 ← Station No.: 2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

(b) Network range assignment (Control station only)



(c) Refresh parameter (Each station common)

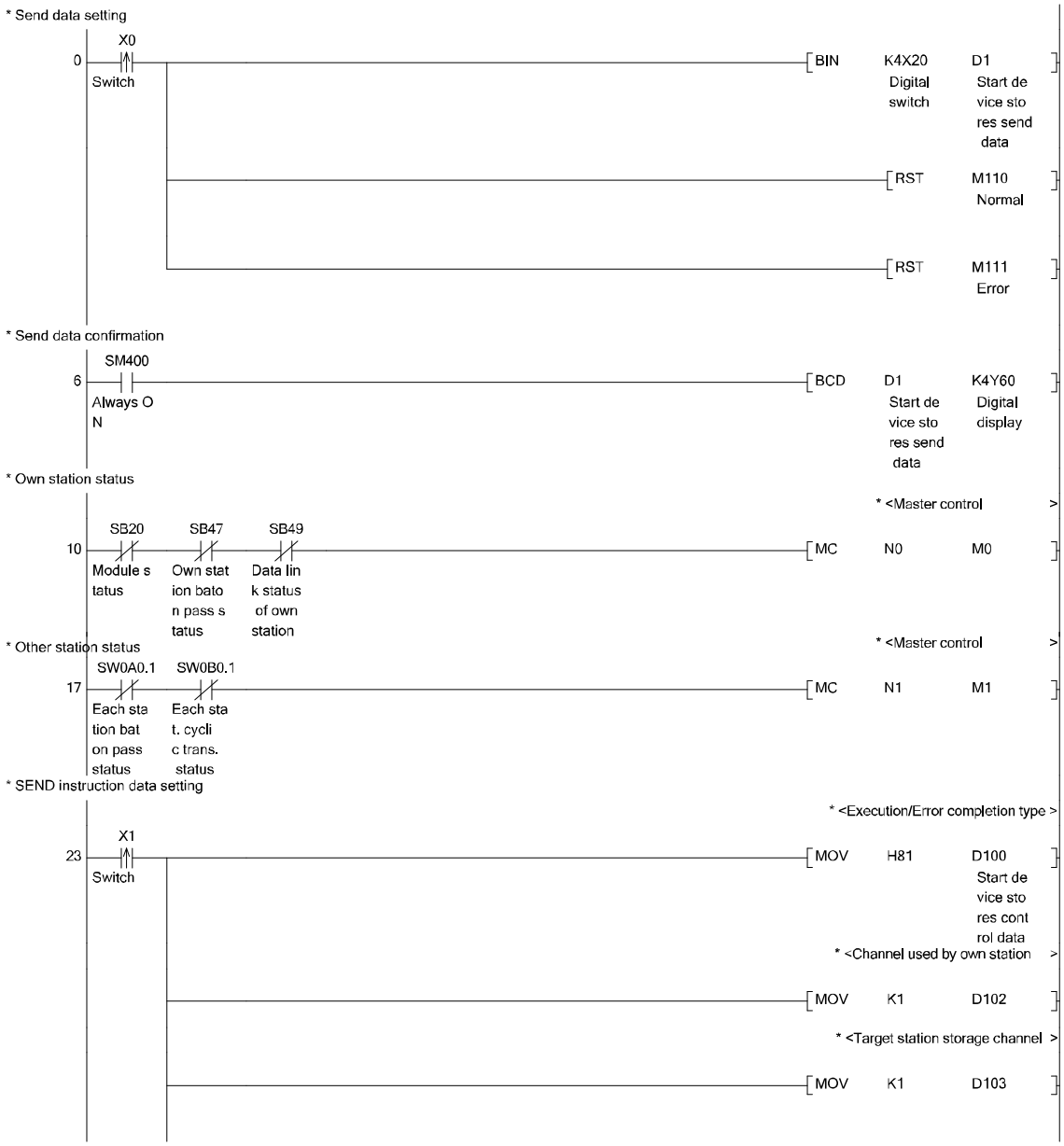


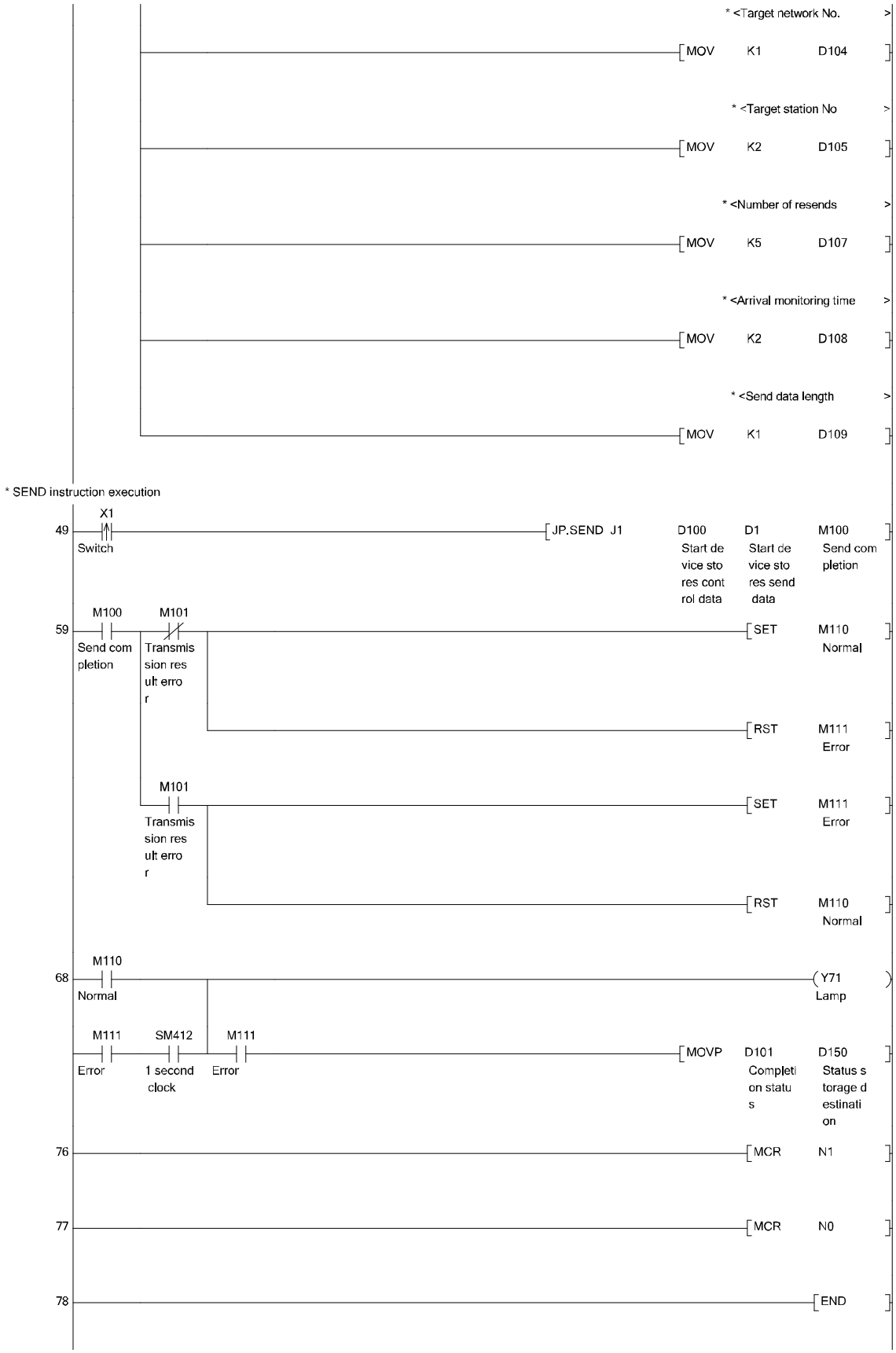
(2) Sequence program

The programs of each station are shown below.

(a) Program of control station (Station No. 1)

Path	Transient transmission (SEND/RECV)
Program name	1MP1

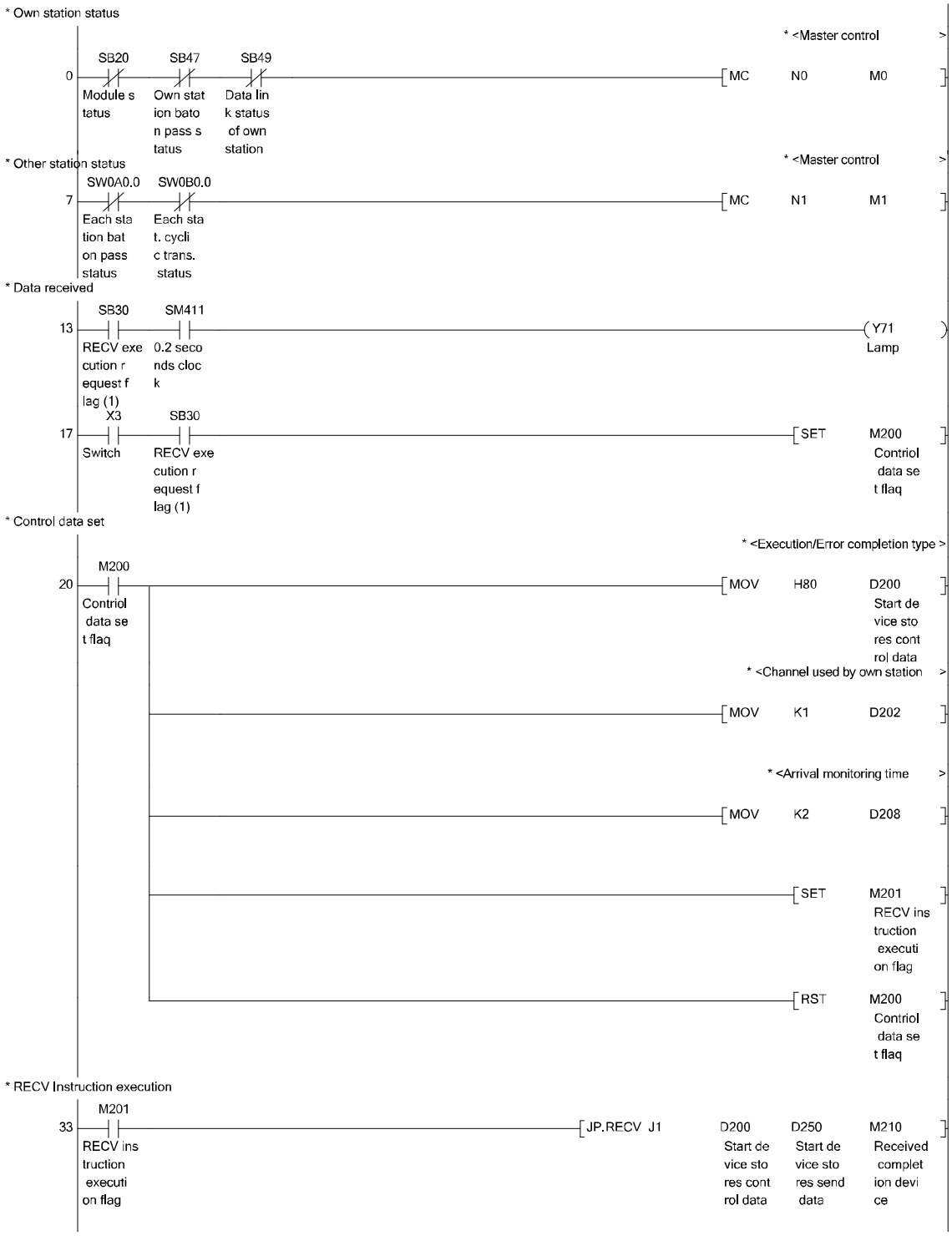


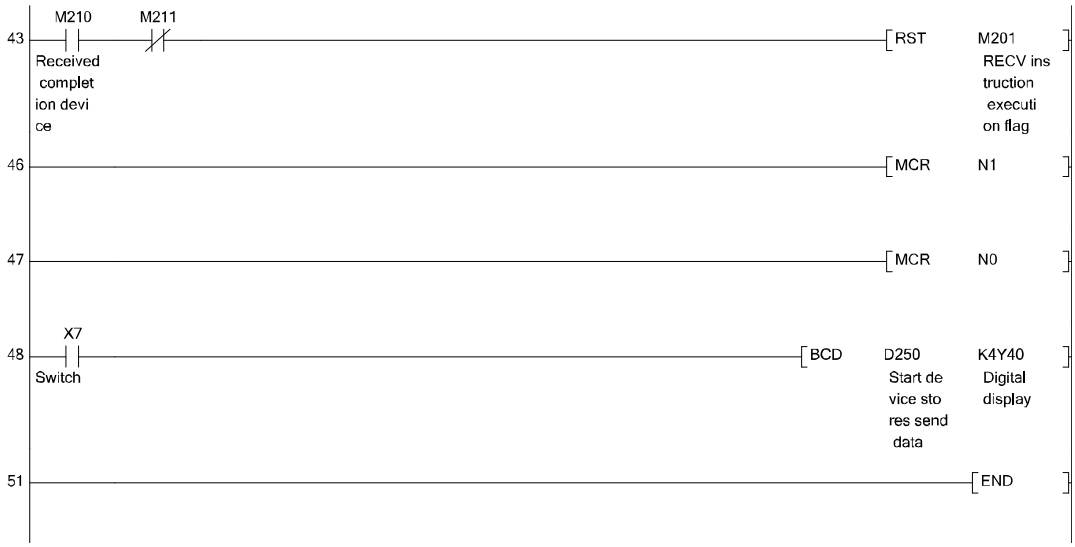


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(b) Program of normal station (Station No. 2)

Path	Transient transmission (SEND/RECV)
Program name	1Ns2





* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(3) Operation method

(1) Set send data (Send side 1MP1)
Set send data on digital switch (X20 to X2F) and store the data in D1 by turning ON X0.

(2) Confirm the setting of the send data (Send side 1MP1)
Confirm the content of the send data (D1) on the digital display (Y60 to Y6F)

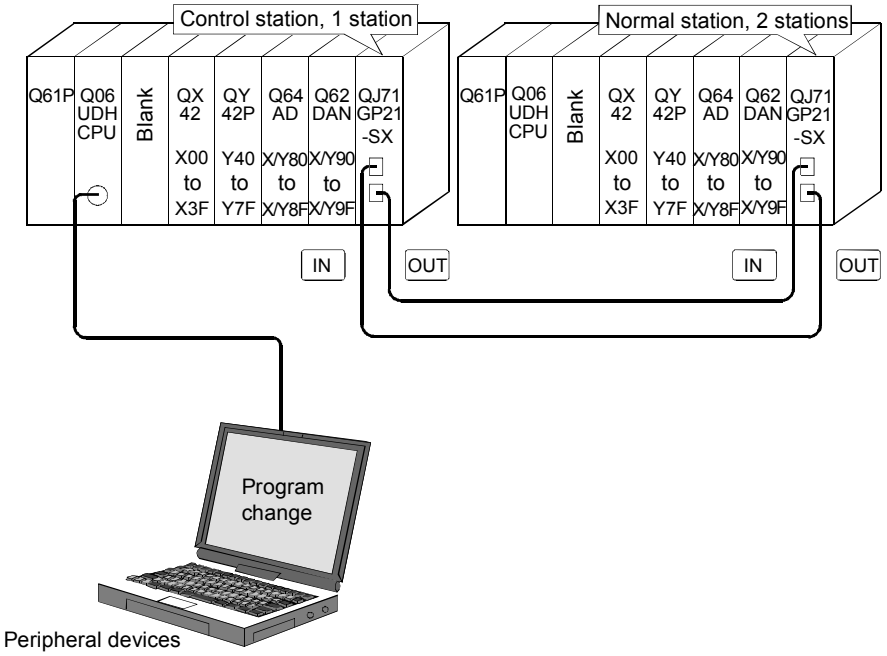
(3) Send data (Send side 1MP1)
Turn ON X1.
When data is sent correctly, Y71 lights. When there is an error, Y71 flashes.

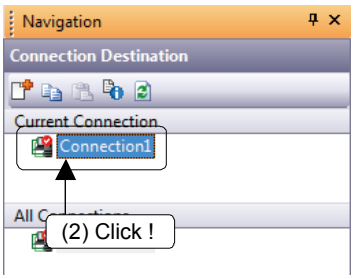
(4) Confirm receiving and read data (Received side 1NS2)
When data is received, Y71 flashes.
When the reception is checked, turn ON X3 and read the received data.
When the reading is completed, Y71 turns OFF.

(5) Display the received data (Received side 1NS2)
Turn ON X7 and check if the received data points are displayed on the digital display (Y40 to Y4F).

4.2 Other station access operation

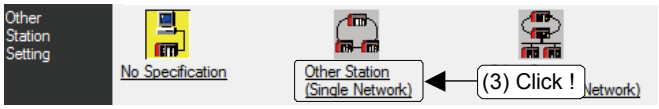
Connect peripheral device to the PLC and access the other station.
When accessing other stations, the same functions as in case of the own station access (PLC program reading/writing, monitor, device ON/OFF, network diagnostic, PLC diagnostics) can be used as well.





(1) In the Navigation window view, click Connection Destination.

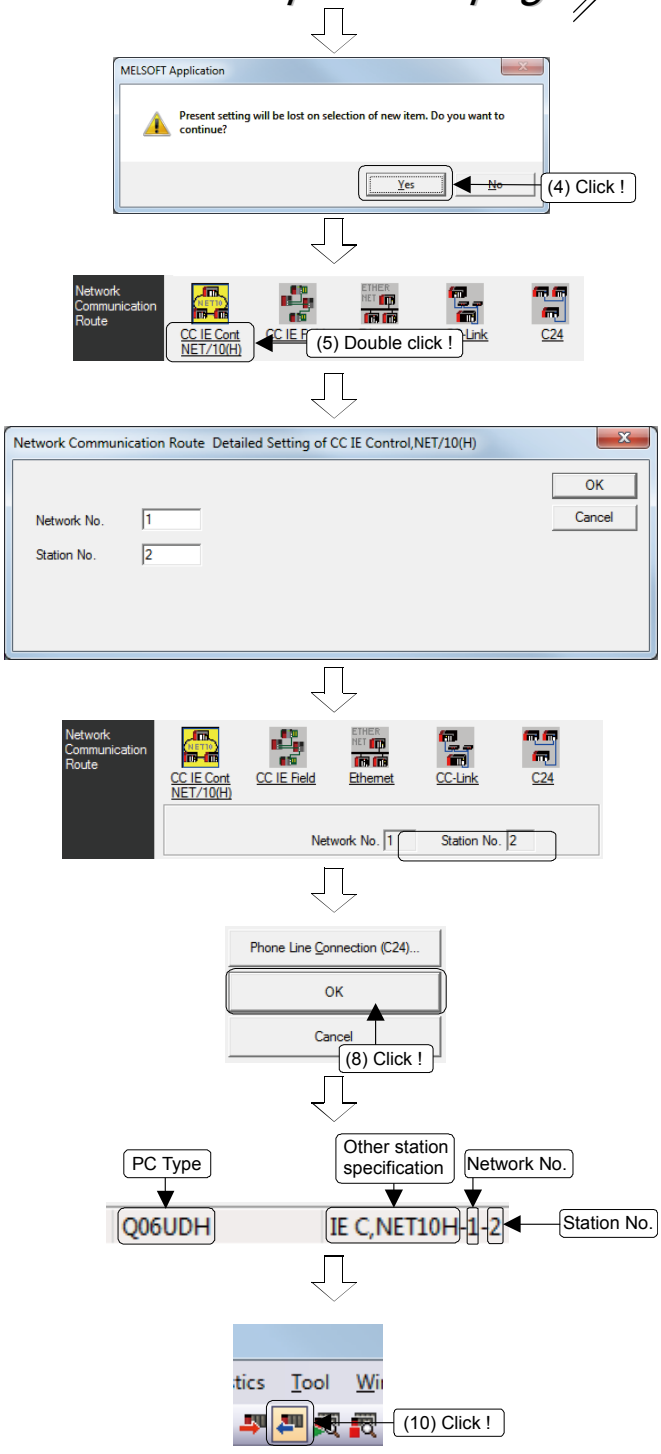
(2) The Connection Destination view is displayed. Double-click "Connection1" in "Current Connection".



(3) From [Other Station Setting], click [Other Station (Single Network)].

To the next page

From the previous page



(4) The confirmation message is displayed. Click [Yes].

(5) From [Network Communication Route], click [CC IE Cont NET/10(H)].

(6) Set access destination network No. and station number then click [OK].

(7) Confirm that Network No. and Station No. have been changed.

(8) Click the [OK] button.

(9) The information is displayed on the left bottom of the screen.

(10) Click the button to execute the PLC reading.
(Parameter and program are read.)

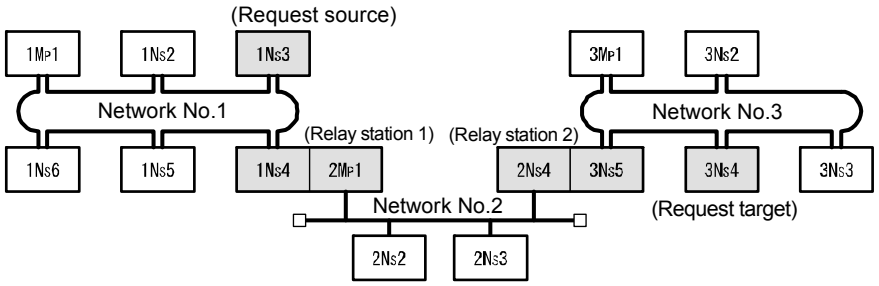
Memo

CHAPTER 5 EXERCISE 3 (ROUTING FUNCTION)

5.1 Routing function

This function allows transient transmissions to stations located on other networks in a multi-network system.
By setting routing parameters for a relay station on the own network, transient data can be sent to another network through this relay station.

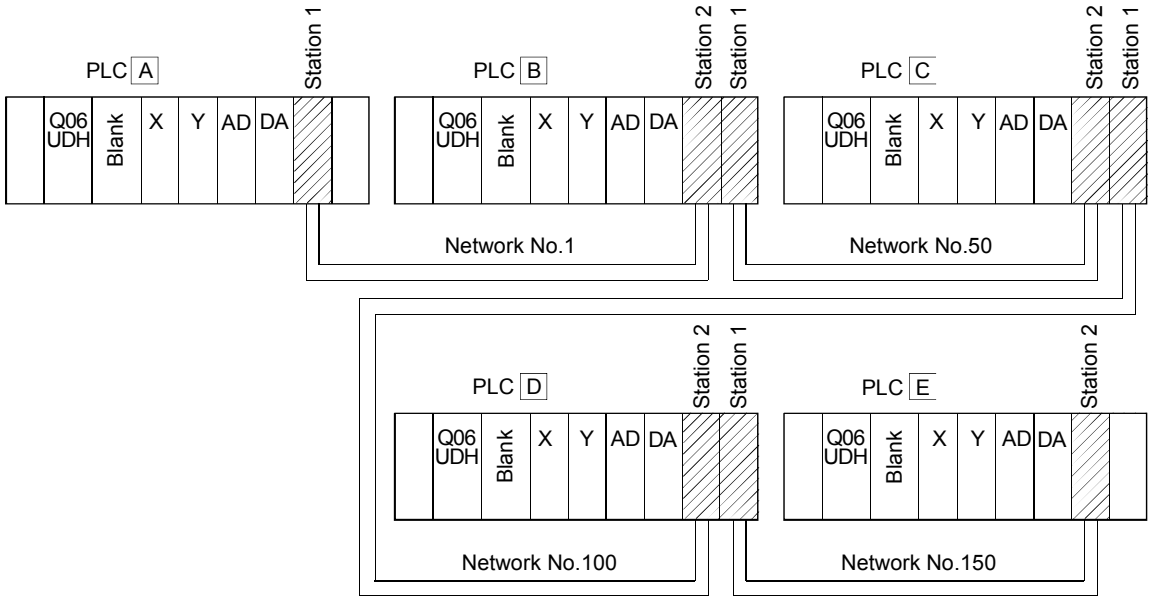
■ Operation of the routing function
This example describes when transient data are sent from the request source (1NS3) to the request target (3NS4).



Station	Transient transmission (request)	Transient transmission (response)
Request source	1NS3 Target network No. 3 / Relay network No. 1 / Relay station No. 4 Passes data to relay station 1NS4 on its own network to reach network No.3.	1NS3
Relay station 1	1NS4 2MP1 Target network No. 3 / Relay network No. 2 / Relay station No. 4 Passes data to relay station 1NS4 on its own network to reach network No.3.	1NS4 2MP1 Passes the data to No.3 on network No.1.
Relay station 2	2NS4 3NS5 Passes the data to 3Ns4 on network No.3.	2NS4 3NS5 Target network No. 1 / Relay network No. 2 / Relay station No. 1 Passes data to relay station 2MP1 on its own network to reach network No.1.
Request target	3NS4	Automatically gives data to the relay station.

5.2 Demonstration machine system

After mounting the network module on the demonstration machine and connecting an optical fiber cable, set switches and network parameters as shown below.
(Create a new project after clearing the existing network parameters.)



5.3 Routing parameter

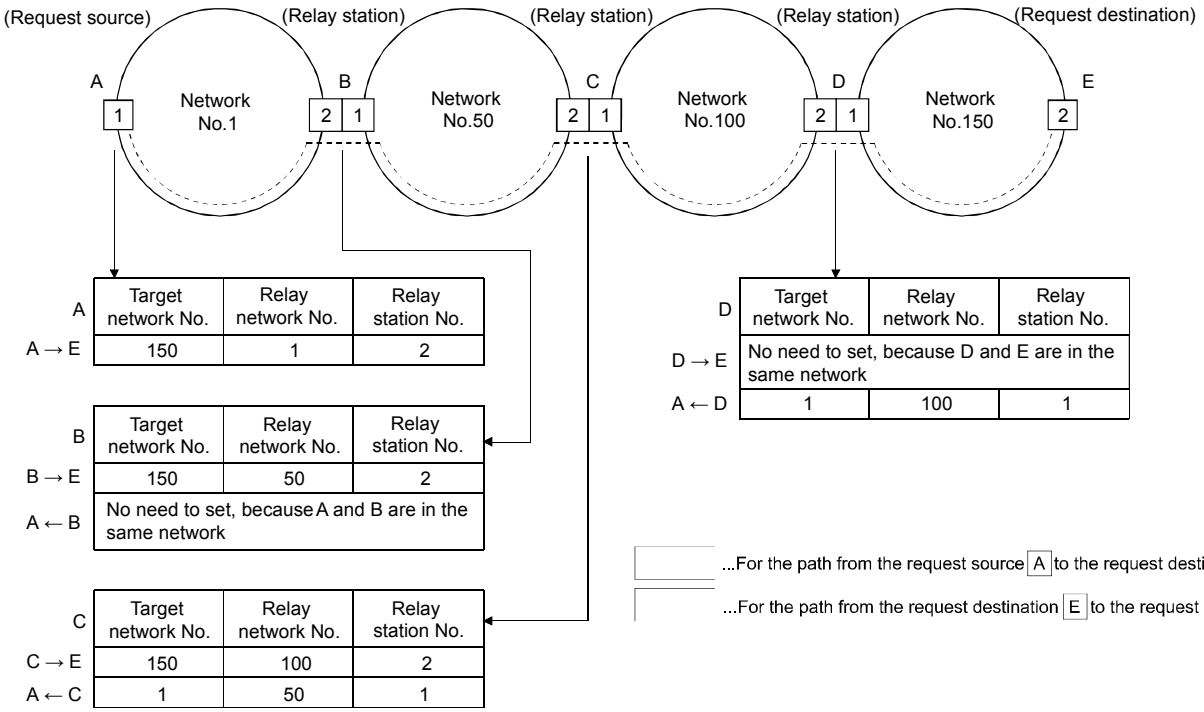
The following routing parameters are required when executing the transient transmission such as reading data from other networks by the READ instruction.

<Things to know before starting parameter setting>

- The routing parameters are set according to the procedure like "To go to the station of the network No. ○, it is required to pass through the station No. △ of network No. □".

  ○: Transfer network No. □: Relay network No. △: Relay station No.
- For relay stations, routing parameters to go "from request source to request destination" and "from request destination to request source" are required.
- When a request destination exists in the same network, routing parameters are not required.

(1) Route for request source (A) to request destination (E)



A	Target network No.	Relay network No.	Relay station No.
A → E	150	1	2

B	Target network No.	Relay network No.	Relay station No.
B → E	150	50	2
A ← B	No need to set, because A and B are in the same network		

C	Target network No.	Relay network No.	Relay station No.
C → E	150	100	2
A ← C	1	50	1

D	Target network No.	Relay network No.	Relay station No.
D → E	No need to set, because D and E are in the same network		
A ← D	1	100	1

(2) PLC [A (Request source)] routing parameter

<Routing Information screen>

	Target Network No.	Relay Network No.	Relay Station No.
1	150	1	2
2			
3			
4			
5			
6			
7			

(3) PLC [B (Relay station)] routing parameter

<Routing Information screen>

	Target Network No.	Relay Network No.	Relay Station No.
1	150	50	2
2			
3			
4			
5			
6			
7			

(4) PLC [C (Relay station)] routing parameter

<Routing Information screen>

	Target Network No.	Relay Network No.	Relay Station No.
1	150	100	2
2	1	50	1
3			
4			
5			
6			
7			

(5) PLC [D (Relay station)] routing parameter

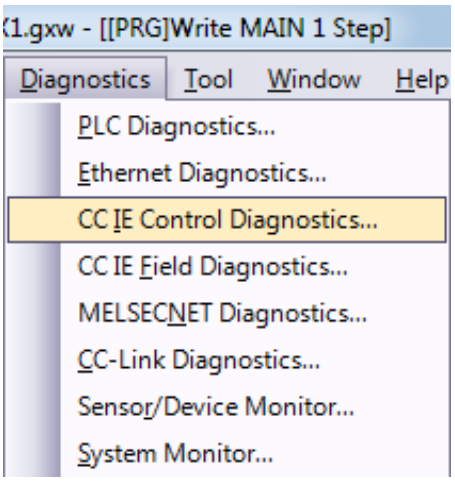
<Routing Information screen>

	Target Network No.	Relay Network No.	Relay Station No.
1	1	100	1
2			
3			
4			
5			
6			
7			

5.4 Communication test

Communication test checks if transient transmission data can be properly routed from the own station to the communication target. Through multiple network system, test of communication to communication target is executed.

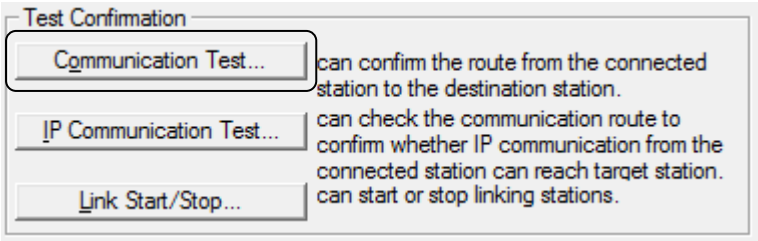
(1) How to display communication test dialog box



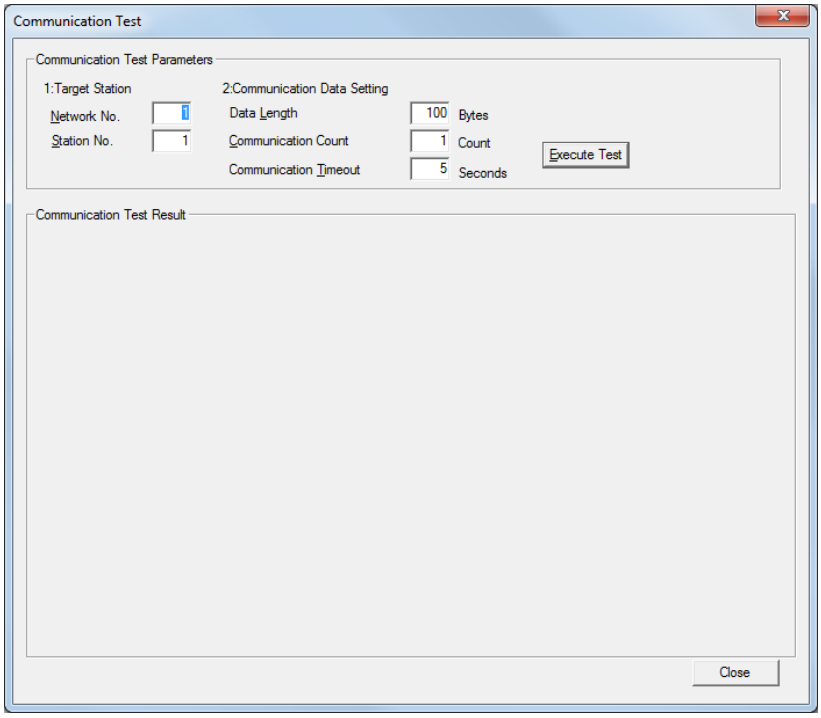
(1) Select [Diagnostics] → [CC IE Control Diagnostics]

* When two or more CC-Link IE Controller Network modules are mounted, the [Select Diagnostics Destination] dialog box appears. Select a network and click the OK button.

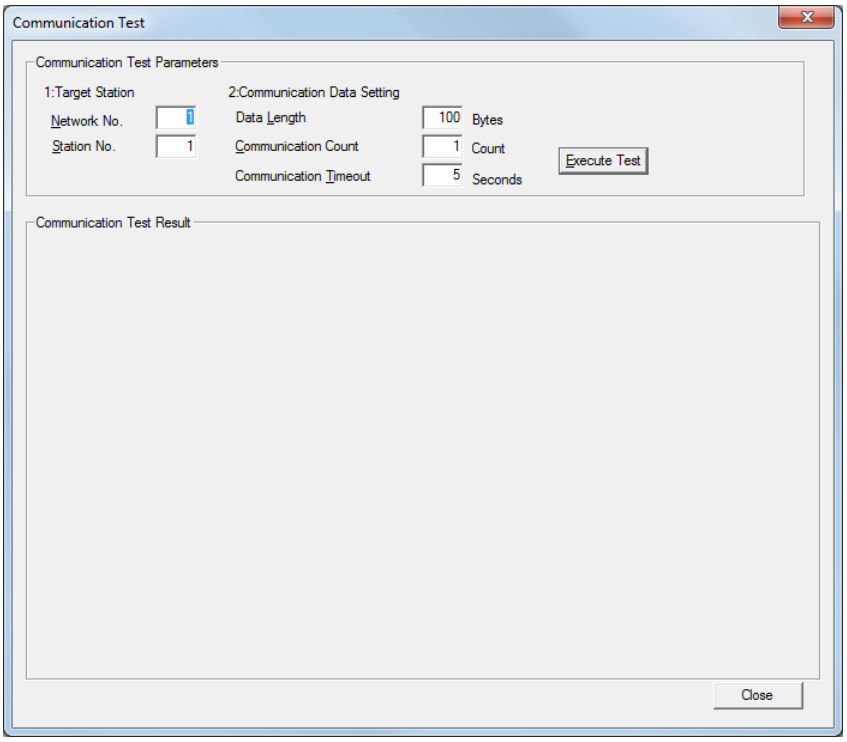
(2) Click [Communication Test] in the [CC-Link IE Controller Network Diagnostics] dialog box.



(3) The [Communication Test] dialog box is displayed.

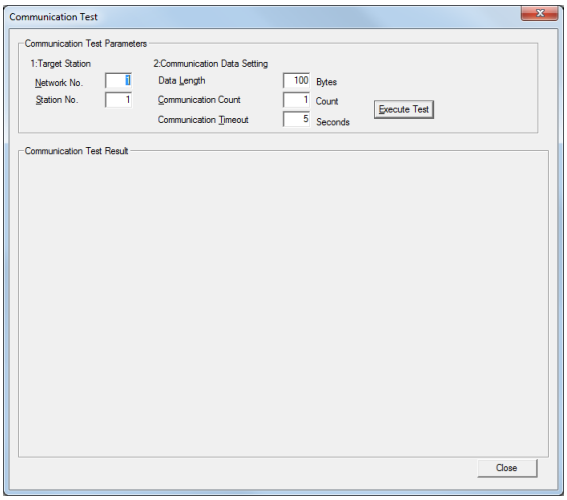


(2) [Communication Test] dialog box



Item		Description
Target Station	Network No.	Set the network No. of the communication target. (Setting range: 1 to 239, Default: 1)
	Station No.	Set the station No. of the communication target. (Setting range for Universal model QCPU: 0 to 120, Default: 1) (Setting range for other than Universal model QCPU: 0 to 64, Default: 1)
Communication Data Setting	Data Length	Set the length of the communication data. (Unit: Bytes) (Setting range: 1 to 900, Default: 100)
	Communication Count	Set the number of communications. (Setting range: 1 to 100, Default: 1)
	Communication Timeout	Set a timeout time of the communication test. (Unit: Seconds) (Setting range: 1 to 100, Default: 5)

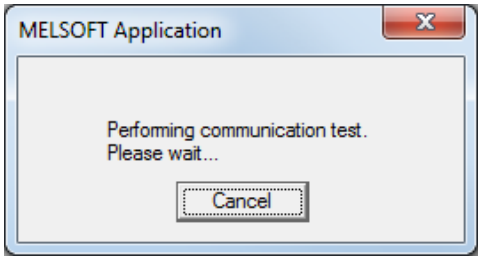
(3) Executing the communication test



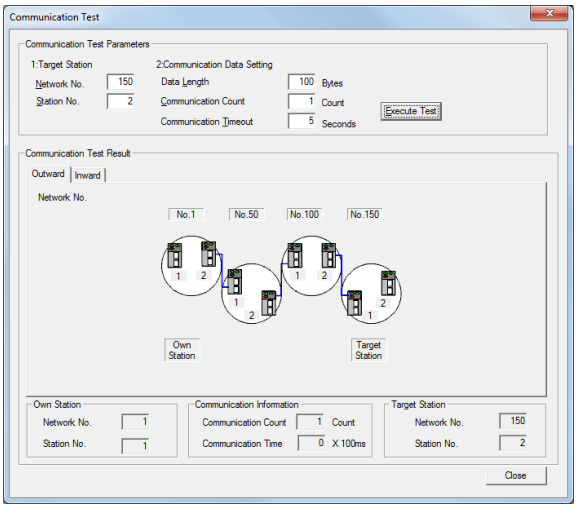
(1) Set the communication test as below.

1: Target Station
Network No.: ···· 150
Station No.: ···· 2

2: Communication Data Setting
Data Length: ···· 100 Bytes
Communication Count: ···· 1 Count
Communication Timeout: ···· 5 Seconds



(2) Click the Execute Test button.



(3) The communication test result dialog box is displayed.

5.5 Confirm the operation using PLC program

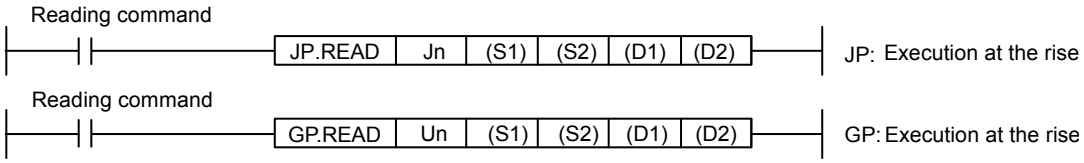
Read the present D0 value of the station No. 2 (E) of the network No. 150 by the READ instruction of the station No. 1 (A) of the network No. 1. The value is displayed on Y60 to Y6F.

5.5.1 Other station word device Read/Write

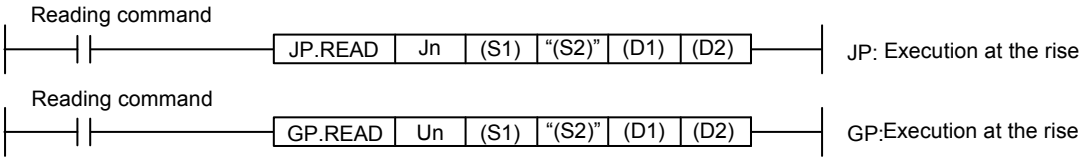
(1) READ/WRITE instruction format

(a) READ

(Specified Network No.)



(Available when own station is a Universal model QCPU)

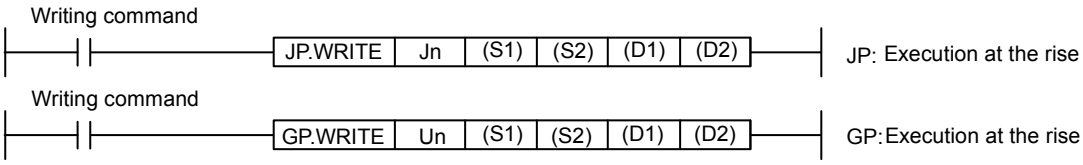


	Setting description	Data type
Jn	Network number of the own station (1 to 239, 254) 254: The network specified in valid module during other station access	Binary 16 bits
Un	Start I/O number of the own station's CC-Link IE Controller Network module (00 to FEH: The higher two digits of the 3-digit I/O number)	
(S1)	Start device of the own station that stores control data	Device name
(S2)	Target station's start device where data to be read are stored	
(D1)	The own station's start device where readout data will be stored (A continuous area for the read data length is required.)	
(D2)	The own station's device that is turned on for one scan upon completion of the instruction. (D2) + 1 also turns on if the instruction execution has failed.	Bit

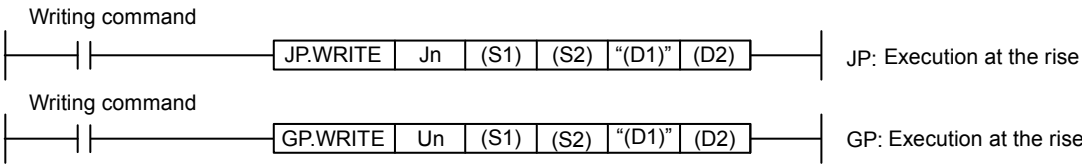
*1: Local devices and file registers for each program cannot be used in the setting data.

(b) WRITE

(Specified Network No.)



(Available when own station is a Universal model QCPU)



	Setting description	Data type
Jn	Network number of the own station (1 to 239, 254). 254: The network specified in valid module during other station access	Binary 16 bits
Un	Start I/O number of the own station's CC-Link IE Controller Network module (00 to FEH: The higher two digits of the 3-digit I/O number.)	
(S1)	Start device of the own station that stores control data.	Device name
(S2)	The target station's start device where write data are stored.	
(D1)	Target station's start device to which data are to be written. (A continuous area for the write data length is required.)	
(D2)	The own station's device that is turned on for one scan upon completion of the instruction. (D2) + 1 also turns on if the instruction execution has failed.	Bit

*1: Local devices and file registers for each program cannot be used in the setting data.

5.5.2 Parameter settings

(1) Number of modules setting

PLC A (Request source)

	Module 1	Module 2
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	2	
Group No.	0	
Station No.	1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

PLC B (Relay station)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	CC IE Control(Control Station)
Start I/O No.	00A0	00C0
Network No.	1	50
Total Stations		2
Group No.	0	0
Station No.	2	1
Mode	Online	Online
		Network Range Assignment
		Network Operation Settings
	Refresh Parameters	Refresh Parameters
	Interrupt Settings	Interrupt Settings
	Specify Station No. by Parameter	Specify Station No. by Parameter

PLC C (Relay station)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	CC IE Control(Control Station)
Start I/O No.	00A0	00C0
Network No.	50	100
Total Stations		2
Group No.	0	0
Station No.	2	1
Mode	Online	Online
		Network Range Assignment
		Network Operation Settings
	Refresh Parameters	Refresh Parameters
	Interrupt Settings	Interrupt Settings
	Specify Station No. by Parameter	Specify Station No. by Parameter

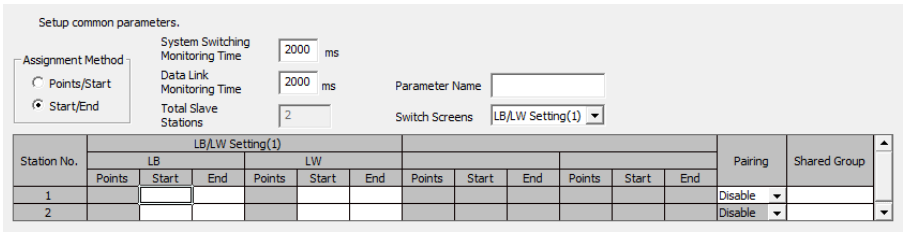
PLC D (Relay station)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	CC IE Control(Control Station)
Start I/O No.	00A0	00C0
Network No.	100	150
Total Stations		2
Group No.	0	0
Station No.	2	1
Mode	Online	Online
		Network Range Assignment
		Network Operation Settings
	Refresh Parameters	Refresh Parameters
	Interrupt Settings	Interrupt Settings
	Specify Station No. by Parameter	Specify Station No. by Parameter

PLC E (Request target)

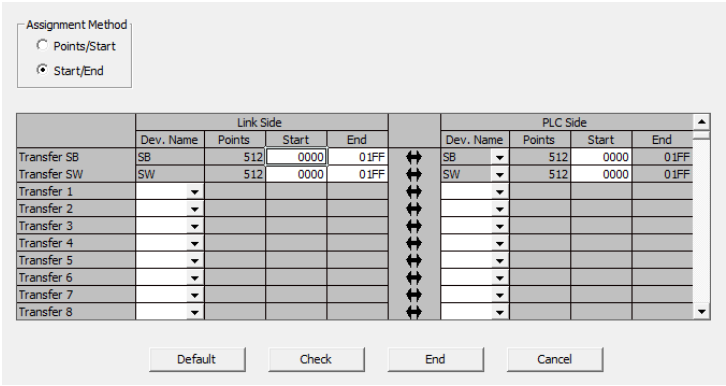
	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	150	
Total Stations		
Group No.	0	
Station No.	2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

(2) Network range assignment (Each control station common)



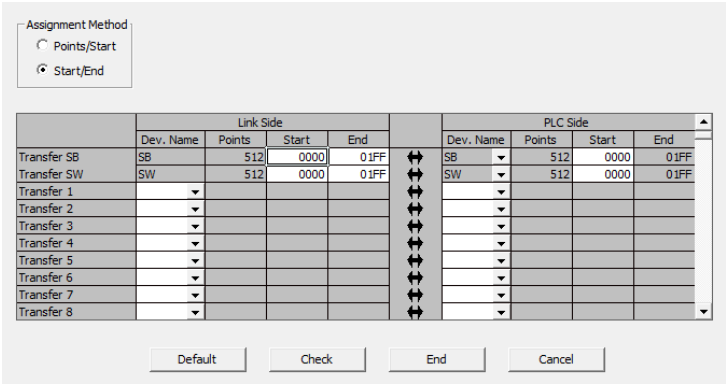
(3) Refresh parameter

(a) PLC A (Request source)

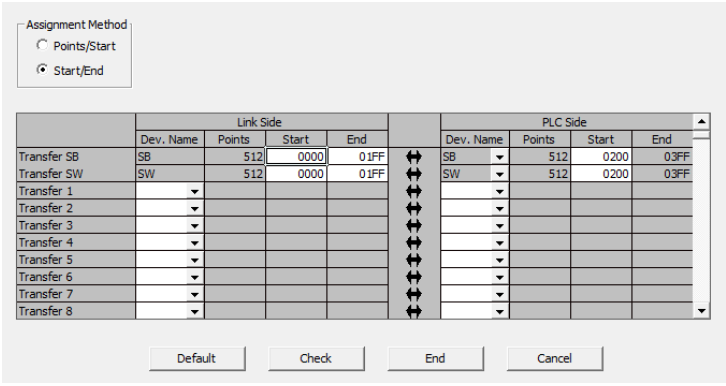


(b) PLC B (Relay station)

Module 1

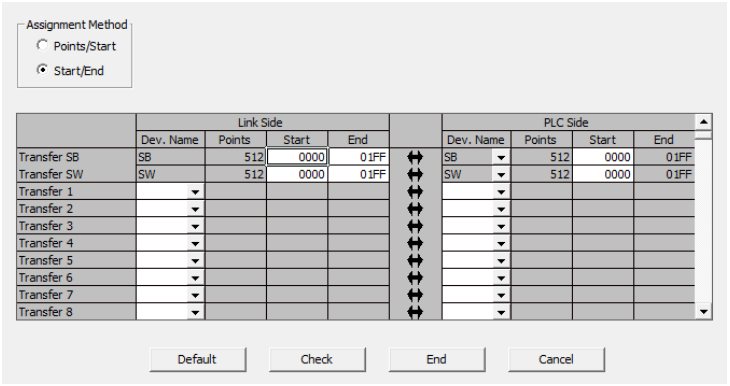


Module 2

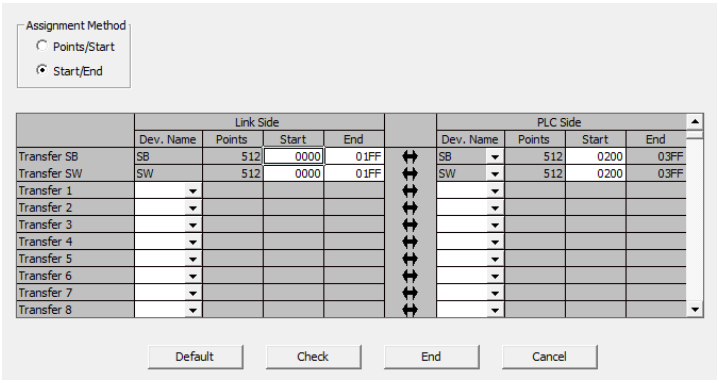


(c) PLC C (Relay station)

Module 1

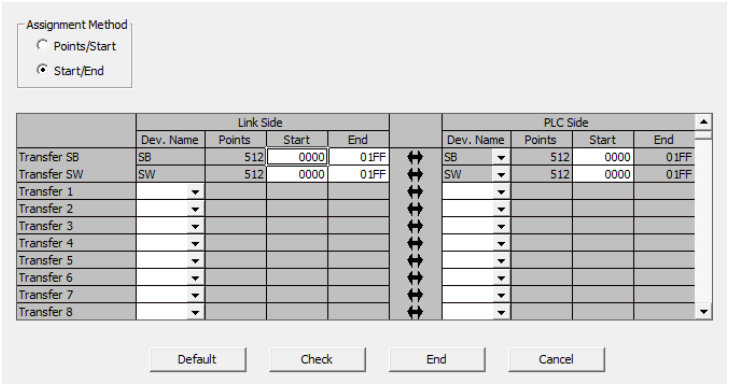


Module 2

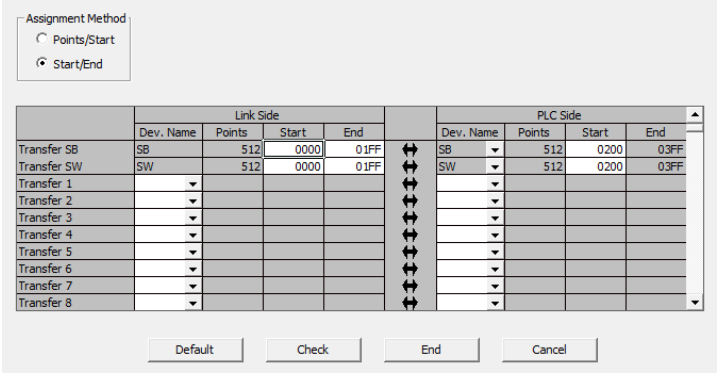


(d) PLC D (Relay station)

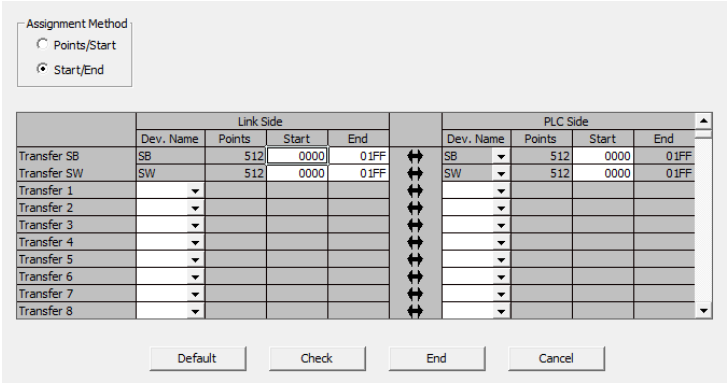
Module 1



Module 2



(e) PLC E (Request source)



(4) Routing parameters

Same settings as in P5-4.

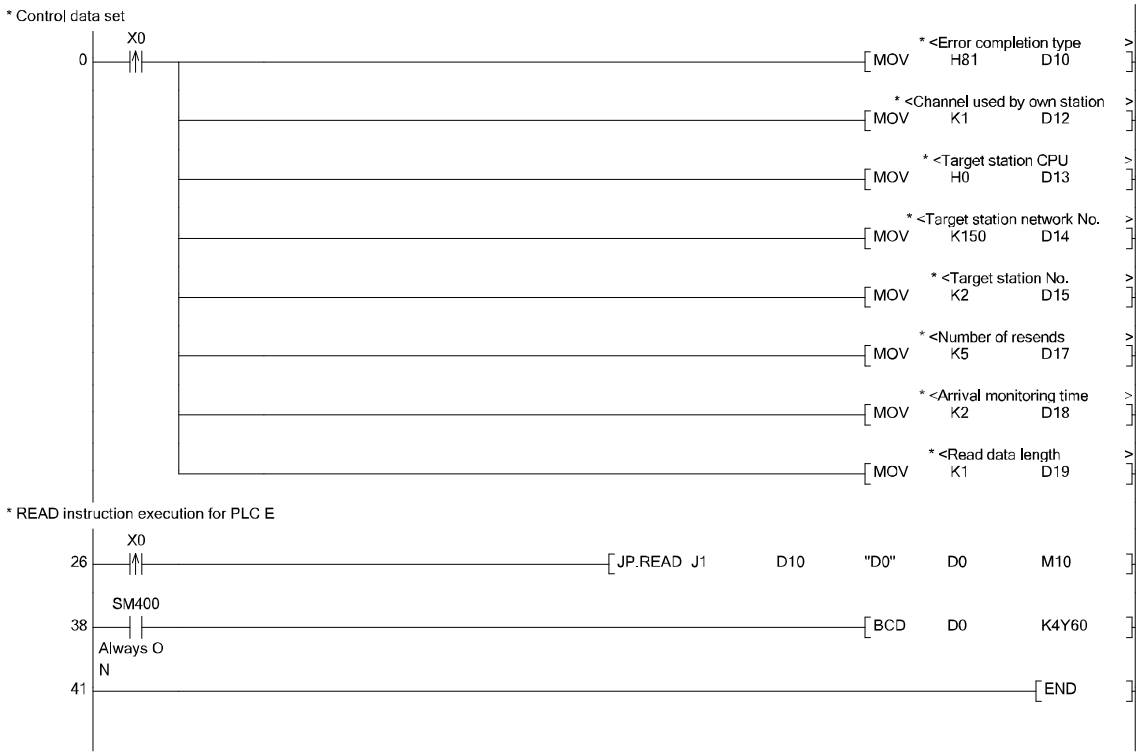
		Transfer network No.	Relay network No.	Relay station No.
A	1	150	1	2
B	1	150	50	2
C	1	150	100	2
	2	1	50	1
D	1	1	100	1

5.5.3 Sequence program

(1) Sequence program of request source PLC A

(The link error detection program is omitted.)

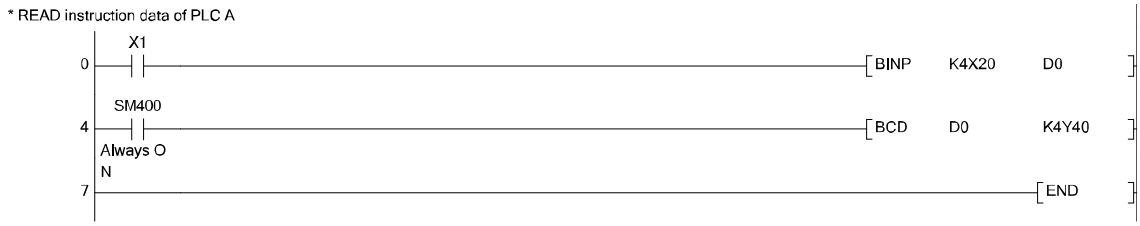
Path	Routing
Program name	A



(2) Sequence program of request destination PLC E

(The link error detection program is omitted.)

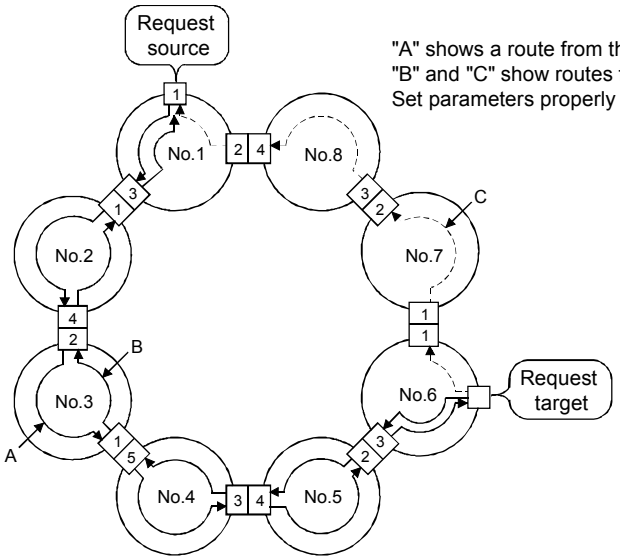
Path	Routing
Program name	E



POINT

(1) When networks are connected in a loop as shown in the figure below, always set the routing parameters so that the same relay stations are routed for both the "route from the request source to the request target" and the "route back from the request target to the request source".

Do not set the parameters so that the route to and from goes around the entire loop. Since the first relay station in the return path from the request target is determined by the station relayed in the forward path, data cannot be transferred to a station in the different path, which results in an error.



(2) When transient transmission is performed to a remote network using the routing parameters, the amount of transmission data and the number of transmissions may affect the entire system since data is transferred through many networks.

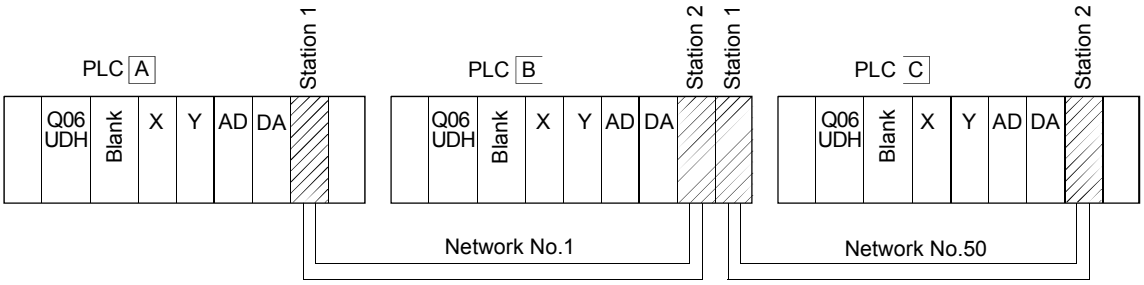
For example, in networks No.2 to 5 in the figure above, the link scan time may become temporarily longer and the transient transmission within the own station may be delayed because of the transient transmissions from other networks.

When using the routing parameters, design the route considering the entire system.

5.6 Multiple network (Interlink transmission)

5.6.1 Performing interlink transmission of multiple network

Communication is executed by the cyclic transmission in the multiple network system. Configure the practice machine as follows, write the parameters and the sequence program to each station to check the operation. The data transmission between networks is executed by the interlink transmission. In this program, the link error detection program is omitted.

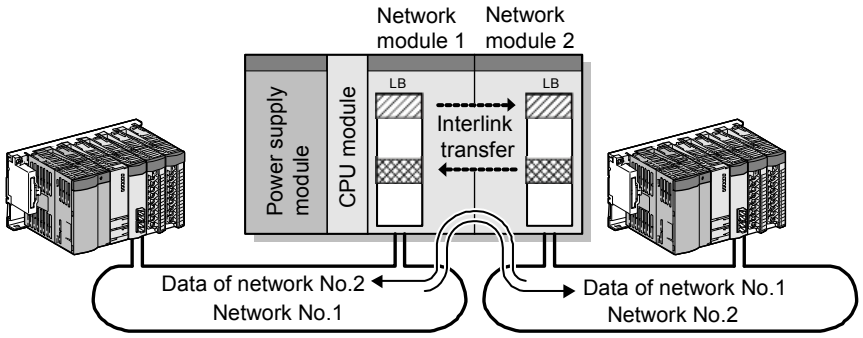


POINT

Interlink transmission

Link device (LB/LW) data of a network module are transferred to another network module through a relay station by network-network communication.

Interlink transmission is also executable between MELSECNET/H and CC-Link IE Field Network.



(1) Set parameters with GX Works2

Double click on [Ethernet/CC IE/MELSECNET] in [Network Parameter] of the Project View, configure settings as described below.

(a) Number of modules setting

PLC A

	Module 1	Module 2
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	2	
Group No.	0	
Station No.	1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

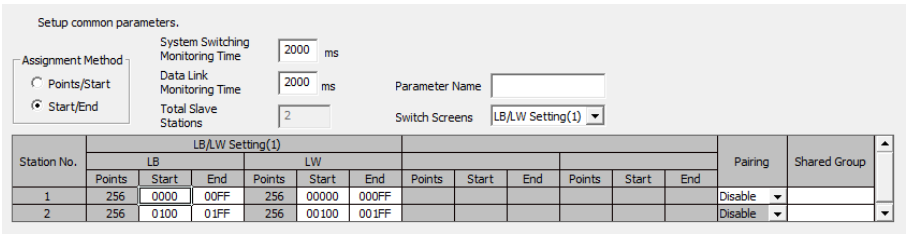
PLC B

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	CC IE Control(Control Station)
Start I/O No.	00A0	00C0
Network No.	1	2
Total Stations		2
Group No.	0	0
Station No.	2	1
Mode	Online	Online
		Network Range Assignment
		Network Operation Settings
	Refresh Parameters	Refresh Parameters
	Interrupt Settings	Interrupt Settings
	Specify Station No. by Parameter	Specify Station No. by Parameter

PLC C

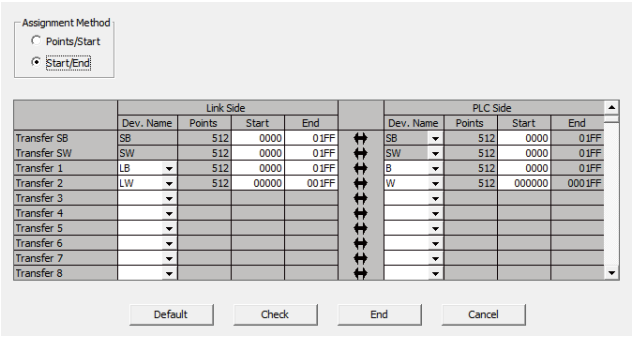
	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	2	
Total Stations		
Group No.	0	
Station No.	2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

(b) Network range assignment (PLC A and module No. 2 of PLC B)

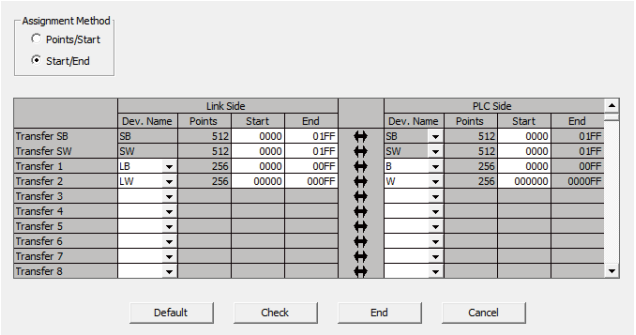


(c) Refresh parameter

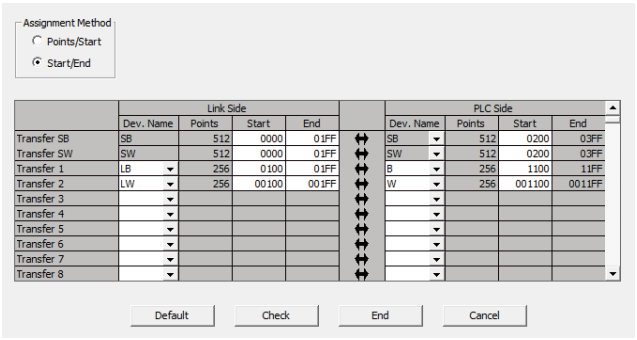
PLC A



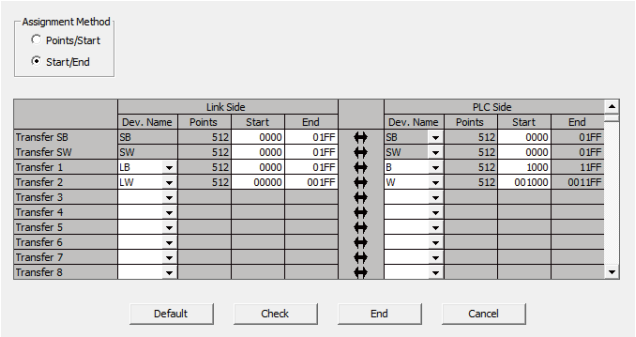
PLC B
Module No.1



PLC B
Module No.2

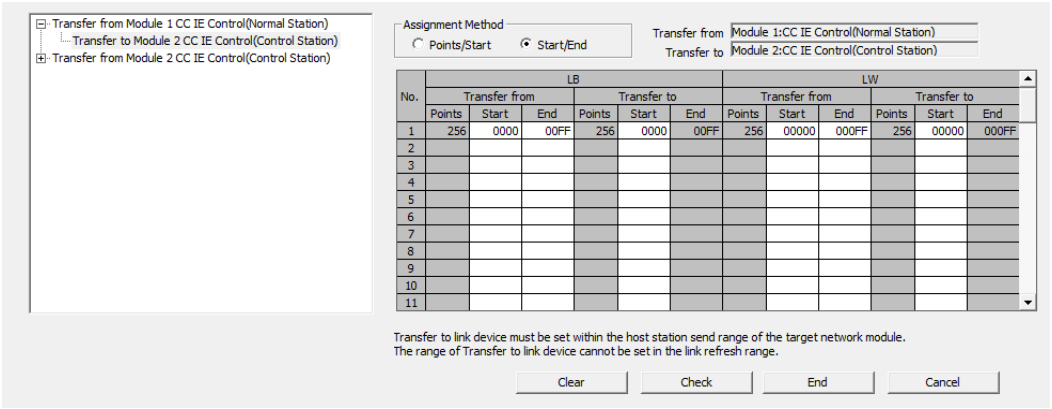


PLC C

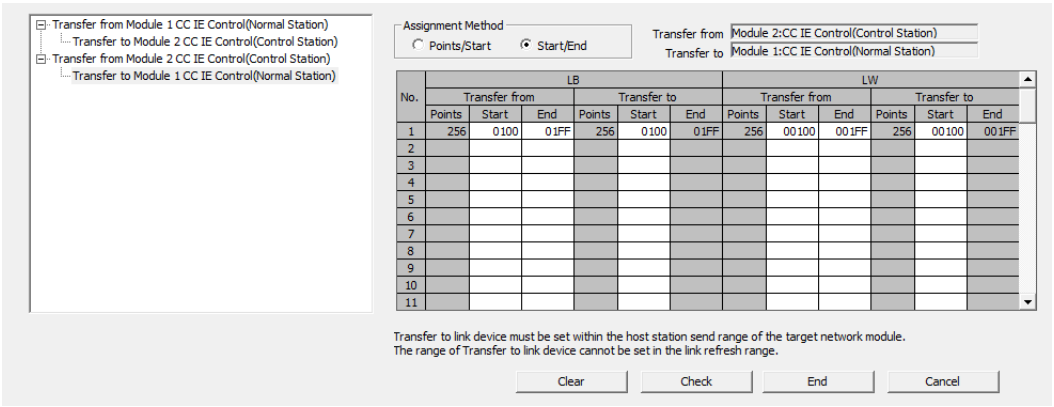


(d) Interlink transmission parameter (PLC B only)

Transfer from: Module 1: CC IE Control(Normal station)
Transfer to: Module 2: CC IE Control(Control station)



Transfer from: Module 2: CC IE Control(Control station)
Transfer to: Module 1: CC IE Control(Normal station)

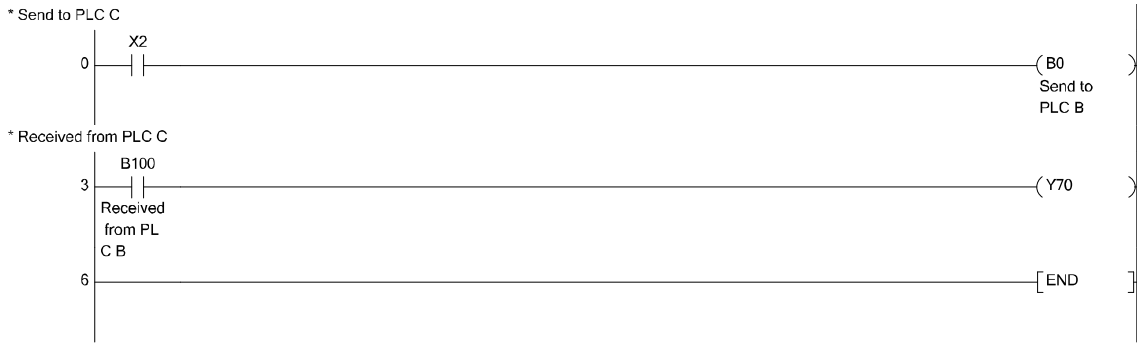


(2) Sequence program

The programs of each station are shown below.

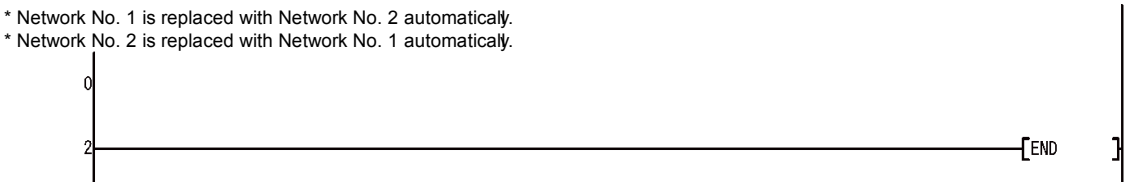
(a) Program of PLC A

Path	Multiple network (Interlink transmission)
Program name	A



(b) Program of PLC B

Path	Multiple network (Interlink transmission)
Program name	B



(c) Program of PLC C

Path	Multiple network (Interlink transmission)
Program name	C

(3) Operation method

(1) Send from PLC A to PLC C

Turn ON X2 of PLC A and confirm that Y70 of PLC C turns ON.

(2) Send from PLC C to PLC A

Turn ON X2 of PLC C and confirm that Y70 of PLC A turns ON.

APPENDIX

Appendix 1 Comparison of network module specifications and compatibility

Appendix 1.1 List of the comparison of specifications between CC-Link IE and MELSECNET/H

The following describes the comparison of specifications between the CC-Link IE and the MELSECNET/H.
The transmission of the CC-Link IE Controller Network is made by the optical loop system only.
When the coaxial bus system is used in the MELSECNET/H, consider replacing it with an optical loop system.
The following shows the comparison of optical loop systems in the CC-Link IE Controller Network and the MELSECNET/H.

List of the comparison of specifications between CC-Link IE and MELSECNET/H

Item specification \ Select mode		CC-Link IE	MELSECNET/H
Maximum link points per network	I/O (LX, LY)	8,192 points	
	Link Relay (LB)	32,768 points	16,384 points
	Link Register (LW)	131,072 points	16,384 points
Maximum link points per station	I/O (LX, LY)	8,192 points	{(LY + LB) ÷ 8 + (2 × LW)} ≤ 2000 bytes However, MELSECNET/H extension mode is {(LY + LB) ÷ 8 + (2 × LW)} ≤ 35840 bytes
	Link Relay (LB)	16,384 points Extended Mode: 32768 points	
	Link Register (LW)	16,384 points Extended Mode: 131072 points	
Transient transmission capacity		Max. 1920 bytes	
Communication speed		1Gbps	25Mbps/10Mbps
Number of stations per network		• When Universal model QCPU is used for control station: 120 (Control station: 1, Normal station: 119) • When other than Universal model QCPUs is used for control station: 64 (Control station: 1, Normal station: 63)	64 stations (Control station: 1, normal station: 63)
Connection cable		Optical fiber cable (Multi-mode fiber) Optical fiber cables used for MELSECNET/H cannot be used.	Optical fiber cable
Link scan time		The link scan time and transmission delay time differs between CC-Link IE Controller Network and MELSECNET/H. When replacing the system, check the link scan time and transmission delay time of the CC-Link IE Controller Network.	
Transmission delay time			
Overall cable distance		66km	30km
Station-to-station distance		550m	200 to 2 km
Max. number of networks		239	
Max. number of groups		32	
Maximum number of mountable modules per CPU		Max. 4 modules	
Transmission path		Duplex loop	
32-bit data assurance		Available	Available
Station-based block data assurance		Available*1	Available
External power supply	Voltage	20.4V to 31.2VDC	
	Current	0.28A	0.20A
	Terminal screw size	M3 screw	
	Applicable solderless terminal	R1.25-3	
	Applicable wire size	0.3 to 1.2mm^2	
	Tightening torque	0.42 to 0.58N•m	
	Allowable momentary power failure time	1ms	
	Noise immunity	By noise simulator of 500Vp-p noise voltage 1μs noise width and 25 to 60Hz noise frequency	
Number of refresh parameter settings per module (Exclude SB, SW)		• Universal model QCPU: 256 per module • High Performance model QCPU: 64 per module	64/Module
Network connection applicable CPU		• Basic model QCPU • High Performance model QCPU • Universal model QCPU • Process CPU • Redundant CPU	• Basic model QCPU • High Performance model QCPU • Universal model QCPU • Process CPU • Redundant CPU • C Controller module
External dimensions		• QJ71GP21-SX: 98(H)×27.4(W)×90(D) [mm] • QJ71GP21S-SX: 98(H)×55.2(W)×90(D) [mm]	• QJ71LP21-25: 98(H)×27.4(W)×90(D) [mm] • QJ71LP21S-25: 98(H)×55.2(W)×90(D) [mm]
Weight		• QJ71GP21-SX: 0.18kg • QJ71GP21S-SX: 0.28kg	• QJ71LP21-25: 0.11kg • QJ71LP21S-25: 0.20kg

*1: For the direct access to link devices, the data are not assured.

Appendix 2 Differences between QJ71GP21-SX/QJ71GP21S-SX and QJ71LP21/QJ71LP21-25/QJ71LP21S-25/QJ71BR11

Appendix 2.1 Differences in LED display and switch settings

Although CC-Link IE Controller Network Module QJ71GP21-SX/QJ71GP21S-SX also has the LED display as MELSECNET/H network module QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71BR11, there are differences between each network module as shown below. Be careful when operating the modules.

Item \ Model name	QJ71GP21-SX	QJ71GP21S-SX	QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71BR11
LED display	RUN		RUN
	MODE		-
	PRM		MNG
	-		T.PASS
	D LINK		D LINK
	SD		SD
	RD		RD
	ERR.*1		ERR.*1
	-		L ERR.*1
Station number setting switch	-		STATION NO. ×10, ×1
Station No. setting status (LED)	STATION NO. ×100, ×10, ×1		-
Mode setting switch	No switch. Set the each diagnostic function in the network parameter.		MODE 0: Online*2 (The parameters are valid) 1: Self-loopback test 2: Internal self-loopback test 3: Hardware test 4: Online *3 5: Self-loopback test *3 6: Internal self-loopback test *3 7: Hardware test*3 8 or later: Use prohibited
Compatible CPU	QCPU		
Compatible base	Q3□B,Q6□B		Q3□B,Q6□B
External dimensions (H×W×D(mm))	98 × 27.4 × 90	98 × 55.2 × 90	Except QJ71LP21S-25: 98 × 27.4 × 90 QJ71LP21S-25: 98 × 55.2 × 90
Weight (kg)	0.18	0.28	Except QJ71LP21S-25: 0.11 QJ71LP21S-25: 0.20

*1: Users can check the error details in the network diagnostics.

*2: Set in the network parameter.

*3: Use only the QJ71LP21-25 and QJ71LP21S-25. The QJ71LP21, QJ71BR11 are prohibited to use.

Appendix 2.2 Precautions for replacing QJ71LP21/QJ71LP21-25/QJ71LP21S-25/QJ71BR11 with QJ71GP21-SX/QJ71GP21S-SX

The following describes precautions for replacing the MELSECNET/H with the CC-Link IE Controller Network.

(1) Optical fiber cable

(a) Applicable optical fiber cable

The cable for the MELSECNET/H module cannot be used with the CC-Link IE Controller Network module.

(b) Station-to-station distance

The station-to-station distance for the CC-Link IE Controller Network is up to 550m.

When the station-to-station distance is longer than 550m, shorten it to 550m or less.

(2) Content set by switch of the MELSECNET/H module main body

Setting should be made at network parameters in the CC-Link IE Controller Network module.

(3) Diversion of network parameters

When changing "Network Type" with GX Works2, data set is canceled.

When diverting network parameters, copy the setting contents to text editor etc. before changing "Network Type".

Copy can be made from [Copy] under [Edit] in GX Works2.

REMARK

The operations of cutting, copying, or pasting network parameters cannot be performed in some range.

Appendix 3 Link special relay (SB) list

The link special relay is turned ON/OFF depending on various factors at data link. Also, the link special relay (SB) can grasp the data link error status by using it in a sequence program or monitoring it.
The link special relays (SB), which store the link status, are used in the detail information of GX Works2 network diagnostics.
When multiple network modules are mounted, data in the SB of each network module will be refreshed to the SB of the following CPU module if a refresh parameter of each network module is not set. After a refresh parameter is set for any network module, check the refresh parameter of the all network modules.

Module mount position	Module 1	Module 2	Module 3	Module 4
Device No.	SB0000 to 01FF	SB0200 to 3FF	SB0400 to 05FF	SB0600 to 07FF

The link special relay has the range where user can turn ON and OFF (SB0000 to SB001F), and the range where the system turns ON and OFF (SB0020 to SB01FF). (When the module mounting position is module 1.)

Link special relay (SB) list

No.	Name	Description	Availability	
			Control station	Normal station
SB0000	Link start (own station)	Restarts cyclic transmission of own station.*1 OFF : Startup not directed ON : Startup directed (valid at rising)	○	○
SB0001	Link stop (own station)	Stops cyclic transmission of own station.*1 OFF : No stop instruction ON : Stop directed (valid at rising)	○	○
SB0002	System link startup	Restarts cyclic transmission of the entire system.*1 The station to restart cyclic transmission can be specified by Link stop/startup direction (SW0000 to SW0008) or Group specification for link stop/startup (SW0012 to SW0013). OFF : Startup not directed ON : Startup directed (valid at rising)	○	○
SB0003	System link stop	Stops cyclic transmission of the entire system.*1 The station to stop cyclic transmission can be specified by Link stop/startup direction (SW0000 to SW0008) or Group specification for link stop/startup (SW0012 to SW0013). OFF : No stop instruction ON : Stop directed (valid at rising)	○	○
SB0006	Clear communication error count	Clears the communication error count that is displayed at CC IE Control diagnostics into 0. OFF : Clear not directed ON : Clear directed (ON Valid)	○	○
SB0007	Clear IN-side transmission error counter	Clears the IN-side line error detection area (SW0068, SW0069, SB006E, SB0140, SW0074, SW0140 to SW0147) into 0. OFF : Clear not directed ON : Clear directed (Number of errors is not counted during ON)	○	○
SB0008	Clear OUT-side transmission error counter	Clears the OUT-side line error detection area (SB006F, SB0150, SW006A, SW006B, SW0084, SW0150 to SW0157) into 0. OFF : Clear not directed ON : Clear directed (Number of errors is not counted during ON)	○	○
SB0009	Clear loop switching counter	Clears the own station's path switching detection area (SB008E, SB0160, SW006E, SW0160 to SW0167) to 0. OFF : Clear not directed ON : Clear directed (Number of errors is not counted during ON)	○	○
SB000A	Clear transient transmission error counter	Clears the own station's area for transient transmission errors (SB008F, SB0170, SW006F, SW170 to SW0177) to 0. OFF : Clear not directed ON : Clear directed (Number of errors is not counted during ON)	○	○

*1: (Condition) Valid when the baton pass status (own station) (SB0047) is OFF.
When the baton pass status (own station) (SB0047) is turned ON (error), the data prior to error is held.

Link special relay (SB) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SB000C	Normal connection information refresh instruction	Updates the normal connection information of the own station. OFF : No refresh instruction ON : Refresh instructed (valid at rising) If executed with the conditions for normal connection information acquisition not satisfied, the normal connection information is cleared.	○	○
SB0020	Module status	Stores the status of communications between a CC-Link IE Controller Network module and a CPU module. OFF : Normal ON : Error	○	○
SB0030	RECV execution request flag (1)	Stores the data reception status of channel 1 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0031	RECV execution request flag (2)	Stores the data reception status of channel 2 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0032	RECV execution request flag (3)	Stores the data reception status of channel 3 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0033	RECV execution request flag (4)	Stores the data reception status of channel 4 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0034	RECV execution request flag (5)	Stores the data reception status of channel 5 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0035	RECV execution request flag (6)	Stores the data reception status of channel 6 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0036	RECV execution request flag (7)	Stores the data reception status of channel 7 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0037	RECV execution request flag (8)	Stores the data reception status of channel 8 of the own station.*1 OFF : No data reception ON : Data received	○	○
SB0040	Network type (own station)	Stores the network type of own station. OFF : Controller network	○	○
SB0042	Power supply status of host	Stores the external power supply status of the CC-Link IE Controller Network module of the own station. OFF : External power not supplied (EXT.PW LED is OFF.) ON : External power supplied (EXT.PW LED is ON.) This relay is always OFF when the CC-Link IE Controller Network module does not have the external power supply function.	○	○
SB0043	Online switch (own station)	Stores the mode of own station. OFF : Online OFF : Other than online	○	○
SB0044	Station setting (own station)	Stores the network type that is set by parameters of own station. OFF : Normal station ON : Control station	○	○
SB0047	Baton pass status	Stores the baton pass status (transient transmission availability) of the own station. OFF : Normal ON : Error When an error is identified, the cause of the error can be checked in Baton pass status (own station) (SW0047) and Cause of baton pass interruption (SW0048).	○	○
SB0048	Control station status (own station)	Stores network type (current status) of own station.*1	○	○
		OFF : Normal station ON : Control station (when SB0044 is turned ON) Sub-control station (when SB0044 is turned OFF)	○	○
SB0049	Data link status of own station	Stores the data link status of own station. OFF : Normal ON : Error When an error is identified, the cause of the error can be checked in Cause of data link stop (SW0049).	○	○
SB004A	Own station's CPU status (1)	Stores the continuation error status of the CPU module of the own station. OFF : Normal ON : Continuation error	○	○

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

Link special relay (SB) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SB004B	Own station's CPU status (2)	Stores the stop error status of the CPU module of the own station. OFF : Normal ON : Stop error	○	○
SB004C	Cyclic transmission start accept status (own station)	Turned ON when startup request for cyclic transmission due to Link startup (own station) (SB0000) is received.*1 OFF : Not received (SB0000 is OFF) ON : Startup received (SB0000 is ON)	○	○
SB004D	Cyclic transmission start completion status (own station)	Turned ON when Cyclic transmission start accept status (own station) (SB004C) is turned ON and startup of cyclic transmission is completed.*1 OFF : Startup uncompleted (SB0000 is OFF) ON : Startup completed (SB0000 is ON)	○	○
SB004E	Cyclic transmission stop accept status (own station)	Turned ON when stop request of cyclic transmission due to Link stop (own station) (SB0001) is received.*1 OFF : Not received (SB0001 is OFF) ON : Startup completed (SB0001 is ON)	○	○
SB004F	Cyclic transmission stop completion status	Turned ON when Cyclic transmission stop accept status (own station) (SB004E) is turned ON and cyclic transmission stop is completed.*1 OFF : Stop uncompleted (SB0001 is OFF) ON : Stop completed (SB0001 is ON)	○	○
SB0050	Cyclic transmission start accept status (system)	Turned ON when startup request due to System link startup (SB0002) is received.*1 OFF : Not received (SB0002 is OFF) ON : Startup received (SB0002 is ON)	○	○
SB0051	Cyclic transmission start completion status (system)	Turned ON when Cyclic transmission start accept status (system)(SB0050) is turned ON and cyclic transmission startup is completed.*1 OFF : Startup uncompleted (SB0002 is OFF) ON : Startup completed (SB0002 is ON)	○	○
SB0052	Cyclic transmission stop accept status (system)	Turned ON when stop request of cyclic transmission due to System link stop (SB0003) is received.*1 OFF : Not received (SB0003 is OFF) ON : Stop received (SB0003 is ON)	○	○
SB0053	Cyclic transmission stop completion status (system)	Turned ON when Cyclic transmission stop accept status (system)(SB0052) is turned ON and cyclic transmission stop is completed.*1 OFF : Stop uncompleted (SB0003 is OFF) ON : Stop completed (SB0003 is ON)	○	○
SB0054	Parameter receive status	Stores the status of receiving parameters. The parameter receive status from the CPU module is stored for the control station. The parameter receive status from the control station is stored for the normal station. OFF : Receive completed ON : Receive uncompleted	○	○
SB0055	Received parameter error	Stores the status of received parameter.(Own parameter status is stored for the control station) OFF : Parameter normal ON : Parameter error	○	○
SB0056	Communication status	Stores the transient transmission status.*1 OFF : Transient transmission by control station ON : Transient transmission by sub-control station	○	○
SB005B	Own station's CPU RUN status	Stores the RUN status of the CPU module of the own station. OFF : RUN, STEP-RUN ON : The CPU module stop due to STOP, PAUSE, or error	○	○
SB005C	I/O master station (block 1)	Stores the I/O master station setting status of block 1.*2 OFF : No setting ON : Setting exists When the setting is set, the station No. is stored into I/O master station (block 1) (SW005C).	○	○
SB005D	I/O master station (block 2)	Stores the I/O master station setting status of block 2.*2 OFF : No setting ON : Setting exists When the setting is set, the station No. is stored into I/O master station (block 2) (SW005D).	○	○
SB0060	Communication mode	Stores the constant link scan status.*2 OFF : Constant link scan is invalid ON : Constant link scan is valid	○	○
SB0061	Cyclic transmission punctuality assurance	Stores the status of cyclic transmission punctuality assurance.*2 OFF : Cyclic transmission punctuality assurance is invalid ON : Cyclic transmission punctuality assurance is valid	○	○

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

Link special relay (SB) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SB0064	Own station's loop status	Stores the transmission path status of the own station. OFF : Normal ON : Error When an error is identified, the error details can be checked by Own station's loop status (SW0064).	○	○
SB0065	Loopback status	Stores the loopback execution status. (Including own station)*1 OFF : All stations normal ON : Station where loopback is performed exists	○	○
SB0066	Own station's IN-side link-up status	Stores the IN-side link-up status of own station. OFF : Linking up ON : Linking down	○	○
SB0067	Own station's OUT-side link-up status	Stores the OUT-side link-up status of own station. OFF : Linking up ON : Linking down	○	○
SB0068	Own station's IN-side link establishing status	Stores the IN-side link establishing status of own station. OFF : Link establishment completed ON : Link establishing	○	○
SB0069	Own station's OUT-side link establishing status	Stores the OUT-side link establishing status of own station. OFF : Link establishment completed ON : Link establishing	○	○
SB006A	Own station's IN-side cabling status	Stores the IN-side cabling status of own station. OFF : Normal ON : Inserted incorrectly	○	○
SB006B	Own station's OUT-side cabling status	Stores the OUT-side cabling status of own station. OFF : Normal ON : Inserted incorrectly	○	○
SB006C	Own station's IN-side error frame reception status	Stores whether the error frame is received or not in the IN-side of own station. OFF : Error frame is not received at present ON : Error frame is received at present	○	○
SB006D	Own station's OUT-side error frame reception status	Stores whether the error frame is received or not in the OUT-side of own station. OFF : Error frame is not received at present ON : Error frame is received at present	○	○
SB006E	Own station's IN-side error frame detection	Stores whether the error frame is received or not in the IN-side of the own station from power-on to the present. OFF : Error frame not received ON : Error frame received	○	○
SB006F	Own station's OUT-side error frame detection	Stores whether the error frame is received or not in the OUT-side of the own station from power-on to the present. OFF : Error frame not received ON : Error frame received	○	○
SB0070	Station No. setting status (own station)	Stores the station No. setting status of the own station when using the UINI instruction for station No. setting. OFF : Station No. determined ON : Station No. not yet determined A determined station No. of the own station can be confirmed in Station No. (SW0042).	×	○
SB008E	Path switching detection flag	Stores the path switching detection status. OFF : Path switching not detected ON : Path switching detected The stored value is cleared when Clear loop switching counter (SB0009) is turned ON.	○	○
SB008F	Transient error	Stores the transient transmission error detection status. OFF : Error not detected ON : Error detected When an error is detected, the number of errors can be checked in transient transmission error (SW006F).	○	○
SB0090	Hardware test completion status	Stores the completion status of hardware test. OFF : Not executed or being executed ON : Complete When completed, the completion status can be checked in Hardware test normal/error completion status (SB0091).	○	○
SB0091	Hardware test normal/error completion status	Stores the normal or error completion status of the hardware test. OFF : Completed normally ON : Failed (Condition) • Valid when Hardware test completion status (SB0090) is ON.	○	○

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

*2: (Condition) Valid when Data link status of own station (SB0049) is OFF.

Link special relay (SB) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SB0092	Self-loopback test completion status	Stores the completion status of the self-loopback test. OFF : Not executed or being executed ON : Complete When completed, the completion status can be checked in Self-loopback test normal/error completion status (SB0093).	○	○
SB0093	Self-loopback test normal/error completion status	Stores the normal or error completion status of self-loopback test. OFF : Completed normally ON : Failed (Condition) • Valid when Self-loopback test completion status (SB0092) is ON.	○	○
SB0094	Line test complete status	Stores the completion status of circuit test. OFF : Not executed or being executed ON : Complete When completed, the completion status can be checked in Circuit test normal/error completion status (SB0095).	○	○
SB0095	Circuit test normal/error completion status	Stores the normal or error completion status of the circuit test. OFF : Completed normally ON : Failed (Condition) • Valid when Circuit test completion status (SB0094) is ON.	○	○
SB0097	Station-to-station test normal/error completion status	Stores the normal or error completion status of the station-to-station test. 0 : Completed normally 1 : Failed	○	○
SB0098	Circuit test request from other station	Stores request status of circuit test from the control station. OFF : Circuit test not received ON : Circuit test received	×	○
SB0099	Station-to-station test request from other station	Stores request status of station-to-station test from the other station. OFF : Station-to-station test not received ON : Station-to-station test received	○	○
SB00A0	Baton pass status of each station	Stores the baton pass status of each station.*1 OFF : All stations normal ON : Faulty station exists When any faulty station exists, each station status can be checked in Baton pass status of each station (SW00A0 to SW00A7).	○	○
SB00B0	Cyclic transmission status of each station	Stores the cyclic transmission status of each station.*1 OFF : Cyclic transmission of all stations being executed ON : Station where cyclic transmission is not executed exists When any non-executing station exists, each station status can be checked in Cyclic transmission status of each station (SW00B0 to SW00B7).	○	○
SB00C0	Reserved station specification	Stores the presence of reserved station.*1 OFF : No reserved station ON : Reserved station exists When any reserved station exists, each station status can be checked in Reserved station specification (SW00C0 to SW00C7). (Condition) • Valid when Data link status of own station (SB0049) is OFF.	○	○
SB00D0	Parameter communication status of each station	Stores the parameter communication status of each station.*1 OFF : Parameter communication is completed or not executed in all stations ON : Station where parameter communication is in execution exists Stations that are communicating parameters can be checked in Parameter communication status of each station (SW00D0 to SW00D7).	○	×
SB00E0	Parameter status of each station	Stores the parameter status of each station.*1 OFF : No station detected parameter error ON : Some stations detected parameter error Stations that have parameter errors can be checked in Parameter error status of each station (SW00E0 to SW00E7).	○	×
SB00F0	CPU RUN status of each station	Stores the RUN status of the CPU module of each station. (Including own station)*1 OFF : All stations are in RUN or STEP-RUN status ON : Some stations are in STOP or PAUSE status When some stations are in the STOP or PAUSE status, each station status can be checked in CPU RUN status of each station (SW00F0 to SW00F7).	○	○

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.
• The reserved station and the station No. of the largest or later are excluded.

*2: (Condition) Valid when Data link status of own station (SB0049) is OFF.

Link special relay (SB) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SB0100	CPU operation status of each station (1)	Stores the stop error status of the CPU module of each station. (Including own station)*1 OFF : All stations normal ON : Stop error occurs to some stations When a stop error has occurred on a station, each station status can be checked in CPU operation status of each station (1) (SW0100 to SW0107).	○	○
SB0110	CPU operation status of each station (2)	Stores the continuation error status of the CPU module of each station. (Including own station)*1 OFF : All stations normal ON : Continuation error occurs to some stations When a continuation error has occurred on a station, each station status can be checked in CPU operation status of each station (2) (SW0110 to SW0117).	○	○
SB0120	Current IN-side error frame reception status	Stores whether the error frame is received or not in the IN-side transmission path of each station.*1 OFF : All stations receive no error frame ON : Some stations receive error frames When error frame reception is identified, each station status can be checked in Current IN-side error frame reception status (SW0120 to SW0127).	○	○
SB0130	Current OUT-side error frame reception status	Stores whether the error frame is received or not in the OUT-side transmission path of each station.*1 OFF : All stations receive no error frame ON : Some stations receive error frames When error frame reception is identified, each station status can be checked in Current OUT-side error frame reception status (SW0130 to SW0137).	○	○
SB0140	IN-side error frame reception detection status	Stores whether the error frame is received or not in the IN-side transmission path of each station from power-on to the present.*1 OFF : All stations receive no error frame ON : Some stations receive error frames When error frame reception is identified, each station status can be checked in Current IN-side error frame reception detection status (SW0140 to SW0147). The stored value is cleared when Clear IN-side transmission error counter (SB0007) is turned ON.	○	○
SB0150	OUT-side error frame reception detection status	Stores whether the error frame is received or not in the OUT-side transmission path of each station from power-on to the present.*1 OFF : All stations receive no error frame ON : Some stations receive error frames When error frame reception is identified, each station status can be checked in Current OUT-side error frame reception detection status (SW0150 to SW0157). The stored value is cleared when Clear OUT-side transmission error counter (SB0008) is turned ON.	○	○
SB0160	Path switching detection flag for each station	Stores the path switching detection status of each station. (Including own station)*1 OFF : Path switching not detected ON : Path switching detected When a path switching has been detected, each station status can be checked in Path switching detection status of each station (SW0160 to SW0167). The path switching detection status is cleared when Clear loop switching counter (SB0009) is turned ON. The stored value is cleared when Clear loop switching counter (SB0009) is turned ON in each station and path switching detection status for all stations is cleared.	○	○
SB0170	Transient error of each station	Stores the transient transmission error detection status of each station. (Including own station)*1 OFF : Error not detected ON : Error detected When an error has been detected, each station status can be checked in Transient error detection status of each station (SW0170 to SW0177). The transient error detection status of own station is cleared when Clear transient transmission error counter (SB000A) is turned ON. The stored value is cleared when Clear transient transmission error counter (SB000A) is turned ON in each station and the transient error detection status for all stations is cleared.	○	○
SB0180	External power supply information	Stores the external power supply status of the CC-Link IE Controller Network module on each station. (Including own station)*1 OFF : No external power supplied to any station ON : External power supplied to station(s) When external power is supplied to station(s), each station status can be checked in Power supply status of each station (SW0180 to SW0187).	○	○
SB0190	Power status consistency check of each station	Stores the external power supply status of the CC-Link IE Controller Network module with external power supply function on each station. (Including own station).*1 OFF : External power supplied to all stations (Normal) ON : No external power supplied to some station(s) (Error) When no external power is supplied to some station(s) (error), each station status can be checked in Power status consistency check of each station (SW0190 to SW0197).	○	○

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.
• The reserved station and the station No. of the largest or later are excluded.

Appendix 4 Link special register (SW) list

The link special register (SW) stores information about data link in a numerical value. The faulty part or cause can be checked by using the link special register (SW) in a sequence program or by monitoring it.
The link special registers (SW), which store the link status, are used in the detail information of GX Works2 network diagnostics.
When multiple network modules are mounted, data in the SW of each network module will be refreshed to the SW of the following CPU module if a refresh parameter of each network module is not set. After a refresh parameter is set for any network module, check the refresh parameter of the all network modules.

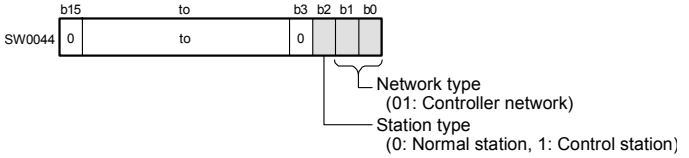
Module mount position	Module 1	Module 2	Module 3	Module 4
Device No.	SW000 to 1FF	SW200 to 3FF	SW400 to 5FF	SW600 to 7FF

The link special register has the range where user can turn ON and OFF (SW0000 to SW001F), and the range where the system turns ON and OFF (SW0020 to SW01FF). (When the module mounting position is module 1.)

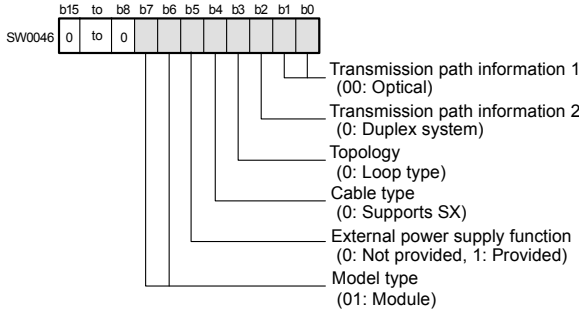
Link special registers (SW) list

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Availability</th></tr>
<tr><th>Control station</th><th>Normal station</th></tr>
<tr><td>SW0000</td><td rowspan="3">Link stop/startup direction</td><td>Sets the station which stops/restarts the data link.
00_H: Own station
01_H: All stations
02_H: Specified station
03_H: Specified group
80_H: Own station (forced link startup)
81_H: All stations (forced link startup)
82_H: Specified station (forced link startup)
83_H: Specified group (forced link startup)
The cyclic transmission stop/startup can be performed by System link startup (SB0002) or System link stop (SB0003).</td><td>○</td><td>○</td></tr>
<tr><td>SW0001
to
SW0008</td><td>Sets the station No. to stop or startup cyclic transmission when 02H or 82H is set in Link stop/startup direction (SW0000).
0: Stop or startup not directed
1: Stop or startup directed
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0001</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0002</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0003</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0004</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
<tr><td>SW0005</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr>
<tr><td>SW0006</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr>
<tr><td>SW0007</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr>
<tr><td>SW0008</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr>
</table>
Each number in the table represents station No.</td><td>○</td><td>○</td></tr>
<tr><td>SW0012
to
SW0013</td><td>Group specification for link stop/startup</td><td>Sets the group No. to stop or start up cyclic transmission when 03H or 83H is set in Link stop/startup direction (SW0000).
0: Stop or startup not directed
1: Stop or startup directed
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0012</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0013</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
</table>
Each number in the table represents group No.</td><td>○</td><td>○</td></tr>
</table>

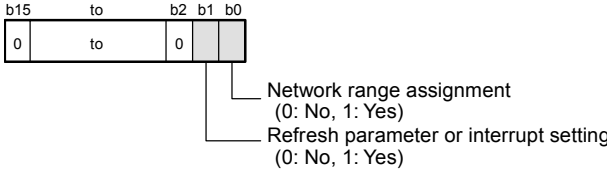
Link special registers (SW) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SW0020	Module status	Stores the status of communications between a CC-Link IE Controller Network module and a CPU module. 0 : Normal 1 or greater : Abnormal FF_H: Module error	○	○
SW0030	ZNRD processing result	Stores a processing result of the ZNRD instruction. 0 : Completed normally 1 or greater : Failed	○	○
	Send/receive instruction (1) processing result	Stores a processing result of the link dedicated instruction that used channel 1 of the own station. 0 : Completed normally 1 or greater : Failed		
SW0031	ZNWR processing result	Stores a processing result of the ZNWR instruction. 0 : Completed normally 1 or greater : Failed	○	○
	Send/receive instruction (2) processing result	Stores a processing result of the link dedicated instruction that used channel 2 of the own station. 0 : Completed normally 1 or greater : Failed		
SW0032	Send/receive instruction (3) processing result	Stores a processing result of the link dedicated instruction that used channel 3 of the own station. 0 : Completed normally 1 or greater : Failed	○	○
SW0033	Send/receive instruction (4) processing result	Stores a processing result of the link dedicated instruction that used channel 4 of the own station. 0 : Completed normally 1 or greater : Failed	○	○
SW0034	Send/receive instruction (5) processing result	Stores a processing result of the link dedicated instruction that used channel 5 of the own station. 0 : Completed normally 1 or greater : Failed	○	○
SW0035	Send/receive instruction (6) processing result	Stores a processing result of the link dedicated instruction that used channel 6 of the own station. 0 : Completed normally 1 or greater : Failed	○	○
SW0036	Send/receive instruction (7) processing result	Stores a processing result of the link dedicated instruction that used channel 7 of the own station. 0 : Completed normally 1 or greater : Failed	○	○
SW0037	Send/receive instruction (8) processing result	Stores a processing result of the link dedicated instruction that used channel 8 of the own station. 0 : Completed normally 1 or greater : Failed	○	○
SW0040	Network No.	Stores the network type of own station. Range : 1 to 239	○	○
SW0041	Group No.	Stores the group No. of own station. 0 : No group specification 1 to 32 : Group No.	○	○
SW0042	Station No.	Stores the station No. of own station. 1 to 120 : Own station No. (Station No. setting status (own station) (SB0070) is OFF.) 255 : Station No. not yet determined (Station No. setting status (own station) (SB0070) is ON.)	○	○
SW0043	Mode status	Stores the mode of own station. 0: Online 2: Offline 5: Station-to-station test 6: Circuit test 7: Self-loopback test 9: Hardware test	○	○
SW0044	Station setting	Stores the setting status of own station. 	○	○

Link special registers (SW) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SW0046	Module type	Stores the hardware status of own station.  	○	○
SW0047	Baton pass status	Stores the communication status of own station. 0: Data linking 1: Data link stop in execution 2: Baton pass being executed 3: Baton pass stop in execution 4: Test being executed 5: Offline	○	○
SW0048	Cause of baton pass interruption	Stores the cause of interrupting communication (baton pass) of the own station. 00H: Normal communication 30H: Cable disconnection or power-on 31H: Cable insertion error 32H: Cable IN-OUT checking 33H: Disconnection or reconnection processing 40H: Offline mode 41H: Hardware test 42H: Self-loopback test 50H: Self-diagnostics in execution	○	○
SW0049	Cause of data link stop	Stores the cause of stopping data link of the own station. 00H: Normal communication 01H: Stop directed 02H: Monitoring timeout 03H: Circuit test being executed 10H: Parameter unreceived 11H: Own station No. out of range 12H: Own station reserved station setting 13H: Own station No. duplication 14H: Control station duplication 15H: Control station/own station No. duplication 16H: Station No. unset 17H: Network No. improper 18H: Parameter error 19H: Parameter communicating 20H: CPU module stop error 21H: CPU module power stop error The CPU module power stop error (21H) can be detected in CC-Link IE Controller Network modules with external power supply function. The above data are detected when a CPU module is powered ON and then OFF.	○	○
SW004A	Data linking stop request station	The station No. of the station where a cyclic transmission stop request is executed is stored into own station. Range: 1 to 120 The stop request of cyclic transmission is executed by System link stop (SB0003). (Condition) • Valid when Baton pass status (own station) (SB0047) is OFF. When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.	○	○
SW004B	Own station's CPU status	Stores the CPU module status of the own station. 01H: STOP (Normal) 02H: STOP (Stop error is occurring) 03H: STOP (Continuation error is occurring) 04H: RUN (Normal) 05H: RUN (Continuation error is occurring) 06H: STEP-RUN 07H: PAUSE 0EH: CPU module resetting 0FH: CPU module initial processing	○	○

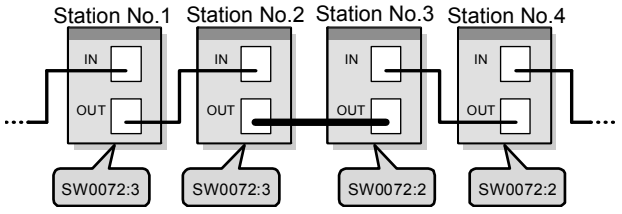
Link special registers (SW) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SW004D	Data linking start status (own station)	Stores the result of starting cyclic transmission with Link startup (own station) (SB0000).*1 0: Normal 1 or later: Error	○	○
SW004F	Data linking stop status (own station)	Stores the result of stopping cyclic transmission with Link stop (own station) (SB0001).*1 0: Normal 1 or later: Error (APPENDIX 7 Error code)	○	○
SW0051	Data linking start status (entire system)	Stores the result of starting cyclic transmission with System link startup (SB0002).*1 0: Normal 1 or later: Error description of own station	○	○
SW0053	Data linking stop status (entire system)	Stores the result of stopping cyclic transmission with System link stop (SB0003).*1 0: Normal 1 or later: Error description of own station	○	○
SW0054	Parameter information	Stores information of parameters.  (Condition) • Valid when Received parameter error (SB0055) is OFF.	○	○
SW0055	Parameter setting status	Stores the status of parameters. 0: Normal 1 or later: Error (Condition) • Valid when Received parameter error (SB0055) is ON.	○	○
SW0056	Current control station	Stores the station No. of the station which is actually operating as a control station.(Including sub-control station) Range: 1 to 120	○	○
SW0057	Designated control station	Stores the station No. of the control station which is set by network parameters. 0: Control station or sub-control station does not exist in a network. 1 to 120: Station No.	○	○
SW0059	Total number of link stations	Stores the total number of link stations which is set by network parameters. Range: 2 to 120	○	○
SW005A	Maximum baton pass station	Stores the largest No. of the station which performs baton pass.*1 Range: 2 to 120	○	○
SW005B	Maximum cyclic transmission station	Stores the largest No. of the station where cyclic transmission is performed.*2 Range: 1 to 120 (Condition) • Valid when Data link status of own station (SB0049) is OFF.	○	○
SW005C	I/O master station (Block 1)	Stores the station No. for I/O master station of block 1.*2 0: No I/O master station 1 to 120: Station No. (Condition) • Valid when Data link status of own station (SB0049) is OFF.	○	○
SW005D	I/O master station (Block 2)	Stores the station No. for I/O master station of block 2.*2 0: No I/O master station 1 to 120: Station No. (Condition) • Valid when Data link status of own station (SB0049) is OFF.	○	○
SW0060	Maximum link scan time	Stores the maximum value of link scan time at cyclic transmission. *1 (Unit: ms)	○	○
SW0061	Minimum link scan time	Stores the minimum value of link scan time at cyclic transmission.*1 (Unit: ms)	○	○
SW0062	Current link scan time	Stores the current value of link scan time at cyclic transmission.*1 The stored value includes an error of up to 1ms. (Unit: ms)	○	○

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

*2: (Condition) Valid when Data link status of own station (SB0049) is OFF.

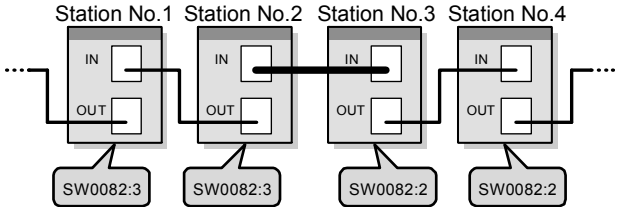
Link special registers (SW) list (Continued)

No.	Name	Description	Availability	
			Control station	Normal station
SW0063	Communication mode	Stores the setting value of the constant link scan which is set by supplementary setting.*1 0 : No setting 1 to 500 : Setting value of constant link scan (Unit: ms)	○	○
SW0064	Own station's loop status	Stores the transmission path status of the own station. 00H: Normal 12H: IN-side loopback (OUT-side cable disconnection) 13H: IN-side loopback (OUT-side cable insertion error) 14H: IN-side loopback (OUT-side line establishing) 21H: OUT-side loopback (IN-side cable disconnection) 31H: OUT-side loopback (IN-side cable insertion error) 41H: OUT-side loopback (IN-side line establishing) 22H: Disconnecting (IN-side or OUT-side cable disconnection) 23H: Disconnecting (IN-side cable disconnection, OUT-side cable insertion error) 24H: Disconnecting (IN-side cable disconnection, OUT-side line establishing) 32H: Disconnecting (IN-side cable insertion error, OUT-side cable disconnection) 33H: Disconnecting (IN-side or OUT-side cable insertion error) 34H: Disconnecting (IN-side cable insertion error, OUT-side line establishing) 42H: Disconnecting (IN-side line establishing, OUT-side cable disconnection) 43H: Disconnecting (IN-side line establishing, OUT-side cable insertion error) 44H: Disconnecting (IN-side or OUT-side line establishing)	○	○
SW0065	Loopback information	Stores the loop status of network. 0: Normal 1: Loopback 2: All stations faulty	○	○
SW0068	IN-side line error occurrence rate (Max.)	Stores the rate (maximum value) of receiving error frame at the IN-side of own station. (Unit: %) The accumulation of errors is cleared when Clear IN-side transmission error counter (SB0007) is turned ON.	○	○
SW0069	IN-side line error occurrence rate (present.)	Stores the rate (present value) of receiving error frame at the IN-side of own station. (Unit: %) The accumulation of errors is cleared when Clear IN-side transmission error counter (SB0007) is turned ON.	○	○
SW006A	OUT-side line error occurrence rate (Max.)	Stores the rate (maximum value) of receiving error frame at the OUT-side of own station. (Unit: %) The accumulation of errors is cleared when Clear OUT-side transmission error counter (SB0008) is turned ON.	○	○
SW006B	OUT-side line error occurrence rate (present.)	Stores the rate (present value) of receiving error frame at the IN-side of own station. (Unit: %) The accumulation of errors is cleared when Clear OUT-side transmission error counter (SB0008) is turned ON.	○	○
SW006E	Number of loop switches	Stores the number (accumulation) of switching communication paths. When Clear loop switching counter (SB0009) turns ON, the number is cleared.	○	○
SW006F	Transient transmission error	Stores the number (accumulation) of transient transmission errors. The number of errors is cleared when Clear transient transmission error counter (SB000A) is turned ON.	○	○
SW0070	IN-side loopback station No.	Stores the station No. of the station where a loopback is executed at IN-side.*1 0 : No station executes loopback 1 to 120 : Station No.	○	○
SW0071	IN-side loopback factor	Stores the factor of IN-side loopback. 00H: No station executes loopback 02H: OUT-side cable disconnection 03H: OUT-side cable insertion error 04H: OUT-side line establishing	○	○
SW0072	OUT-side mis-cabling station No.	Stores the station No. of the station where the OUT-side cable is incorrectly inserted.*1 The station No. to be stored is a station No. of the target station where a cable is connected.  0 : No station connects cable incorrectly 1 to 120 : Station No. (Condition) • Valid when IN-side loopback factor (SW0071) is 03H (OUT-side cable insertion error).	○	○
SW0074	IN-side cable disconnection detection count	Stores the number (accumulation) of detecting cable disconnection at IN-side. The number of detections is cleared when Clear IN-side transmission error counter (SB0007) is turned ON.	○	○

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

*2: (Condition) Valid when Data link status of own station (SB0049) is OFF.

Link special registers (SW) list (Continued)

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Availability</th></tr>
<tr><th>Control station</th><th>Normal station</th></tr>
<tr><td>SW0080</td><td>OUT-side loopback station No.</td><td>Stores the station No. of the station where a loopback is executed at OUT-side.*1
0 : No station executes loopback
1 to 120 : Station No.</td><td>○</td><td>○</td></tr>
<tr><td>SW0081</td><td>OUT-side loopback factor</td><td>Stores the factor of OUT-side loopback.*1
00H: No station executes loopback
02H: IN-side cable disconnection
03H: IN-side cable insertion error
04H: IN-side line establishing</td><td>○</td><td>○</td></tr>
<tr><td>SW0082</td><td>IN-side mis-cablingstation No.</td><td>Stores the station No. of the station where the IN-side cable is incorrectly inserted.
The station No. to be stored is a station No. of the target station where a cable is connected.
 

0 : No station connects cable incorrectly
1 to 120 : Station No.
(Condition)
• Valid when OUT-side loopback factor (SW0081) is 03H (IN-side cable insertion error).</td><td>○</td><td>○</td></tr>
<tr><td>SW0084</td><td>OUT-side cable disconnection detection count</td><td>Stores the number (accumulation) of detecting cable disconnection at OUT-side.
The number of detections is cleared when Clear OUT-side transmission error counter (SB0008) is turned ON.</td><td>○</td><td>○</td></tr>
<tr><td>SW0096</td><td>Station-to-station test station</td><td>Stores the station No. of the target station where a station-to-station test is performed.
(Valid only at station-to-station test)
Stores the station No. of a target station when monitoring an executing station.
Stores the station No. of an executing station when monitoring a target station.
0 : Station No. not set
1 to 120 : Station No. for target station of station-to-station test</td><td>○</td><td>○</td></tr>
<tr><td>SW00A0 to SW00A7</td><td>Baton pass status of each station</td><td>Stores the baton pass status of each station.*1
0: Baton pass normally operating station
1: Baton pass faulty station
<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW00A0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW00A1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW00A2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW00A3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
<tr><td>SW00A4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr>
<tr><td>SW00A5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr>
<tr><td>SW00A6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr>
<tr><td>SW00A7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr>
</table>
Each number in the table represents station No
(Condition)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
</table>

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Availability</th></tr>
<tr><th>Control station</th><th>Normal station</th></tr>
<tr><td>SW00B0 to SW00B7</td><td>Cyclic transmission status of each station</td><td>Stores the cyclic transmission status of each station.*1
0: Cyclic transmission normally operating station
1: Cyclic transmission faulty station
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00B0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00B1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00B2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00B3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00B4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00B5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00B6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00B7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
If a CPU module installed together with the CC-Link IE Controller Network module with external power supply function is turned OFF, detection of a data link error may take more time than usual.
For immediate detection of a data link error, program an interlock using the link relay (LB) in each station's send range.
(Condition)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
<tr><td>SW00C0 to SW00C7</td><td>Reserved station specification</td><td>Stores the setting status of reserved station.
0: Other than reserved station
1: Reserved station
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00C0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00C1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00C2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00C3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00C4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00C5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00C6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00C7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid when Data link status of own station (SB0049) is OFF.
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
<tr><td>SW00D0 to SW00D7</td><td>Parameter communication status of each station</td><td>Stores the parameter communication status of each station.*1
0: Parameter communication completed or not executed
1: Parameter communicating
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00D0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00D1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00D2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00D3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00D4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00D5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00D6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00D7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>×</td></tr>
</table>

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

Link special registers (SW) list (Continued)

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Availability</th></tr>
<tr><th>Control station</th><th>Normal station</th></tr>
<tr><td>SW00E0 to SW00E7</td><td>Parameter error status of each station</td><td>Stores the parameter status of each station.*1
0: Parameter normal
1: Parameter error
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00E0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00E1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00E2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00E3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00E4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00E5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00E6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00E7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>×</td></tr>
<tr><td>SW00F0 to SW00F7</td><td>CPU RUN status of each station</td><td>Stores the RUN status of the CPU module of each station. (Including own station)*1
0: RUN, STEP-RUN
1: STOP, PAUSE, Stop error
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00F0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00F1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00F2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00F3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW00F4</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW00F5</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW00F6</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW00F7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
<tr><td>SW0100 to SW0107</td><td>CPU operation status of each station (1)</td><td>Stores the stop error status of the CPU module of each station. (Including own station) *1
0: Normal
1: Stop error
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0100</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0101</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0102</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0103</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0104</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0105</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0106</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0107</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
</table>

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Availability</th></tr>
<tr><th>Control station</th><th>Normal station</th></tr>
<tr><td>SW0110 to SW0117</td><td>CPU operation status of each station (2)</td><td>Stores the continuation error status of the CPU module of each station. (Including own station) *1
0: Normal
1: Continuation error
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0110</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0111</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0112</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0113</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0114</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0115</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0116</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0117</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
<tr><td>SW0120 to SW0127</td><td>Current IN-side errorframe reception status</td><td>Stores whether the error frame is received or not in the IN-side transmission path of each station.*1
0: Error frame is not received at present
1: Error frame is received at present
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0120</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0121</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0122</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0123</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0124</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0125</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0126</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0127</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)</td><td>○</td><td>○</td></tr>
<tr><td>SW0130 to SW0137</td><td>Current OUT-side error framereception status</td><td>Stores whether the error frame is received or not in the OUT-side transmission path of each station.*1
0: Error frame is not received at present
1: Error frame is received at present
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0130</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0131</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0132</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0133</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0134</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0135</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0136</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0137</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)</td><td>○</td><td>○</td></tr>
</table>

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Availability</th></tr>
<tr><th>Control station</th><th>Normal station</th></tr>
<tr><td>SW0140 to SW0147</td><td>IN-side error frame reception detection status</td><td>Stores whether the error frame is received or not in the IN-side transmission path of each station from power-on to the present.*1
The stored value is cleared when Clear IN-side transmission error counter (SB0007) is turned ON.
0: Error frame not received
1: Error frame received
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0140</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0141</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0142</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0143</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0144</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0145</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0146</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0147</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)</td><td>○</td><td>○</td></tr>
<tr><td>SW0150 to SW0157</td><td>OUT-side error frame reception detection status</td><td>Stores whether the error frame is received or not in the OUT-side transmission path of each station from power-on to the present.
The stored value is cleared when Clear OUT-side transmission error counter (SB0008) is turned ON.
0: Error frame not received
1: Error frame received
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0150</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0151</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0152</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0153</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0154</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0155</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0156</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0157</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• Valid only for the normally operating station at Baton pass status of each station (SW00A0 to SW00A7)</td><td>○</td><td>○</td></tr>
<tr><td>SW0160 to SW0167</td><td>Transient error detection status of each station</td><td>Stores whether the path switching is detected or not in each station from power-on to the present.
The path switching detection status is cleared when Clear loop switching counter (SB0009) is turned ON.
Turn ON Clear loop switching counter (SB0009) when clearing the path switching detection status of other station.
0: Path switching not detected
1: Path switching detected
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0160</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0161</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0162</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0163</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0164</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0165</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0166</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0167</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.</td><td>○</td><td>○</td></tr>
</table>

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

Link special registers (SW) list (Continued)

<table>
<tr><th rowspan="2">No.</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Availability</th></tr>
<tr><th>Control station</th><th>Normal station</th></tr>
<tr><td>SW0170
to
SW0177</td><td>Transient error detection status of each station</td><td>Stores whether the transient transmission error is detected or not in each station from power-on to the present.
The transient error detection status of own station is cleared when Clear transient transmission error counter (SB000A) is turned ON.
Turn ON Clear transient transmission error counter (SB000A) at other station side when clearing the transient error detection status of other station.
0: Error not detected
1: Error detected
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0170</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0171</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0172</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0173</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0174</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0175</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0176</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0177</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.</td><td>○</td><td>○</td></tr>
<tr><td>SW0180
to
SW0187</td><td>Power supply status of each station</td><td>Stores the external power supply status of the CC-Link IE Controller Network module on each station. (Including own station)
0: No external power supplied
1: External power supplied
This register is always OFF when the CC-Link IE Controller Network module does nothave the external power supply function.
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0180</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0181</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0182</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0183</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0184</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0185</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0186</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0187</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
<tr><td>SW0190
to
SW0197</td><td>Power status consistency check of each station</td><td>Stores the external power supply status of the CC-Link IE Controller Network module with external power supply function on each station. (Including own station)
0: External power supplied (Normal)
1: No external power supplied (Error)
This register is always OFF when the CC-Link IE Controller Network module does not have the external power supply function.
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>b11</th><th>b10</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0190</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0191</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0192</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0193</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr><tr><td>SW0194</td><td>80</td><td>79</td><td>78</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td><td>69</td><td>68</td><td>67</td><td>66</td><td>65</td></tr><tr><td>SW0195</td><td>96</td><td>95</td><td>94</td><td>93</td><td>92</td><td>91</td><td>90</td><td>89</td><td>88</td><td>87</td><td>86</td><td>85</td><td>84</td><td>83</td><td>82</td><td>81</td></tr><tr><td>SW0196</td><td>112</td><td>111</td><td>110</td><td>109</td><td>108</td><td>107</td><td>106</td><td>105</td><td>104</td><td>103</td><td>102</td><td>101</td><td>100</td><td>99</td><td>98</td><td>97</td></tr><tr><td>SW0197</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>120</td><td>119</td><td>118</td><td>117</td><td>116</td><td>115</td><td>114</td><td>113</td></tr></table>Each number in the table represents station No.
(Condition)
• The reserved station and the station No. of than the largest or later are excluded.</td><td>○</td><td>○</td></tr>
</table>

*1: (Condition) Valid when Baton pass status (own station) (SB0047) is OFF.
When Baton pass status (own station) (SB0047) is turned ON (error), data prior to error is held.

Appendix 5 Error codes

When the data link is disabled during cyclic transmission, or normal communication is not performed during transient transmission by the sequence program instructions or from GX Works2, the error code (hexadecimal) will be stored in the link special register, or displayed at the GX Works2 system monitor.

Appendix 5.1 Error code of controller network

Error code list

Error No.	Description	Error detail	Corrective action
4000H to 4FFFH	Errors detected by the CPU module		
7000H to 7FFFH	Errors detected by the serial communication module, etc.		
B000H to BFFFH	Errors detected by the CC-Link system		
C000H to CFFFH	Errors detected by the Ethernet interface module		
E000H to E005H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E006H	Receive queue full	The receive queue is full.	• Temporarily stop the transient transmission, and then retry it. • Reduce the operation frequency of transient transmission, and then retry the operation. • Using the COM instruction, increase the processing frequency of transient transmission. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E007H to E011H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E012H	Parameter check result error	The network parameter setting is not correct.	• Write correct network parameters to the programmable controller. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E013H			
E014H to E018H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E019H	CPU module error	No response has been received from the CPU for 5 seconds.	
E01AH	CPU module stop error	A stop error has occurred in the CPU module.	• Check the error in "PLC Diagnostics" of GX Works2, and take corrective actions.
E01BH	CPU module power failure	Power failure occurred in the CPU module.	• The CPU module has been powered off. Power it on again.
E101H	Parameter error	Some of the network parameters are incorrect.	• Write correct network parameters to the programmable controller. • If the error persists even after taking the above action, please consult your local Mitsubishi representative.

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E102H	Reserved own station error	The own station was set as a reserved station.	• Cancel the reserved station setting in "Network Range Assignment" of the control station. • Change the station No. to the one that is not specified as a reserved station.
E103H	Invalid own station No.	The own station No. set is outside the range of total stations.	• Increase the number of total stations in the network setting of the control station. • Change the station number to the one that is within the number of total stations.
E104H to E10AH	Parameter error	Some of the network parameters are incorrect.	• Write correct network parameters to the programmable controller. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E10BH	Parameter error	Some of the network parameters are incorrect.	• Write correct network parameters to the programmable controller. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E10CH			
E10DH	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E110H to E117H	Parameter error	Some of the network parameters are incorrect.	• Write correct network parameters to the programmable controller. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E120H	UINI execution at control station	The UINI instruction was executed at a control station.	• Setting the station number with the UINI instruction is not allowed for control stations. Set it with a network parameter. • Change the station type setting to Normal station, and then retry it.
E121H	Own station No. error (UINI instruction)	With "Specify Station No. by Parameter" selected in the network parameters, the UINI instruction was executed.	• Select "Specify Station No. by Program." in the network parameters, and execute it again.
E122H	Duplicated station No. (UINI instruction)	Duplicated station No. was set for the own station using the UINI instruction.	• Change the own station No. setting in the control data, and then retry the instruction. • Change the other station's No. which is duplicated.
E123H	Station No. already set (UINI instruction)	After setting a station No. with the UINI instruction, the instruction was executed again.	• Station No. setting with the UINI instruction is limited to one time only. Reset the CPU module, and then retry the instruction.
E152H	Link startup condition error	Link startup was attempted from a station different from the one where cyclic transmission has stopped.	• Execute link startup from the station where cyclic transmission has stopped. • Execute the forced link startup.
E160H	Invalid link startup/stop direction	The link stop/startup direction content (SW0000) was not set properly.	• Check the setting and stop or restart cyclic transmission.
E162H	Link startup/stop reexecution error (instructed by other station)	Reexecution was attempted during processing for cyclic transmission stop/restart.	• Reexecute it after completing the processing for cyclic transmission stop/restart.
E163H	Link startup/stop reexecution error (instructed by own station)		
E164H	Link startup/stop reexecution error (instructed by entire system)		
E165H	Link startup/stop station specification error	The link stop/startup direction contents (SW0001 to SW0008) were not set properly.	• Check the setting and stop or restart cyclic transmission.
E166H	Link startup/stop group specification error	The link stop/startup group specification (SW0012 to SW0013) is not correct.	

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E170H to E172H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E173H	Communication test retry error	During execution of the communication test, the test was retried.	• Reexecute it after completing the currently executing communication test.
E174H	Communication test transmission completion signal retried out	The maximum number of transmission completion signal retries was reached.	• Check the network status in the CC IE Control diagnostics, and retry the operation. • Check if the routing parameters are set correctly.
E175H	Communication test monitoring time timeout	No response has been returned within the communication monitoring time.	
E176H	Communication test transmission completion wait time timed out	Timeout has occurred without transmission completion.	
E177H to E179H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E17AH	Duplicated communication test data reception	Duplicated communication test data reception.	• Check the network status in the CC IE Control diagnostics, and retry the operation.
E17BH	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E17CH	Communication test target station specification error	The own station or a relay station was selected as a destination.	• Confirm a correct destination and retry the operation.
E200H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E201H	Duplicated transient data reception error	The same transient data have been received two times or more.	• Check the network status in the CC IE Control diagnostics, and retry the operation.
E202H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E203H	Send buffer full	The send buffer is full.	• Temporarily stop the transient transmission, and then retry it. • Reduce the operation frequency of transient transmission, and then retry the operation. • Using the COM instruction, increase the processing frequency of transient transmission. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E204H	Transient data resend count exceeded	The specified number of resends has been reached.	• Check the network status in the CC IE Control diagnostics, and retry the operation.
E205H	Receive buffer full	The receive buffer is full.	• Temporarily stop the transient transmission, and then retry it. • Reduce the operation frequency of transient transmission, and then retry the operation. • Using the COM instruction, increase the processing frequency of transient transmission. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E206H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E207H			
E208H	Transient data target station No. error	The target station No. setting is not correct.	• Confirm the target station No. on the own station, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E209H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E20AH			

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E20BH	Transient data relay count error	The number of relay stations exceeded the upper limit.	• Modify the system configuration so that the number of relay stations is seven or less. • Check if the routing parameters are set correctly.
E20CH to E20EH	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E20FH	Transient data target station No. error	The target station No. is zero (0).	• Confirm the target station No. on the own station, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E210H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E211H	Invalid assign control station No. in transient data	The specified "assign control station" does not exist.	• Confirm the target station No. on the own station, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E212H	Invalid present control station No. in transient data	The specified "present control station" does not exist.	
E213H	Transient data transmission completion wait time timed out	Timeout has occurred without transmission completion.	• Check the network status in the CC IE Control diagnostics, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E214H to E21AH	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E21BH	Transient transmission with own station No. unspecified	Transient transmission was attempted without specifying a station No. of the own station.	• Specify a station No. in the UINI instruction, and then retry it. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E21CH to E21FH	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E240H to E245H	Target network module error (Dedicated instruction)	The hardware of the target network module has failed.	• Please consult your local Mitsubishi representative.
E246H to E24EH	Network module error	The hardware has failed.	
E24FH	Target station No. error (Dedicated instruction)	The target station No. setting is not correct.	• Confirm the target station No. in the control data, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E250H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E251H	Duplicated dedicated instruction reception error	Transient data for the same dedicated instruction have been received two times or more.	• Check the network status in the CC IE Control diagnostics, and retry the operation.
E252H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E253H			
E254H	Target station CPU type error (Dedicated instruction)	The target station CPU type setting is not correct.	• Confirm the target station CPU type in the control data, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E255H	Data size error (Dedicated instruction)	The data length setting is not correct.	• Confirm the data length in the control data, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E256H	Arrival monitoring time specification error (Dedicated instruction)	The arrival monitoring time was not specified correctly.	• Confirm the arrival monitoring time in the control data, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E257H	Resend count specification error (Dedicated instruction)	The number of resends was not set correctly.	• Confirm the number of resends in the control data, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E258H	Target network No. error (Dedicated instruction)	The target network No. was not set correctly.	• Confirm the target network No. in the control station, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E259H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E25AH	Modification specification error (UINI instruction)	Modification specification is not set correctly for the UINI instruction.	• Check the Modification specification in the control data, and then retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E25BH	Own station No. error (UINI instruction)	Incorrect own station No. is set for the UINI instruction.	• Check the own station No. set in the control data, and then retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E25CH to E261H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E262H	Arrival confirmation error (Dedicated instruction)	In all stations or group designation, the dedicated instruction was executed "with arrival confirmation" set for the execution type. For the REQ instruction, the set request type is not correct.	• Change the execution type in the control data to "No arrival confirmation", and retry the operation. • For the REQ instruction, check the request type in the request data, and retry it. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E263H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E264H	Transmission completion wait time timeout error (Dedicated instruction)	Timeout has occurred without transmission completion.	• Check the network status in the CC IE Control diagnostics. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E265H	Response timer timeout error (Dedicated instruction)	Timeout has occurred without response reception.	• Check the network status in the CC IE Control diagnostics. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E266H	Unsupported request reception error (Dedicated instruction)	The SEND instruction was received from any other station.	• Change the target station at the station where the SEND instruction was executed. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E267H	Target station No. error (Dedicated instruction)	The own station No. was set as the target station No.	
E268H	Execution/abnormal completion type error (Dedicated instruction)	The execution/abnormal completion type was not set correctly.	• Confirm the execution/abnormal completion type in the control data, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E269H	Request or sub-request type error (REQ instruction)	The request or sub-request type of the REQ instruction is not set correctly.	• Check the request or sub-request type in the request data, and retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E26AH	No assign/present control station (Dedicated instruction)	When there was no control station on the network, the dedicated instruction was executed with an "assign or present control station" specified.	• Confirm the target station No. in the control data, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E26BH	Dedicated instruction execution mode error	The dedicated instruction was executed in circuit test mode.	• Change the circuit test mode of the control station to online mode, and retry the operation. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E26CH	Channel busy (Dedicated instruction)	The channel specified for "Channel used by the own station" or "Target station channel" is being used for another instruction.	• Wait for a little while, and retry it. • Change the setting of "Channel used by the own station" or "Target station channel" in the control data.
E26DH	Interrupt setting channel duplication (Dedicated instruction)	The channel specified for "Channel used by the own station" is duplicated with the channel used for the interrupt setting.	• Check and correct the Channel used by the own station in the control data, and retry the instruction. • Check and correct the channel used for the interrupt setting, and retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E26EH E26FH	Device specification error (ZNRD/ZNWR instruction)	The device range specified in the setting data for the ZNRD/ZNWR instruction is not correct.	• Check the setting data of the ZNRD/ZNWR instruction, and then retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E270H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E271H	Operation mode error (RSTOP instruction)	The Operation mode for the RSTOP instruction is not set correctly.	• Check and correct the Operation mode setting in the setting data, and then retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E272H	Clear mode error (RRUN instruction)	The Clear mode for the RRUN instruction is not set correctly.	• Check and correct the Clear mode setting in the setting data, and then retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E273H	Mode error (RRUN instruction)	The Mode for the RRUN instruction is not set correctly.	• Check the Mode setting in the setting data, and then retry the instruction. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E274H E280H to E288H E300H to E302H E310H E311H E320H to E325H E330H to E333H E340H to E343H E350H E361H to E36DH E380H to E383H E390H to E397H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E3A0H E3A1H E3BH to E3BAH	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E3BBH	Max. number of stations exceeded	The total number of stations exceeded the setting range.	• Assign some stations to another network so that the total number of stations will be within the setting range.
E3BCH	Network line error	Baton (or token) passing stopped due to a communication line error or a CC-Link IE Controller Network module error.	• Check the network status in the CC IE Control diagnostics. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E3BDH E3C0H to E3C2H E501H to E503H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E504H	Transient execution error (no baton passing on the own station)	Transient transmission was executed while the own station did not perform baton (or token) passing.	• Execute the dedicated instruction, interlocking with Baton pass status (own station) (SB0047) and Baton pass status of each station (SW00A0 to SW00A7). • Check the Cause of baton pass interruption (SW0048) at the own station and restart baton (or token) passing before executing the transient transmission. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E505H	Transient execution error with own station number duplicated	Transient transmission was executed with the own station number duplicated.	• Remove the duplication of the own station numbers before executing the transient transmission.
E506H E507H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E508H	Duplication of station No. and control station setting of the own station	Station No. and control station setting of the own station are duplicated.	• Change the station No. of the own or other station and the control station setting. • After taking the above action, reset the error station. • After turning on the own station, turn on the other stations to identify the station that has a duplicate station No. and/or control station setting.
E509H	Own station No. duplication error	Station No. of the own station is duplicated.	• Change the station No. of the own or other station. • After taking the above action, reset the error station. • After turning on the own station, turn on the other stations to identify the station that has a duplicate station No. setting.
E50AH	Duplication of the own station's control station setting	The control station setting for the own station is duplicated.	• Change the control station setting of the own or other station. • After taking the above action, reset the error station. • After turning on the own station, turn on the other stations to identify the station that has a duplicate control station setting.
E50BH	Network No. error	The network No. of the (sub-) control station is different from the network No. of the own station.	• Set the same network No. to the own station and the (sub-) control station.
E521H to E524H E5D1H to E5D5H E5E1H to E5E9H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
E5F0H	Transient execution error (no baton passing on the target station)	Transient transmission was executed while the target station did not perform baton (or token) passing.	• Reconnect the target station to the network. • Execute the dedicated instruction, interlocking with Baton pass status (own station) (SB0047) and Baton pass status of each station (SW00A0 to SW00A7). • Check the Cause of baton pass interruption (SW0048) at another station and restart baton (or token) passing before executing the transient transmission. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
E5F1H	Specified station No. duplication error	The station No. specified for the transient transmission is duplicated.	• Change the station No. of the normal station.

Error code list (Continued)

Error No.	Description	Error detail	Corrective action
E5F2H to E5F7H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
EA00H to EA04H			
EA10H to EA18H			
EAE0H to EAE4H			
EAE5H	CPU module error	Incorrect data have been set in the CPU.	
EAE6H	CC-Link IE Controller Network-incompatible CPU error	The CPU module is not compatible with the CC-Link IEController Network module.	• Use a CPU module that is compatible with the CC-Link IE Controller Network module. • If the error persists even after taking the above actions, please consult your local Mitsubishi representative.
EAE7H	Network module error	The hardware has failed.	• Please consult your local Mitsubishi representative.
EAF0H to EAF6H			
F000H to FEFFH	Errors detected in the MELSECNET/H or MELSECNET/10 network system.		

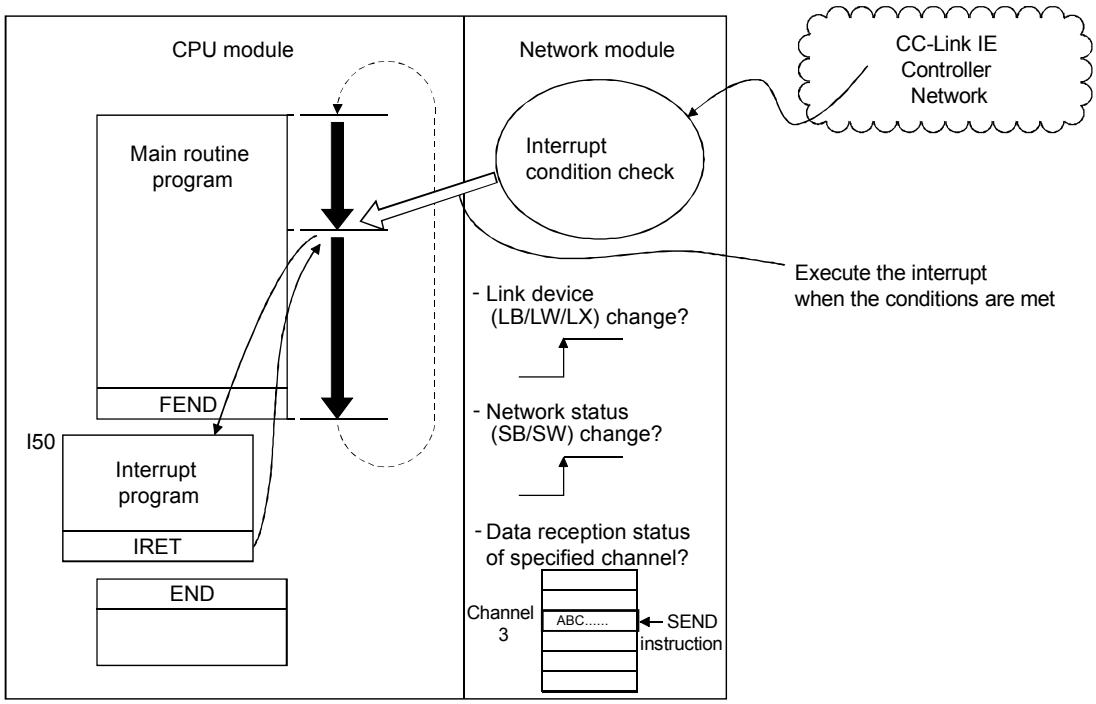
Appendix 6 Overview of interrupt program start

The Q-series CC-Link IE Network modules have the function that performs the interrupt request from the network module to CPU and starts the interrupt sequence program of the host station CPU, when interrupt conditions are met.
Up to 16 interrupt conditions can be set for each network module.
(Advantages)

1) Interrupt program start instruction of the corresponding station can be performed from other stations.
2) The number of steps is reduced and the scan time becomes shorter because the sequence program of startup condition part is not necessary.

(Visual representation of the function)

Confirm the interrupt conditions by using the interrupt setting parameter of the own station when receiving data from other stations.

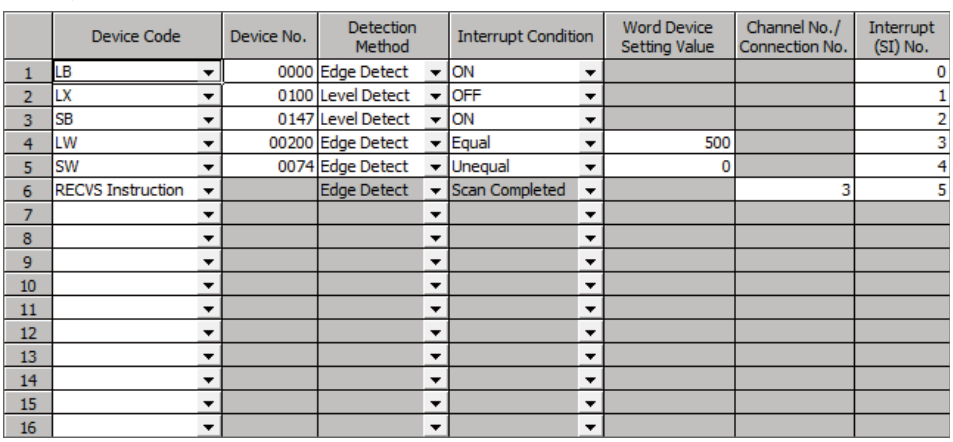


POINT
• When multiple interrupt conditions are set, interrupt requests occur at the same time and the operation may be delayed. • When performing the interrupt program, it is necessary to perform "EI" (Enable Interrupt) in main program.

Appendix 6.1 Interrupt setting parameter

Up to 16 interrupt conditions can be set for each device code of the interrupt setting conditions in the following setting screen.

Click the [Interrupt Settings] button on the PLC parameter setting screen to display this screen.



	Device Code	Device No.	Detection Method	Interrupt Condition	Word Device Setting Value	Channel No./ Connection No.	Interrupt (SI) No.
1	LB	0000	Edge Detect	ON			0
2	LX	0100	Level Detect	OFF			1
3	SB	0147	Level Detect	ON			2
4	LW	00200	Edge Detect	Equal	500		3
5	SW	0074	Edge Detect	Unequal	0		4
6	RECVS Instruction		Edge Detect	Scan Completed		3	5
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

(Selection of each interrupt condition for interrupt device code and setting applicable range)

Setting condition / Device code	Device No.	Detection method	Interrupt condition	Word device setting value	Channel No./Connection No.	Interrupt (SI) No.
RECVS	–	Edge Detect (Fixed)	Scan Completed (Fixed) Interrupt occurs when the specified channel has received data	–	1 to 8	0 to 15
LB	0 to 7FFFH	Edge Detect/Level Detect + ON/OFF Interrupt occurs with the following conditions At ON : (ON + Level Detect*1) At OFF : (OFF + Level Detect*1) At rising : (ON + Edge Detect) At falling : (OFF + Edge Detect)		–	–	0 to 15
LX	0 to 1FFFH			–	–	0 to 15
SB	0 to 1FFH			–	–	0 to 15
LW	0 to 1FFFH	Edge Detect/Level detect + Equal/Unequal Interrupt occurs with the following conditions At value match : (Equal + Level Detect*1) At value mismatch : (Unequal + Level Detect*1) At value match (the first time only) : (Equal + Edge Detect) At value mismatch (the first time only) : (Unequal + Edge Detect)		0 to 65535	–	0 to 15
SW	0 to 1FFH			0 to 65535	–	0 to 15

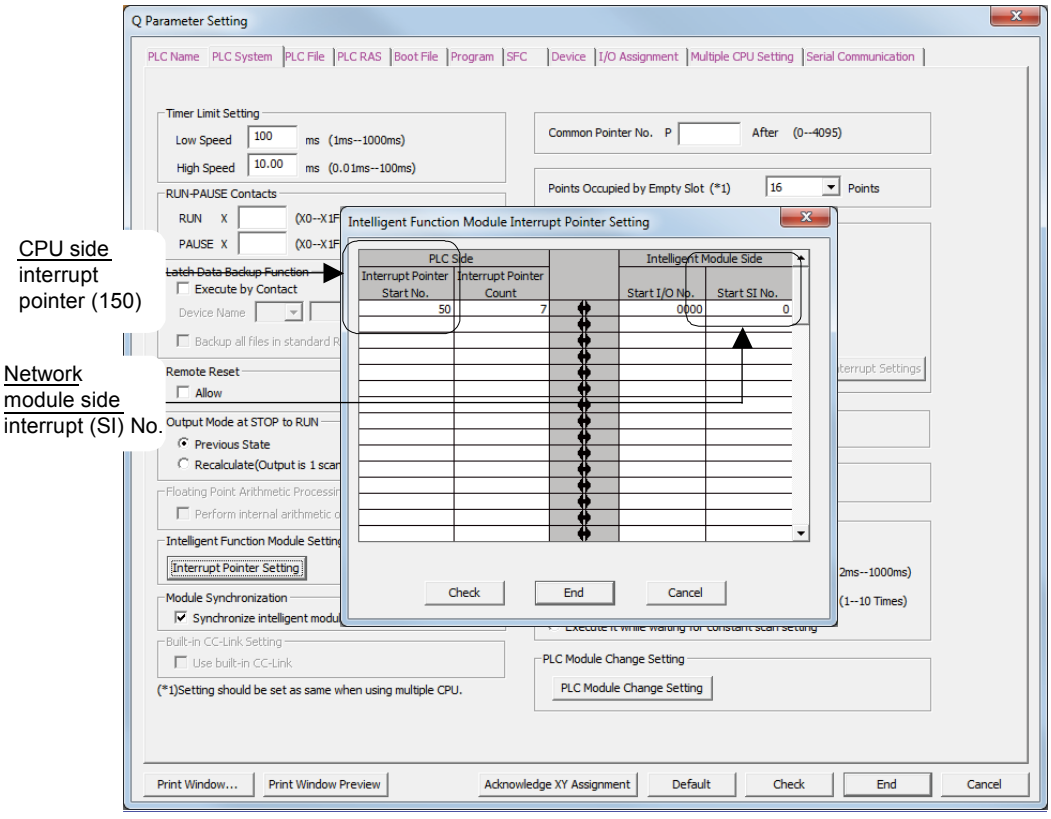
*1: When selecting the "Level detect" as the detection method, an interrupt occurs by checking the level condition of the specified device for every configured link scan of network module.

REMARK

Set the relation between network module interrupt (SI) No. and CPU side interrupt pointer (I□□)*1 in the following Q Parameter Setting screen inside the PC parameter.
The following describes the Q Parameter Setting screen configuration based on the interruption setting parameter in the previous page.
Assign the network module side interrupt (SI) No. (0 to 6) to the CPU side interrupt pointer (I50 to I56).

The following settings are shown as examples.
<Intelligent Module Side>
(1) Start I/O No.: 0000 ····· Network module mount position
(2) Start SI No.: 0 ····· Interrupt (SI) No. start number (0 to 6)

<PLC Side>
(1) Interrupt Pointer Start No.: 50 Start No. of the interrupt program (150 to 156)
(2) Interrupt Pointer Count: 7 Number of interrupt conditions

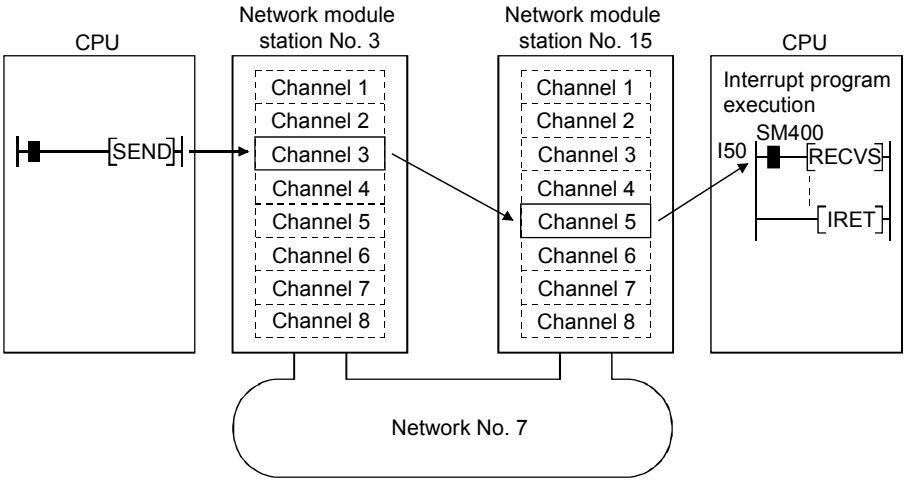


*1: The number used for the actual interrupt program (I□□)

Appendix 6.2 Interrupt by the RECVS instruction

When the SEND instruction is received in the channel specified in the parameter with the RECVS instruction, the interrupt program can be started.
Selecting the "RECVS instruction" as a device code enables the settings to "Channel No." and "Interrupt (SI) No.".

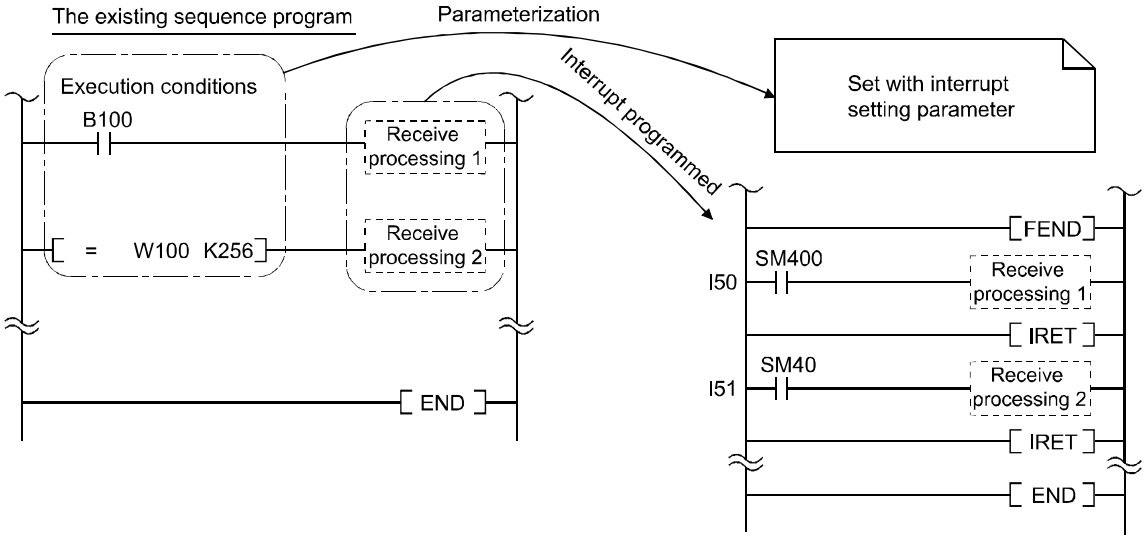
In the following example, data points are sent from the station No. 3 to channel 5 of the station No. 15 using the SEND instruction.
Set the interrupt setting parameter so that the interrupt program is started by the SEND instruction to channel 5.



Appendix 6.3 Interrupt by cyclic transmission link device (LB/LW/LX)

From other stations, the specified interrupt sequence program can be executed, setting the conditions of "Rising/Falling" of the link devices (LB/LX) or "Equal/Unequal" of the link register (LW).

Comparison with sequence program where interruptions are built



The interrupt by the link devices (LB/LW/LX) can be used as a direct access destination and a normal cyclic transmission.

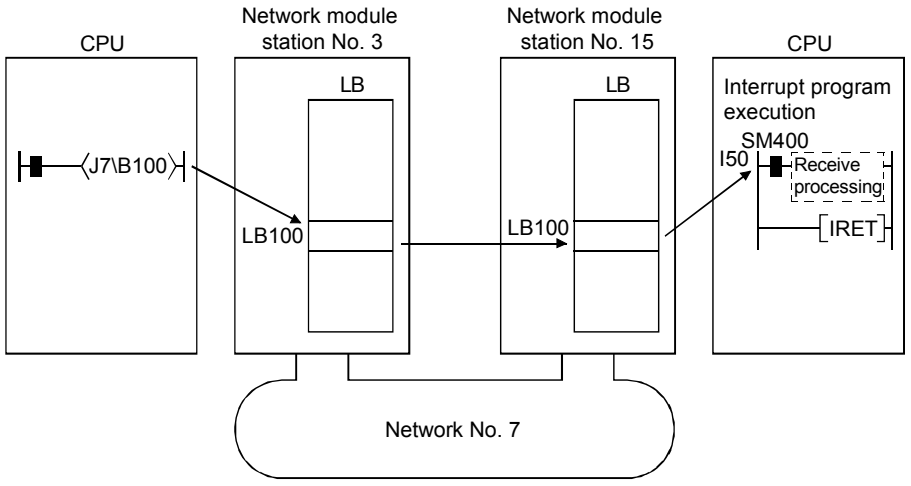
In the following example, the link device LB100 of station No. 15 is turned ON (1) by using the direct access (use own station's link devices which are not in auto refresh range) of the link device of station No. 3. Set the interrupt setting parameter to station No.15 so that the interrupt program is started when LB100 is turned ON.

(Interrupt setting parameter)

Device code	Device No.	Detection method	Interrupt condition	Word device setting value	Channel No./connection No.	Interrupt (SI) No.
LB	100	Edge detect	ON	—	—	○

(Interrupt pointer setting)

CPU side			Intelligent module side	
Interrupt pointer start No.	Interrupt pointer count		Start I/O No.	Start SI No.
50	1	⟷	0000	0



REMARK

(1) When the sequence program is performed at high speed, the scan time may be prolonged because the interrupt program execution time adversely affects the effectiveness of the interrupt program.

(2) When multiple interrupt requests occur at the same time, the operation may be delayed.

(3) The interrupt function cannot be used during the offline or online test.

(4) Do not start the interrupt sequence program by rise (such as PLS instruction) or fall (such as PLF instruction) of the specified device, because the device status change may not be read out.

Appendix 6.4 Interrupt by link special device (SB/SW)

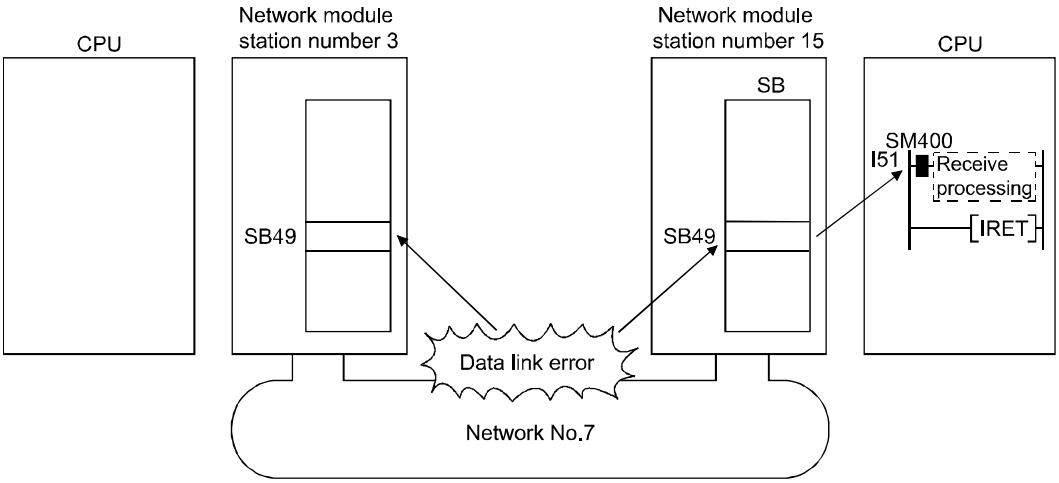
It is possible to execute interrupt program by setting data link information (SB/SW) as an interrupt condition.
In the following example, set the interrupt setting parameter so that the interrupt program is started up with the ON of SB49 (Data link error) in channel 15.

(Interrupt setting parameter)

Device code	Device No.	Detection method	Interrupt condition	Word device setting value	Channel No./connection No.	Interrupt (SI) No.
SB	49	Edge detect	ON	—	—	○

(Interrupt pointer setting)

CPU side			Intelligent Module Side	
Interrupt pointer start No.	Interrupt pointer count		Start I/O No.	Start SI No.
51	1		0000	0



REMARK

(1) When the sequence program is performed at high speed, the execution time of the interrupt program can have an influence and the scan time can become longer without exhibiting effects of the interrupt program.

(2) When multiple interrupt requests occur at the same time, the operation may be delayed.

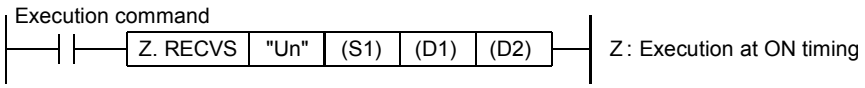
(3) The interrupt function cannot be used during the offline or online test.

Appendix 6.5 Message received "Scan completed" instruction (RECVS instruction)

Data sent by the SEND instruction from another station are read out from the specified channel.

Data can be processed faster than the RECV instruction because the processing completes at the time of the instruction execution.

(1) RECVS instruction format



	Setting description	Range	Usable devices
Un	Start I/O number of the own station's Network module Specify the 3- digit I/O number with the two higher digits.	0 to FE$_H$	–
(S1)	Start device that stores control data. Start device of the own station that stores control data.	Within the range of the specified device	Word device*2
(D1)	Start device that stores the received data Specify the start device of the own station that stores received data.	Within the range of the specified device	Word device*2
(D2)	Dummy	–	Bit device*1 Specify the bits of word device*3

*1: Bit device ·····X, Y, M, L, F, V, B

*2 Word device ·····T, C, D, W, ST, R, ZR (Q00JCPU can not use R, ZR.)

*3: Specified bits of word device·····Word device, bit No.

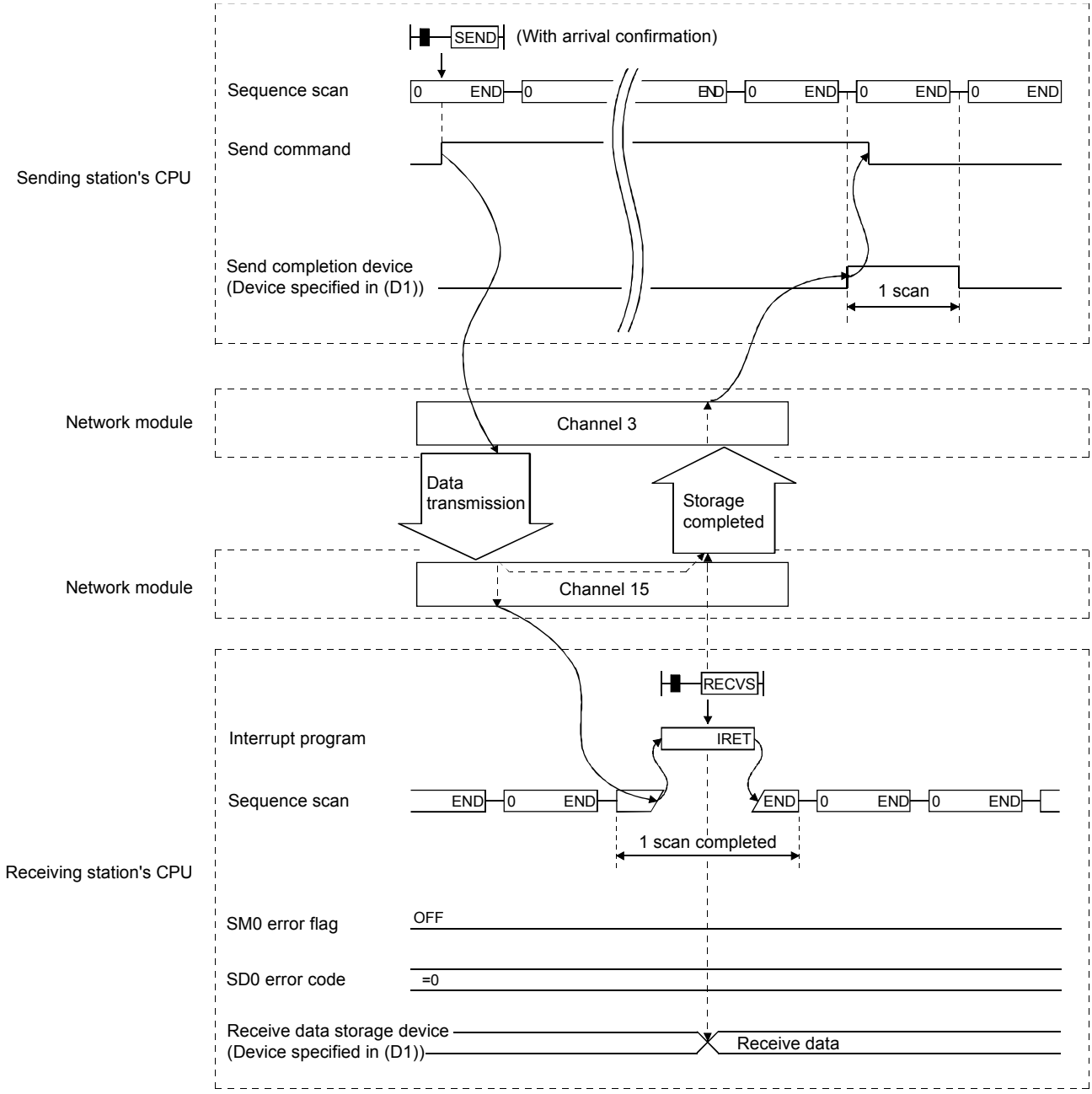
Control data detailed description

Device	Item	Description	Range	Setting side*1
(S1) + 0	Execution/Error completion type	b15 to b0 0000H (fixed)	0000H	User
(S1) + 1	Completion status	The instruction completion status is stored. 0 : Normal Other than 0 : Error	–	System
(S1) + 2	Own station channel	Specify the channel of the own station, where receive data are stored.	1 to 8	User
(S1) + 3	Channel used by sending station	Stores the channel used by the sending station. 1 to 8 : Channel	–	System
(S1) + 4	Network No. of sending station	Stores network No. of the sending station. 1 to 239 : Network No.	–	System
(S1) + 5	Sending station No.	Stores station No. of the sending station. 1 to 120 : Station No.	–	System
(S1) + 6	–	Unused	0	User
(S1) + 7	–	Unused	0	User
(S1) + 8	–	Unused	0	User
(S1) + 9	Receive data length	Stores the receive data size stored in (D1) to (D2)+n. 1 to 960 : Receive data size (words)	–	System

*1 The setting side is as shown below.
User: Before execution of the link dedicated instruction, data must be set by the user.
System: The CPU module stores the execution result of the link dedicated instruction.

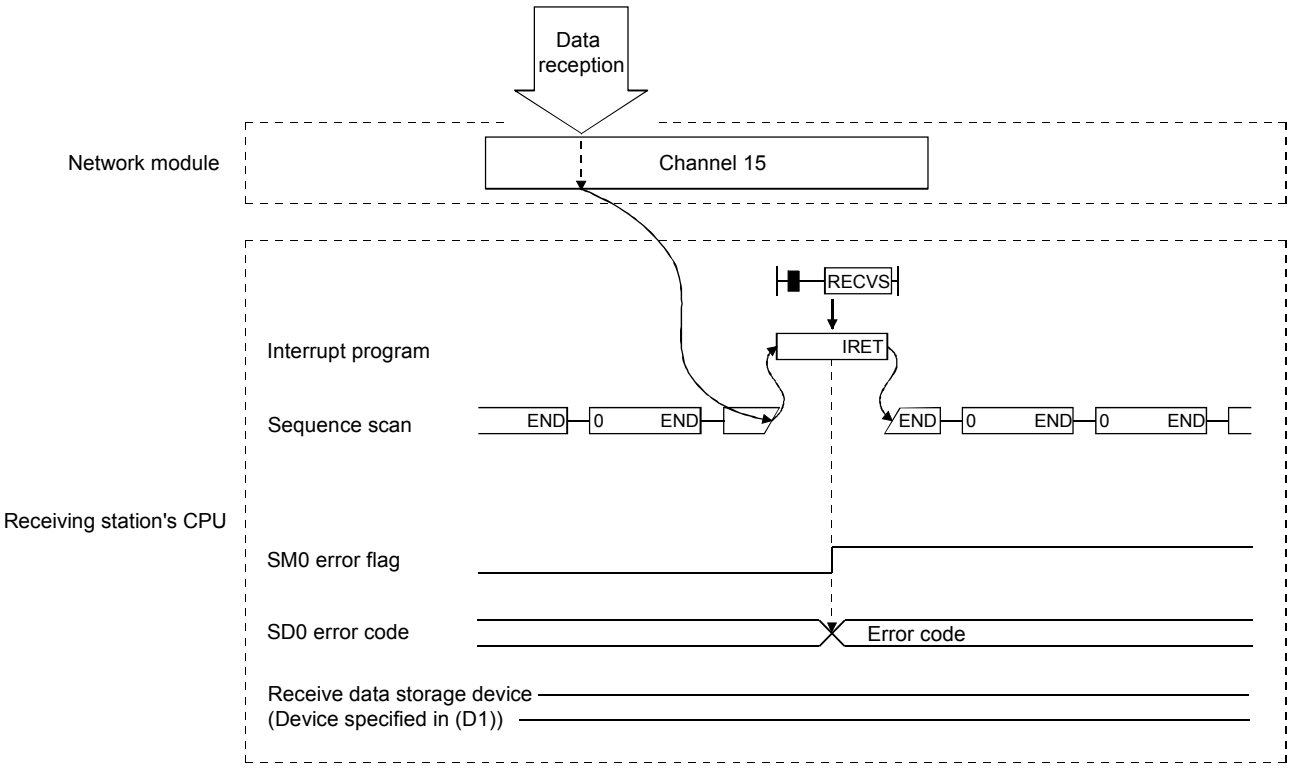
(2) Instruction execution timing

1) When completed normally

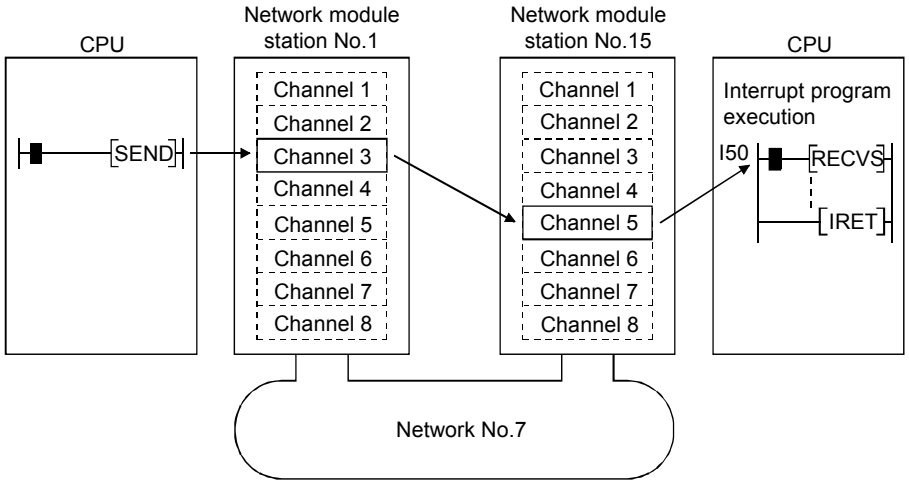


2) When failed

In case of RECVS instruction



Appendix 6.6 Example of use



(1) Parameter setting in the interrupt setting screen (network parameter)
Set the device code, Channel No., and Interrupt (SI) No. so that the event is issued to the CPU side when data are received in channel 5 of the station No. 15 network module.

Device code	Device No.	Detection method	Event condition	Word device value	Channel No.	Interrupt (SI) No.
RECVS instruction		(Edge Detect)	(Scan completed)		0005	0

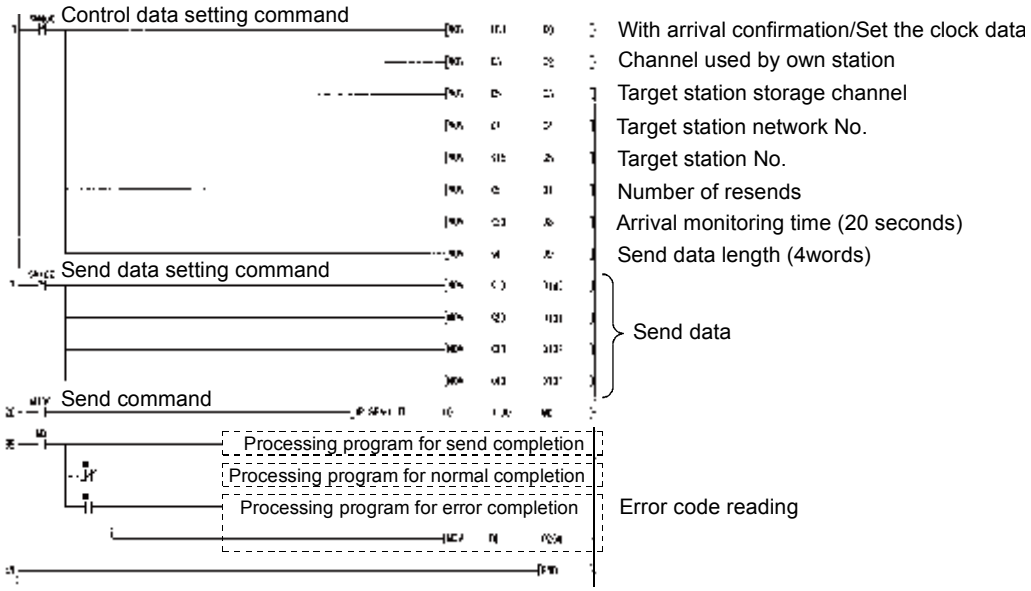
(2) Parameter setting in the interrupt pointer setting screen (PLC parameter)
Set Start I/O No. (0000) of the network module and Interrupt SI No. (0) on the intelligent module side, and set the interrupt pointer (I50), which is executed when an event is issued, on the PLC side. Multiple interrupt programs can be started by setting the interrupt pointer count (the number of interrupt conditions).

PLC Side			Intelligent Module Side	
Interrupt Pointer Start No.	Interrupt Pointer Count		Start I/O No.	Start SI No.
50	1	⟷	0000	0

(3) Program example

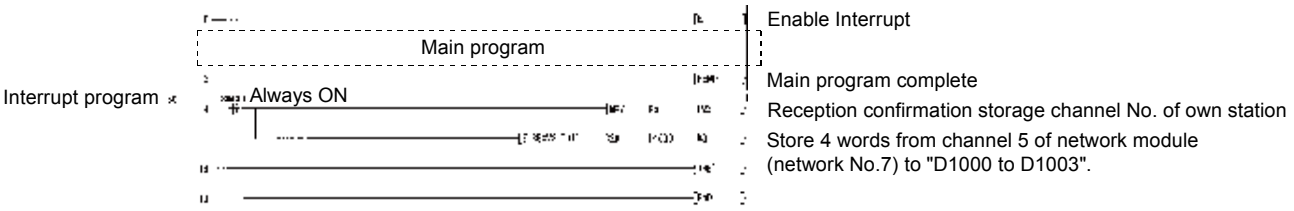
(a) Program of station number 3

Before using the following program, establish an interlock according to Appendix 7.1.1.



(b) Program of station number 15

Before using the following program, establish an interlock according to Appendix 7.1.1.



REMARK

(1) Link special relay for the RECV request that corresponds to the channel No. at reception (SB00A0 to SB00A7) is not set.

(2) When the sequence program is performed at high speed, the execution time of the interrupt program can have an influence and the scan time can become longer without exhibiting effects of the interrupt program.

(3) When multiple interrupt requests occur at the same time, the operation may be delayed.

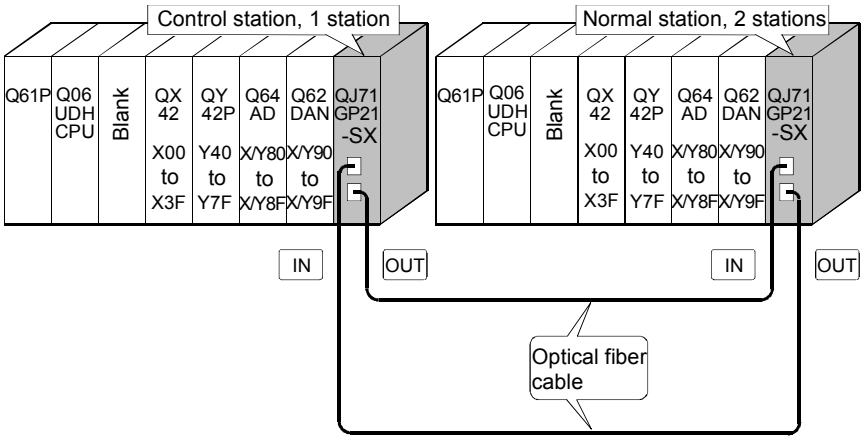
(4) The interrupt function cannot be used during the offline or online test.

POINT

Execute "EI" (Enable Interrupt) because the RECVS instruction starts the interrupt program execution using parameters. When the Enable Interrupt is not executed when data is received, the status of the channel in use is held.

Appendix 6.7 Additional practice 1 (Interrupt processing)

The system configuration for the practice is the same as task 1.
Parameter and sequence program are written to the each station to check the operation.



(1) Set parameters with GX Works2
Double-click [Ethernet/CC IE/MELSECNET] in [Network Parameter] of the Project View, configure settings as described below.

(a) Number of modules setting

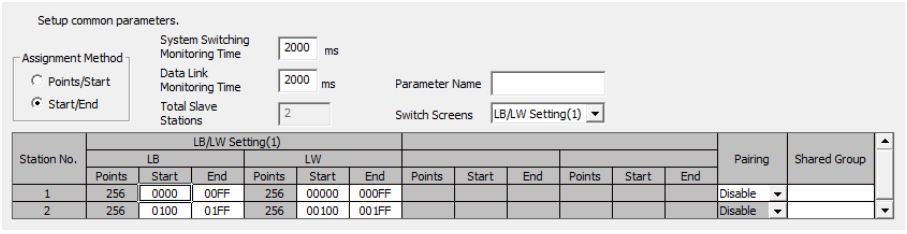
In case of control station (station No.1)

	Module 1	Module 2
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	2 ← Total number of stations for link: 2	
Group No.	0	
Station No.	1 ← Station No.: 1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

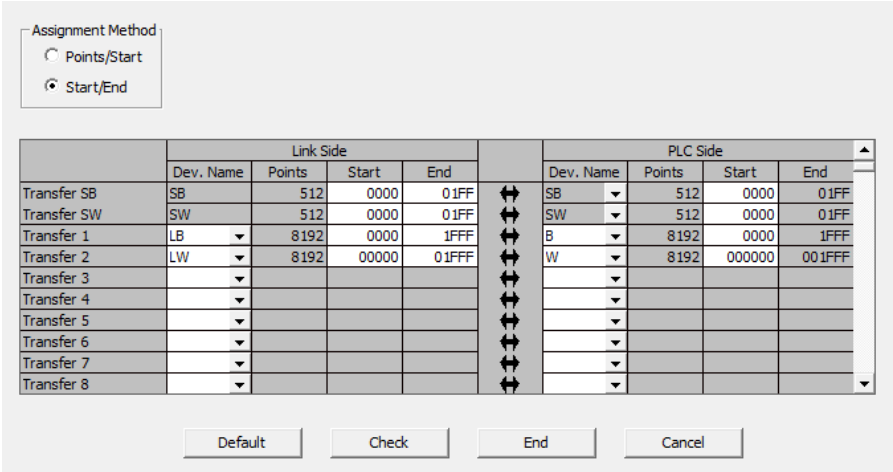
In case of normal station (station No.2)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	2 ← Station No.: 2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

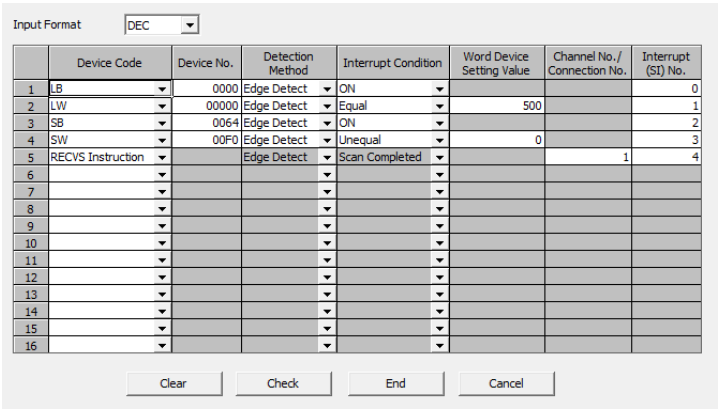
(b) Network range assignment (Control station only)



(c) Refresh parameter (Each station common)

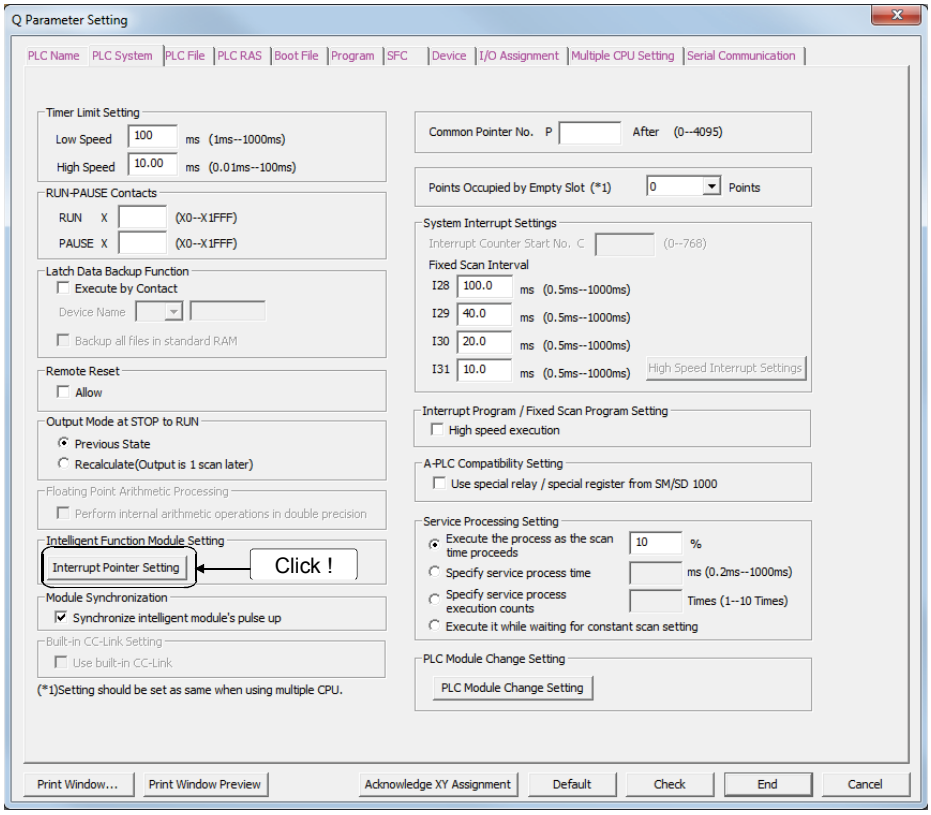


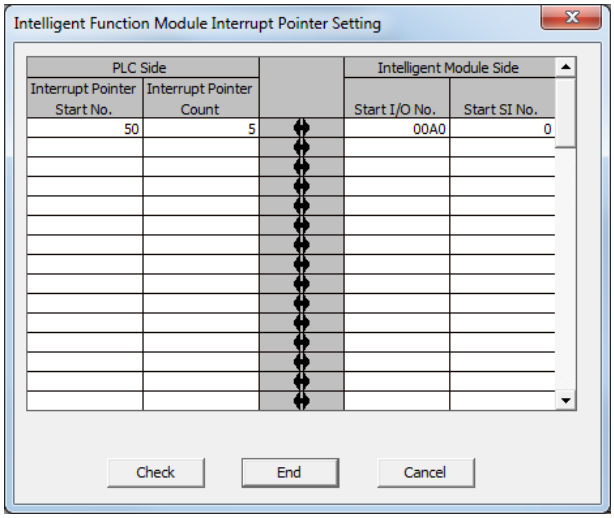
(d) Interrupt setting (Normal station only)



(2) Intelligent function module interrupt pointer setting

Double-click "PLC Parameter" in the project data list, click the [Interrupt Pointer Setting] button of the [PLC System] tab, and configure the setting as shown below.



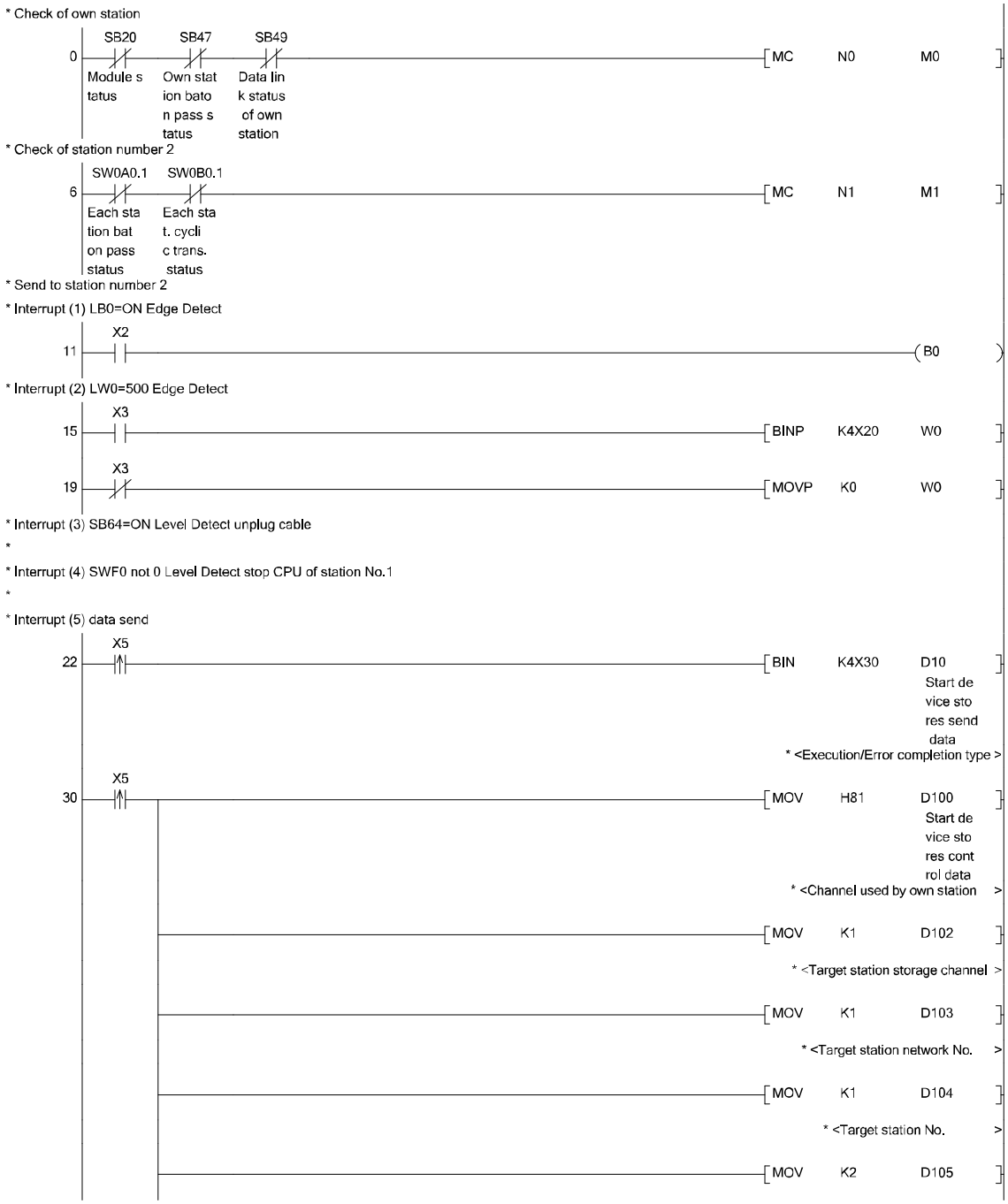


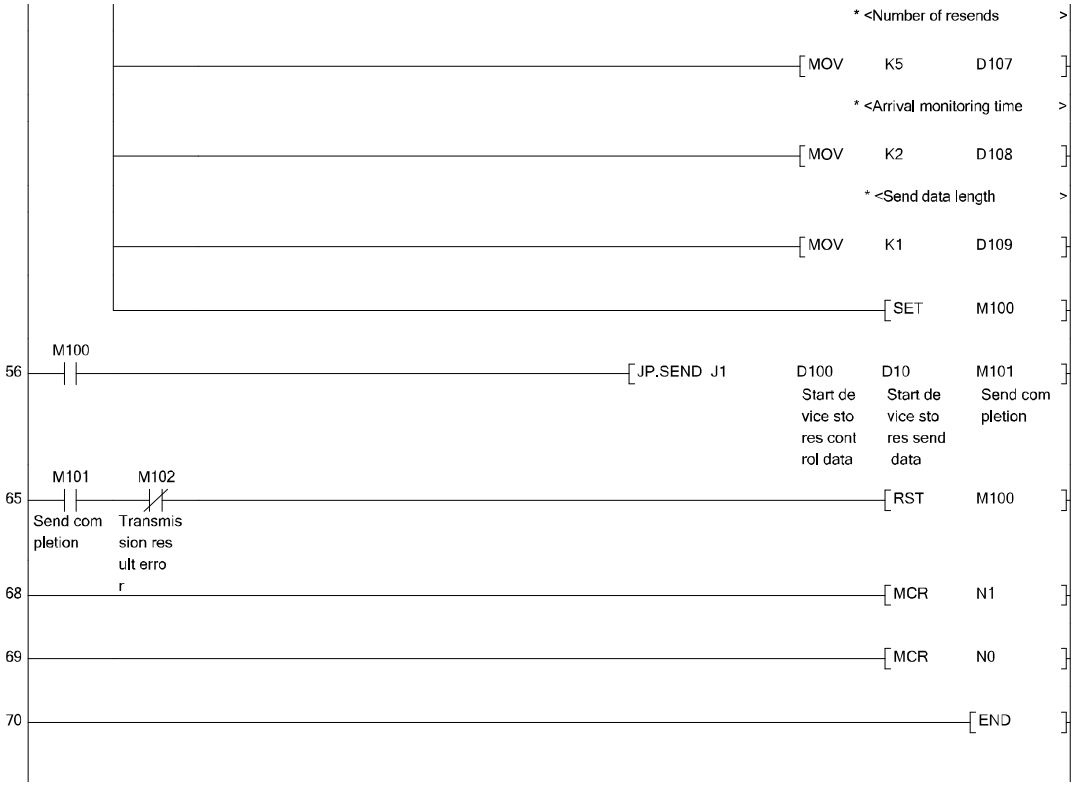
(3) Sequence program

The programs of each station are shown below.

(a) Program of control station (Station No. 1)

Path	Interrupt
Program name	1MP1

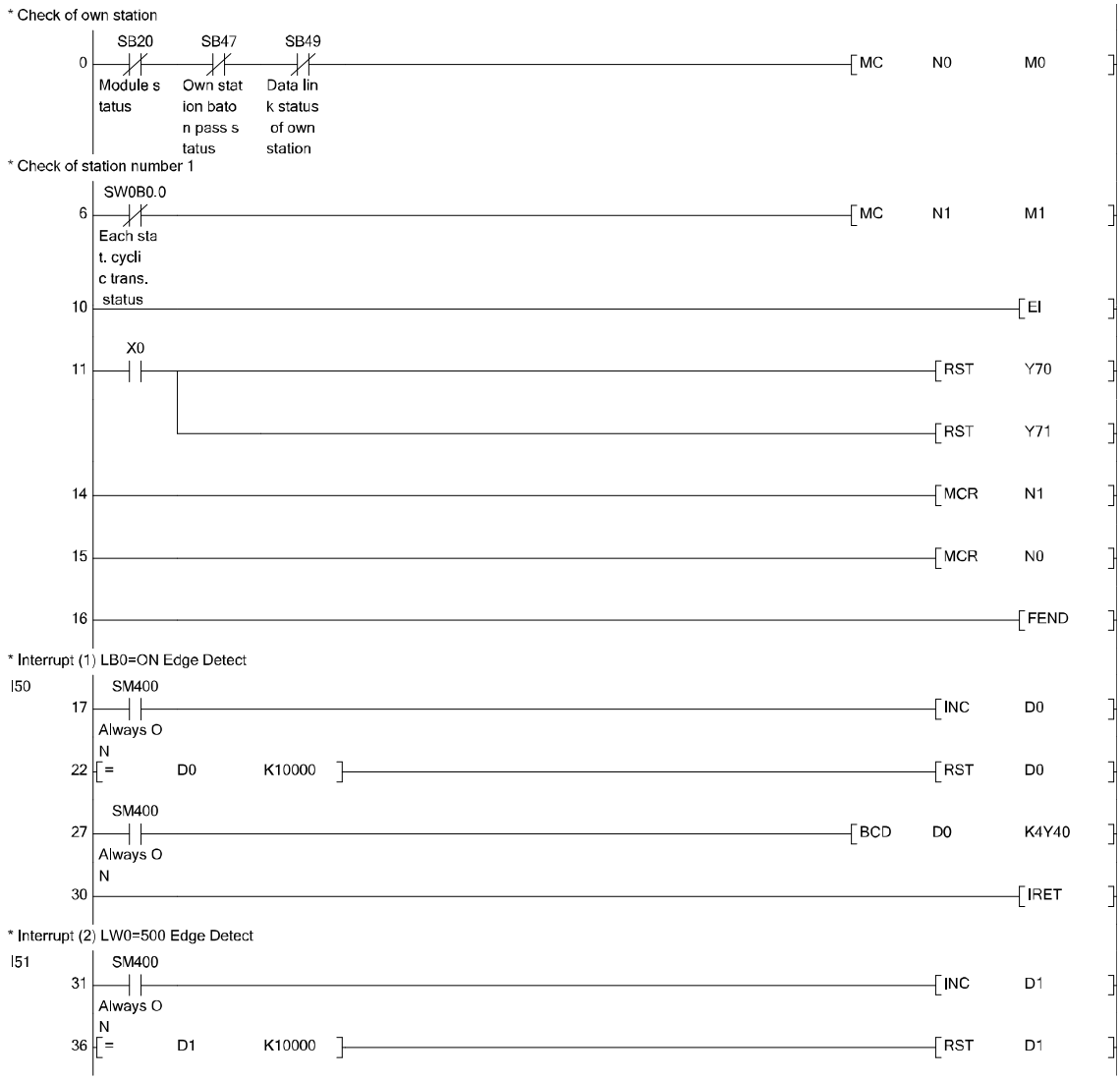


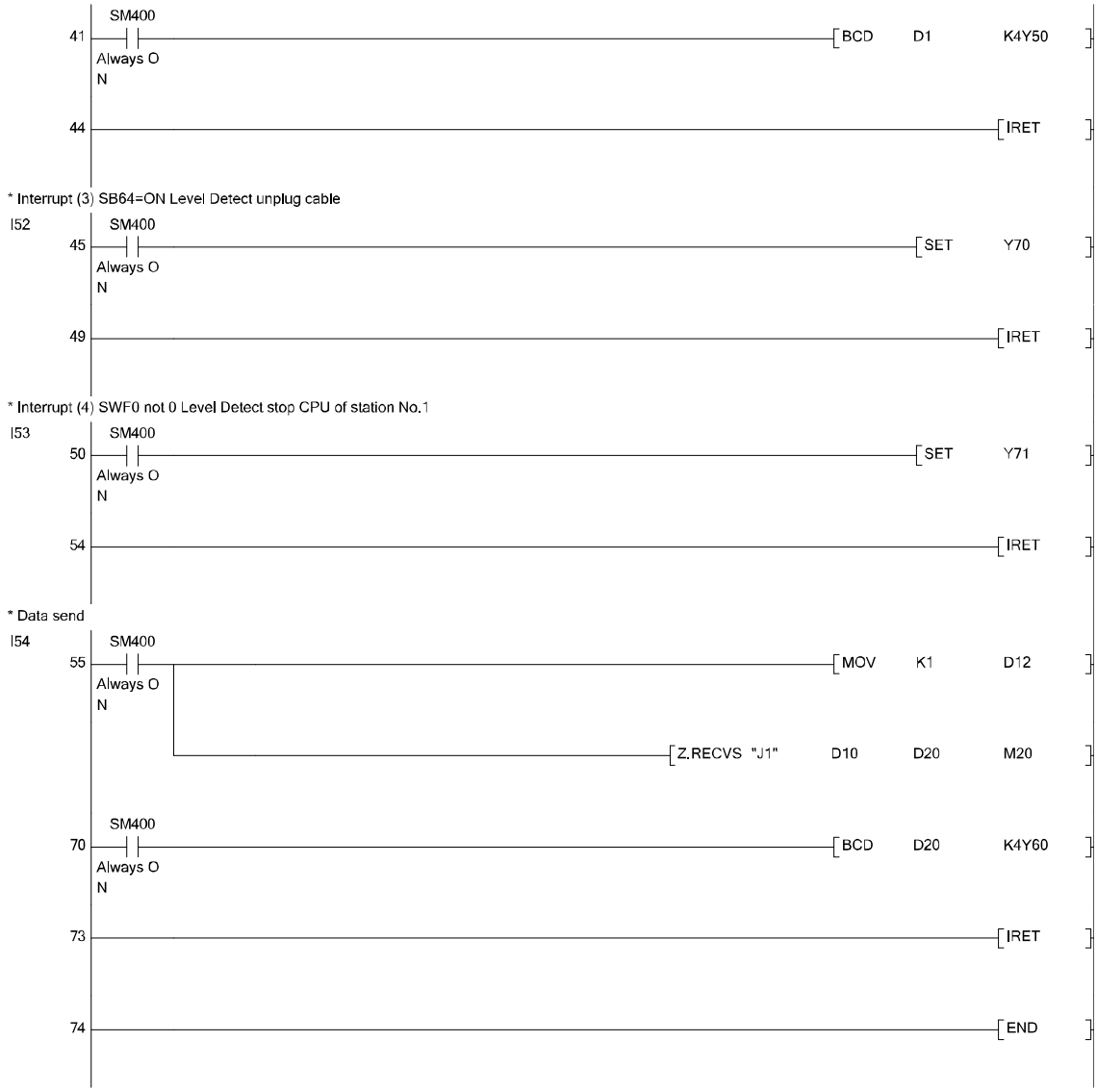


* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(b) Program of normal station (Station No. 2)

Path	Interrupt
Program name	1Ns2





* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(4) Demonstration machine operation

- Interrupt processing (1) (LB0 = ON: Edge Detection)
  Confirm that the interrupt processing is executed by ON of X2 of station No. 1 and the value displayed on the digital display of station No. 2 changes.
- Interrupt processing (2) (LW0 = 500: Edge Detection)
  Confirm that the interrupt processing is executed by ON of X3 while the station No. 1 digital switches (X20 to X2F) are set to 500, and that the value displayed on the digital display of station No. 2 changes.
- Interrupt processing (3) (SB64 = ON: Level Detection)
  Confirm that the interrupt processing is executed by disconnecting the optical fiber cable and the lamp of station No. 2 (Y70) lights.
- Interrupt processing (4) (SWF0 is not 0: Level Detection)
  Confirm that the interrupt processing is executed by setting the CPU to the STOP status and the lamp of station No. 2 (Y71) lights.
- Interrupt processing (5) (Data reception)
  Confirm that the interrupt processing is executed by ON of X5 of station No. 1, and the value displayed on the digital display of station No. 2 changes.

Appendix 7 Programming

Appendix 7.1 Precautions on programming

Appendix 7.1.1 Interlock related signals

The following table shows a list of interlock signal devices used in a sequence program.
For details of other devices to check the operating status, setting status, and other functions of the own station and other stations, refer to Appendix 3 "Link special relay (SB) list" and Appendix 4 "Link special register (SW) list".
When multiple network modules are mounted, data will be refreshed to the device on the CPU module side at 512 points (0H to 1FFH) intervals as shown below according to the default settings.

POINT
The Q-series intelligent function modules share the link special relays (SB) and the link special registers (SW). Do not use the same SB/SW twice in the program.

Assignment of link special relays (SB)/link special registers (SW) when mounting multiple network modules

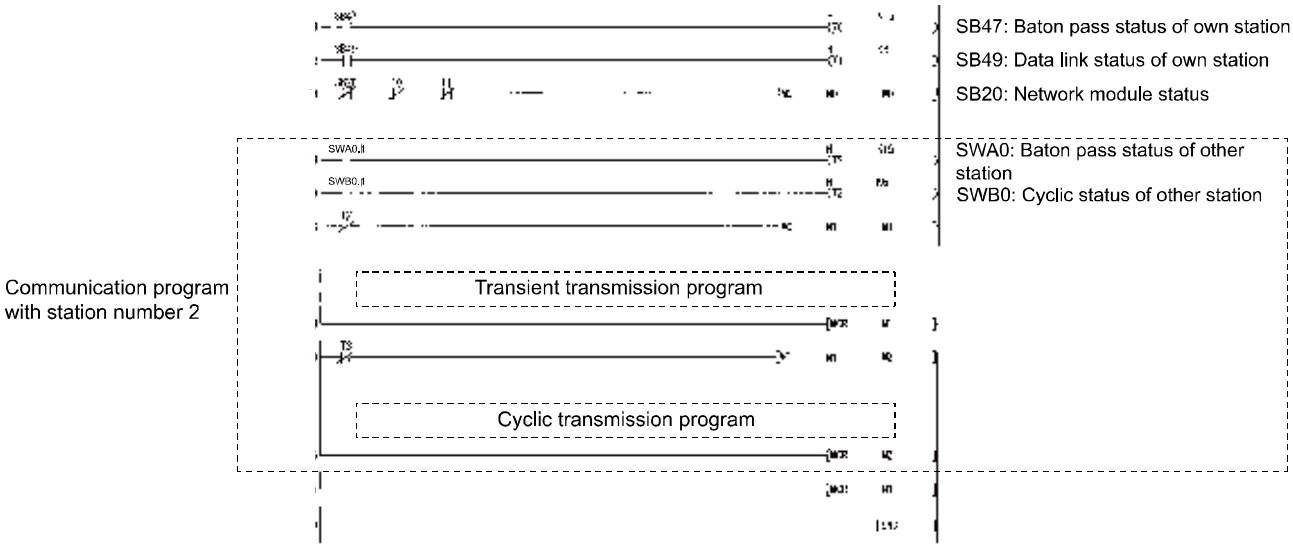
Mount position / Device	1st module	2nd module	3rd module	4th module
SB	0H to 1FFH	200H to 3FFH	400H to 5FFH	600H to 7FFH
SW	0H to 1FFH	200H to 3FFH	400H to 5FFH	600H to 7FFH

Devices used for interlocks

<table>
<tr><th rowspan="2">Device</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="2">Device status</th></tr>
<tr><th>OFF(0)</th><th>ON(1)</th></tr>
<tr><td>SB20</td><td>Module status</td><td>Displays the network module operation status and CPU communication status.</td><td>Normal</td><td>Error</td></tr>
<tr><td>SB47</td><td>Own station baton pass status</td><td>Displays the baton pass status of the own station
When operations are normal, this status indicates that cyclic transmission and transient transmission can be executed.</td><td>Normal
(Data link available)</td><td>Error
(Own station disconnected status)</td></tr>
<tr><td>SB49</td><td>Data link status of own station</td><td>Displays the data link status of the own station (cyclic transmission status).</td><td>Data linking
(Cyclic transmission)</td><td>Data link stop
(Set after refresh completion)</td></tr>
<tr><td>SBA0</td><td>Each station baton pass status</td><td>Displays the baton pass status of each station. (Including the own station)
The reserved station and the station No. later than the largest one are excluded.
Can be checked with SWA0 to A7.</td><td>All stations are normal.</td><td>Faulty station(s) exists.</td></tr>
<tr><td>SBB0</td><td>Each stat. cyclic trans. status</td><td>Displays the cyclic transmission status of each station. (Including the own station)
The reserved station and the station No. later than the largest one are excluded.
Can be checked with SWB0 to B7.</td><td>All stations are executing cyclic transmission.
(All station in cyclic transmission)</td><td>Station where data link is not executed exists</td></tr>
<tr><td>SWA0 to A7</td><td>Each station baton pass status</td><td>Displays the baton pass status of each station. (Including the own station)
<table>
<tr><th></th><th>b15</th><th>b14</th><th>to</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>to</th><th>b1</th><th>b0</th></tr>
<tr><td>SW00A0</td><td>16</td><td>15</td><td>to</td><td>10</td><td>9</td><td>8</td><td>7</td><td>to</td><td>2</td><td>1</td></tr>
<tr><td>SW00A1</td><td>32</td><td>31</td><td>to</td><td>26</td><td>25</td><td>24</td><td>23</td><td>to</td><td>18</td><td>17</td></tr>
<tr><td>SW00A2</td><td>48</td><td>47</td><td>to</td><td>42</td><td>41</td><td>40</td><td>39</td><td>to</td><td>34</td><td>33</td></tr>
<tr><td>SW00A3</td><td>64</td><td>63</td><td>to</td><td>58</td><td>57</td><td>56</td><td>55</td><td>to</td><td>50</td><td>49</td></tr>
<tr><td>SW00A4</td><td>80</td><td>79</td><td>to</td><td>74</td><td>73</td><td>72</td><td>71</td><td>to</td><td>66</td><td>65</td></tr>
<tr><td>SW00A5</td><td>96</td><td>95</td><td>to</td><td>90</td><td>89</td><td>88</td><td>87</td><td>to</td><td>82</td><td>81</td></tr>
<tr><td>SW00A6</td><td>112</td><td>111</td><td>to</td><td>106</td><td>105</td><td>104</td><td>103</td><td>to</td><td>98</td><td>97</td></tr>
<tr><td>SW00A7</td><td>0</td><td>0</td><td>to</td><td>0</td><td>0</td><td>120</td><td>119</td><td>to</td><td>114</td><td>113</td></tr>
</table>
Numbers from1 to 120 in the table indicate station numbers
Numbers for b8 to b15 of SW00A7 are 0 (fixed).</td><td>Baton pass normally operating station
(Online reserved station, station No. later than the largest one are included)</td><td>Baton pass faulty station
(Offline reserved station, station No. later than the largest one are included)</td></tr>
<tr><td>SWB0 to B7</td><td>Each station cyclic transmission status</td><td>Stores the cyclic transmission status of each station. (Including the own station)
<table>
<tr><th></th><th>b15</th><th>b14</th><th>to</th><th>b9</th><th>b8</th><th>b7</th><th>b6</th><th>to</th><th>b1</th><th>b0</th></tr>
<tr><td>SW00B0</td><td>16</td><td>15</td><td>to</td><td>10</td><td>9</td><td>8</td><td>7</td><td>to</td><td>2</td><td>1</td></tr>
<tr><td>SW00B1</td><td>32</td><td>31</td><td>to</td><td>26</td><td>25</td><td>24</td><td>23</td><td>to</td><td>18</td><td>17</td></tr>
<tr><td>SW00B2</td><td>48</td><td>47</td><td>to</td><td>42</td><td>41</td><td>40</td><td>39</td><td>to</td><td>34</td><td>33</td></tr>
<tr><td>SW00B3</td><td>64</td><td>63</td><td>to</td><td>58</td><td>57</td><td>56</td><td>55</td><td>to</td><td>50</td><td>49</td></tr>
<tr><td>SW00B4</td><td>80</td><td>79</td><td>to</td><td>74</td><td>73</td><td>72</td><td>71</td><td>to</td><td>66</td><td>65</td></tr>
<tr><td>SW00B5</td><td>96</td><td>95</td><td>to</td><td>90</td><td>89</td><td>88</td><td>87</td><td>to</td><td>82</td><td>81</td></tr>
<tr><td>SW00B6</td><td>112</td><td>111</td><td>to</td><td>106</td><td>105</td><td>104</td><td>103</td><td>to</td><td>98</td><td>97</td></tr>
<tr><td>SW00B7</td><td>0</td><td>0</td><td>to</td><td>0</td><td>0</td><td>120</td><td>119</td><td>to</td><td>114</td><td>113</td></tr>
</table>
Numbers from1 to 120 in the table indicate station numbers.
Numbers for b8 to b15 of SW00B7 are 0 (fixed).</td><td>Data linking
(The reserved station and the station No. later than the largest one are included).</td><td>Data link not in operation</td></tr>
</table>

Appendix 7.1.2 Example of interlock program

Establish an interlock depending on the link status of the own station and other stations.
The following is an example of a communication interlock program using the link status of the own station (SB47, SB49) and station No. 2 (SWA0 bit 1, SWB0 bit 1).
(Example)



Set the following value to the timer constant K□.

Baton pass status (T0, T2)	(Link scan time ×6) + (CPU target station scan time × 6) or more
Cyclic transmission status (T1, T3)	(Link scan time × 3) or more

Reason: In order not to stop the control even if the network detects a momentary error caused by noise or cables status.
Multipliers of 6 times, 2 times, and 3 times are for reference only.

Appendix 7.2 Cyclic transmission

Because the link scan of the CC-Link IE Controller Network and the sequence scan of the user program are operated asynchronously, the link refresh that is performed during each sequence scan is performed asynchronously with the link scan.
Therefore if link data includes data type of more than 32-bit (such as given below), the new data and old data may be mixed depending on link refresh timings.

- Floating-point data
- Current values and command speed of positioning module

The CC-Link IE Controller Network provides the following functions to handle the link data easier.

- 32-bit data assurance····· Appendix 7.2.1
- Block data assurance per station setting ····· Appendix 7.2.2

When a condition (32-bit data assurance execution condition) is not met, establish an interlock according to the example in Appendix 7.2.3.

Appendix 7.2.1 32-bit data assurance

When "Network Range Assignment" of the control station is set with the following four conditions met, 32-bit data integrity is automatically assured.

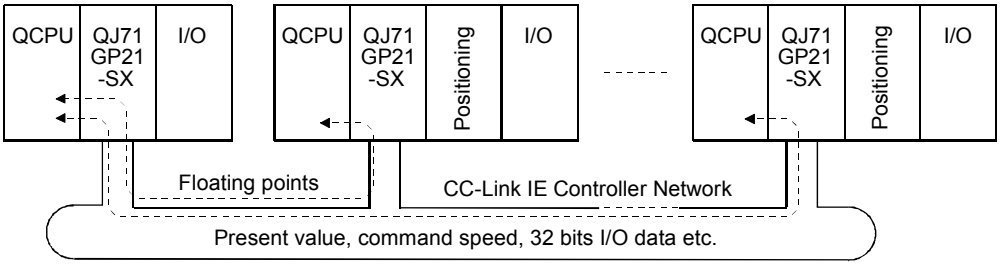
(1) The start device No. of LB is a multiple of 20H.
(2) The points assigned per station in LB is a multiple of 20H.
(3) The start device No. of LW is a multiple of 2.
(4) The points assigned per station in LW is a multiple of 2.

Parameter setting of network range assignment

Station No.	LB/LW Setting(1)												Pairing	Shared Group
	LB			LW										
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End		
1	32	0000	001F	2	00000	00001							Disable	
2	64	0020	005F	4	00002	00005							Disable	
3	96	0060	00BF	6	00006	0000B							Disable	

(2) (1) (4) (3)

For the sending data of 32-bits or less, the interlock program is not required when meeting the conditions.



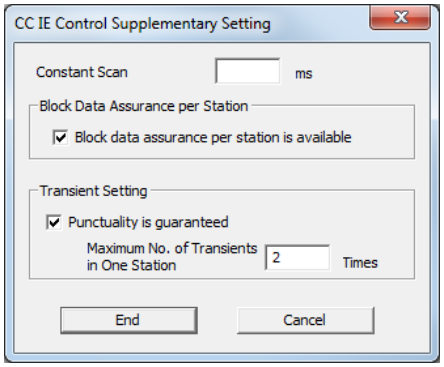
POINT

When using data of 32-bits (2-words) or more, enable the block data assurance from Appendix 7.2.2 or establish an interlock according to the example of the interlock program in Appendix 7.2.3.

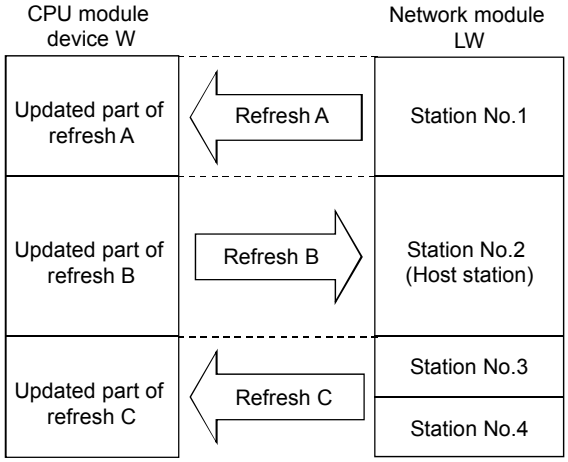
Appendix 7.2.2 Block data assurance per station setting

Since link refresh is performed by handshaking between the CPU and CC-Link IE Controller Network modules, cyclic data integrity is assured in units of stations.
Set the station-based block data assurance in "Supplementary Setting" of "Network Range Assignment" of the control station.

CC IE Control Supplementary Setting



By selecting "Block data assurance per station is available", an interlock is not necessary for the link data between the stations.



<Notes>

(1) To perform the station-based block data assurance, setting the refresh parameter is required.
(2) It is not required to set this setting in normal stations.
(3) When using the device which is set as a refresh destination with the interrupt program, the station-based block data assurance becames unavailable.

POINT

- Establish an interlock when using the direct access (specifying J□¥□) of the link device, because the block data assurance per station is applied to the refresh processing only.
- The following shows calculation formulas for cyclic transmission delay time (with the station-based block data assurance set).
  (1) Sequence scan time > Link scan time
  Normal value: (ST + αT) × 1.5 + LS × 0.5 + (SR + αR) × 1.5
  Maximum value: (ST + αT) × 2 + LS × 1 + (SR + αR) × 2
  (2) Sequence scan time < Link scan time
  Normal value: (ST + αT) + LS × 1 + (SR + αR) × 1.5
  Maximum value: (ST + αT) + LS × 2 + (SR + αR) × 2

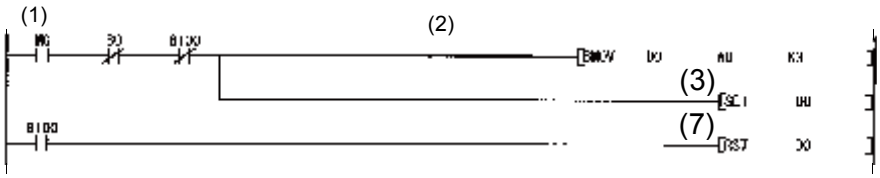
  ST : Sequence scan time on sending side (excluding link refresh time)
  SR : Sequence scan time on receiving side (excluding link refresh time)
  αT : Link refresh time*1 on sending side
  αR : Link refresh time *1 on receiving side
  LS : Link scan time

  *1 Total of the number of mounted network modules.

Appendix 7.2.3 Example of interlock program

When using data of more than 32-bits at the same time without the 32-bit data integrity assurance function or the station-based block data assurance function, new data and old data may be mixed.
As shown in the following example, the establishment of an interlock with the link relay (B) or link register (W).

Sending station



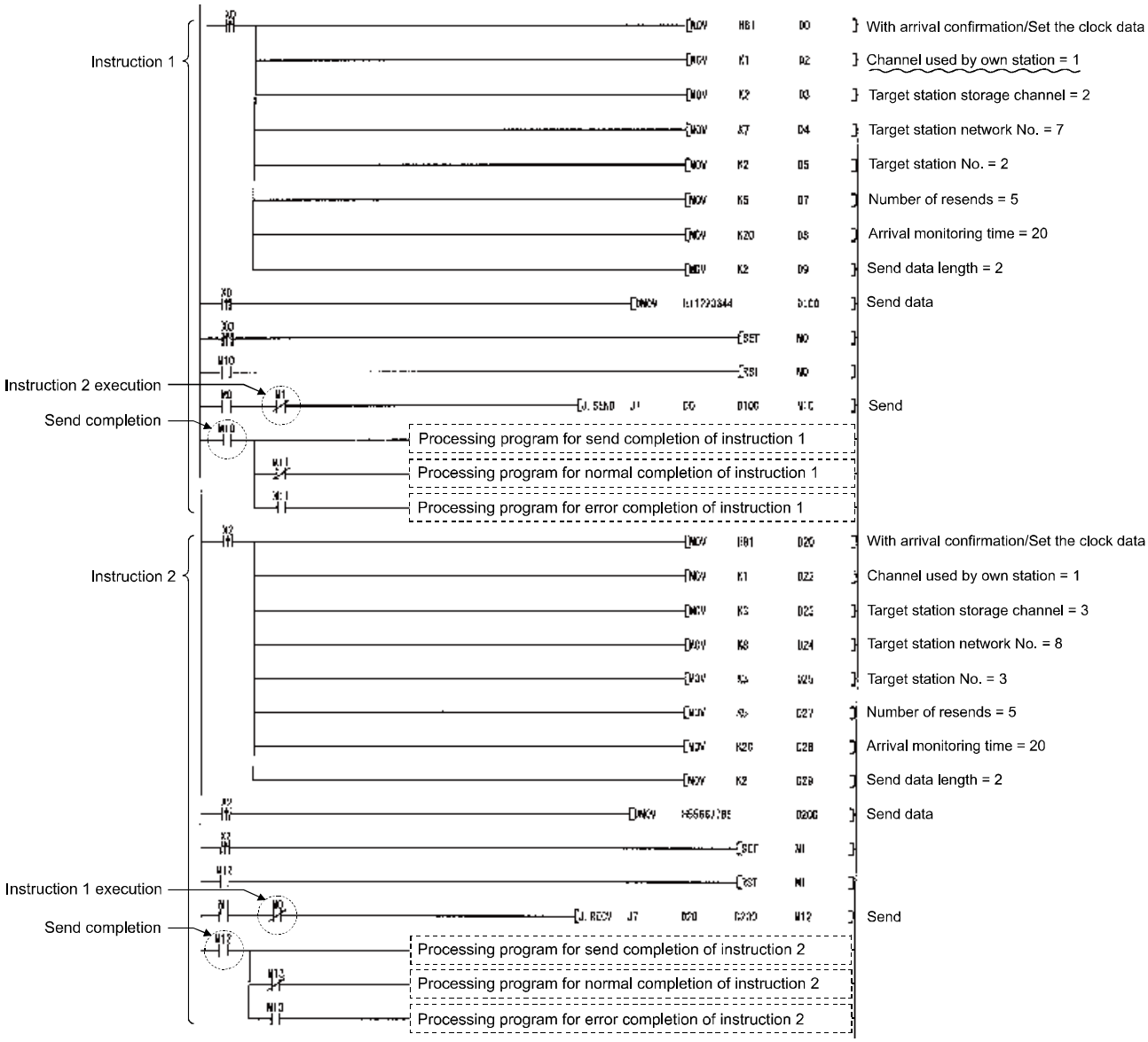
Receiving station

(1) Send command turns ON.
(2) The contents of D0 to D2 are stored in W0 to W2.
(3) Upon completion of storage in W0 to W2, B0 for handshaking turns ON.
(4) By cyclic transmission, link relay (B) data are sent after link register (W) data transmission, which turns ON B0 of the receiving station.
(5) The contents of W0 to W2 are stored in D100 to D102.
(6) Upon completion of storage in D100 to D102, B100 for handshaking turns ON.
(7) When the data are sent to the receiving station, B0 turns OFF.

Appendix 7.3 Transient transmission

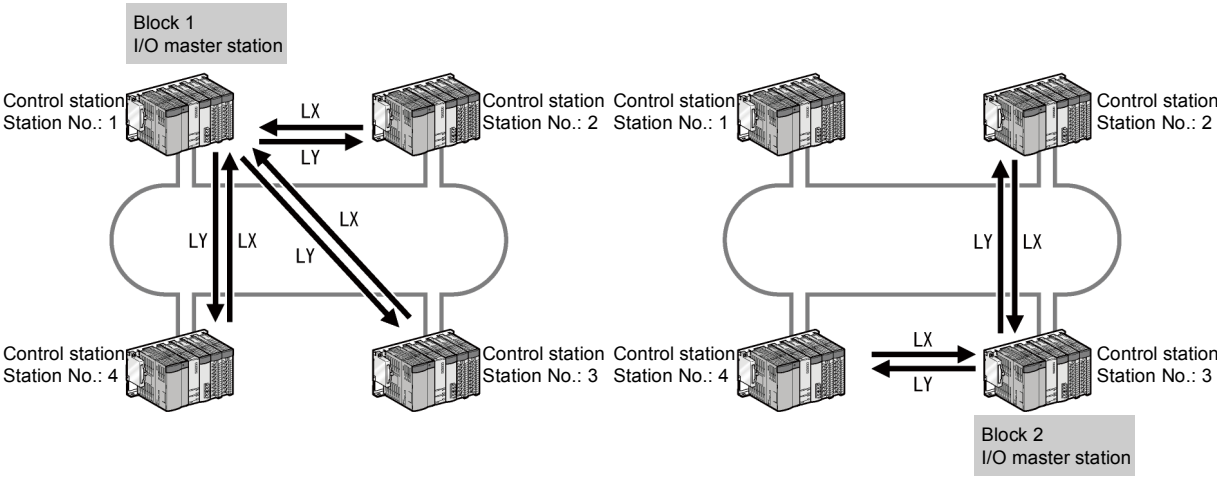
In the transient transmission, it is required to establish the following interlock.
The network module has 8 channels to execute instructions.
These 8 channels can be used at the same time, but the same channel cannot be used simultaneously by multiple instructions.
When using the same channel simultaneously, the following instructions have to wait.
Therefore, create a program that sets a flag until the previous instruction is completed.

(Example) When executing the same channel by two instructions



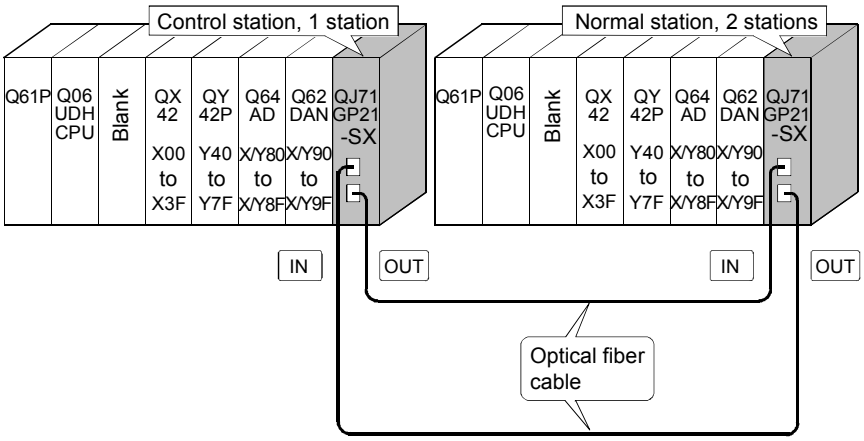
Appendix 8 Additional task 2 (Communication using LX, LY)

Function used to exchange data between the I/O master station that controls LX/LY and another station on a one-to-one (1:1) basis.
The link input (LX) is used to receive the input information from each station in a block, and the link output (LY) is used to send the output information of the I/O master station.
For details, refer to MELSEQ-Q CC-Link IE Controller Network Reference Manual.



(Example communication using LX/LY)

The system configuration for the demonstration machine is the same as task 1.
Parameter and sequence program are write to the each station to check the operation.



(1) Set parameters with GX Works2

Double-click [Ethernet/CC IE/MELSECNET] in [Network Parameter] of the Project View, configure settings as described below.

(a) Number of modules setting

In case of control station (station No.1)

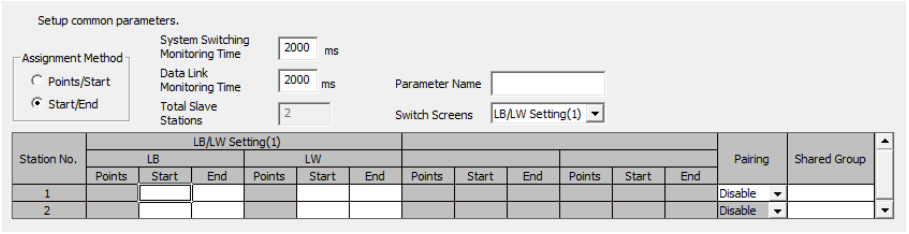
	Module 1	Module 2
Network Type	CC IE Control(Control Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations	2 ← Total number of stations for link: 2	
Group No.	0	
Station No.	1 ← Station No.: 1	
Mode	Online	
	Network Range Assignment	
	Network Operation Settings	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

In case of normal station (station No.2)

	Module 1	Module 2
Network Type	CC IE Control(Normal Station)	None
Start I/O No.	00A0	
Network No.	1	
Total Stations		
Group No.	0	
Station No.	2 ← Station No.: 2	
Mode	Online	
	Refresh Parameters	
	Interrupt Settings	
	Specify Station No. by Parameter	

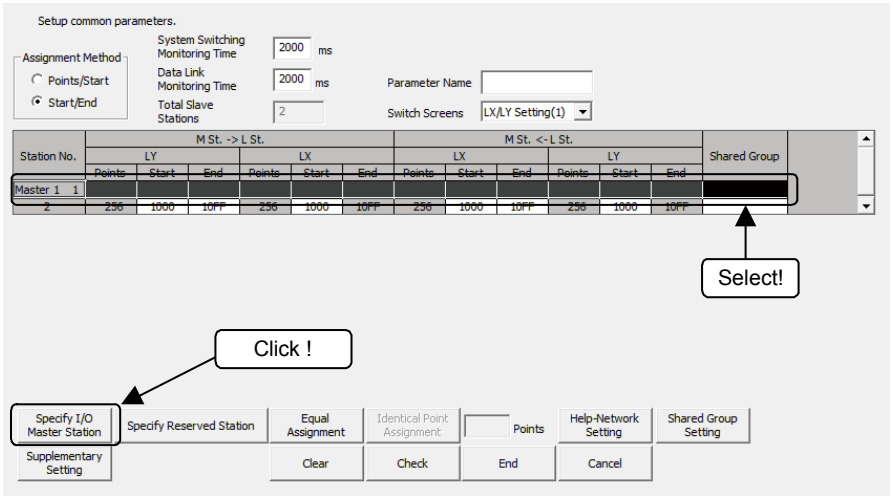
(b) Network range assignment (Control station only)

(LB/LW setting (1))

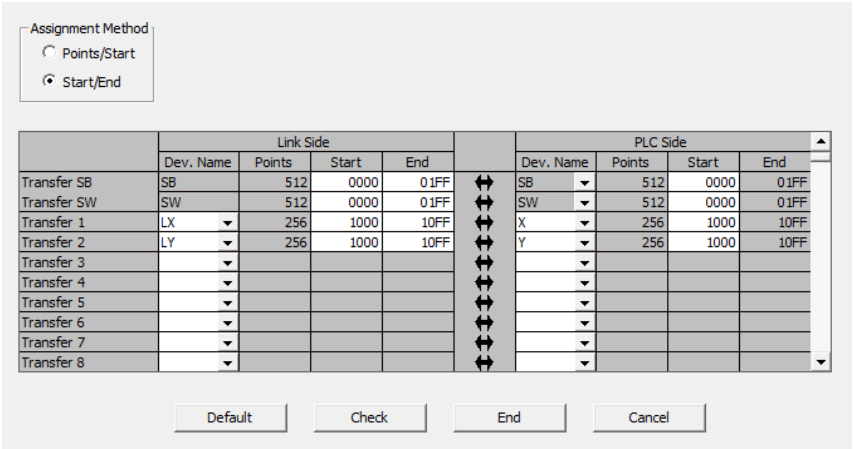


(LX/LY setting (1))

After selecting the I/O master station number (station No.1), click the [Specify I/O Master Station] button.



(c) Refresh parameter (Each station common)

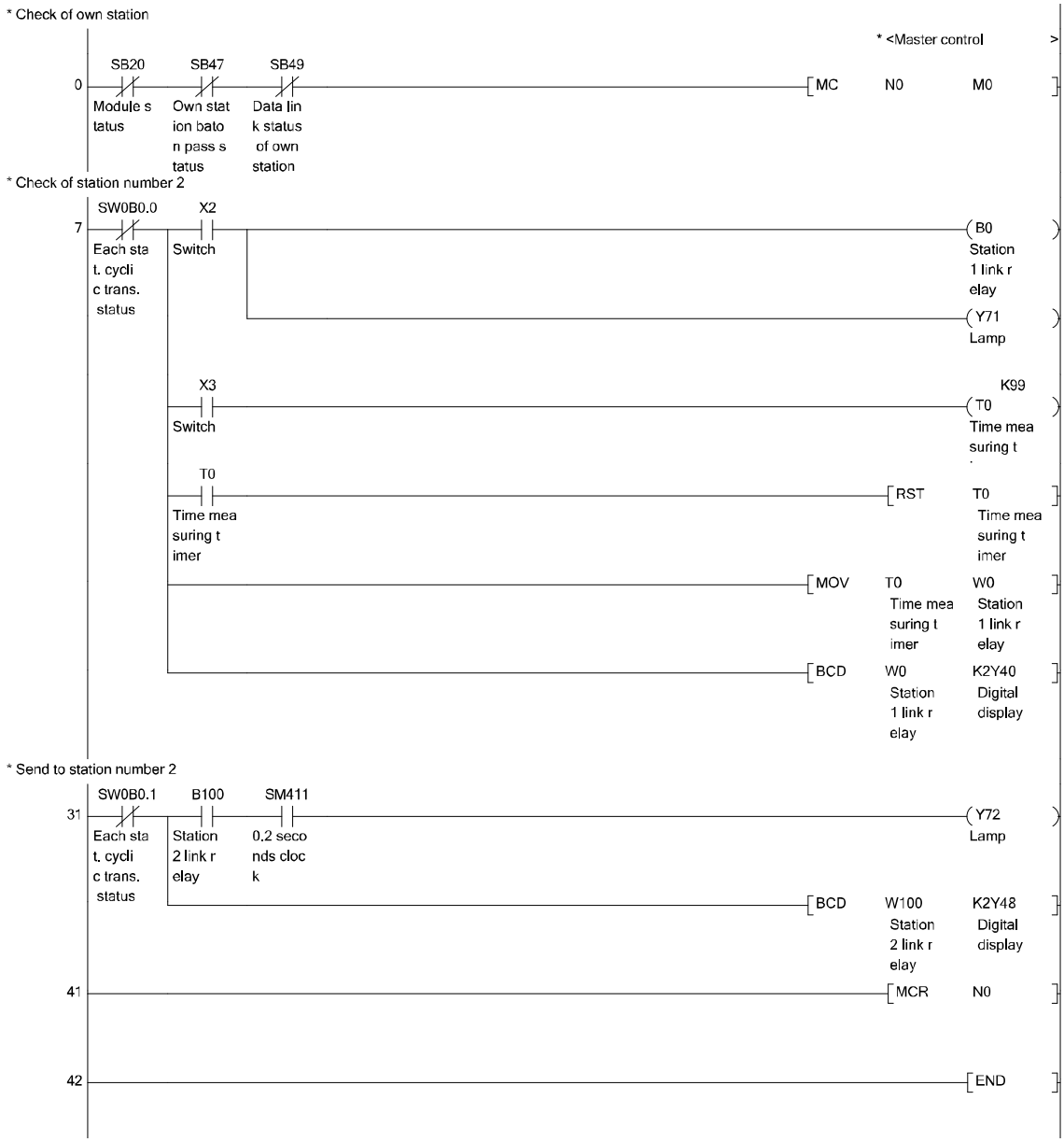


(2) Sequence program

The programs of each station are shown below.

(a) Program of control station (Station No. 1)

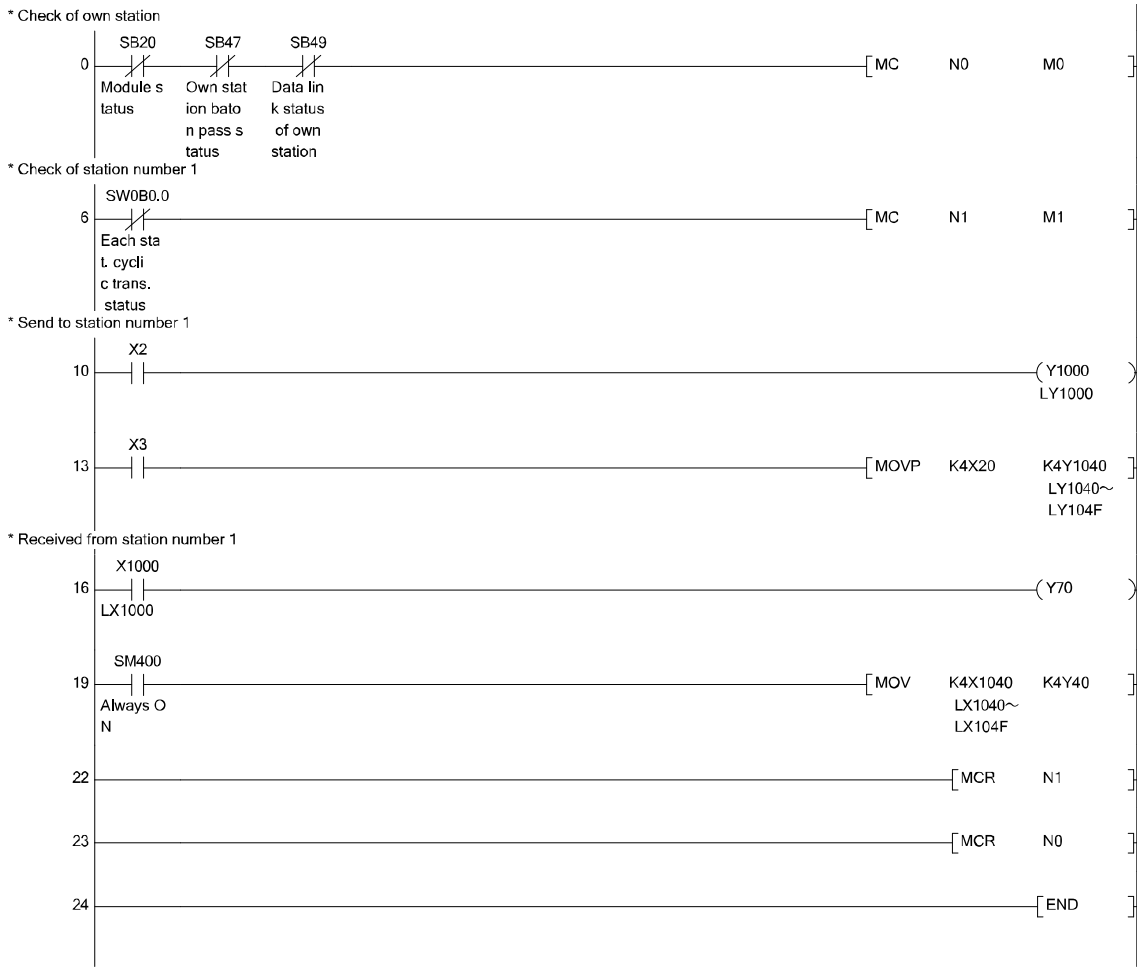
Path	LX-LY
Program name	1MP1



* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(b) Program of normal station (Station No. 2)

Path	LX-LY
Program name	1Ns2



* In GX Works2, the ON/OFF status of the master control circuit is displayed on the title tag of the monitor screen.

(3) Demonstration machine operation

1) Turn ON X2 of station No.1.
When Y1000 of station No. 1 turns ON, confirm that the lamp of station No. 2 lights.

2) Operate the digital switch (X20 to X2F) of station No. 1.
By the data of Y1020 to Y102F of station No. 1, confirm the value displayed on the digital display of station No. 2 changes.

3) Turn ON X2 of station No. 2.
When Y1000 of station No. 2 turns ON, confirm that the lamp of station No. 1 lights.

4) Operate the digital switch (X20 to X2F) of station No. 2.
By the data of Y1020 to Y102F of station No. 1, confirm the value displayed on the digital display of station No. 2 changes.

Memo

Mitsubishi Programmable Controllers Training Manual
CC-Link IE Controller Network (for GX Works2)

MODEL	
MODEL CODE	

SH-081375ENG-A (1403) MEE

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN