

Q Corresponding MELSECNET/H
Network System

Reference Manual

mitsubishi

(PLC to PLC network)

Q series
Q series

Mitsubishi
Programmable Controller

MELSEC-Q

QJ71LP21
QJ71LP21-25
QJ71LP21S-25
QJ71LP21G
QJ71LP21GE
QJ71BR11

• SAFETY PRECAUTIONS •

(Always read before starting use.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.

The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the CPU module user's manual.

In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".




DANGER

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

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

Please store this manual in a safe place and make it accessible when required. Always forward it to the end user.

[Design Precautions]



DANGER

- Make sure to see this manual for information about each station's operating status when a communication error occurs in the network. Erroneous outputs and malfunctions may result in serious accidents.
- If a coaxial cable is disconnected, this may destabilize the line, and a data link communication error may occur in multiple stations. Make sure to create an interlock circuit in the sequence program so that the system will operate safely even if the above error occurs. Failure to do so may result in a serious accident due to faulty output or malfunctions.
- When performing control operations to a programmable controller (modifying data) in operation by connecting GX Developer to the CPU module or connecting personal computers to the intelligent functional modules, configure an interlocking circuit in a sequence program so that the safety of the overall system is maintained. Also, before performing other control operations (program modifications and operating status modifications (status control)) on the programmable controller in operation, be sure to read the manual thoroughly and confirm the safety. Especially if the above mentioned control operations are performed from an external device to a remote programmable controller, problems arising on the programmable controller side may not be dealt with immediately due to abnormal data communication. Thus, in addition to configuring an interlocking circuit in a sequence program, determine how the system should handle data communication errors between the programmable controller CPU and external devices.



CAUTION

- Do not bundle the control wires and communication cables with the main circuit or power wires, or install them close to each other. They should be installed at least 100 mm (3.94 in.) away from each other. Failure to do so may generate noise that may cause malfunctions.

[Installation Precautions]

CAUTION

- Use the programmable controller in the operating environment that meets the general specifications given in the user's manual of the CPU module.
Using the programmable controller in any other operating environment may cause an electric shock, fire or malfunction, or may damage or degrade the product.
- While pressing the installation lever located at the bottom of module, insert the module fixing tab into the fixing hole in the base unit until it stops.
Then, securely mount the module with the fixing hole as a supporting point.
If the module is not installed properly, it may cause the module to malfunction, fail or fall off.
In an environment of frequent vibrations, secure the module with the screw.
Be sure to tighten the screws using the specified torque. If the screws are loose, it may cause the module to malfunction or fall off. If the screws are tightened excessively, it may damage the screws and/or the module, and cause the module to malfunction or fall off.
- Completely turn off the externally supplied power used in the system before mounting or removing the module. Failure to do so may damage the product.
- Do not directly touch the conducting parts and electronic parts of the module. This may cause the module to malfunction or fail.

[Wiring Precautions]

DANGER

- Completely turn off the externally supplied power used in the system when installing or placing wiring. Failure to do so may cause electric shocks or damage the product.

CAUTION

- Always connect the FG terminals to the ground using class D (class 3) or higher grounding exclusively designed for programmable controller.
Failure to do so may cause malfunctions.
- When connecting cables to the terminal block for external power supply, check the rated voltage and terminal layout of the product for correct wiring.
Connecting a cable to power supply of different voltage or incorrect wiring may cause a fire or fault.
- Tighten the terminal screws with the specified torque.
Loose tightening may lead to a short circuit, fire or malfunction.
- Solder coaxial cable connectors properly. Incomplete soldering may result in malfunctioning.
- Be careful not to let foreign objects such as dust and wire chips get inside the module. They may cause a fire, mechanical breakdown or malfunction.
- The top surface of the module is covered with a protective film to prevent foreign objects such as wire chips from entering the module during wiring work. Do not remove this film until all the wiring work is complete. Before operating the system, be sure to remove the film to release the heat.

[Wiring Precautions]

CAUTION

- Make sure to place the communication and power cables into a duct or fasten them using a clamp. Failure to do so may damage the module or cables by pulling a dangling cable inadvertently or cause the module to malfunction due to bad connection.
- When disconnecting the communication and power cables from the module, do not pull a cable part by hand. When disconnecting a cable with a connector, hold the connector connected to the module by hand and pull it out to remove the cable. When disconnecting a cable connected to a terminal block, loosen the screws on the terminal block first before removing the cable. If a cable is pulled while being connected to the module, it may cause the module to malfunction or damage the module and cables.

[Setup and Maintenance Precautions]

CAUTION

- Please read this manual thoroughly and confirm the safety before starting online operations (especially, program modifications, forced outputs, and operating status modifications), which are performed by connecting the GX Developer via the MELSECNET/H network system to a running CPU module of other station. Performing incorrect online operations may damage the machinery or result in accidents.
- Never disassemble or modify the module. This may cause breakdowns, malfunctions, injuries or fire.
- Use any radio communication device such as a cellular phone or a PHS phone more than 25cm (9.85 inch) away in all directions of the programmable controller.
Not doing so can cause a malfunction.
- Completely turn off the externally supplied power used in the system before mounting or removing the module. Failure to do so may damage the module or result in malfunctions.
- Do not touch the terminals while the power is on. Doing so may cause malfunctions.
- Switch off all phases of the externally supplied power used in the system when cleaning the module or retightening the terminal or module mounting screws. Failure to completely shut off all phases of the external power supply may cause module breakdowns and malfunctions. If the screws are loose, it may cause the module to short-circuit, malfunction or fall off. If the screws are tightened excessively, it may damage the screws and cause the module to short circuit, malfunction or fall off.
- Do not install/remove the module to/from the base unit more than 50 times after the first use of the product. (IEC 61131-2 compliant)
Failure to do so may cause malfunction.
- Before handling the module, always touch grounded metal, etc. to discharge static electricity from the human body.
Not doing so may cause a failure or malfunction of the module.

[Disposal Precautions]

CAUTION

- When disposing of this product, treat it as industrial waste.

REVISIONS

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INTRODUCTION

Thank you for purchasing the MELSEC-Q series programmable controller.
Before using the equipment, please read this manual carefully to develop full familiarity with the functions and performance of the Q series programmable controller you have purchased, so as to ensure correct use.
Please forward a copy of this manual to the end user.

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About Manuals

The following manuals are also related to this product.
In necessary, order them by quoting the details in the tables below.

Related Manuals

| Manual Name | Manual Number (Model Code) |
|--|-------------------------------|
| Q corresponding MELSECNET/H Network System Reference Manual (Remote I/O network) This manual describes the specifications, setup and procedures before starting the operation, parameter setting, programming and troubleshooting of the remote I/O network of the MELSECNET/H network system. (Sold separately) | SH-080124 (13JF96) |
| Type MELSECNET/10 Network system (PLC to PLC network) Reference Manual This manual describes the system configuration, performance, specifications and programming of MELSECNET/10 network system (PLC to PLC network). (Sold separately) | IB-66440 (13JE33) |
| For QnA/Q4AR MELSECNET/10 Network System Reference Manual This manual describes the system configuration, performance, specifications and programming of MELSECNET/10 network system (PLC to PLC network). (Sold separately) | IB-66690 (13JF78) |

Compliance with the EMC and Low Voltage Directives

- (1) For programmable controller system
To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and Low Voltage Directives compliant) into other machinery or equipment, refer to Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.
- (2) For the product
For the compliance of this product with the EMC and Low Voltage Directives, refer to Section 9.1.3 "Cables" in Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

About the Generic Terms and Abbreviations

| Generic term/abbreviation | Description of generic term/abbreviation |
|--------------------------------------|--|
| QJ71LP21 | Abbreviation for QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G and QJ71LP21GE MELSECNET/H network modules. However, QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G and QJ71LP21GE are used in this manual to indicate special machine types. |
| QJ71BR11 | Abbreviation for QJ71BR11 MELSECNET/H network modules. |
| Network modules | Generic term for QJ71LP21 and QJ71BR11. |
| CC-Link IE controller network module | Abbreviation for QJ71GP21-SX or QJ71GP21S-SX CC-Link IE controller network module. |
| MELSECNET/H | Abbreviation for Q corresponding MELSECNET/H network system. |
| MELSECNET/10 | Abbreviation for AnU and QnA/Q4AR corresponding MELSECNET/10 network system. |
| QCPU | Generic term for Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q06PHCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q13UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q13UDEHCPU, and Q26UDEHCPU. |
| Basic model QCPU | Generic term for Q00JCPU, Q00CPU, and Q01CPU. |
| High Performance model QCPU | Generic term for Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU. |
| Process CPU | Generic term for Q12PHCPU, and Q25PHCPU. |
| Redundant CPU | Generic term for Q12PRHCPU and Q25PRHCPU. |
| Universal model QCPU | Generic term for Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q13UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q13UDEHCPU, and Q26UDEHCPU. |
| Built-in Ethernet port QCPU | Generic term for Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q13UDEHCPU, and Q26UDEHCPU. |
| Safety CPU | Generic term for QS001CPU. |
| C Controller module | Generic term for Q06CCPU-V, Q06CCPU-V-B type C Controller module. |
| GX Developer | Generic product name for SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA. ("n" means version 4 or later.) "-A" and "-V" mean "volume license product" and "version-upgrade product" respectively. |
| SEND | Abbreviation for JP.SEND, GP.SEND. |
| RECV | Abbreviation for JP.RECV, GP.RECV. |
| READ | Abbreviation for JP.READ or GP.READ. |
| SREAD | Abbreviation for JP.SREAD, GP.SREAD. |
| WRITE | Abbreviation for JP.WRITE, GP.WRITE. |
| SWRITE | Abbreviation for JP.SWRITE, GP.SWRITE. |
| REQ | Abbreviation for J.REQ, JP.REQ, G.REQ, GP.REQ. |
| ZNRD | Abbreviation for J.ZNRD, JP.ZNRD. |
| ZNWR | Abbreviation for J.ZNWR, JP.ZNWR. |
| RRUN | Abbreviation for Z.RRUN, ZP.RRUN. |
| RSTOP | Abbreviation for Z.RSTOP, ZP.RSTOP. |
| RTMRD | Abbreviation for Z.RTMRD, ZP.RTMRD. |
| RTMWR | Abbreviation for Z.RTMWR, ZP.RTMWR. |
| RECVS | Abbreviation for Z.RECVS. |

DEFINITIONS OF TERMINOLOGY

| Term | Description |
|----------------------------|---|
| Cyclic transmission | Using the link devices (LB/LW/LX/LY) of the network module, data can be transferred periodically between stations on the same network. ·LB/LW is used to send data of one station to all stations. (1:N communication) ·LX/LY is used to send data of one station to another station. (1:1 communication) |
| Transient transmission | This function allows communication with another station's programmable controller when a request is made with a link dedicated instruction or from GX Developer. Communications can be made with programmable controllers on the same or other networks. |
| Link dedicated instruction | Dedicated instruction used for transient transmission. |
| RAS | Abbreviation for Reliability, Availability, and Serviceability. This term is used to express the overall usability of automation systems. |
| Control station | Only one station that controls the network to which it is connected. Each station's send range for cyclic transmission is assigned to the control station. |
| Normal station | Station that performs cyclic transmission according to the range assignment of the control station. |
| Reserved station | Station that is not actually connected to the network. It must be included in the total number of stations in the network, since it is to be connected in the future. |
| Relay station | Station that relays transient transmission data to another network. Link device data of a network module are transferred to another network module via this station. Multiple network modules are connected to one programmable controller. |
| Reconnection | Processing of restarting data link when a faulty station becomes normal. |
| Disconnection | Processing of stopping data link when a data link error occurs. |
| Device | Devices (X, Y, M, D, etc.) that are contained in a CPU module. |
| Link Device | Devices (LB/LW/LX/LY) that are contained in a network module. |
| Link scan time | Time required for data of each station to be sent in order and to make one rotation in the network. The link scan time changes depending on the data volume or transient transmission request. Link scans are performed "asynchronously" with sequence scans of the CPU module. |
| Link refresh | Processing of data transfer between link devices of the network module and CPU module devices. Link refresh is performed in "END processing" of the sequence scan of the CPU module. |
| Buffer memory | Memory area in an intelligent function module, in which data are temporarily stored. The network module does not have any buffer memory area that is offered to the user. |
| Baton pass | A control mechanism in which transmission right (token) is passed around the network for data transmission. |
| Control station shift time | Time taken from when the control station went down due to a reason such as power-off until data link is started by the sub-control station. |
| Group No. | Number that is assigned for transient transmission to any given stations. By specifying a group of stations as transient transmission target, data can be sent to the stations of the same group No. |

Product Configuration

| Model name | Part name | Quantity |
|--------------|---|----------|
| QJ71LP21 | Model QJ71LP21 MELSECNET/H Network Module (optical loop type) | 1 |
| QJ71LP21-25 | Model QJ71LP21-25 MELSECNET/H Network Module (optical loop type) | 1 |
| QJ71LP21S-25 | Model QJ71LP21S-25 MELSECNET/H Network Module (optical loop type, with external power supply function) | 1 |
| QJ71LP21G | Model QJ71LP21G MELSECNET/H Network Module (optical loop type) | 1 |
| QJ71LP21GE | Model QJ71LP21GE MELSECNET/H Network Module (optical loop type) | 1 |
| QJ71BR11 | Model QJ71BR11 MELSECNET/H Network Module (coaxial bus type) | 1 |
| | F-type connector (A6RCON-F) | 1 |

REMARKS

For the coaxial bus system, terminal resistors (75 Ω) are required in the network terminal stations.

Terminal resistors are not supplied with the QJ71BR11; they must be purchased separately.

For a list of the model names and how to use the terminal resistors, refer to Section 4.6.2.

1 OVERVIEW

1

The MELSECNET/H network system includes an PLC to PLC network for interactively communicating between control stations and normal stations, and a remote I/O network for interactively communicating between remote master stations and remote I/O stations.

This manual is to be read when structuring PLC to PLC networks on MELSECNET/H network systems (hereinafter known as MELSECNET/H.)

The Q corresponding MELSECNET/H Network System Reference Manual (Remote I/O networks) is to be read when structuring remote I/O networks with MELSECNET/H.

REMARKS

Networks previously known as MELSECNET/10H are abbreviated here as MELSECNET/H.

1.1 Overview

The PLC to PLC network system of MELSECNET/H provides more functionality, higher processing speed and more capacity than the conventional PLC to PLC network system of MELSECNET/10 network system.

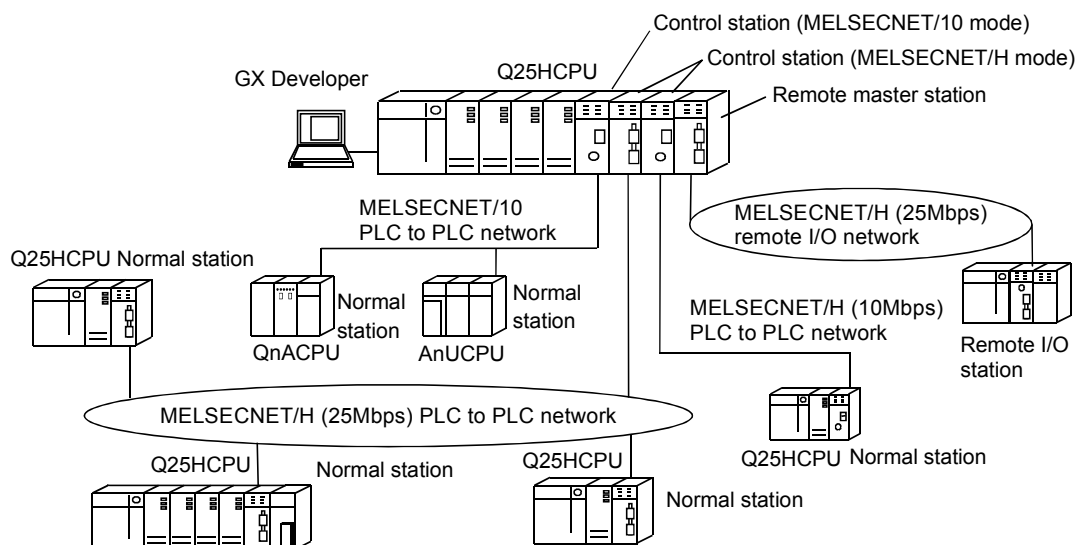
In addition, in pursuit of the maximum ease of use of the MELSECNET/10 network system, the FA system can be networked easily by combining with GX Developer. The MELSECNET/H system supports the MELSECNET/H and MELSECNET/H Extended modes (high functionality and high-speed mode) and the MELSECNET/10 mode (functional and performance compatibility mode) to achieve the network performance improvement and upward compatibility of MELSECNET/10.

MELSECNET/H PLC to PLC network optical loop systems can be set at communications speeds of 25Mbps and 10Mbps.

| | Network system | Communication speed |
|-------------|---------------------------|---------------------|
| MELSECNET/H | Optical loop, coaxial bus | 10Mbps |
| | Optical loop*1 | 25Mbps |

*1: QJ71LP21-25 and QJ71LP21S-25 only

Unless otherwise categorized, this is abbreviated as MELSECNET/H for explanatory purposes in this manual.



REMARKS

This manual is written assuming that MELSECNET/H is used in the MELSECNET/H or MELSECNET/H Extended mode. Thus, if MELSECNET/H is to be used in the MELSECNET/10 mode, please refer to the "For QnA/Q4AR MELSECNET/10 Network System Reference Manual".

POINT

- (1) Select a QCPU as a programmable controller of the MELSECNET/H for PLC to PLC network system.
- (2) When any of the conventional series QnA, AnU and ACPUs exist in the same network, select the MELSEC NET/10 mode, which is compatible with the MELSECNET/10.
- (3) Set the control station and normal stations within the same network to the same network type.
Stations of different network types cannot be used together within the same network.

The table below shows the CPU modules that can be combined for use on each network.

| CPU module | Type of networks that can be used with CPU | Network to be connected | | | |
|------------|--|--------------------------|--------------------|--|--------------------|
| | | MELSECNET/10 | | MELSECNET/H | |
| | | PLC to PLC network | Remote I/O network | PLC to PLC network | Remote I/O network |
| QCPU | MELSECNET/H (10 Mbps) | ○ (MELSECNET/10 mode) | × | ○ (MELSECNET/H mode, MELSECNET/H Extended mode) | ○ |
| | MELSECNET/H (25 Mbps) | × | | | |
| AnUCPU | MELSECNET/10 | ○ | ○ | × | × |
| QnACPU | MELSECNET/10 | | | | |

○: Use possible ×: Use not possible

REMARKS

What is network type?

The network type is a parameter set for specifying the network where the network module is used.

Set the network type of the network module in the Network parameter of GX Developer.

There are the following network types.

| Network type | Description |
|---------------------------|---|
| MELSECNET/H mode | Set this mode when all CPUs within the network are QCPUs. |
| MELSECNET/H Extended mode | The maximum number of link points per station has been increased compared with the MELSECNET/H mode. In excess of 2000 bytes, a maximum of 35840 bytes can be set. Set this mode when the system uses many link points per station. |
| MELSECNET/10 mode | This mode is used to operate the network module on a MELSECNET/10 network where the QnA/AnU exists. |

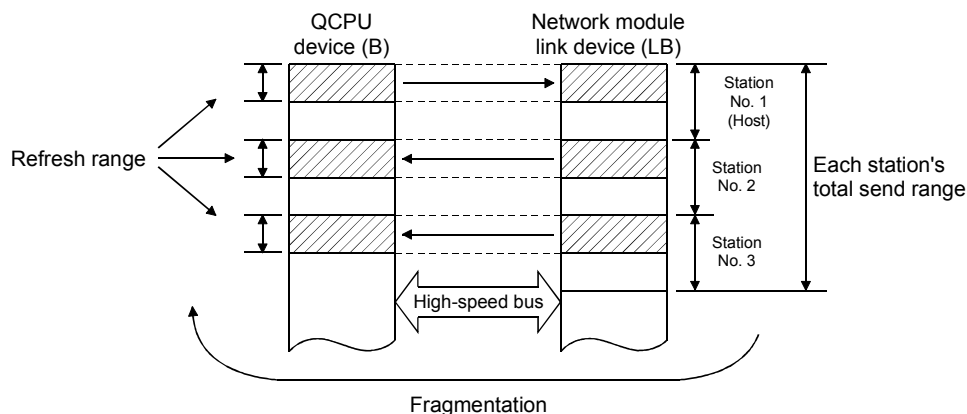
1.2 Features

The MELSECNET/H is designed to provide higher processing speed, more capacity, and more functionality while maintaining the connectivity with the MELSECNET/10; it is easier to use than ever in combination with GX Developer. Furthermore, the MELSECNET/H has the following features that were not available with the conventional MELSECNET (II) and MELSECNET/B data link systems.

(1) Achievement of a high-speed communication system

- (a) The MELSECNET/H enables high-speed communications with 25Mbps and 10Mbps communication speeds. (25Mbps for only the QJ71LP21-25 and QJ71LP21S-25 optical loop system)
- (b) The link scan time has become even faster through the use of processors specifically designed for linking.
- (c) Refresh parameter area can be subdivided
By subdividing ranges with refresh parameters, refreshing of the areas not used for the sequence program can be eliminated and the refresh time can be reduced by refreshing only those required. (Refer to Section 5.7 "Refresh Parameters.")
 - In the case of the High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU, the refresh parameter area of a network module can be divided into 64 (excluding SB and SW).
 - In the case of the Basic model QCPU and safety CPU, the refresh parameter area of a network module can be divided into 8 (excluding SB and SW).

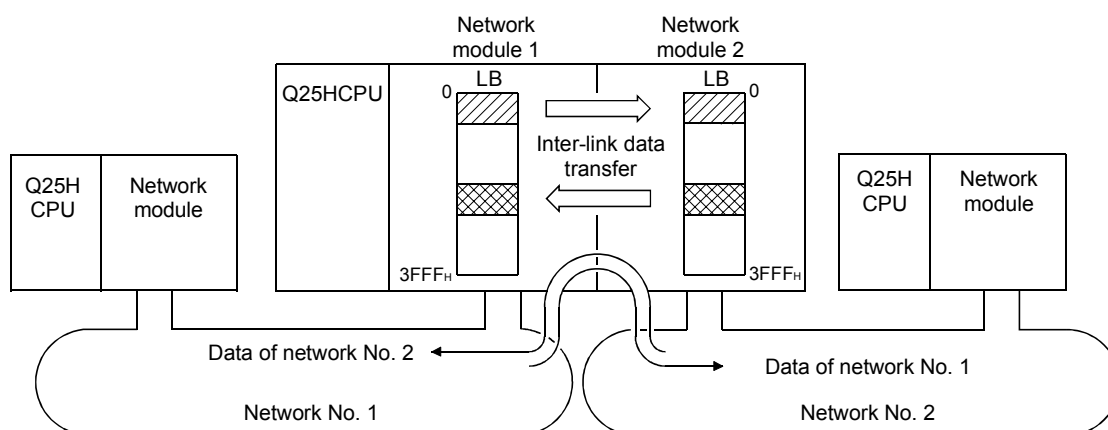
Also, because the bus speed between a QCPU and a network module has been improved, the refresh time has been reduced.



- (d) The optical loop system enables even faster levels of data communication with multiplex transmission (refer to Multiplex Transmission Function in section 7.6.)

(2) Large-scale and flexible system configuration

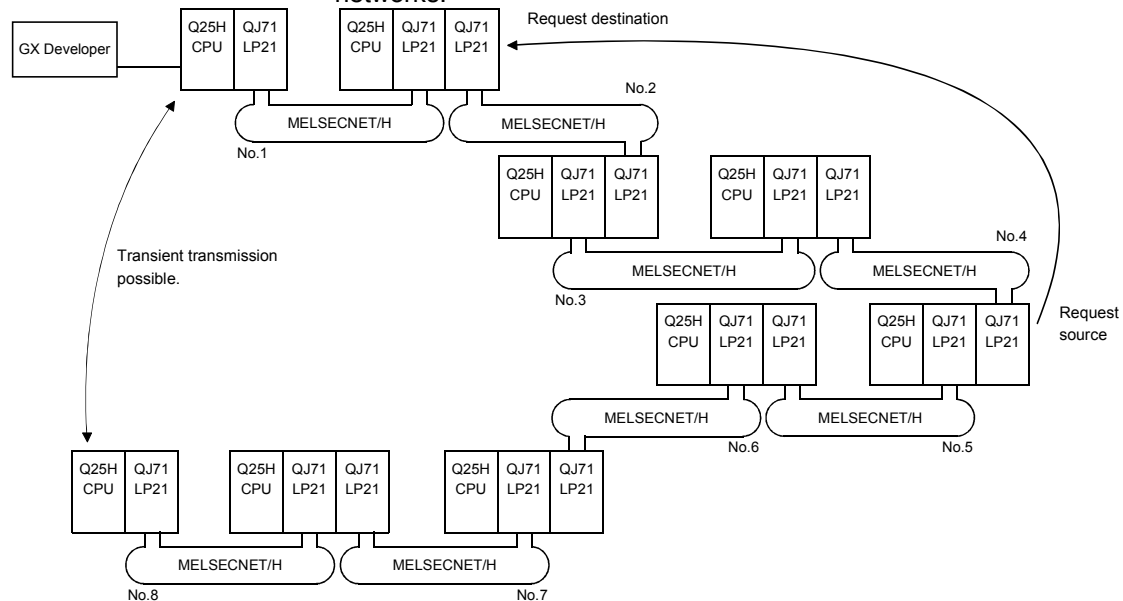
- (a) The link device has a larger capacity: 16384 points for the link relay (LB) and 16384 points for the link register (LW). (Refer to Section 3.1.1)
 - (b) The maximum number of link points per station has been increased.
By selecting the network type, the maximum number of link points per station can be increased.
 - 1) MELSECNET/H Extended mode *1
By selecting the MELSECNET/H Extended mode as the network type, the maximum number of link points per station can be set up to 35840 bytes in excess of 2000 bytes.
It is not necessary to install multiple network modules for a single CPU module to increase the number of transmission points.
 - 2) MELSECNET/H mode *1
By selecting the MELSECNET/H mode as the network type, the maximum number of link points per station can be set up to 2000 bytes.
Furthermore, by installing multiple network modules with the same network number for the same CPU module, the link points of "number of modules \times maximum number of link points per station" can be sent. (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU) (Refer to Section 7.9 "Increasing the Number of Send Points by Installing Multiple Modules Having the Same Network Number.")
- *1: The link scan time varies depending on the network type.
Refer to Section 3.3.2 for details.
- (c) The commands for transmitting and receiving data with other stations on the MELSECNET/H network system (SEND, RECV, RECVS, READ, SREAD, WRITE, SWRITE) enable a maximum of 960 words of data to be transmitted and received (refer to Programming in section 7.4.5.)
 - (d) A system can be expanded to contain a maximum of 239 networks. (Refer to Section 2.1.4, "A Network System Containing Multiple Networks.")
 - (e) By using the inter-link data transfer function, data (LB/LW) can be transferred to another network without creating a sequence program. (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU) (Refer to Section 7.2, "Inter-link Data Transfer Function.")



- (f) By installing multiple network modules, N:N communication (transient transmission) with destination stations on eight network systems that use the programmable controllers as relay stations can be performed using the routing function.

(Refer to Section 7.4.2, "Routing Function.")

Transient transmission using the routing function can be performed not only in a system composed of MELSECNET/H networks but also in a system that contains CC-Link IE controller network and/or MELSECNET/10 networks.



※: Only the High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU accept multiple network modules.

- (g) Either of the following systems can be chosen: the optical loop system (maximum total extension of 30 km (98430 ft.)) which has a long station-to-station distance and total distance, and is resistant to noise, or the coaxial bus system (maximum total extension of 500 m (1640.5 ft.)) which can easily be wired.

(Refer to Section 3.1, "Performance Specifications.")

- (h) The following functions facilitate network connection:

- 1) Any station to be connected in the future can be specified as a reserved station.

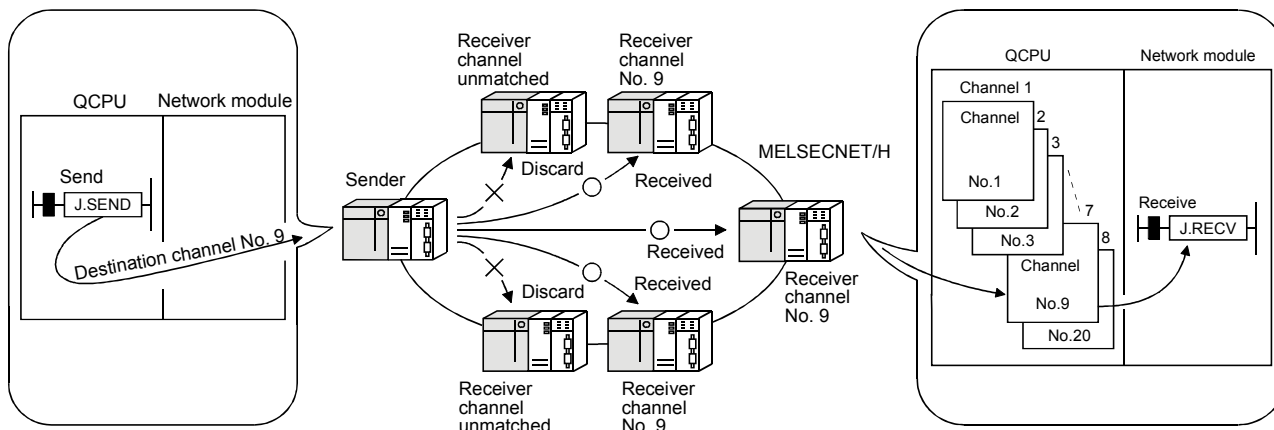
Specifying a station not actually connected as a reserved station prevents a communication error. (Refer to Section 5.3.4 "Designation of the reserved station.")

- 2) It is not necessary to connect stations in order of the station Nos. in the network. (Refer to Section 4.3.1 "Setting the station number.")

(3) Providing various communication services

- (a) Transient transmission can be performed by designating a channel number (1 to 64) of the receiving station. This function allows to set (change) the channel numbers arbitrarily with the sequence programs and to perform transmission to multiple stations with the same channel number at one time.

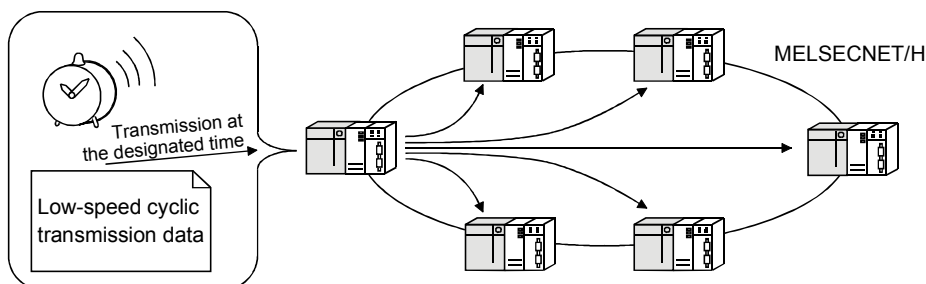
(Refer to Section 7.4.4, "Message Sending Function Using the Logical Channel Numbers.")



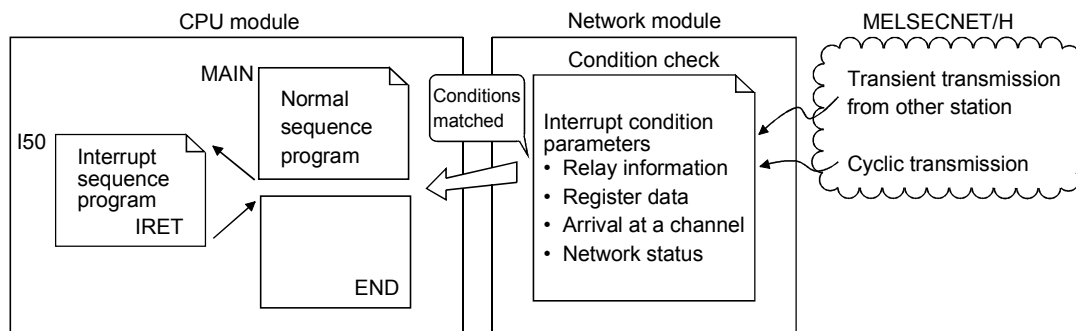
- (b) By using the low-speed cyclic transmission function, it is possible to cyclically send data that does not require high-speed transmission in a batch mode, separately from the normal cyclic transmission (LB/LW). High-speed transmission can be achieved by efficiently dividing the data to transmit into data that requires high-speed transmission, which is sent by the normal cyclic transmission, and other data that is sent by low-speed cyclic transmission.

There are three types of transmission method depending on how the transmission is activated.

- 1) "Transmission of data for one station in one link scan" (default)
- 2) "Periodical cycle interval" which transmits in a set time cycle (h/min/s)
- 3) "System times" which transmits at the designated time
(year/month/day/h/min/s)
(High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)
(Refer to Section 7.3, "Low-Speed Cyclic Transmission Function.")

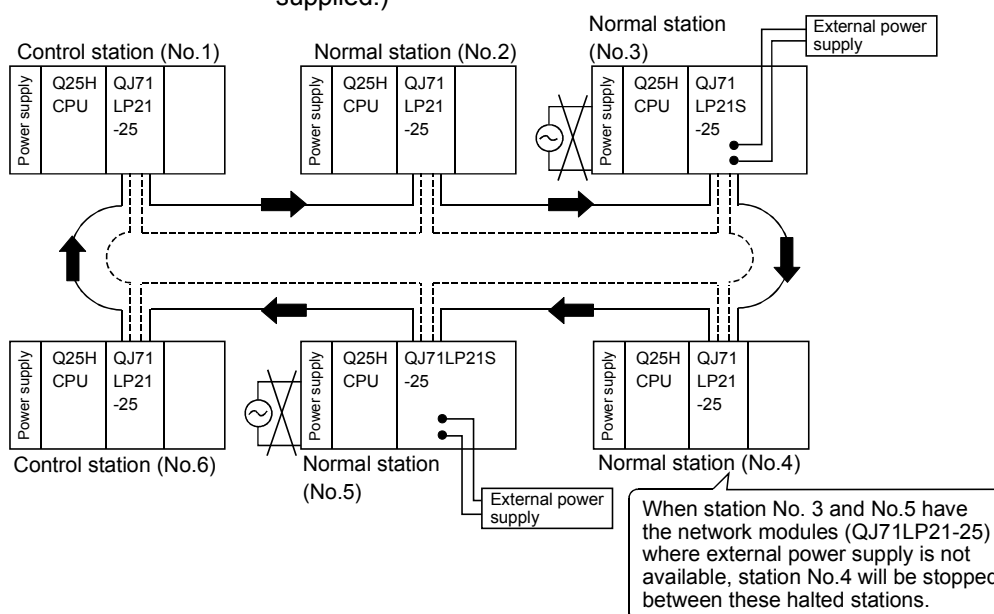


- (c) The interrupt sequence program of the host's CPU module can be started up using the event issue function. This function reduces the response time of the system and process real-time data receiving. (Refer to Section 7.5, "Starting Up the Interrupt Sequence Program.")



(4) Expanded RAS functions (Refer to Section 3.2.2, "RAS function.")

- By using the control station switch function, if the control station of the network is down, a normal station is substituted for the control station, enabling to continue the network communication.
- When a faulty station recovers and can resume normal operation, it automatically returns to the network to resume the data communication using the automatic return function.
- The automatic return control function allows a failed control station to be reconnected to the network as a normal station, reducing network downtime.
- The loopback function (in the optical loop system) isolates a faulty part, where a fault such as cable disconnection or a station error has occurred, and enables data communications among operable stations.
- Preventing station failure using external power supply
When two or more stations are faulty and halted in the optical loop system, stations between these faulty stations can continue the data link. Because the loop back is prevented, the link scan time will be stabilized. (The QJ71LP21S-25 is the network module where external power can be supplied.)



- (f) By using the station detach function (coaxial bus system), even when some of the connected stations are down due to power off, etc., the normal communication can be continued among other operational stations.
- (g) When an error occurs in a normal network due to disconnection, etc. the data link can be continued by switching to link data refresh on the standby network if two network modules, a regular module and a standby module, are installed for each programmable controller CPU (High Performance model QCPU and Process CPU)
- (h) The network module can continue the transient transmission even if an error that stops the CPU module while the system is operating occurs.
- (i) It is possible to check the time when a transient error occurred.

| |
|---------|
| REMARKS |
|---------|

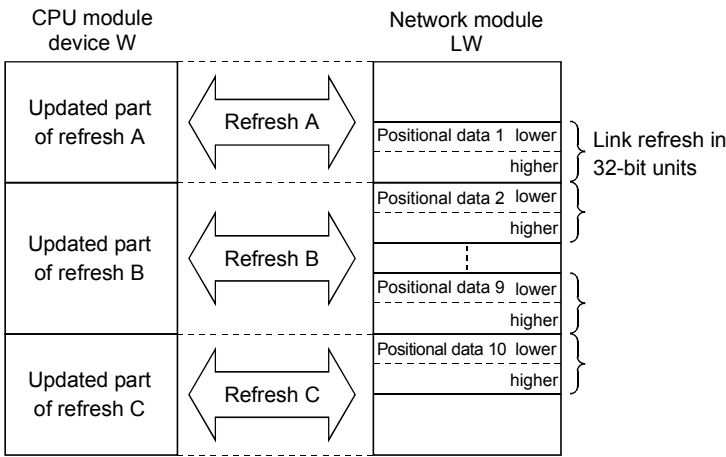
The following faults make the RAS functions valid.

- Break in cable
- Power-off of slave station
- Network setting error
- Fault detectable by self-diagnostics of CPU module

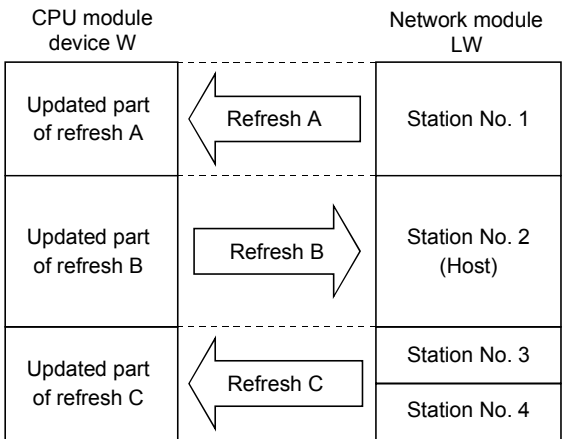
If the network module has become faulty, the RAS functions may not be activated depending on the fault.

(5) Enhancement and compatibility of the network functions

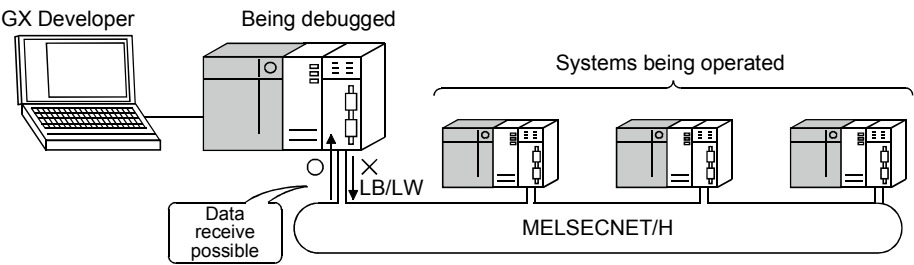
- (a) Because of the 32-bit data guarantee, data with double word precision (32 bits) can be guaranteed without an interlock.
(Refer to Section 6.2.1, "32-bit data guarantee.")



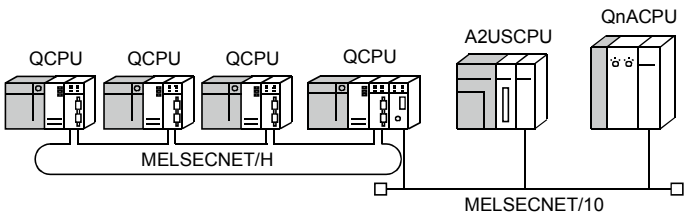
- (b) Through the block guarantee of cyclic data per station, it is possible to manipulate multiple word data without interlocks.
(Refer to Section 6.2.2, "Block guarantee of cyclic data per station.")



- (c) In the network debug mode, the network functions of user programs can be tested in the online environment without affecting systems being operated.
(Refer to Section 5.2.5, "Mode.")



- (d) By using the MELSECNET/10 mode (functional compatibility and performance compatibility mode), the MELSECNET/H can be used together with the conventional network modules to easily install a programmable controller network system.
To use the MELSECNET/H in the MELSECNET/10 mode (functional compatibility and performance compatibility mode), please refer to the "For QnA/Q4AR MELSECNET/10 Network System Reference Manual".



- (6) Increased ease of network configuration in combination with GX Developer
 - (a) The network parameters can easily be set by visualising pull-down menus, dialogue boxes, etc.
 - (b) The settings of network Nos., group numbers and operation modes have been simplified so that these values can be designated only through software settings.

(Network parameters)

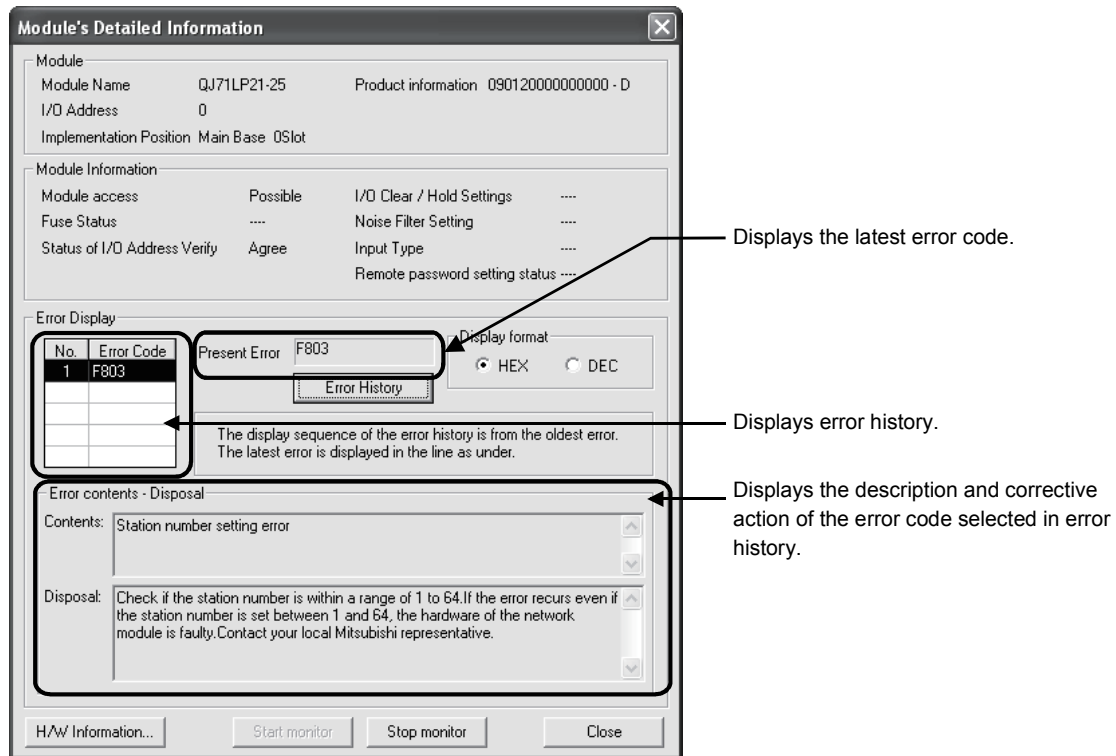
Simplified

| | Module 1 | Module 2 |
|------------------|-------------------------------|---|
| Network type | MNET/H mode (Control station) | None |
| Starting I/O No. | 0000 | None |
| Network No. | | CC IE Control(Control station) CC IE Control(Normal station) |
| Total stations | 2 | MNET/H mode (Control station) MNET/H mode (Normal station) |
| Group No. | 0 | MNET/10 mode (Control station) MNET/10 mode (Normal station) |
| Station No. | | MNET/H Stand by station MNET/H(Remote master) |
| Mode | On line | Ethernet MNET/H Ext. mode (Control station) MNET/H Ext. mode (Normal station) |
| | Network range assignment | |
| | Refresh parameters | |
| | Interrupt settings | |
| | Return as control station | |

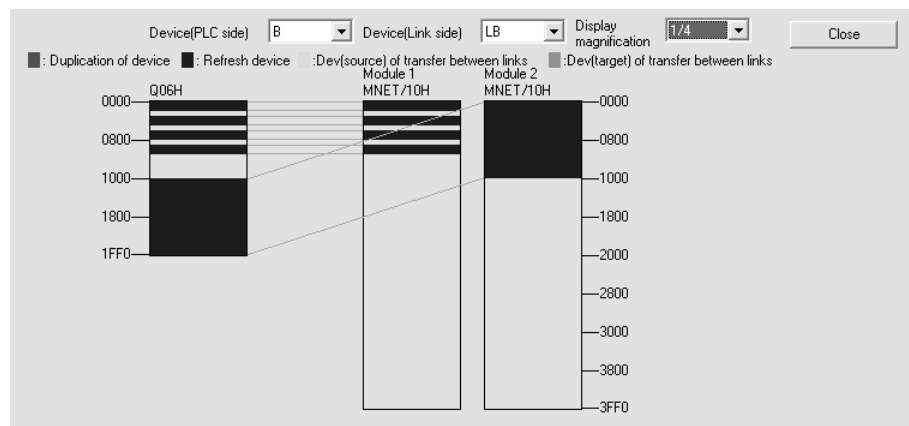
Pull-down menu

(c) Troubleshooting process has been simplified through system monitoring.

(System monitor/error code display)



(d) After assigning the refresh parameters and inter-link data transfer devices to a network system in which multiple network modules are installed, duplicate device settings can easily be checked with [Assignment image diagram].



(7) Redundant system construction

(a) Network modules can be dualized.

A system containing a network module can be dualized (redundant system) by installing another network module and using redundant CPUs.

In case of an error in the control system CPU or a network module, the redundant system including double network modules switches the control system to the standby system, allowing system control and data linking to be continued on the standby system. (Refer to Section 7.10.1.)

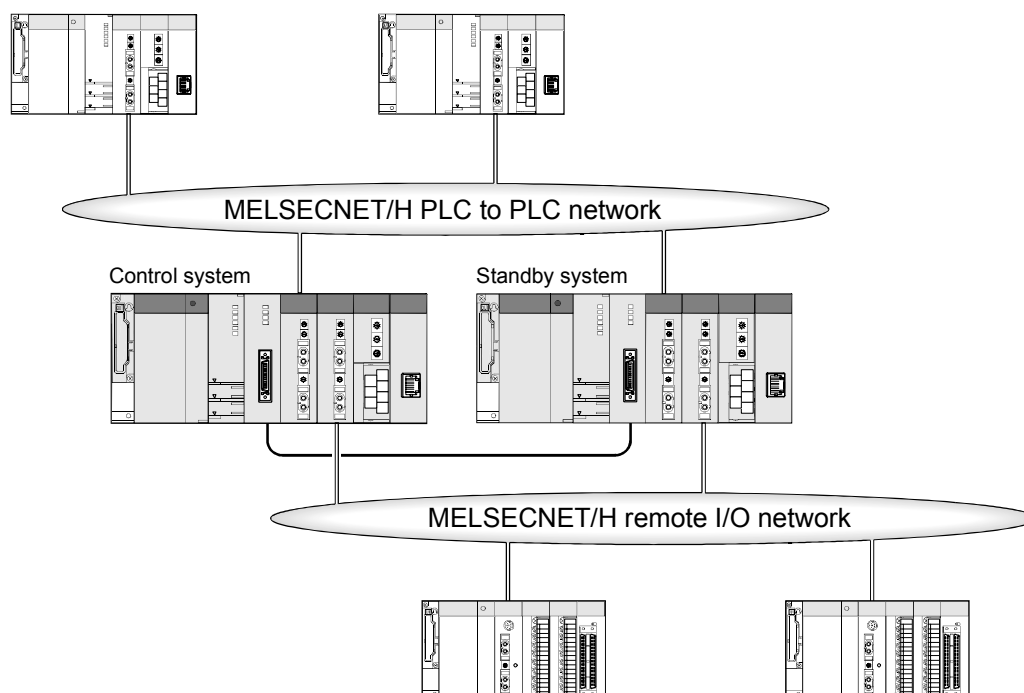
(b) Automatically issuing system switching request to the control system CPU

If failure of a network module mounted to the control system CPU of the redundant system or a data link error is detected, a system switching request will be automatically issued to the CPU. (Refer to Section 7.10.5.)

(c) Transient transmission to redundant system is available.

By transient transmission using special link instructions or GX Developer, device data can be read from or written to the host system, control/standby system, or system A/B in the redundant system, and remote RUN/STOP can be executed. (Refer to Section 7.4.5.)

When the redundant system is a target station, even if system switching occurs, the target can be followed by specifying the CPU type of the station to control or standby system.

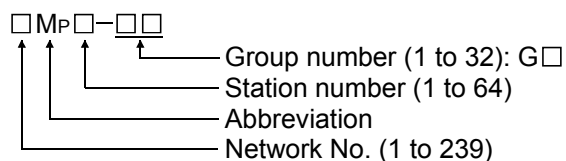


1.3 Abbreviations Used in the Text, Tables and Diagrams of This Manual

(1) Abbreviation

| Abbreviation | Name |
|--------------|--|
| MP | Control station |
| Ns | Normal station (Station that can serve as a control station) |

(2) Symbol format



[Example]

- 1) Network No. 3, control station, station number 6: 3MP6
- 2) Network No. 5, normal station, station number 3: 5Ns3

(3) Generic terms and abbreviations for CPU modules

| Generic terms and abbreviations for CPU modules | CPU model | | | | | | | |
|---|--------------------|-------------------------------------|----------------------------------|------------------|---|--|-------|--------------------------|
| | Q00J Q00 Q01 | Q02 Q02H Q06H Q12H Q25H | Q02PH Q06PH Q12PH Q25PH | Q12PRH Q25PRH | Q02U Q03UD Q04UDH Q06UDH Q13UDH Q26UDH | Q03UDE Q04UDEH Q06UDEH Q13UDEH Q26UDEH | QS001 | Q06CCPU-V Q06CCPU-V-B |
| Basic model QCPU | ○ | — | — | — | — | — | — | — |
| High Performance model QCPU | — | ○ | — | — | — | — | — | — |
| Process CPU | — | — | ○ | — | — | — | — | — |
| Redundant CPU | — | — | — | ○ | — | — | — | — |
| Universal model QCPU | — | — | — | — | ○ | — | — | — |
| Safety CPU | — | — | — | — | — | — | ○ | — |
| C Controller module | — | — | — | — | — | — | — | ○ |
| Other than Redundant CPU | — | ○ | — | — | ○ | — | — | — |
| Other than Universal model QCPU | — | — | ○ | — | — | — | ○ | — |
| Other than Safety CPU | — | — | — | ○ | — | — | — | — |

2 SYSTEM CONFIGURATION

This chapter explains different system configurations that are available with the MELSECNET/H.

2.1 MELSECNET/H network configurations

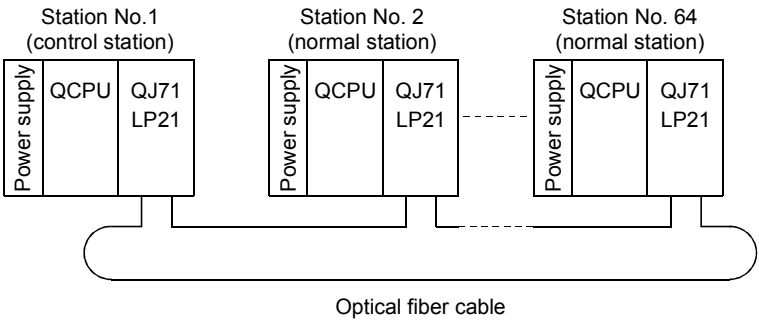
This section describes network configurations available with the MELSECNET/H.

2.1.1 Single network system

A single network system is one system that connects the control station and the normal stations with an optical fiber cable or a coaxial cable.

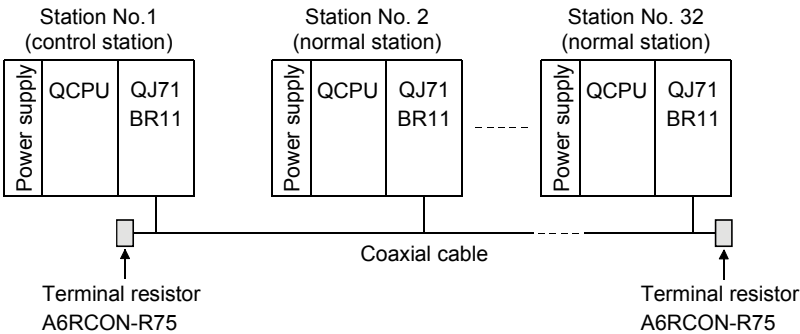
(1) Optical loop system

In the optical loop system, 1 control station and 63 normal stations (a total of 64 stations) can be connected. Any station number can be assigned as the control station. However, only one station can be set as the control station per system. In the following sample system, station number 1 has been assigned as the control station.



(2) Coaxial bus system

In the coaxial bus system, 1 control station and 31 normal stations (a total of 32 stations) can be connected. As in the optical loop system, any station number can be assigned as the control station. However, only 1 station can be assigned as the control station per system.



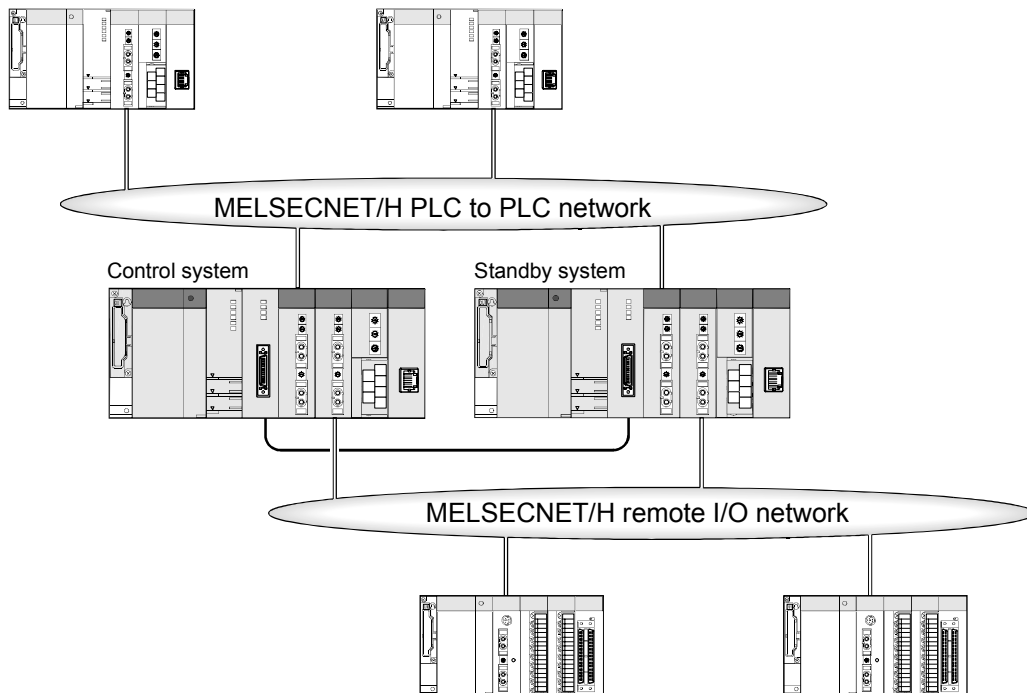
| |
|---|
| POINT |
| A safety CPU operates as a normal station. (It cannot be set to a control station.) |

2.1.2 Redundant system (Redundant CPU)

The redundant system refers to a system where a system including a network module is dualized by connecting another network module to another redundant CPU (redundant system).

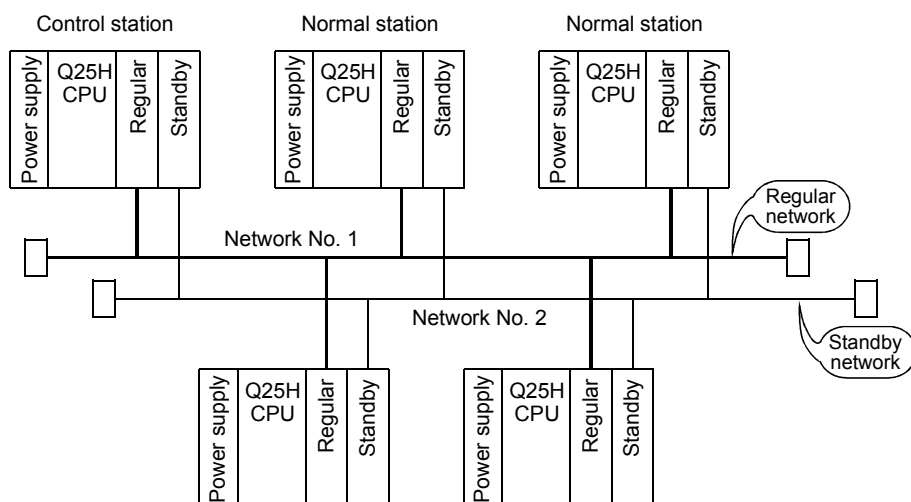
If failure of the control system CPU or a network module occurs, the redundant system switches the control system to the standby system, allowing system control and data linking to be continued on the standby system.

For further information, refer to Section 7.10.1.



2.1.3 Simple dual-structured system (High Performance model QCPU and Process CPU)

In a simple dual-structured system, "regular" and "standby" network modules are installed in each CPU module, so that if the regular network is down, the data link can still be continued by switching to the standby network through link data refresh. For more details, refer to Section 7.7.

**POINT**

Simple dual-structured system cannot be configured with the Basic model QCPU, Redundant CPU, and Universal model QCPU. These CPUs are applicable for a single network system.

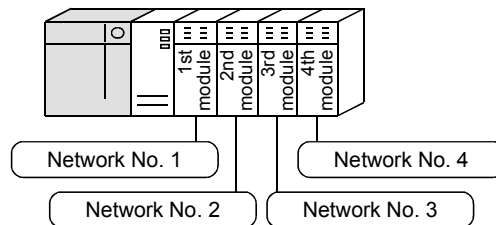
2.1.4 Multiple network system (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)

(1) What is multiple network system

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

- (a) Duplicated setting of a network number is not allowed. The network number can be freely set within a range from 1 to 239 unless the same number is used two or more times in a system.
- (b) A maximum of 4 network modules can be installed per programmable controller.

Note that there are restrictions on the number of modules that can be installed to each programmable controller, depending on the CPU module model. (Refer to Section 2.2.).



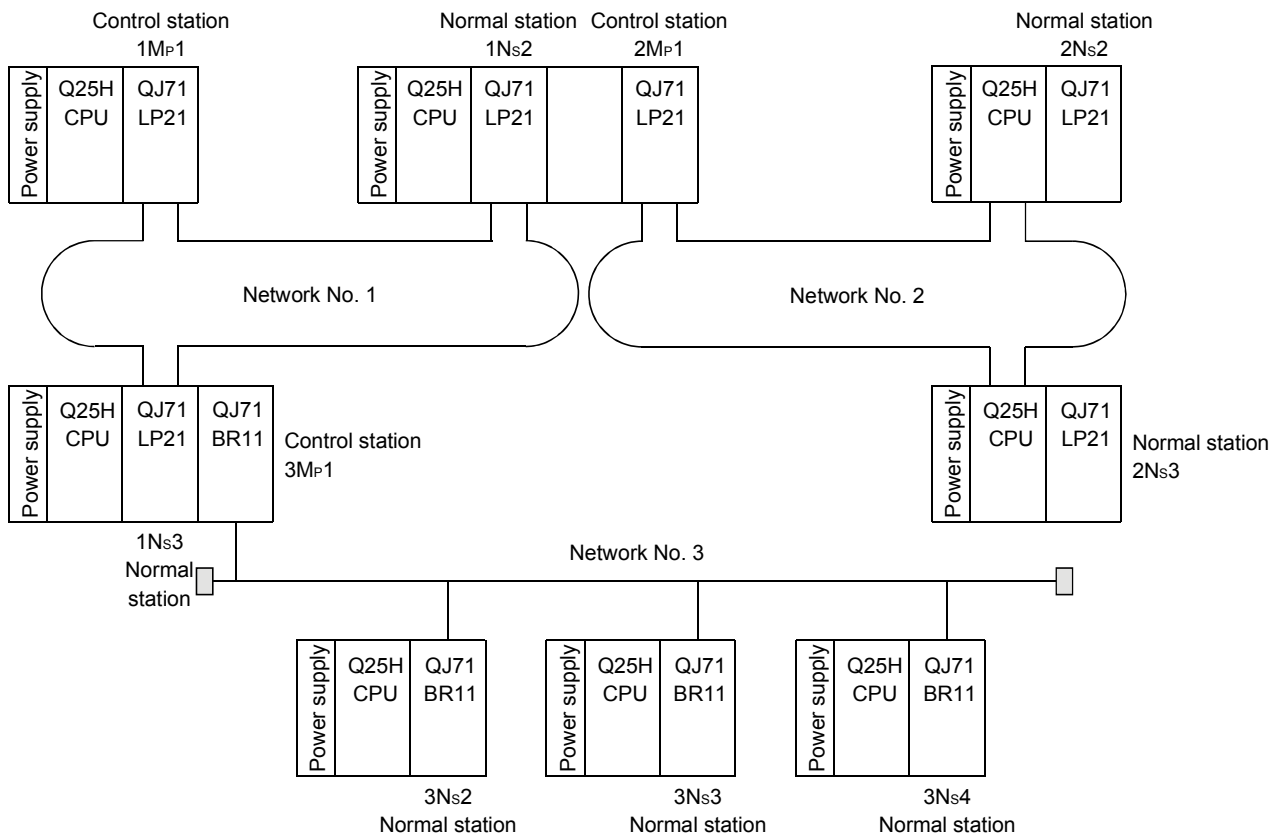
POINT

Only one network module can be mounted to the Basic model QCPU and safety CPU.

For this reason, these CPUs cannot be used as relay stations when constructing a multiple network system using the MELSECNET/H.

(2) Configuration

The following example shows how three networks can be connected.



2.2 Applicable Systems

This section describes the applicable systems.

No. of mountable modules is the maximum number of mountable network modules with CC-Link IE controller network.

(1) Applicable modules and base units, and No. of modules

(a) When mounted with a CPU module

The table below shows the CPU modules and base units applicable to the 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 | | Main base unit | Extension base unit |
| Programmable controller CPU | Basic model QCPU | Q00JCPU | 1 | ○ | ○ |
| | | Q00CPU | | | |
| | | Q01CPU | | | |
| | High Performance model QCPU | Q02CPU | 4 | ○ | ○ |
| | | Q02HCPU | | | |
| | | Q06HCPU | | | |
| | | Q12HCPU | | | |
| | | Q25HCPU | | | |
| | Process CPU | Q02PHCPU | 4 | ○ | ○ |
| | | Q06PHCPU | | | |
| | | Q12PHCPU | | | |
| | | Q25PHCPU | | | |
| | Redundant CPU | Q12PRHCPU | 4* ³ | ○ | × |
| | | Q25PRHCPU | | | |
| | Universal model QCPU | Q02UCPU | 2 | ○ | ○ |
| | | Q03UDCPU | 4 | ○ | ○ |
| | | Q04UDHCPU | | | |
| | | Q06UDHCPU | | | |
| | | Q13UDHCPU | | | |
| | | Q26UDHCPU | | | |
| | | Q03UDECPU | | | |
| | | Q04UDEHCPU | | | |
| | | Q06UDEHCPU | | | |
| | | Q13UDEHCPU | | | |
| | | Q26UDEHCPU | | | |
| | Safety CPU | QS001CPU | 1* ⁴ | ○ | × |
| C Controller module | | Q06CCPU-V | 4* ⁵ | ○ | ○ |
| | | Q06CCPU-V-B | | ○ | ○ |

○: 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: Mountable number for one of the systems.
Use a network module of function version D or later.
- *4: Use a network module of function version D or later, whose serial No. (first five digits) is "08102" or later.
- *5: Use a network module of function version B or later.
Only QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, and QJ71BR11 are mountable.

| |
|---------|
| REMARKS |
|---------|

When using C Controller module, refer to C Controller Module User's Manual.

(b) Mounting to a MELSECNET/H remote I/O station

The network module cannot be mounted to any MELSECNET/H remote I/O station.

Mount it to a CPU module on a master station.

(2) Support of the multiple CPU system

When using the network module in a multiple CPU system, refer to the QCPU User's Manual (Multiple CPU System) first.

To construct the MELSECNET/H with a multiple CPU system, use a network module of function version B or later.

For precautions for the use in a multiple CPU system, refer to Section 2.2.2.

(3) Compatible network modules

Available network types and systems vary depending on the function version of the network module.

(a) When MELSECNET/H mode or MELSECNET/10 mode is used

| | | Compatible network modules |
|--|---------------------|---|
| Q00J/Q00/Q01CPU | Single CPU system | Function version A or later |
| | Multiple CPU system | Function version B or later |
| Q02/Q02H/Q06H/ Q12H/Q25HCPU | Single CPU system | Function version A or later |
| | Multiple CPU system | Function version B or later |
| Q02PH/Q06PH/ Q12PH/Q25PHCPU | Single CPU system | Function version A or later |
| | Multiple CPU system | Function version B or later |
| Q12PRH/Q25PRHCPU | Redundant system | Function version D or later |
| Q02U/Q03UD/Q04UDH/ Q06UDH/Q13UDH/ Q26UDH/Q03UDE/ Q04UDEH/Q06UDEH/ Q13UDEH/Q26UDEHCPU | Single CPU system | Function version A or later |
| | Multiple CPU system | Function version B or later |
| QS001CPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "08102" or later) |

(b) When MELSECNET/H Extended mode is used

| | | Compatible network modules |
|--|---------------------|---|
| Q00J/Q00/Q01CPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) |
| | Multiple CPU system | |
| Q02/Q02H/Q06H/ Q12H/Q25HCPU | Single CPU system | |
| | Multiple CPU system | |
| Q02PH/Q06PH/ Q12PH/Q25PHCPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "07102" or later) |
| | Multiple CPU system | |
| Q12PRH/Q25PRHCPU | Redundant system | Function version D or later (First 5 digits of serial No. is "07102" or later) |
| Q02U/Q03UD/Q04UDH/ Q06UDH/Q13UDH/ Q26UDH/Q03UDE/ Q04UDEH/Q06UDEH/ Q13UDEH/Q26UDEHCPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) |
| | Multiple CPU system | |
| QS001CPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "08102" or later) |

(4) Compatible software packages

The systems using network modules and compatible software packages are shown in the table below.

Using a network module requires GX Developer.

(a) When MELSECNET/H mode or MELSECNET/10 mode is used

| | | Software version |
|---|---------------------|------------------------|
| | | GX Developer |
| Q00J/Q00/Q01CPU | Single CPU system | Version 7 or later |
| | Multiple CPU system | Version 8 or later |
| Q02/Q02H/Q06H/ Q12H/Q25HCPU | Single CPU system | Version 4 or later |
| | Multiple CPU system | Version 6 or later |
| Q02PH/Q06PHCPU | Single CPU system | Version 8.68W or later |
| | Multiple CPU system | |
| Q12PH/Q25PHCPU | Single CPU system | Version 7.10L or later |
| | Multiple CPU system | |
| Q12PRH/Q25PRHCPU | Redundant system | Version 8.18U or later |
| Q02U/Q03UD/Q04UDH/ Q06UDHCPU | Single CPU system | Version 8.48A or later |
| | Multiple CPU system | |
| Q13UDH/Q26UDHCPU | Single CPU system | Version 8.62Q or later |
| | Multiple CPU system | |
| Q03UDE/Q04UDEH/ Q06UDEH/Q13UDEH/ Q26UDEHCPU | Single CPU system | Version 8.68W or later |
| | Multiple CPU system | |
| QS001CPU | Single CPU system | Version 8.40S or later |

(b) When MELSECNET/H Extended mode is used

| | | Software version |
|---|---------------------|------------------------|
| | | GX Developer |
| Q00J/Q00/Q01CPU | Single CPU system | Version 8.20W or later |
| | Multiple CPU system | |
| Q02/Q02H/Q06H/ Q12H/Q25HCPU | Single CPU system | Version 8.20W or later |
| | Multiple CPU system | |
| Q02PH/Q06PHCPU | Single CPU system | Version 8.68W or later |
| | Multiple CPU system | |
| Q12PH/Q25PHCPU | Single CPU system | Version 8.20W or later |
| | Multiple CPU system | |
| Q12PRH/Q25PRHCPU | Redundant system | Version 8.29F or later |
| Q02U/Q03UD/Q04UDH/ Q06UDHCPU | Single CPU system | Version 8.48A or later |
| | Multiple CPU system | |
| Q13UDH/Q26UDHCPU | Single CPU system | Version 8.62Q or later |
| | Multiple CPU system | |
| Q03UDE/Q04UDEH/ Q06UDEH/Q13UDEH/ Q26UDEHCPU | Single CPU system | Version 8.68W or later |
| | Multiple CPU system | |
| QS001CPU | Single CPU system | Version 8.40S or later |

2.2.1 Precautions when using link dedicated instructions

When accessing to other stations from MELSECNET/H network modules (who issue the request) with function version B or later upon link dedicated instructions, the handling methods are different depending on the module of the target station. The handling methods for each module of the target station are explained below.

(1) Link dedicated instructions modified for function version B

The data length of the SEND, READ, SREAD, WRITE and SWRITE instructions is changed (480 words → 960 words.)

(a) When the target station is a network module

| Request issued by | Target station | | | |
|-------------------|--------------------------------------|----------------------------|--------------------|-----------------------------|
| | CC-Link IE controller network module | MESLECNET/H network module | | MESLECNET/10 network module |
| | | Function version B or D | Function version A | |
| 480 words or less | ○ | ○ | ○ | ○ |
| 481 to 960 words | ○ | ○ | x*1 | x |

○: Processed normally

x: Ends abnormally. Error code returned to the request source.

*1: The SEND instruction ends abnormally. Error code returned to the request source.

The READ, SREAD, WRITE, and SWRITE instructions are processed normally.

(b) When the target station is a Q series Ethernet module

| Request issued by | Target station (Q series Ethernet module) | | | |
|-------------------|---|---------------------|--------------------|--------------------|
| | Function version D | | Function version B | Function version A |
| | 07082 or later *3 | 07081 or earlier *3 | | |
| 480 words or less | ○ | ○ | ○ | ○ |
| 481 to 960 words | ○ | x*1 | x*1 | x*2 |

○: Processed normally

x: Ends abnormally. Error code returned to the request source.

*1: The SEND instruction ends abnormally. Error code returned to the request source.

The READ, SREAD, WRITE, and SWRITE instructions are processed normally.

*2: The operations for the SEND instruction are not normal. (Error support available F7C3H)

The READ, SREAD, WRITE, and SWRITE instructions are processed normally.

*3: Shows the first 5 digits of the serial number.

(2) Instructions added for function version B

| Request issued by | Target station | | | |
|---------------------------|--------------------------------------|----------------------------|-----------------------------|--------------------------|
| | CC-Link IE controller network module | MELSECNET/H network module | MELSECNET/10 network module | Q series Ethernet module |
| RRUN, RSTOP, RTMRD, RTMWR | ○ | ○ | × | ○ |

○: Processed normally.

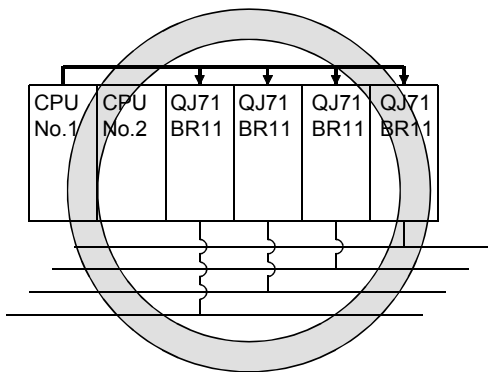
×: Ends abnormally. Error code returned to the request source.

2.2.2 Precautions when using network modules in the multiple CPU system

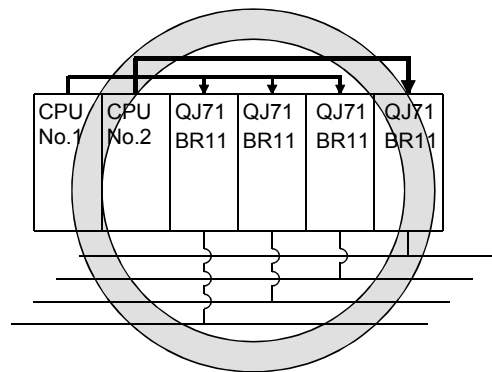
Pay attention to the following points when structuring a MELSECNET/H network system with a multiple CPU system.

- (1) Set the network parameters in the control CPU that controls the network modules.
- (2) A maximum of four network modules can be set for each control CPU module.
Note that a total of four network modules can be mounted onto the multipul CPU system.

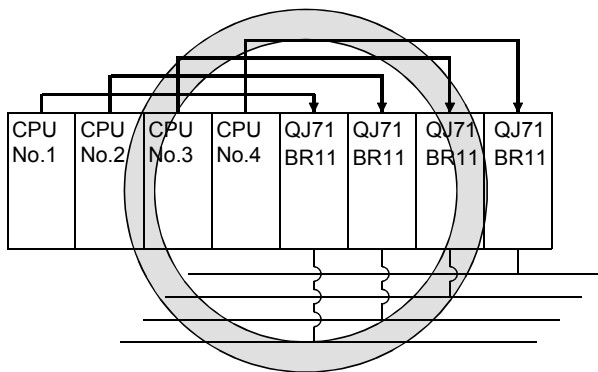
(a) CPU No.1 controls all network modules.



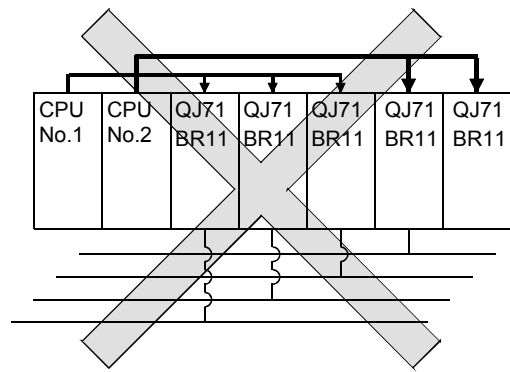
(b) CPU No.1 and CPU No.2 control network modules separately.



(c) CPU No.1 to CPU No.4 control each network module.



(d) Up to 4 network modules can be mounted on the system.



* : The number of modules exceeded the limit.

(3) Precautions for execution of transient transmission

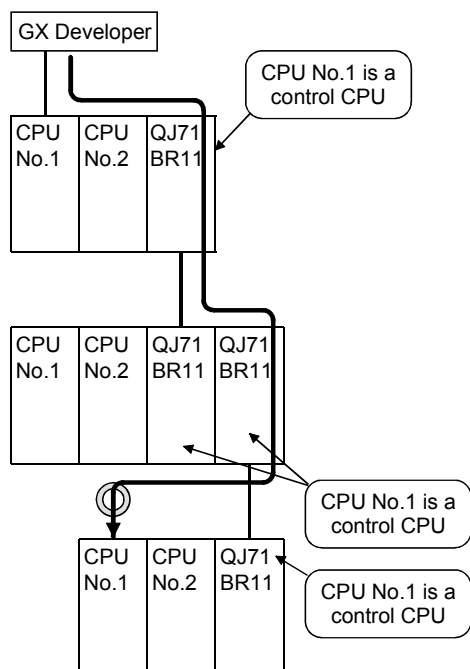
(a) Access range of GX Developer

When connecting the GX Developer to a CPU module and accessing other stations, it is possible for the GX Developer to access up to the 8th network system whether the relay stations on the multiple CPU system are control or non-control CPUs.

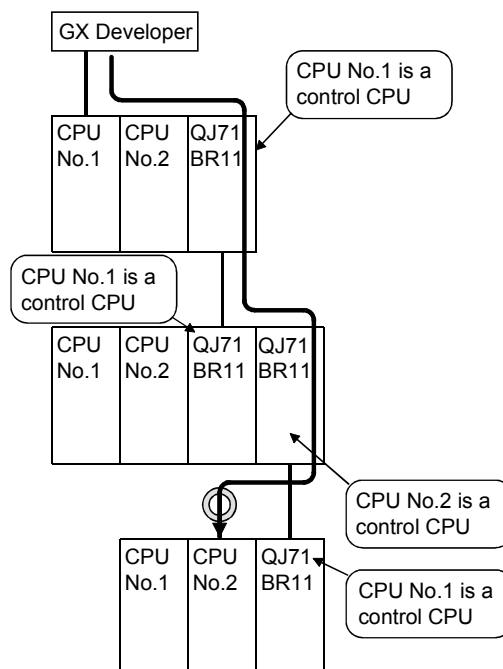
(Refer to Routine Functions in section 7.4.2.)

It is also possible for the GX Developer to access either a control or non-control CPU if the target station is in a multiple CPU system.

- 1) Relaying is possible if the relay station's control CPU is the same



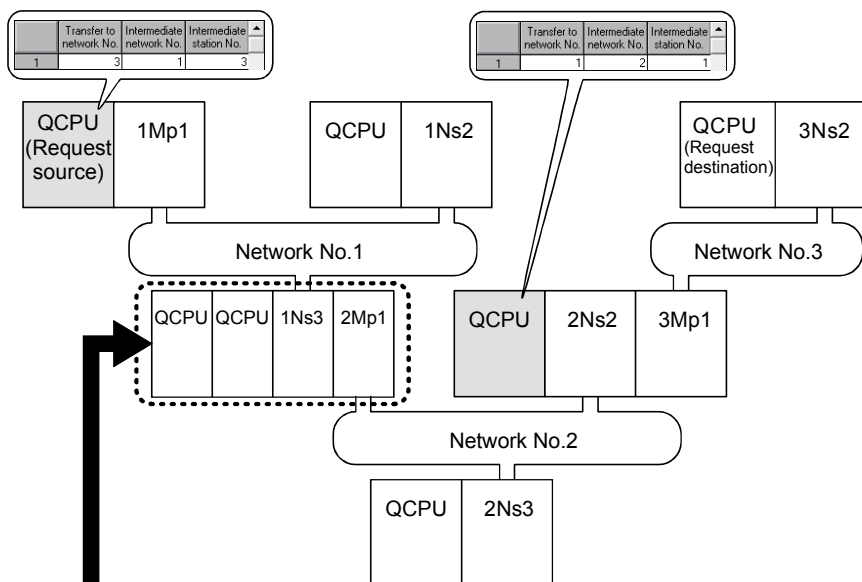
- 2) Relaying is also possible if the relay station's control CPU is different



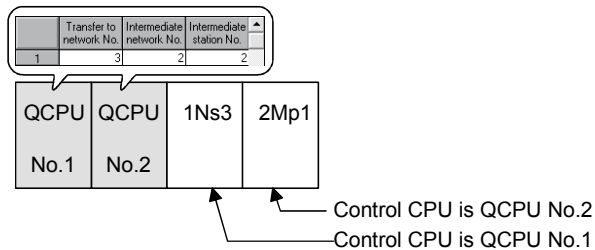
(b) Setting routing parameters

If different control CPUs are set to relay stations, set the same routing parameter to each of the control CPUs.

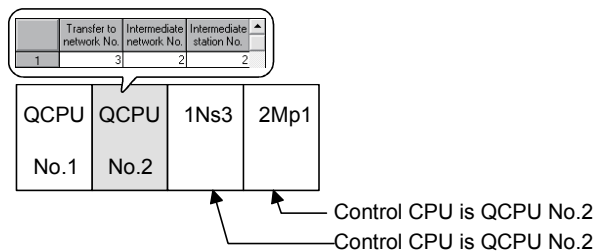
The following illustration shows a setting example where transient data are transmitted from 1Mp1 to 3Ns2.



1) When different control CPUs are set to relay stations, set the same routing parameter.



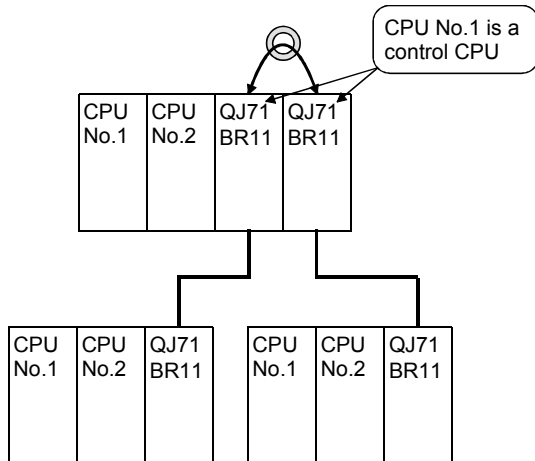
2) When the same control CPU is set to relay stations, set the routing parameter only to the control CPU.



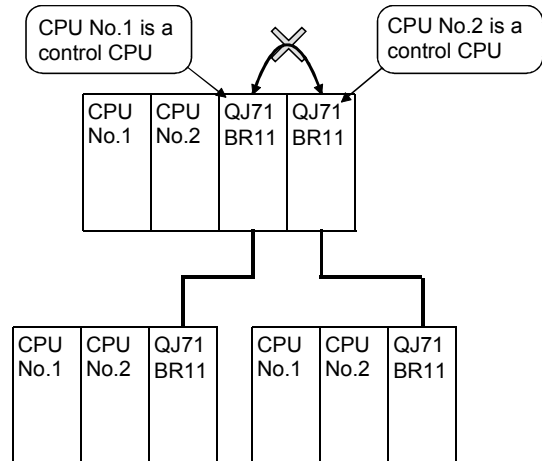
- (4) Data cannot be transferred between data links with data link transmission parameters if the control CPUs of the network modules on the multipul CPU system are different.

To transfer data to another network, use the CPU shared memory.

(a) Transmission between data links possible



(b) Transmission between data links not possible



(5) Precautions for executing a link dedicated instruction to a multiple CPU system
(Group specification, All stations)

If a WRITE/SWRITE, REQ, RRUN/RSTOP or RTMWR instruction is issued under the following conditions (a), it may not be executed on some stations depending on the system configuration (Control CPU setting) of the target multiple CPU system. (See (b).)

(a) Execution conditions

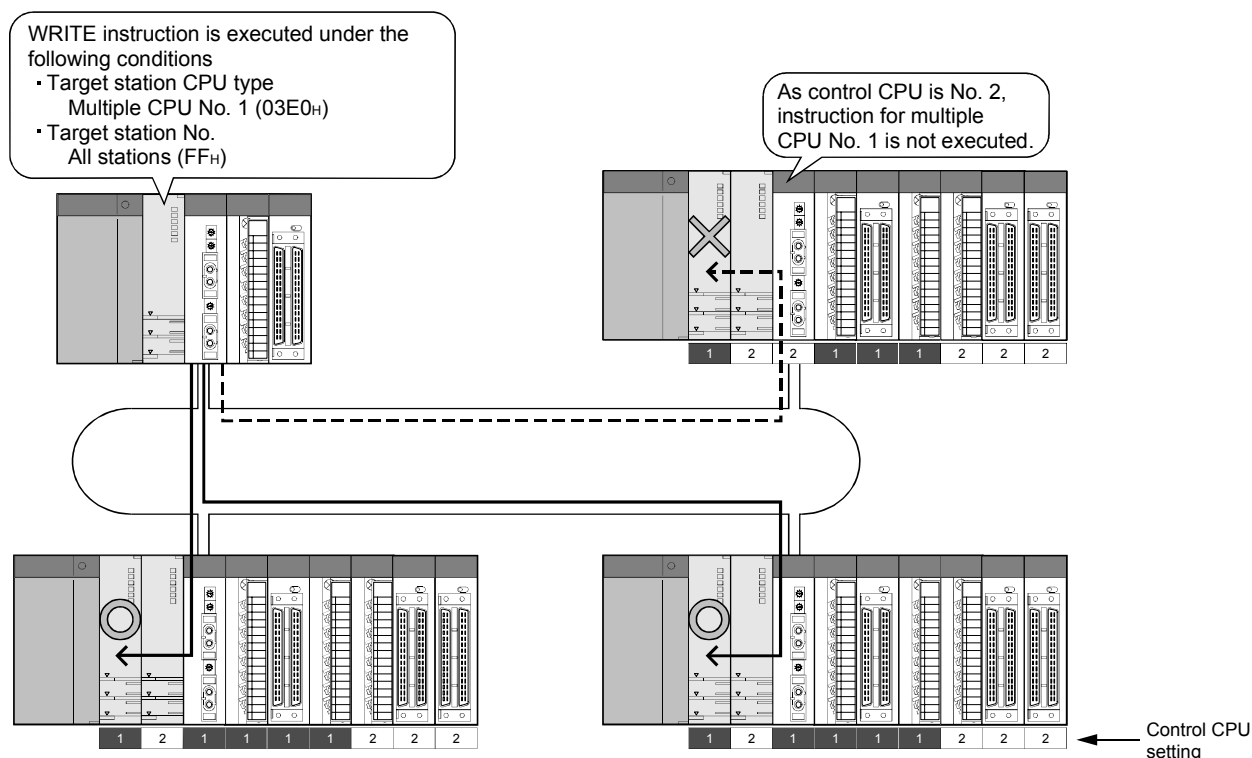
| Item | Setting |
|--|--|
| Target station CPU type ((S1)+3) setting | Set the CPU type to any of the following. <ul style="list-style-type: none"> • Multiple CPU No. 1 (03E0_H) • Multiple CPU No. 2 (03E1_H) • Multiple CPU No. 3 (03E2_H) • Multiple CPU No. 4 (03E3_H) |
| Target station No. ((S1)+5) setting | Set the station No. of the target station to either of the following. <ul style="list-style-type: none"> • Group specification (81_H to A0_H) • All stations (FF_H) |

(b) Execution result

| Target station No. ((S1)+5) setting | Target station CPU type ((S1)+3) setting | Execution result | | | |
|--|---|--|--|--|--|
| | | Target station's control CPU is No.1 | Target station's control CPU is No.2 | Target station's control CPU is No.3 | Target station's control CPU is No.4 |
| Group specification (81 _H to A0 _H) or All stations (FF _H) | Multiple CPU No.1 (03E0 _H) | ○ | × | × | × |
| | Multiple CPU No.2 (03E1 _H) | × | ○ | × | × |
| | Multiple CPU No.3 (03E2 _H) | × | × | ○ | × |
| | Multiple CPU No.4 (03E3 _H) | × | × | × | ○ |

○ : The instruction is executed.

×



- (6) When all of the following conditions from a) to d) are met, use a MELSECNET/H module whose first five digits of the serial number is "10042" or later.
 - (a) A multiple CPU system containing a Built-in Ethernet port QCPU is configured.
 - (b) To the Ethernet port of the Built-in Ethernet port QCPU, GX Developer or GOT is connected.
 - (c) From GX Developer or GOT, access is made to another station through a MELSECNET/H module controlled by another CPU.
 - (d) The access target on another station is an A/QnQ series CPU module.

2.2.3 List of functions for each CPU module

The available functions of the MELSECNET/H depend on the CPU module to which a network module is mounted.

1)High Performance model QCPU, Process CPU

2)Basic model QCPU

3)Redundant CPU

4)Universal model QCPU

5)Safety CPU

| Function | CPU module | | | | | Reference section |
|--|------------|-----------------|----|-----------------|-------------------|-------------------|
| | 1) | 2) | 3) | 4) | 5) | |
| Cyclic transmission function | ○ | ○ | ○ | ○ | ○ | Section 3.2.1 |
| MELSECNET/H Extended mode | ○ | ○ | ○ | ○ | ○ | Section 5.1 |
| Refresh parameter | ○ | ○ ^{*1} | ○ | ○ | ○ ^{*1} | Section 5.7 |
| Common parameter | ○ | ○ ^{*2} | ○ | ○ | ○ ^{*2} | Section 5.3 |
| Station inherent parameter | ○ | × | ○ | ○ | × | Section 5.6 |
| Inter-link data transfer function | ○ | × | ○ | ○ ^{*5} | × | Section 7.2 |
| Designation of I/O master station | ○ | ○ | ○ | ○ | ○ | Section 5.3.3 |
| Designation of reserved station | ○ | ○ | ○ | ○ | ○ | Section 5.3.4 |
| Low-speed cyclic transmission function | ○ | × | ○ | ○ ^{*5} | × | Section 7.3 |
| Redundant system function | × | × | ○ | × | × | Section 7.10 |
| Transient transmission function | ○ | ○ | ○ | ○ | ○ | Section 7.4 |
| Routing function | ○ | ○ ^{*1} | ○ | ○ | ○ ^{*1} | Section 7.4.2 |
| Group function | ○ | ○ | ○ | ○ | ○ | Section 7.4.3 |
| Message sending function using logical channel numbers | ○ | ○ | ○ | ○ | × | Section 7.4.4 |
| Link dedicated instruction | ○ | ○ ^{*3} | ○ | ○ | ○ ^{*3*6} | Section 7.4.5 |
| RAS function | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Automatic return function | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Control station shift function | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Control station return control function | ○ | ○ | ○ | ○ | × | Section 3.2.2 |
| Loopback function | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Station detach function | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Transient transmission possible even in case of CPU error | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Confirmation of transient transmission error detection time | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Module diagnosis | ○ | ○ | ○ | ○ | ○ | Section 3.2.2 |
| Network test | ○ | ○ ^{*7} | ○ | ○ ^{*5} | ○ ^{*7} | Section 7.8 |
| Network diagnosis | ○ | ○ | ○ | ○ | ○ | Section 8.1 |
| Direct accessing of link device | ○ | ○ | ○ | ○ | × | Section 7.1 |
| Clock setting to a station on the network by GX Developer | ○ | ○ | ○ | ○ | ○ | Section 7.4.6 |
| Getting the interrupt sequence program started | ○ | ○ ^{*4} | ○ | ○ | × | Section 7.5 |
| Multiplexed transmission function | ○ | ○ | ○ | ○ | ○ | Section 7.6 |
| Simplified redundant setting of network | ○ | × | × | × | × | Section 7.7 |
| Increasing the number of send points by connecting multiple modules of the same network number | ○ | × | ○ | ○ | × | Section 7.9 |

○: Available, ×: Unavailable

*1: Up to 8 modules can be set.

*2: The low-speed LB/LW cannot be set because these models do not support the low-speed cyclic transmission function.

*3: The SREAD/SWRITE instruction's read/write notice device (D3) becomes invalid. (The same operation as the READ/WRITE instructions takes place.)

*4: It is available for the Basic model QCPU of function version B or later.

*5: Available for the Universal model QCPU whose serial No. (first 5 digits) is "09042" or later.

*6: For link dedicated instruction for the safety CPU, refer to Section 6.3.

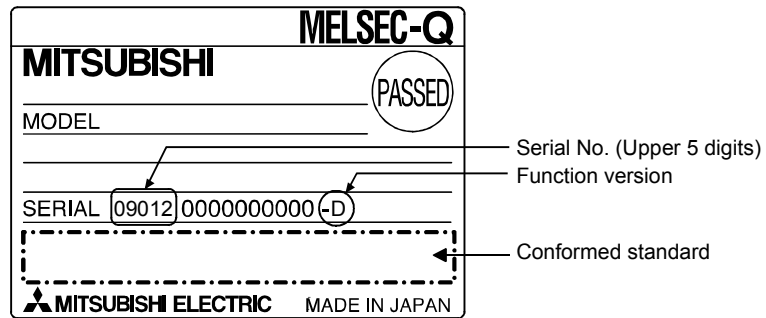
*7: Basic model QCPU and safety CPU cannot execute a network test on a sequence program.

2.3 Checking the function version and serial number

This section describes how to check the function version and serial number of a network module.

(1) Checking the "Rating plate" on the side of the module

The serial No. and function version of the module are displayed in the SERIAL line of the rating plate.



(2) Checking through GX Developer

The following explains how to check the serial No. and function version of the target module through GX Developer.

The serial No. and function version are displayed on the "Product Information List" or the "Module's Detailed Information" screen of GX Developer.

The following diagram shows how to check the serial No. and function version on the "Product Information List" screen.

[Startup procedure]

"Diagnostics" → "System monitor" → "Product Information List"

[illegible]

[Serial No., Ver., Product No.]

- The serial No. of the target module is displayed in the serial No. column.
- The function version of the target module is displayed in the Ver. column.
- The serial No. (Product No.) shown on the rating plate is displayed in the Product No. column. *1

Note that "-" is displayed in the Product No. column for the network module since this module is not supporting Product No. display.

*1: The Product No. is displayed in the column only when the Universal model QCPU is used.

POINT

The serial No. described on the rated plate may not match with the serial No. displayed on the product information of GX Developer.

- The serial No. on the rated plate describes the management information of the product.
- The serial No. displayed on the product information of GX Developer describes the function information of the product.

The function information of the product is updated when adding functions.

3 SPECIFICATIONS

This chapter explains the performance specifications and function specifications of the network modules as well as the specifications of the send/receive processing time of the link data.

For details on the general specifications, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

3.1 Performance Specifications

3.1.1 Performance specifications of the QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, QJ71LP21GE and QJ71BR11 network modules

Table 3.1 lists the performance specifications of the network modules.

Table 3.1 Performance specifications of the network modules

| Item | | Optical loop system | | | | |
|--|--|--|---|--------------------------------------|--|------------|
| | | QJ71LP21 | QJ71LP21-25 | QJ71LP21S-25 | QJ71LP21G | QJ71LP21GE |
| Maximum number of link points per network | LX/LY | 8192 points | | | | |
| | LB | 16384 points (8192 points in the MELSECNET/10 mode) | | | | |
| | LW | 16384 points (8192 points in the MELSECNET/10 mode) | | | | |
| Maximum number of link points per station *1 | | $\{(LY + LB) / 8 + (2 \times LW)\} \leq 2000$ bytes | • MELSECNET/H mode. MELSECNET/10 mode $\{(LY + LB) / 8 + (2 \times LW)\} \leq 2000$ bytes • MELSECNET/H Extended mode $\{(LY + LB) / 8 + (2 \times LW)\} \leq 35840$ bytes | | | |
| Communication speed | | 10 Mbps | 25 Mbps/10 Mbps (Change with MODE switch) | | 10 Mbps | |
| Number of stations per network | | Up to 64 stations (1 control station, 63 normal stations) | | | | |
| Connection cable | | Optical fiber cable *2 | | | | |
| Overall distance | | 30km | | | | |
| Distance between stations*2 | During 25Mbps | — | SI optical cables: 200m H-PCF optical cables: 400m Broad-band H-PCF Optical Cables: 1km QSI optical cables: 1km | | — | |
| | During 10Mbps | SI optical cables: 500m H-PCF optical cables: 1km Broad-band H-PCF optical cables: 1km QSI optical cables: 1km | | | GI-50/125 optical cables: 2km GI-62.5/125 optical cables: 2km | |
| Maximum number of networks | | 239 (total including remote I/O networks) | | | | |
| Maximum number of groups | | 32 (9 in the MELSECNET/10 mode) | | | | |
| Transmission path format | | Duplex loop | | | | |
| Communication method | | Token ring | | | | |
| Synchronous method | | Frame synchronous | | | | |
| Encoding method | | NRZI code (Non Return to Zero Inverted) | | | | |
| Transmission format | | Conforms to HDLC (frame type) | | | | |
| Error control system | | Retries based on CRC ($X^{16} + X^{12} + X^5 + 1$) and timeover | | | | |
| RAS function | | • Loopback function upon abnormal detection and cable breakage (optical loop system only) • Diagnostic function of host link line check • Prevention of system down by switching the control station • Abnormal detection using link special relays and link special registers | | | | |
| Transient transmission | | • N:N communication (monitor, program upload/download, etc.) • Various send/receive instructions from sequence programs (ZNRD/ZNWR, SEND/RECV, RECVS, READ/WRITE, SREAD/SWRITE, REQ, RRUN/RSTOP, RTMRD/RTMWR.) • Send function addressed to logical channel number of channel numbers 1 to 8 | | | | |
| Number of occupied I/O points | | 32 (Intelligent function module: 32) | 48 (I/O assignment: Empty; first 16, intelli.; last 32)*3 | 32 (Intelligent function module: 32) | | |
| External Power Supply | Voltage | — | 20.4 to 31.2 V DC | — | | |
| | Current | — | 0.20 A | — | | |
| | Size of terminal screw | — | M3 Screw | — | | |
| | Suitable crimp terminal | — | R1.25-3 | — | | |
| | Suitable cable size | — | 0.3 to 1.25 mm ² | — | | |
| | Tightening torque | — | 0.42 to 0.58 N·m | — | | |
| | Allowable momentary power failure time | — | 1ms (Level PS1) | — | | |
| | Noise immunity | — | By noise simulator of 500Vp-p noise voltage, 1μs noise width, and 25 to 60Hz noise frequency | | — | |
| Current consumed internally with 5VDC | | 0.55 A | | | | |

Table 3.1 Performance specifications of the network modules (continued)

| Item | Optical loop system | | | | |
|---------------------|--|-------------|--|--|------------|
| | QJ71LP21 | QJ71LP21-25 | QJ71LP21S-25 | QJ71LP21G | QJ71LP21GE |
| External dimensions | 98 (3.86)(H) × 27.4 (1.08)(W) × 90 (3.54)(D) [mm (inch)] | | 98 (3.86)(H) × 55.2 (2.18)(W) × 90 (3.54)(D) [mm (inch)] | 98 (3.86)(H) × 55.2 (2.18)(W) × 90 (3.54)(D) [mm (inch)] | |
| Weight | 0.11 kg | | 0.20kg | 0.11kg | |

* 1 The number of LY points of the stations set in the I/O master station is the sum total of the LY points for output to all stations within the block.

* 2 For old optical fiber cables (A-2P-□), L type differs from H type in the distance between stations. Refer to Section 4.6.1 for details.

* 3 Two slots are occupied.

Set the numeric value resulted from adding 10H to the I/O No. of the slot where a module mounted as the "Starting I/O No." of the "Network parameter". The first empty 16 points can be set to "0" on the "I/O assignment" tab screen within the "Q Parameter" screen.

Example: Set 10H as the "Starting I/O No." when the module is mounted on slot 0.

(Set 0H as the "Starting I/O No." when 0 has been set to slot 0 on the "I/O assignment" tab screen.)

Table 3.1 Performance specifications of the network modules (continued)

| Item | | Coaxial bus system | |
|--|-------|--|--|
| | | QJ71BR11 | |
| Maximum number of link points per network | LX/LY | 8192 points | |
| | LB | 16384 points (8192 points in the MELSECNET/10 mode) | |
| | LW | 16384 points (8192 points in the MELSECNET/10 mode) | |
| Maximum number of link points per station *1 | | <ul style="list-style-type: none"> MELSECNET/H mode, MELSECNET/10 mode $\{(LY + LB) / 8 + (2 \times LW)\} \leq 2000$ bytes MELSECNET/H Extended mode $\{(LY + LB) / 8 + (2 \times LW)\} \leq 35840$ bytes | |
| Communication speed | | 10 Mbps | |
| Number of stations per network | | Up to 32 stations (1 control station, 31 normal stations) | |
| Connection cable | | Coaxial cable | |
| Overall distance for one network (distance between stations) | 3C-2V | 300m (300m between stations) * 4 | |
| | | 500m (500m between stations) * 4 | |
| | 5C-2V | Can be extended up to 2.5km with the use of a repeater unit (A6BR10, A6BR10-DC.) | |
| Maximum number of networks | | 239 (total including remote I/O networks) | |
| Maximum number of groups | | 32 (9 in the MELSECNET/10 mode) | |
| Transmission path format | | Single bus | |
| Communication method | | Token bus | |
| Synchronous method | | Frame synchronous | |
| Encoding method | | Manchester code | |
| Transmission format | | Conforms to HDLC (frame type) | |
| Error control system | | Retries based on CRC ($X^{16} + X^{12} + X^5 + 1$) and timeover | |
| RAS function | | <ul style="list-style-type: none"> Diagnostic function of host link line check Prevention of system down by switching the control station Abnormal detection using link special relays and link special registers | |
| Transient transmission | | <ul style="list-style-type: none"> N:N communication (monitor, program upload/download, etc.) Various send/receive instructions from sequence programs (ZNRD/ZNWR, SEND/RECV, RECVS, READ/WRITE, SREAD/SWRITE, REQ, RRUN/RSTOP, RTMRD/RTMWR.) Send function addressed to logical channel number of channel numbers 1 to 8 | |
| Special cyclic transmission function | | <ul style="list-style-type: none"> Low-speed cyclic transmission function | |
| Number of occupied I/O points | | 32 points (intelligent function modules: 32 points) | |
| Current consumed internally with 5 V DC | | 0.75A | |
| External dimensions | | 98 (3.86)(H) × 27.4 (1.08)(W) × 90 (3.54)(D) [mm (inch)] | |
| Weight | | 0.11kg | |

* 1 The number of LY points of the stations set in the I/O master station is the sum total of the LY points for output to all stations within the block.

* 4 Certain restrictions exist in cable length between stations depending on the number of stations connected. Refer to section 4.6.2 for further details.

3.1.2 Optical fiber cable specifications

This section explains the specifications of the optical fiber cables used with the MELSECNET/H optical loop system. Confirm that the cable in use conforms to the details of the optical fiber cable specifications.

A technical skill and a special tool are needed when connecting an optical fiber cable to an exclusive connector.

Optical fiber cables with connectors are available from Mitsubishi Electric System & Service Co. Ltd. (Catalogs of the optical fiber cables are also available.)

For cabling, consult your local Mitsubishi Electric System & Service representative.

Table 3.2 Optical fiber cable specifications

| Item | | SI (Multi-particulate glass) | H-PCF (Plastic-clad) | Broad-band H-PCF (Plastic-clad) | QSI (Quartz glass) | GI-50/125 (Quartz glass) | GI-62.5/125 (Quartz glass) |
|---------------------------|---------|--|----------------------|---------------------------------|--------------------|--------------------------|----------------------------|
| Distance between stations | 10 Mbps | 500m | 1 km | 1 km | 1 km | 2 km | 2 km |
| | 25 Mbps | 200m | 400m | 1 km | 1 km | Must not be used | Must not be used |
| Transmission loss | | 12 dB/km | 6 dB/km | 5 dB/km | 5.5 dB/km | 3 dB/km | 3 dB/km |
| Core diameter | | 200 μm | 200 μm | 200 μm | 185 μm | 50 μm | 62.5 μm |
| Clad diameter | | 220 μm | 250 μm | 250 μm | 230 μm | 125 μm | 125 μm |
| Primary membrane | | 250 μm | — | — | 250 μm | — | — |
| Applicable connector | | F06/F08 or equivalent (JIS C5975/5977 conformance) | | | | | |

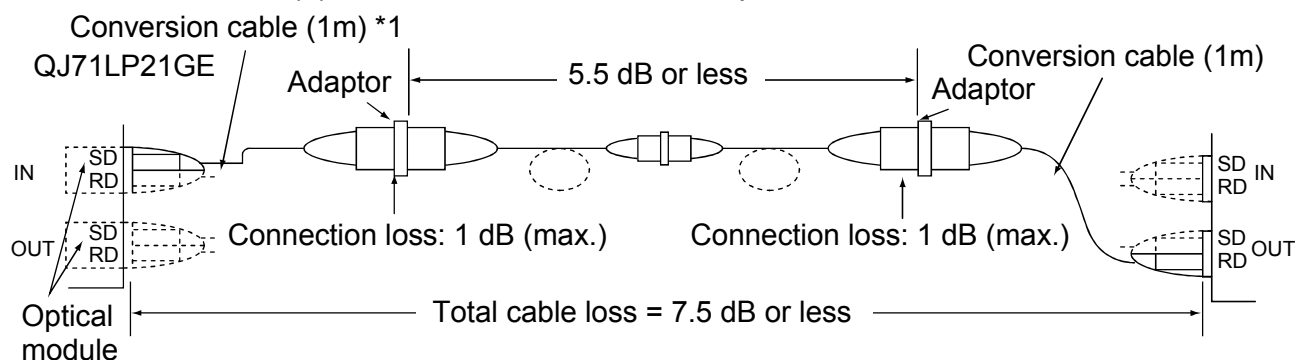
REMARKS

The following types of optical fiber cables are available.

- A type : Cable for connection inside control panel
- B type : Cable for connection between control panels inside a building
- C type : Cable for outdoor connection
- DL type : Reinforced cable for outdoor connection

For other special-purpose cables such as flexible cables or heat-resistant cables, contact Mitsubishi Electric System & Service Co., Ltd.

(1) Cable loss of GI-62.5/125 optical fiber cable



*1: Conversion cable

| Conversion Type | Cable |
|------------------------------------|---------------------|
| CA type \leftrightarrow FC type | AGE-1P-CA/FC1.5M-A |
| CA type \leftrightarrow ST type | AGE-1P-CA/ST1.5M-A |
| CA type \leftrightarrow SMA type | AGE-1P-CA/SMA1.5M-A |

Purchased from: Mitsubishi Electric Europe GmbH

3.1.3 Coaxial cable specifications

The following table lists the specifications of the coaxial cables used for the coaxial bus system.

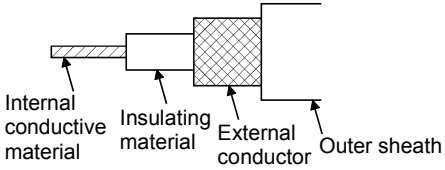
The high frequency coaxial cable "3C-2V" or "5C-2V" (conforms to JIS C 3501) is used.

(1) Coaxial cable specifications

The specifications of the coaxial cable are shown in Table 3.3.

Select coaxial cables that meet the operating ambient temperature (0 to 55°C) shown in the general specifications of the programmable controller.

Table 3.3 Coaxial cable specifications

| Item | 3C-2V | 5C-2V |
|-------------------------------|--|---|
| Structure |  | |
| Cable diameter | 5.4 mm (0.21 in.) | 7.4 mm (0.29 in.) |
| Minimum allowable bend radius | 22 mm (0.87 in.) or more | 30 mm (1.18 in.) or more |
| Internal conductor diameter | 0.5 mm (0.02 in.) (annealed copper wire) | 0.8 mm (0.03 in.) (annealed copper wire) |
| Insulating material diameter | 3.1 mm (0.12 in.) (polyethylene) | 4.9 mm (0.19 in.) (polyethylene) |
| External conductor diameter | 3.8 mm (0.15 in.) (single annealed copper wire mesh) | 6.6 mm (0.26 in.) (single annealed copper wire mesh) |
| Applicable connector plug | 3C-2V connector plug (BNC-P-3-NiCAu is recommended.) | 5C-2V connector plug (BNC-P-5-NiCAu is recommended.) |

REMARKS

Consult the nearest Mitsubishi representative for connector plugs.

(2) Connecting the coaxial cable connectors

The following section explains how to connect the BNC connector (the connector plug for the coaxial cable) to the cable.

**CAUTION**

- Solder the coaxial cable connectors properly. Insufficient soldering may result in malfunctions.

(a) Structure of the BNC connector and coaxial cable

The structure of the BNC connector and coaxial cable are shown in Figure 3.1.

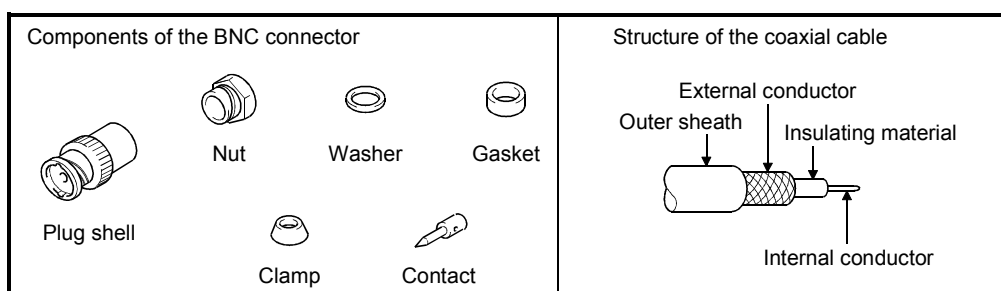
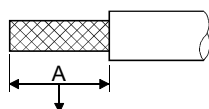


Figure 3.1 Structure of the BNC connector and coaxial cable

(b) How to connect the BNC connector and the coaxial cable

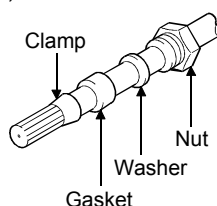
- 1) Cut the portion of the outer sheath of the coaxial cable as shown in the diagram below.



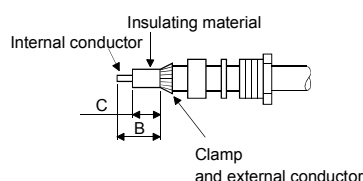
Cut this portion of the outer sheath

| Cable | A |
|------------------|-----------------|
| 3C-2V | 15mm (0.59 in.) |
| 5C-2V, 5C-2V-CCY | 10mm (0.39 in.) |

- 2) Fit the nut, washer, gasket and clamp onto the coaxial cable, as shown below, and then loosen the external conductor.

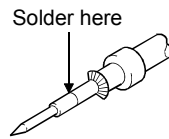


- 3) Cut the external conductor, insulating material and internal conductor to the dimensions shown below. Note that the external conductor should be cut to the same dimension as the tapered section of the clamp and smoothed down to the clamp.

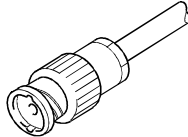


| Cable | B | C |
|------------------|----------------|----------------|
| 3C-2V | 6mm (0.24 in.) | 3mm (0.12 in.) |
| 5C-2V, 5C-2V-CCY | 7mm (0.28 in.) | 5mm (0.20 in.) |

- 4) Solder the contact to the internal conductor.



- 5) Insert the connector assembly shown in (4) into the plug shell and screw the nut into the plug shell.



- (1) Note the following precautions when soldering the internal conductor and contact.

- Make sure that the solder does not bead up at the soldered section.
- Make sure there are no gaps between the connector and cable insulator or they do not cut into each other.
- Perform soldering quickly so the insulation material does not become deformed.

- (2) Before connecting or disconnecting the coaxial connector, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may result in a module malfunction.

3.2 Function Specifications

This section describes the functions of the MELSECNET/H.
The list of functions is shown below:

| | | | |
|-----------------------|--|---|-------------------|
| Basic functions | Cyclic transmission function (Periodical communication) | Communication using LB/LW | Section 3.2.1 (1) |
| | | Communication using LX/LY | Section 3.2.1 (2) |
| | RAS function | Automatic return function | Section 3.2.2 (1) |
| | | Control station switch function | Section 3.2.2 (2) |
| | | Control station return control function | Section 3.2.2 (3) |
| | | Loopback function (optical loop system) | Section 3.2.2 (4) |
| | | Prevention of station failure by using external power supply (Optical loop system) | Section 3.2.2 (5) |
| | | Station detach function (coaxial bus system) | Section 3.2.2 (6) |
| | | Transient transmission enabled even at CPU module error | Section 3.2.2 (7) |
| | | Checking transient transmission abnormal detection time | Section 3.2.2 (8) |
| | | Diagnostic function | Section 3.2.2 (9) |
| Application functions | Direct access to link devices | | Section 7.1 |
| | Cyclic transmission function (Periodical communication) | Inter-link data transfer function | Section 7.2 |
| | | Low-speed cyclic transmission | Section 7.3 |
| | Transient transmission function (Non-periodical communication) | Communication function | Section 7.4.1 |
| | | Routing function | Section 7.4.2 |
| | | Group function | Section 7.4.3 |
| | | Message transmission function using logical channel numbers | Section 7.4.4 |
| | | Data sending/receiving (SEND/RECV) | Section 7.4.5 (1) |
| | | Other station word device read/write (READ/SREAD/WRITE/SWRITE) | Section 7.4.5 (2) |
| | | Other station transient request (REQ) | Section 7.4.5 (3) |
| | | Other station word device read/write (ZNRD/ZNWR) | Section 7.4.5 (4) |
| | | Remote RUN/Remote STOP (RRUN/RSTOP) | Section 7.4.5 (5) |
| | | Reading and writing other station CPU module's clock data (RTMRD/RTMWR) | Section 7.4.5 (6) |
| | Clock setting to stations on a network using GX Developer | | Section 7.4.6 |
| | Starting interrupt sequence program ——— Message receiving "1 scan completion" (RECVS) | | Section 7.5 |
| | Multiplex transmission function (optical loop system) | | Section 7.6 |
| | Simple dual-structured network | | Section 7.7 |
| | Stopping/restarting of cyclic transmission and stopping link refresh (network test) | | Section 7.8 |
| | Increasing number of send points by installing multiple modules with the same network number | | Section 7.9 |
| | Redundant system function | Pairing setting | Section 7.10.3 |
| | | Redundant settings | Section 7.10.4 |
| | | System switching request function | Section 7.10.5 |
| | Network diagnostic (line monitor) | | Section 8.1 |

3.2.1 Cyclic transmission function (periodical communication)

The cyclic transmission function periodically allows data communication between stations on the same network using the link devices (LB/LW/LX/LY).

In this manual, the devices on the network module side are prefixed by "L" so that devices on the CPU module side (B/W/X/Y) and the link devices on the network module side can be distinguished.

(1) Communication using LB/LW

By using this function, it is possible to write data to the link relay (LB) and link register (LW) of the network module and to send the data to all the stations connected within the same network.

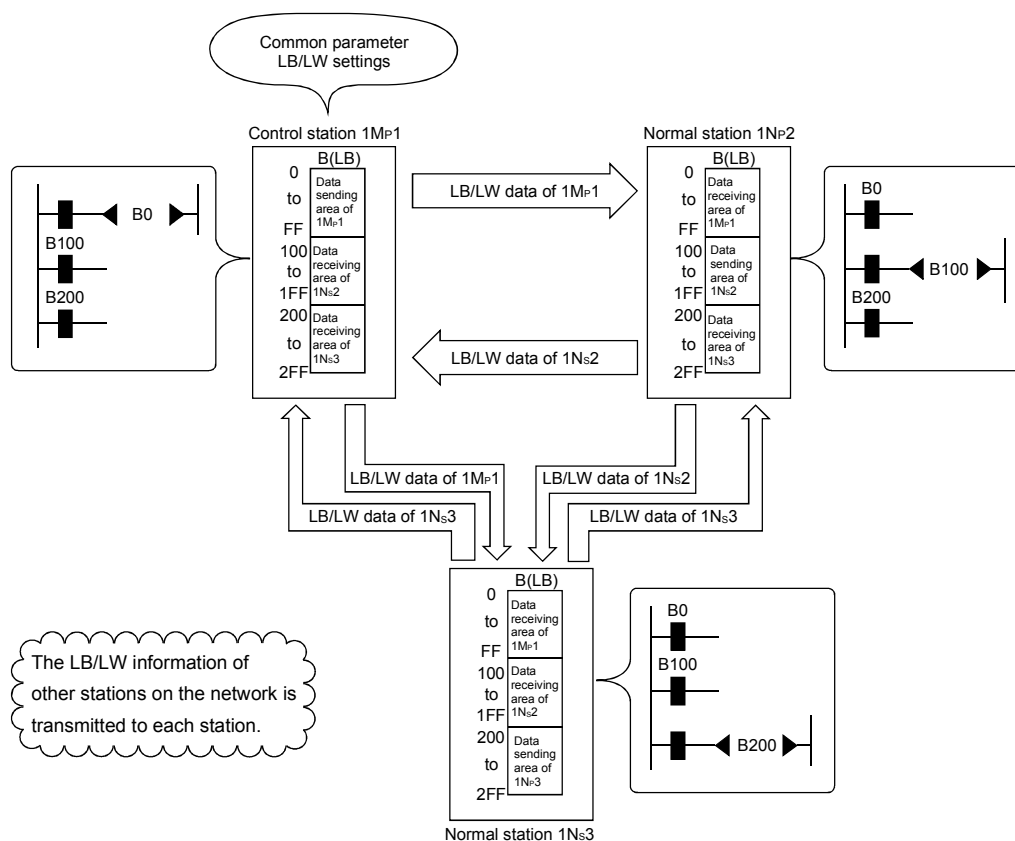
(a) Available device range

Assign the link devices (LB/LW) in the network within the valid range for writing data of each station on the common parameter LB/LW setting screen of the control station. In addition, the actual device range may be set with the refresh parameters or the station inherent parameters for each station.

(b) Data communication

The link relay (LB) can send and receive the on/off information and the link register (LW) can send and receive 16-bit data.

For example, in a network consisting of a control station and two normal stations, when B0 of the control station turns on, the B0 contacts of the two normal stations turn on. At this point, the station inherent parameters have not been set.



(2) Communication using LX/LY

This function allows 1:1 communication between the I/O master station that controls LX/LY and other stations (maximum of 63 stations in the optical loop system and maximum of 31 stations in the coaxial bus system).

(a) Available device range

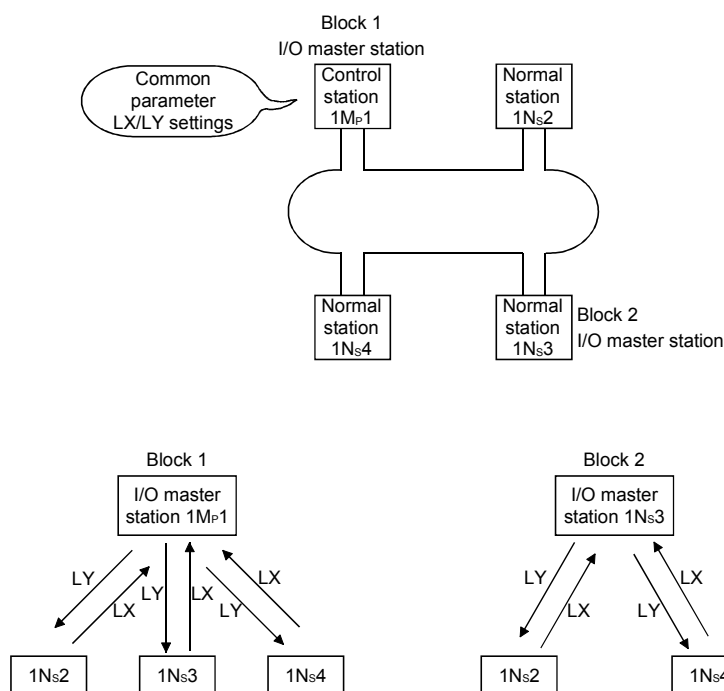
Data communication is performed using the input (X) and output (Y) after the actual I/O of the host.

For the assignments of the link devices (LX/LY) in the network, the I/O master station and the valid range for writing data for each station are set on the common parameter LX/LY setting screens (two screens) of the control station. The actually available device ranges can also be set for each station with refresh parameters. Up to two stations in a network may be set as the I/O master stations.

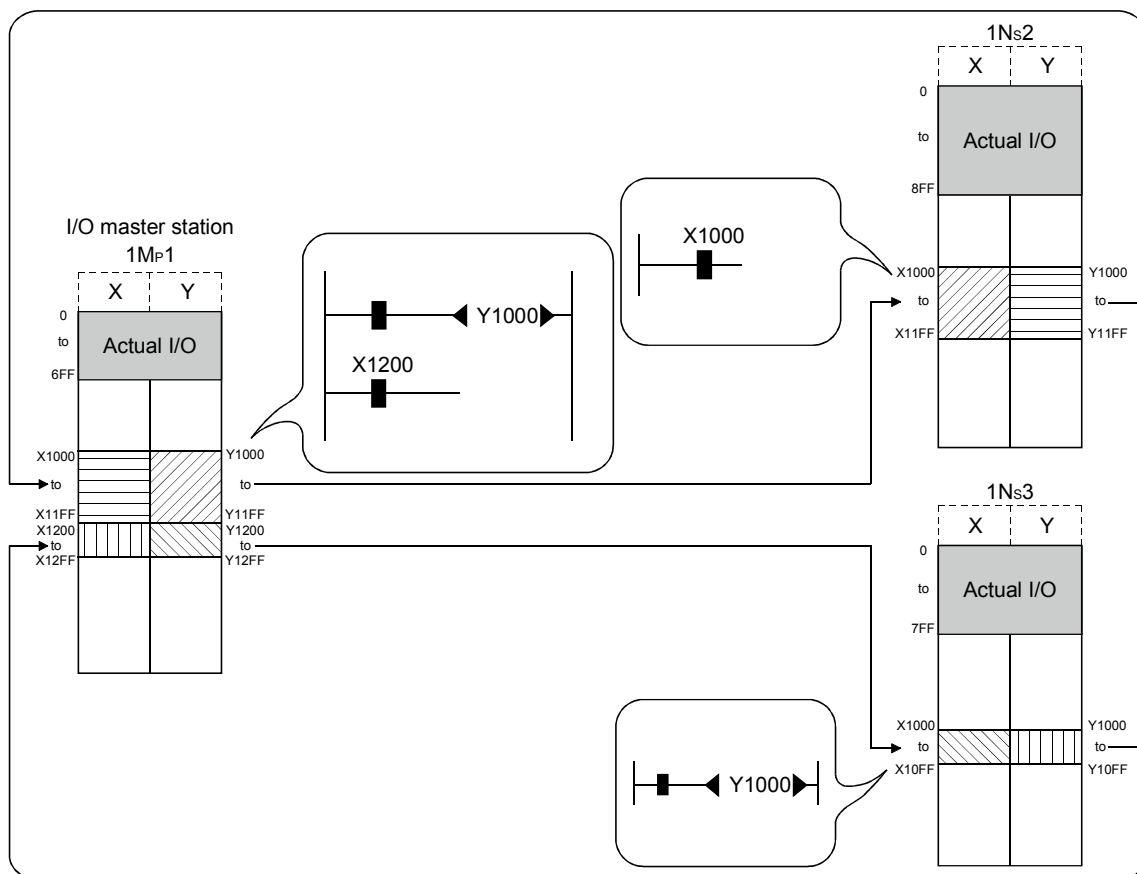
(b) Data communication

The link input (LX) can send/receive the input information of each station in the block and the link output (LY) can send/receive the output information of the I/O master station.

For example, in a network consisting of a control station and three normal stations, the on/off status can be controlled using the input/output devices between each station and the I/O master station in each block, as shown below.

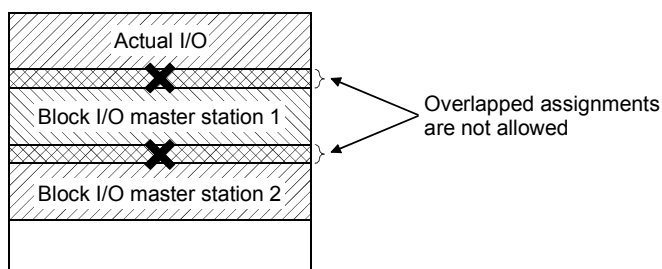


The following diagram shows an example of the LX/LY communication assignments between the 1M_P1 station (I/O master station) and the 1N_s2 and 1N_s3 stations. When the 1M_P1 station turns on Y1000, X1000 of the 1N_s2 station turns on. Also, when the 1N_s3 station turns on Y1000, X1200 of the 1M_P1 station turns on.



POINT

- Any station can be set as an I/O master station regardless of whether the station is a control or normal station.
- The range in which the X/Y signals should be set in the LX/LY communication is the device range starting from the end of the actual I/O of the host (X/Y1000 or thereafter is recommended). Assign these device ranges so that they do not overlap in the following situations:
 - When installing multiple network modules to also set the I/O master station using another network module (CC-Link IE controller network, MELSECNET/H, CC-Link, etc.).
 - When setting two I/O master stations.



3.2.2 RAS function

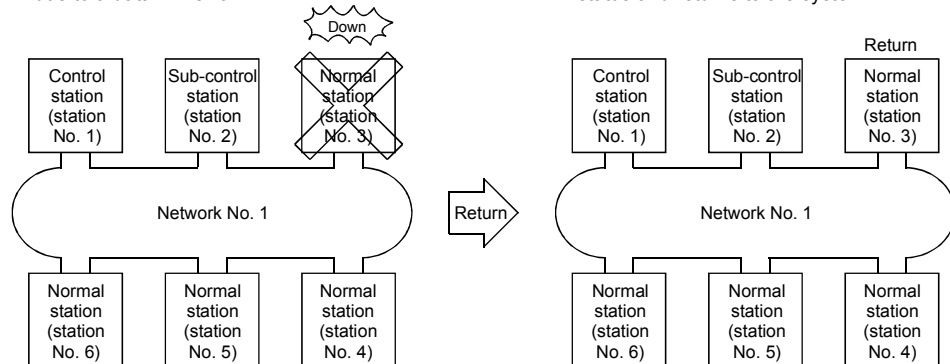
The RAS function stands for Reliability, Availability and Serviceability and refers to the overall ease of use of the automated equipment.

(1) Automatic return function

When a station disconnected from a network due to a data link error recovers from the error, the station is automatically reconnected to the network and restarts data link.

1) The normal station No. 3 is disconnected due to a data link error.

2) The station No. 3 recovers to the normal status and returns to the system.

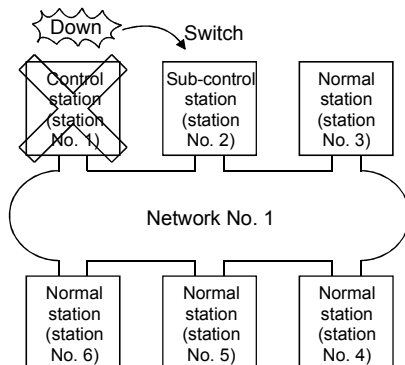
**POINT**

There is a limit to the number of faulty stations that can return to the system within one link scan. For details, refer to Section 5.4, "Supplementary Settings."

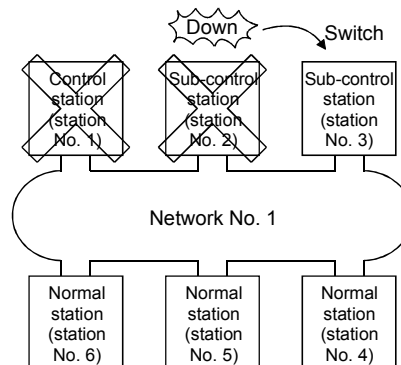
(2) Control station switch function

By using this function, if the control station (the station for which the common parameters have been set) goes down, another normal station becomes the sub-control station to continue the data link.

1) When the control station goes down, the station No. 2 becomes the sub-control station.



2) When the sub-control station No. 2 goes down, the station No. 3 becomes the sub-control station.



(a) When switching the control station, whether to continue the cyclic transmission or not can be selected from sub-control station.

- Common parameter supplementary setting: "Data link by sub-control station when control station is down." is available. (For more details, refer to Section 5.4, "Supplementary Settings.")

| | Selection of function | Operation during control station switching | |
|---|-----------------------|--|------------------------|
| | | Cyclic transmission | Transient transmission |
| 1 | Select | ○ | ○ |
| 2 | Do not select | × | ○ |

○: Continued, ×: Stopped

- (b) When the control station is switched, the data link stops temporarily. During the data link pause, data immediately before the stop is maintained.
- (c) During the data link pause, all the stations except the host are treated as faulty stations.

REMARKS

- 1) The control station does not switch even if the cyclic transmission of the control station is stopped with GX Developer (Refer to Section 7.8).
- 2) Any of the normal stations whose cyclic transmission is stopped with GX Developer can be a control station.

(3) Control station return control function

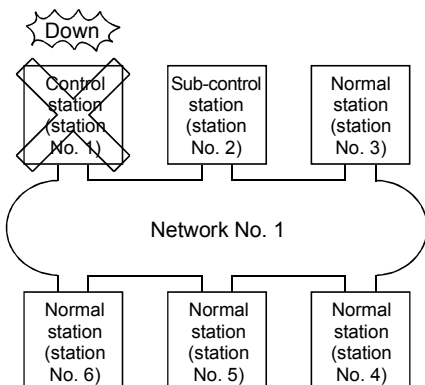
The network stop time can be eliminated by correcting the errors that caused the control station to go down and making it return to the network as a normal station. How the control station returns to the network can be selected by the network settings.

For details on the network setting, refer to Section 5.5, "Control Station Return Setting."

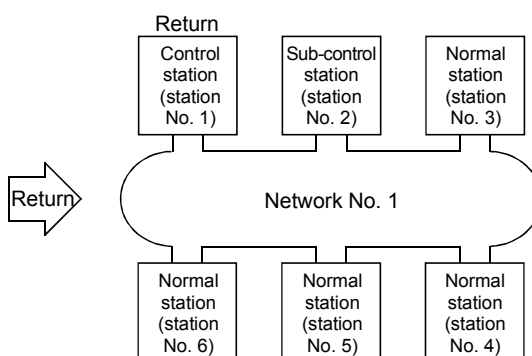
For the control station return control function in the redundant system, refer to Section 7.10.6.

| | Selection of function | Control station after returning |
|---|-------------------------------|---|
| 1 | Return as the control station | The control station returns as the control station of the network. |
| 2 | Return as a normal station | The control station returns to the network again as a normal station, making the operating sub-control station the new control station of the network. It can become the control station again only by returning to the network when all other stations have gone down. |

1) When the control station is down, the station No. 2 becomes the sub-control station.



2) The network does not stop since the control station returns to the network as a normal station.



REMARKS

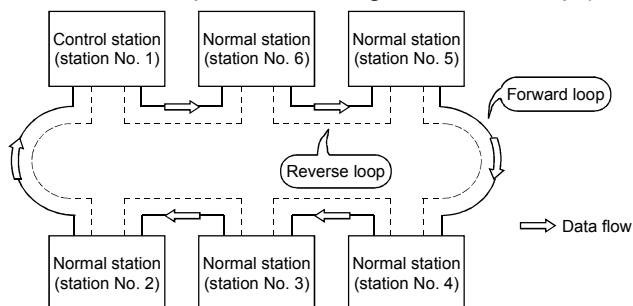
- When "Return as the control station" is selected, the network stop time becomes longer because the baton pass is stopped, but the common parameters can be changed only by resetting the CPU of the control station.
- If "Return as a normal station" is selected, the network does not stop because the control station returns to the network without stopping the baton pass. However, it is necessary to reset the CPUs of all the stations after changing the common parameters of the control station while the network is operating. If only the CPU of the control station is reset, a parameter mismatch error is detected in the control station and it is disconnected from the network.

(4) Loopback function (optical loop system)

In the optical loop system, the transmission path is dual-structured. When an error occurs in a transmission path, the faulty area is disconnected by switching the transmission path from the forward loop to the reverse loop or from the reverse loop to the forward loop, or performing a loopback. The transmission is continued normally between the stations that are still able to perform data communication.

(a) When normal

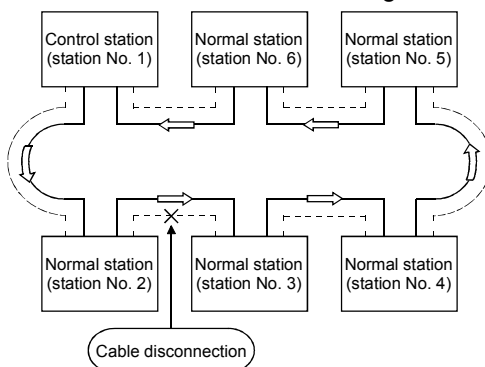
The data link is performed using the forward loop (or the reverse loop).



(b) When abnormal

1) Error in the forward loop (reverse loop)

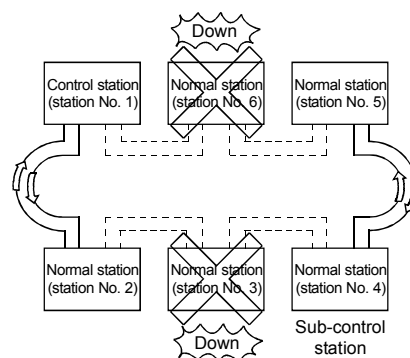
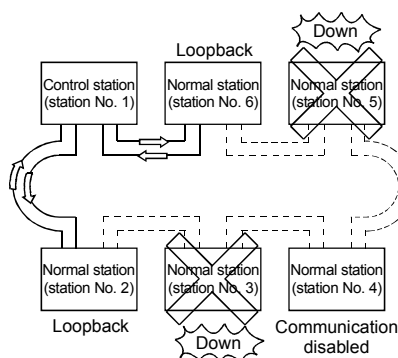
The data link continues using the reverse loop (forward loop).



2) When some of the stations are down

The data link continues excluding the stations that are down.

When two or more stations are down, the data link cannot be performed with the station located between the stations that are down. However, when there are two or more stations between the stations that are down, the normal station with younger station number becomes the sub-control station to continue the data link.



(c) Precautions in using the optical loop system

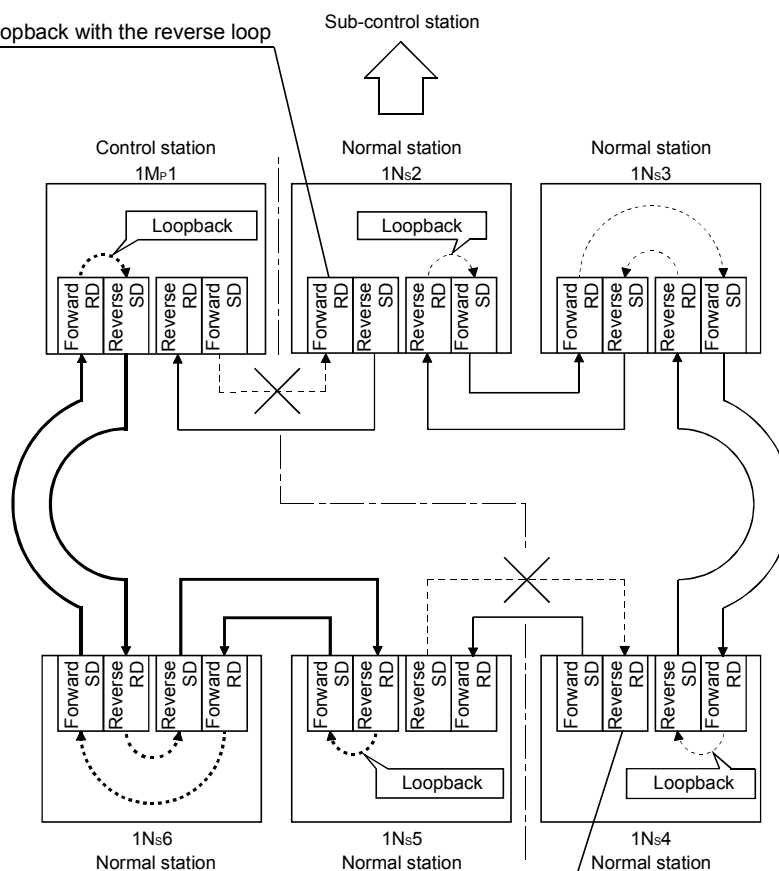
- 1) When the cable is inserted or removed, the line (forward loop/reverse loop) may be switched, but the data link will be performed normally.
- 2) When the loopback is being executed due to a cable disconnection, both the forward and reverse loops may be recognized as normal depending on the condition of the cable disconnection.
Whether the forward/reverse loop is normal/abnormal is determined by the status of "RD" (receive) of the loopback station.

(Example)

In the cases described below, the data link continue by dividing the network into two loops: "1M_P1-1N_s5-1N_s6" and "1N_s2-1N_s3-1N_s4."

| | | |
|---|--|--|
| <Loop containing 1M _P 1-1N _s 5-1N _s 6> | | } Forward loop normal Reverse loop normal |
| 1M _P 1: | Forward loop normal/reverse loop normal | |
| 1N _s 5: | Forward loop normal/reverse loop normal | |
| 1N _s 6: | Forward loop normal/reverse loop normal | |
| <Loop containing 1N _s 2-1N _s 3-1N _s 4> | | } Forward loop abnormal Reverse loop abnormal |
| 1N _s 2: | Forward loop "RD" abnormal/reverse loop normal | |
| 1N _s 3: | Forward loop normal/reverse loop normal | |
| 1N _s 4: | Forward loop normal/reverse loop "RD" abnormal | |

An RD abnormal detection in the forward loop → Loopback with the reverse loop



An RD abnormal detection in the reverse loop → Loopback with the forward loop

| |
|---------|
| REMARKS |
|---------|

If the network module has become faulty, a loopback may not be made depending on the fault. In this case, the data link may become deactivated. Identify the faulty network module in the following method.

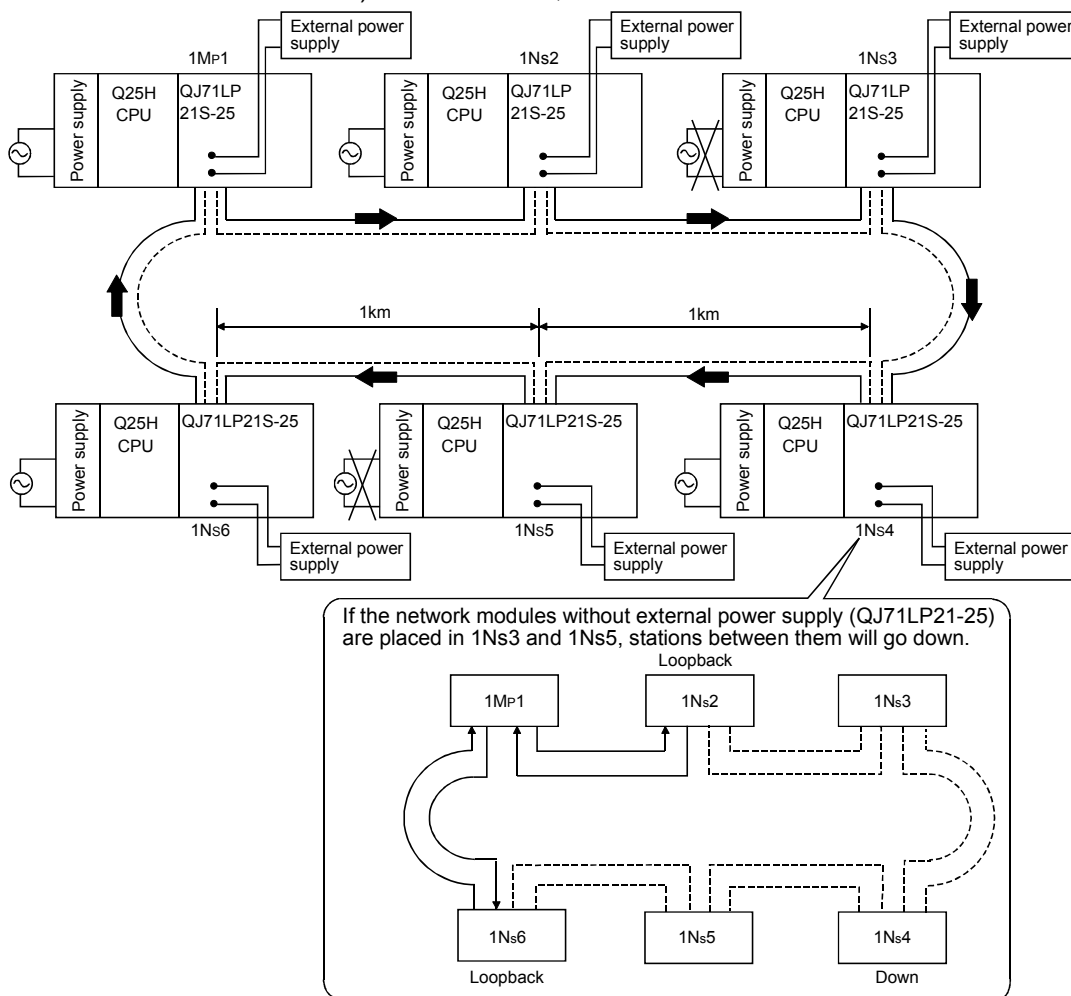
- (1) Check the LED indications (RUN LED off, ERR. LED on) of all network modules for a faulty station.
- (2) Turn off the power to all stations, then turn it on in order from the control station. In this process, check to which station of the network loopback is properly executed. Confirm in the Link information of the Network diagnostics (Host information) screen that the control station and the normal station returned to the network is displayed as loopback stations. (Refer to Section 8.1.1.)

Replace any network module in which malfunction has been detected, and confirm that the data link is properly recovered.

(5) Prevention of station failure by using external power supply (Optical loop system)

Direct power supply (24 V DC) from outside to network modules will prevent the loopback operation. Because of this, station(s) placed between faulty stations will not go down when more than one station go down, (The QJ71LP21S-25 is the network module where power can be supplied from outside.)

Even if the distance between normally operating stations (1Ns2 and 1Ns4, 1Ns4 and 1Ns6) is 1 km or more, normal data link will be available



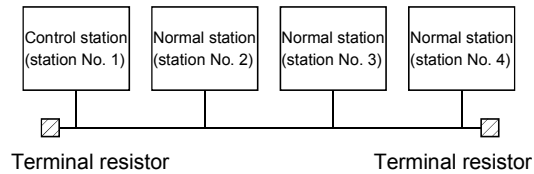
REMARKS

Even if the Q25H CPU of the control station is powered OFF, the control station status will not shift to other station since the network module functions normally.

(6) Station detach function (coaxial bus system)

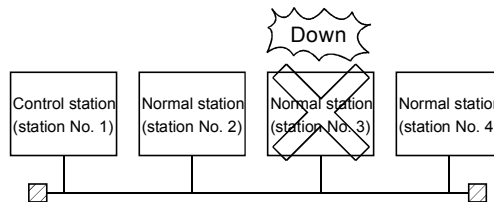
In the coaxial bus system, even if the power to a connected station is turned off, the data link continues between other stations which are still able to perform data communication.

(a) When normal



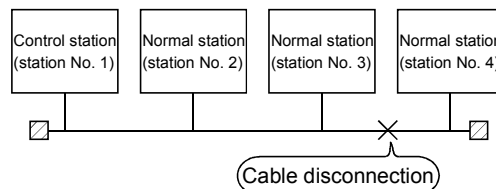
(b) When abnormal

The data link continues excluding the station that is down.



POINT

When a cable disconnection occurs, the data link cannot be performed because there will be no terminal resistors.

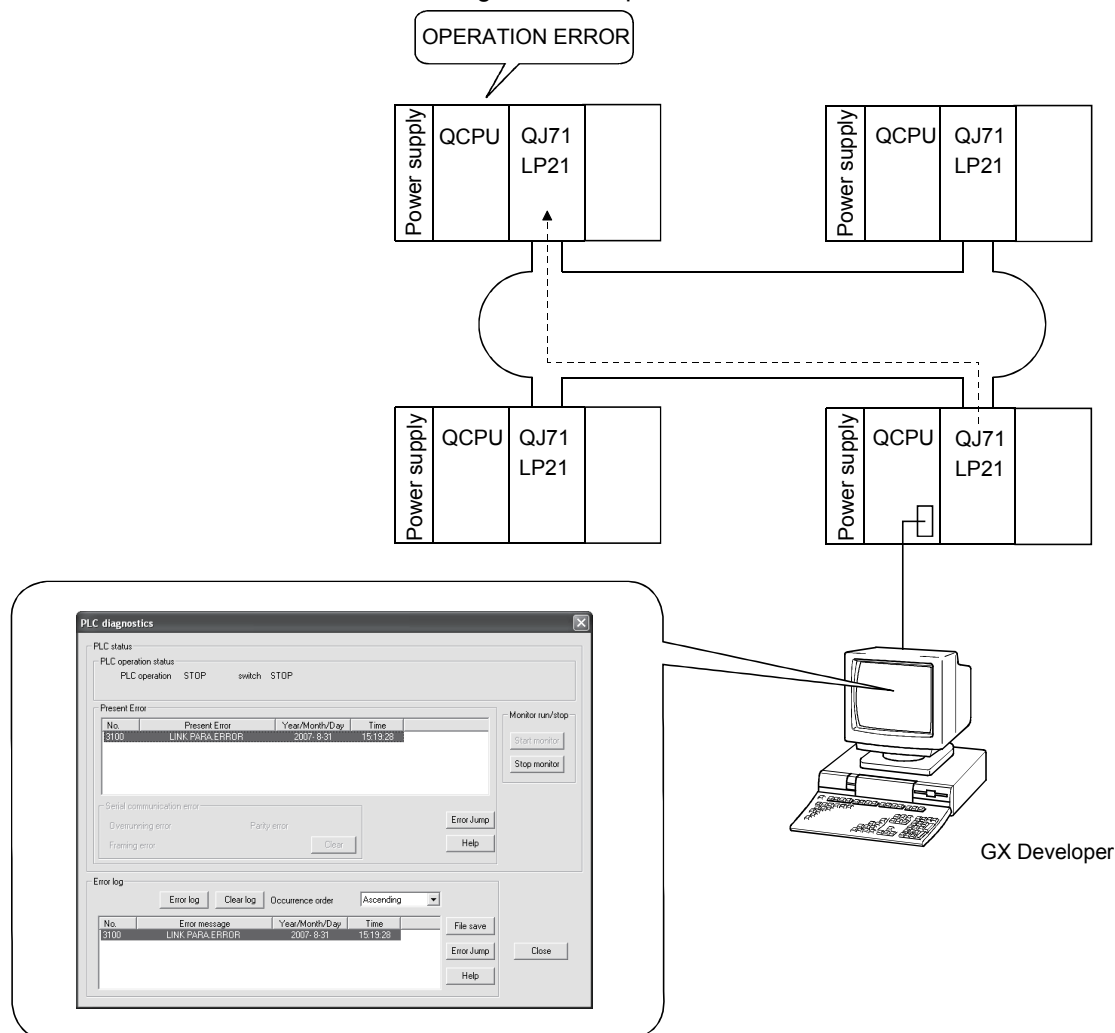


In addition, even if the cable is normal, the data link cannot be performed if a terminal resistor is detached from an F-type connector.

(7) Transient transmission enabled even at CPU module error

By using this function, the network module can continue the transient transmission even if an error that stops the CPU module occurs while the system is operating.

The description of the error of the corresponding station can be checked from other stations using GX Developer.



The following table lists the operations of the cyclic and transient transmissions for each CPU module status.

| CPU module status | Rank | Cyclic transmission | Transient transmission |
|---|--------------|---------------------|------------------------|
| | | | |
| Battery error Annunciator error ON, etc. (Continue error) | Minor error | Continued | Enabled |
| Parameter error Instruction code error, etc. (Stop error) | Medium error | Stopped | Enabled |
| CPU reset, etc. (MAIN CPU down) | Major error | Stopped | Disabled*1 |

*1 When the CPU module on the target station is an ACPU, a communication error occurs.

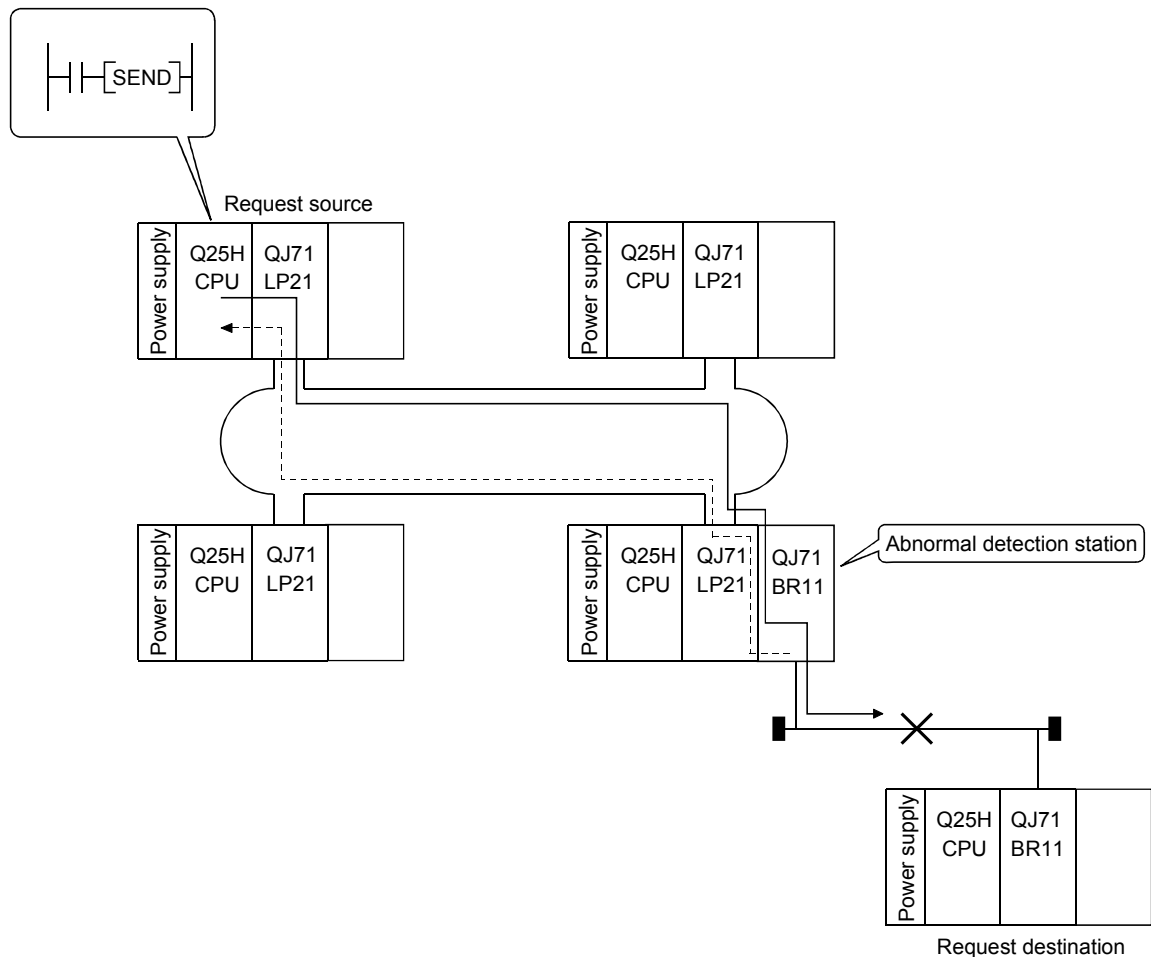
In case of the QCPU and QnACPU, a CC-Link IE controller network, MELSECNET/H, MELSECNET/10 error is returned.

(8) Checking the transient transmission abnormal detection time

By using this function, the "Time," "Abnormal detection network number," and "Abnormal detection station number" can be checked when a transient transmission (SEND, READ, SREAD, WRITE, SWRITE, REQ and other instructions) ends abnormally.

Logs such as time logs can be used to identify the network problems.

For details on these instructions, refer to Section 7.4.5.



(9) Diagnostic function

The diagnostic function is used to check the network's line status and the module setting status.

The diagnostic function consists mainly of following two types of tests:

- Offline tests
- Online tests

POINT

Execute the online tests when the network module is communicating (T.PASS LED is on). An error occurs if any of the online tests is executed from a station that has been disconnected from the data link.

1) Offline tests

The network module's hardware and the data link cable wiring can be checked at the system startup by setting the network module or GX Developer to the test mode.

| Item | Description | Optical loop system | Coaxial bus system | Reference section |
|--------------------------------|--|---------------------|--------------------|-------------------|
| Self-loopback test | Checks hardware including the send/receive circuits and the cables of the transmission system of an individual network module. | ○ | ○ | Section 4.5.1 |
| Internal self-loopback test | Checks hardware including the send/receive circuits of the transmission system of an individual network module. | ○ | ○ | Section 4.5.2 |
| Hardware test | Checks hardware inside the network module. | ○ | ○ | Section 4.5.3 |
| Station-to-station test | Checks a line between two stations. | ○ | ○ | Section 4.7.1 |
| Forward loop/reverse loop test | Checks the wiring status of the forward and reverse loops in the status in which all the stations are connected. | ○ | × | Section 4.7.2 |

2) Online tests

The status of a line and other items can be easily checked with GX Developer.

If an error occurs while the system is in operation, the diagnostics listed below can be executed while remaining in the online status.

| Item | Description | Optical loop system | Coaxial bus system | Data link status (cyclic transmission or transient transmission) | Reference section |
|--------------------------|---|---------------------|--------------------|--|-------------------|
| Loop test | Checks the line status. | ○ | × | Pause | Section 4.8.1 |
| Setup confirmation test | Checks for duplicate control stations and station numbers. | ○ | ○ | Pause | Section 4.8.2 |
| Station order check test | Checks the order of stations connected in the directions of the forward and reverse loop. | ○ | × | Pause | Section 4.8.3 |
| Communication test | Checks whether or not the transient transmission can be performed normally. It also checks the routing parameter settings. | ○ | ○ | Continue | Section 4.8.4 |

3.3 Specifications of the Link Data Sending/Receiving Processing Time

This section explains the link data sending/receiving processing time and how to calculate the data link transmission delay time in the MELSECNET/H network system.

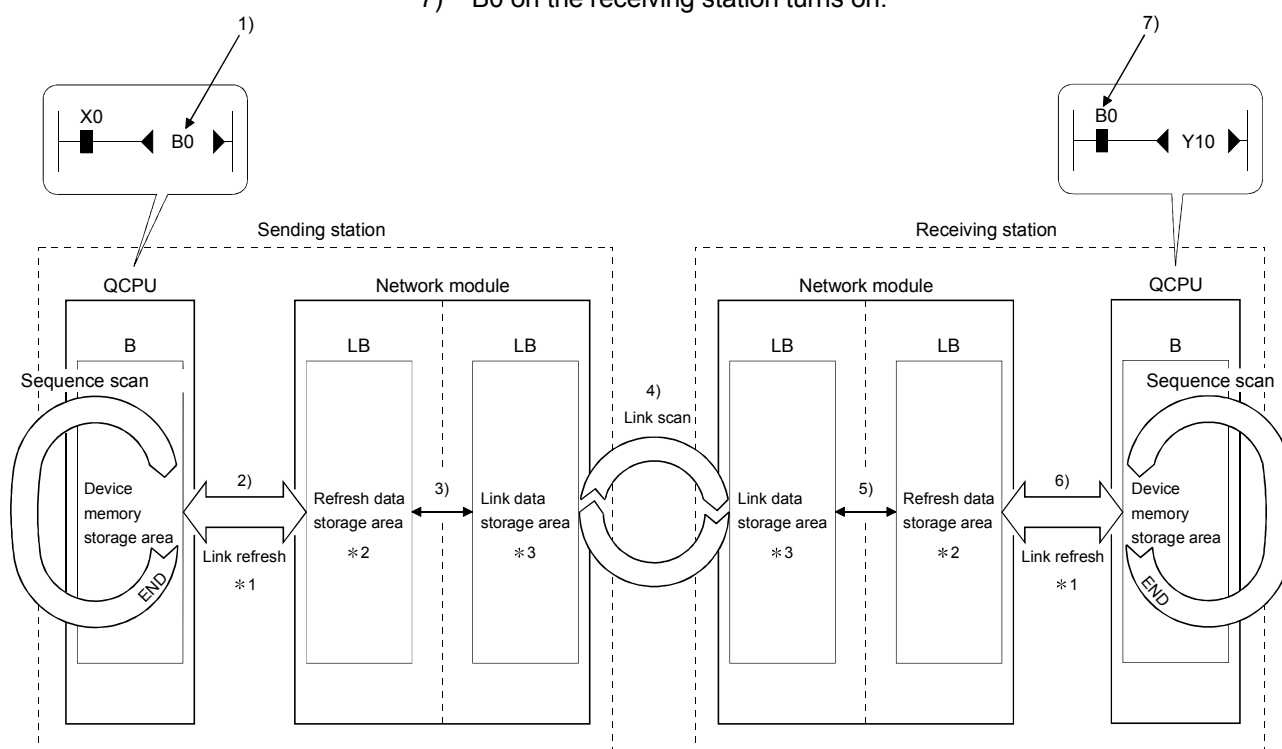
3.3.1 Link data sending/receiving processing

(1) Overview of the sending/receiving processing

In the cyclic transmission, communication is performed using the LB/LW/LX/LY devices of the network module.

This section explains the case when the link relay (B) is used on the CPU module side.

- 1) B0 on the sending station turns on.
- 2) By a link refresh, the B0 information is stored in the refresh data storage area (LB) of the network module.
- 3) The B0 information in the refresh data storage area (LB) is stored in the link data storage area (LB).
- 4) By a link scan, the B0 information in the link data storage area (LB) is stored in the link data storage area (LB) of the network module on the receiving station.
- 5) The B0 information in the link data storage area (LB) is stored in the refresh data storage area (LB).
- 6) By a link refresh, the B0 information is stored in the device memory storage area (B) of the CPU module.
- 7) B0 on the receiving station turns on.



* 1: Sets the values with the refresh parameters.

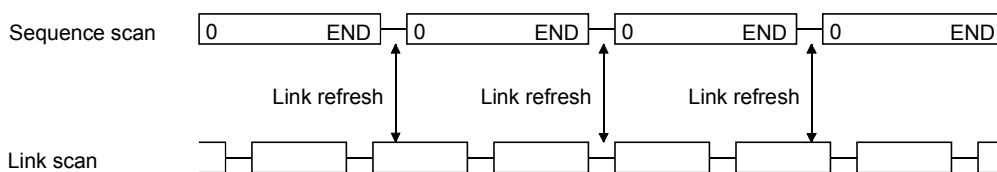
* 2: Sets the values with the station inherent parameters. (If the settings are not made, the values of the common parameters are stored as is.)

* 3: Sets the values with the common parameters of the control station.

(2) Link scan and link refresh

The link scan is executed "asynchronous" with the sequence scan of the CPU module.

The link refresh is executed by the "END processing" of the CPU module.



(3) Link data when a communication error station or communication stop station occurs on the network

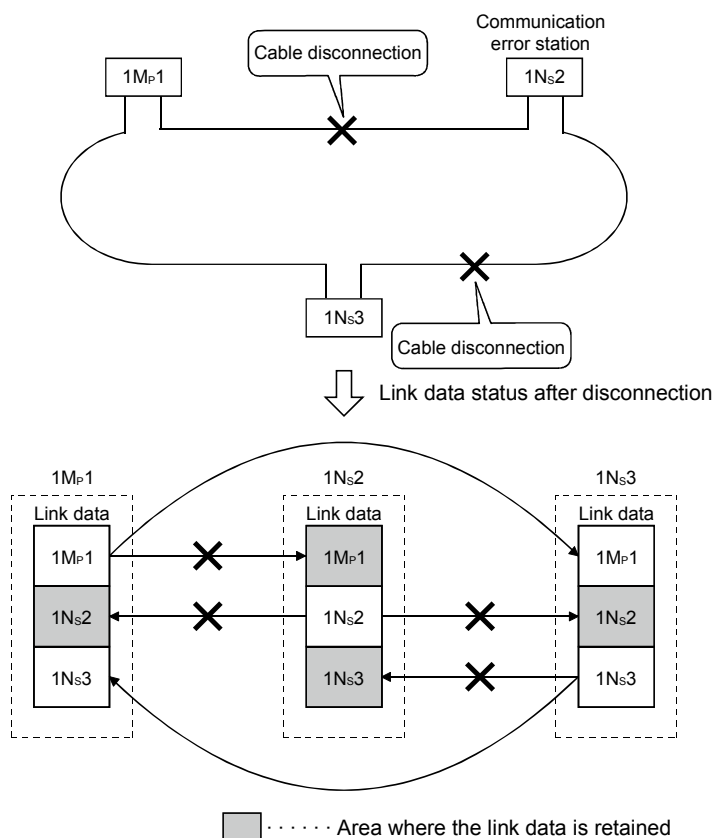
When a communication error or communication stop station occur on the network during the data link, the receive data from those stations immediately before the error occurrence is retained.

(A "communication stop station" refers to a station whose cyclic transmission has been stopped by a peripheral device.)

- (a) The receive data from a communication error station or communication stop station is retained by a normally communicating station.
- (b) The receive data from other station is retained by a communication stop station.

(Example)

When a communication error has occurred to 1Ns2 due to cable disconnection



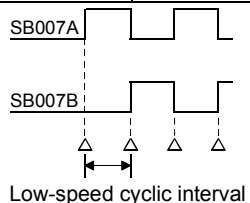
(4) SB/SW when a communication error station/communication stop station occurs on the network

The status of whether there are any communication error/communication stop stations on the network can be checked with the link special relay/link special register (SB/SW).

Use them as interlocks for programs.

For interlock program examples, refer to Section 6.1.2.

Link special relays and registers

| Link special relay/link special register | Description | Signal status | |
|--|---|--|--|
| | | Off | On |
| SB0020 | Shows the status of the network module. | Normal | Abnormal |
| SB0047 | Shows the baton pass execution status of the host. | The baton pass is being executed | The baton pass is stopped |
| SB0049 | Shows the cyclic transmission status of the host. | Normal | Abnormal |
| SB0070 | Shows the baton pass execution status of all stations (including the host). However, it only shows the status for the number of stations set with parameters. | The baton pass is being executed on all stations | Occurrence of communication stop station |
| SW0070 to 0073 | Shows the baton pass execution status of each station. Each bit corresponds to the status of each station. | The baton pass is being executed | The baton pass is stopped |
| SB0074 | Shows the cyclic transmission status of all stations (including the host). However, it only shows the status for the number of stations set with parameters. | All stations normal | Occurrence of abnormal station |
| SW0074 to 0077 | Shows the cyclic transmission status of each station. Each bit corresponds to the status of each station. | Normal | Abnormal |
| SB007A, 007B | Shows the low-speed cyclic transmission status. The transmission completion is indicated by the on/off status of either bit SB007A or 007B. |  <p>Low-speed cyclic interval</p> | |
| SW01FC to SW01FF | Indicates the redundant system status (control system/standby system) of each station. Each bit corresponds to the status of each station. | Control system ^{*1} | Standby system |

*1: Signals for the stations in other than a redundant system are off.

3.3.2 How to calculate the transmission delay time

(1) Transmission delay time in the same network

(a) Cyclic transmission (LB/LW/LX/LY periodical communication)

The transmission delay time in the B/W/Y communication is obtained by the equation below using the following variables:

- Scan time for the sending and receiving stations (except link refresh time)
- Link refresh
- Link scan time
- Tracking time
- Scan time delay due to tracking transfer

[Transmission delay time (T_{D1}) in B/W/Y communication]

1) When a non-redundant CPU receives data

$$T_{D1} = S_T + \alpha_T + (LS \times 0.5) + (S_R + \alpha_R) \times 1.5 \text{ [ms]}$$

$$(\text{MAX} : T_{D1} = S_T + \alpha_T + (LS \times 1) + (S_R + \alpha_R) \times 2)$$

2) When a redundant CPU receives data

$$T_{D1} = S_T + \alpha_T + (LS \times 0.5) + (S_R + \alpha_R + T_s) \times 1.5 \text{ [ms]}$$

$$(\text{MAX} : T_{D1} = S_T + \alpha_T + (LS \times 1) + (S_R + \alpha_R + T_s) \times 2)$$

S_T : Scan time of the sending station (except link refresh time)

S_R : Scan time of the receiving station (except link refresh time)

α_T : Link refresh time of the sending station *1

α_R : Link refresh time of the receiving station *1

LS : Link scan time

T_s : Scan time delay due to tracking transfer*2

*1: Total of installed network modules

*2: For the scan time delay due to tracking transfer, refer to the QnPRHCPU User's Manual (Redundant System).

The equation above assumes the following conditions:

- There is no faulty station.
- The transient transmission is not executed.

POINT

- (1) For the transmission delay time in the B/W/Y communication (T_{D1}), use the equation for the "MAX" if the worst conditions coincide because the scan of the sequence program and the link scan are asynchronous.
- (2) When the "Block send/receive data assurance per station" boxes is checked, add the following delay time to the transmission delay time (T_{D1}).
 - In the case of $S_T > LS$

Normal : Add "+ 0.5 \times ($S_T + \alpha_T$)"

MAX : Add "+ 1.0 \times ($S_T + \alpha_T$)"
 - In the case of $S_T < LS$

Normal : Add "+ 0.5 \times LS "

MAX : Add "+ 1.0 \times LS "
- (3) In the MELSECNET/H Extended mode, the "Block send/receive data assurance per station" boxes are preset by default. Therefore, add any of the values shown in (2) above to the transmission delay time (T_{D1}).

- (b) Communication with the SEND/RECV/RECVS/ZNRD/ZNWR instruction
 The transmission delay time in communication with the SEND, RECV, RECVS, ZNRD, or ZNWR instruction depends on the system of the sending and receiving stations, as shown below.

| Sending station \ Receiving station | Non-redundant system | Redundant system (control system CPU) |
|-------------------------------------|--|--|
| | Non-redundant system | Redundant system |
| Non-redundant system | Expression of 1) | Expression of 2) (Note that the T_{ST} value is "0.") |
| Redundant system | Expression of 2) (Note that the T_{SR} value is "0.") | Expression of 2) |

The transmission delay time can be calculated using the following:

- Scan time for the sending and receiving stations (except link refresh time)
- Link refresh
- Link scan time
- Scan time delay due to tracking transfer

[Transmission delay time in SEND, RECV, RECVS, ZNRD, or ZNWR instruction communication]

- 1) $T_{D2} = (S_T + \alpha_T + S_R + \alpha_R) \times 2 + (LS \times 4) + LS_U$ [ms]
 (MAX : $T_{D2} = (S_T + \alpha_T + S_R + \alpha_R) \times 2 + (LS \times 6) + LS_U$)
- 2) $T_{D3} = (S_T + \alpha_T + T_{ST} + S_R + \alpha_R + T_{SR}) \times 2 + (LS \times 4) + LS_U$ [ms]
 (MAX : $T_{D3} = (S_T + \alpha_T + T_{ST} + S_R + \alpha_R + T_{SR}) \times 2 + (LS \times 6) + LS_U$)

S_T : Scan time of the sending station (except link refresh time)

S_R : Scan time of the receiving station (except link refresh time)

α_T : Link refresh time of the sending station *2

α_R : Link refresh time of the receiving station *2

T_{ST} : Scan time delay due to tracking transfer on the sending side*3

T_{SR} : Scan time delay due to tracking transfer on the receiving side*3

LS : Link scan time

$$LS_U = \left\{ \left(\frac{(\text{Number of simultaneous transient requests})}{(\text{Maximum number of transient times})} \right)^{*1} - 1 \right\} \times (LS \times 2)$$

Number of simultaneous transient requests:

The total number of times transient requests that are made during one link scan from a station on the same network.

Maximum number of transients:

The maximum number of transients within one link scan set in the supplementary settings of the common parameters.

*1: The fraction is rounded up to the nearest whole number.

*2: Total of installed network modules

*3: For the scan time delay due to tracking transfer, refer to the QnPRHCPU User's Manual (Redundant System).

REMARKS

When executing transient transmissions from multiple stations at the same time, the execution time of the instruction may be shortened by increasing the setting value for the maximum number of transient requests in one link scan.

For instance, when there are seven stations that execute an instruction, the time for " $LS \times 4$ " may be shortened by changing the setting value of the maximum transient requests from the default value of two to seven or larger with the transient setting in the supplementary settings of the common parameters of GX Developer.

Note, however, that the scan time of the CPU module increases by that time amount.

(c) READ, WRITE, REQ, RRUN, RSTOP, RTMRD, or RTMWR instruction communication

The transmission delay time in communication with the READ, WRITE, REQ, RRUN, RSTOP, RTMRD, or RTMWR instruction depends on the system of the sending and receiving stations.

| Sending station \ Receiving station | Non-redundant system | Redundant system | | | |
|-------------------------------------|--|--|--|--|--|
| | | Host system | | Other system | |
| | | Access to control system CPU | Access to standby system CPU | Access to standby system CPU via control system | Access to control system CPU via standby system |
| Non-redundant system | Expression of 1) | Expression of 2) (Note that the T_{ST} value is "0.") | Expression of 2) (Note that the values of T_{ST} , S_R , and α_R are "0.") | Expression of 3) (Note that the T_{ST} value is "0.") | Expression of 3) (Note that the values of T_{ST} , S_R , and α_R are "0.") |
| Redundant system | Expression of 2) (Note that the T_{SR} value is "0.") | Expression of 2) | Expression of 2) (However, the values of S_R , and α_R are "0.") | Expression of 3) | Expression of 3) (Note that the values of S_R , and α_R are "0.") |

The transmission delay time in instruction communication can be calculated from the following:

- Scan time of the sending and receiving stations (except link refresh time)
- Link refresh time
- Link scan time
- Scan time delay due to tracking transfer

[Transmission delay time in READ/WRITE/REQ/RRUN/RSTOP/RTMRD/RTMWR instruction communication]

$$\begin{aligned}
 1) \quad T_{D4} &= (S_T + \alpha_T + S_R + \alpha_R) \times 2 + (LS \times 4) + LS_U \text{ [ms]} \\
 (\text{MAX : } T_{D4} &= (S_T + \alpha_T + S_R + \alpha_R) \times 2 + (LS \times 6) + LS_U) \\
 2) \quad T_{D5} &= (S_T + \alpha_T + T_{ST} + S_R + \alpha_R + T_{SR}) \times 2 + (LS \times 4) + LS_U \text{ [ms]} \\
 (\text{MAX : } T_{D5} &= (S_T + \alpha_T + T_{ST} + S_R + \alpha_R + T_{SR}) \times 2 + (LS \times 6) + LS_U) \\
 3) \quad T_{D6} &= (S_T + \alpha_T + T_{ST} + S_R + \alpha_R + T_{SR}) \times 2 + (LS \times 4) + 3 + LS_U \text{ [ms]} \\
 (\text{MAX : } T_{D6} &= (S_T + \alpha_T + T_{ST} + S_R + \alpha_R + T_{SR}) \times 2 + (LS \times 6) + 6 + LS_U)
 \end{aligned}$$

(To next page)

- S_T : Scan time of the sending station (except link refresh time)
 S_R : Scan time of the receiving station *1 (except link refresh time)
 α_T : Link refresh time of the sending station *2
 α_R : Link refresh time of the receiving station *2
 LS : Link scan time
 T_{ST} : Scan time delay due to tracking transfer on the sending side*4
 T_{SR} : Scan time delay due to tracking transfer on the receiving side*4

$$LSu \left\{ \left(\frac{(\text{Number of simultaneous transient requests})}{(\text{Maximum number of transient times})} \right)^{*3} - 1 \right\} \times (LS \times 2)$$

Number of simultaneous transient requests:

The total number of times transient requests that are made during one link scan from a station on the same network.

Maximum number of transients:

The maximum number of transients within one link scan set in the supplementary settings of the common parameters.

*1: For the redundant system, it is a scan time of the control system CPU.

*2: Total time for the installed network modules.

*3: The fraction is rounded up to the nearest whole number.

*4: For the scan time delay due to tracking transfer, refer to the QnPRHCPU User's Manual (Redundant System).

REMARKS

When executing transient transmissions from multiple stations at the same time, the execution time of the instruction may be shortened by increasing the setting value for the maximum number of transient requests in one link scan.

For instance, when 7 stations are supposed to execute an instruction, the time for " $LS \times 4$ " may be shortened by changing the setting value of the maximum transient requests from the default value of 2 to 7 or larger in the transient setting in supplementary settings of Common parameters from GX Developer.

Note, however, that the scan time of the CPU module increases by that time amount.

(d) Link refresh time

1) Other than safety CPU

The link refresh time (the time delay of the END processing time in the CPU module) is obtained by the equation below using the following variables:

- Number of assignment points of the link device
- Transfer to the file registers (R, ZR), extended data register (D), and extended link register (W) on the memory card
- Inter-link data transfer

[Link refresh time]

$$\alpha_T, \alpha_R = KM1 + KM2 \times \left(\frac{LB + LX + LY + SB}{16} + LW + SW \right) + \alpha_E + \alpha_L \text{ [ms]}$$

$$\alpha_E = KM3 \times \left(\frac{LB + LX + LY}{16} + LW \right)$$

$$\alpha_L = KM4 + KM5 \times \left(\frac{LB}{16} + LW \right)$$

α_T : Link refresh time (sending station)

α_R : Link refresh time (receiving station)

LB : Total points of link relays (LB) refreshed by the corresponding station *1

LW : Total points of link registers (LW) refreshed by the corresponding station *1

LX : Total points of link inputs (LX) refreshed by the corresponding station *1

LY : Total points of link outputs (LY) refreshed by the corresponding station *1

SB : Number of points of the link special relay (SB)

SW : Number of points of the link special register (SW)

α_E : Transfer time of the file registers (R, ZR), extended data register (D), and extended link register (W) on the memory card *2

α_L : Inter-link data transfer time *2*3

KM1, KM2, KM3, KM4, KM5 : Constant

*1: Total link device points that are within the range set in Refresh parameters and that are set in Network range assignment.
Note that points assigned to reserved stations are excluded.

*2: The total transfer time when transient transmissions are simultaneously executed from multiple stations.

*3: For Universal model QCPUs, the calculation method for the data link transfer time varies.

The calculation method is shown in **REMARKS**.

Refer to Section 3.3.3.

- When network modules are installed on the main base unit

| Constant | | KM1 | KM2 ($\times 10^{-3}$) | KM3 ($\times 10^{-3}$) | KM4 | | | KM5 ($\times 10^{-6}$) |
|-----------------------------|------------------|------|-----------------------------|-----------------------------|------|------|------|-----------------------------|
| CPU type | | | | | 2 | 3 | 4 | |
| Basic model QCPU | Q00JCPU | 1.30 | 0.67 | | | | | |
| | Q00CPU | 1.10 | 0.66 | | | | | |
| | Q01CPU | 0.90 | 0.61 | | | | | |
| High Performance model QCPU | Q02CPU | 0.30 | 0.48 | 0.47 | 0.60 | 0.89 | 1.18 | 0.14 |
| | Other than above | | | | | | | |
| Process CPU | | 0.13 | 0.41 | 0.53 | 0.25 | 0.38 | 0.51 | 0.13 |
| Redundant CPU | | | | | | | | |
| Universal model QCPU | Q02UCPU | 0.16 | 0.41 | 0.39 | | | | |
| | Q03UD/Q03UDE CPU | 0.09 | 0.41 | 0.39 | | | | |
| | Other than above | 0.09 | 0.41 | 0.33 | | | | |

- When network modules are installed on the extension base unit

| Constant | | KM1 | KM2 ($\times 10^{-3}$) | KM3 ($\times 10^{-3}$) | KM4 | | | KM5 ($\times 10^{-6}$) |
|-----------------------------|------------------|------|-----------------------------|-----------------------------|------|------|------|-----------------------------|
| CPU type | | | | | 2 | 3 | 4 | |
| Basic model QCPU | Q00JCPU | 1.30 | 1.50 | | | | | |
| | Q00CPU | 1.10 | 1.44 | | | | | |
| | Q01CPU | 0.90 | 1.42 | | | | | |
| High Performance model QCPU | Q02CPU | 0.30 | 1.20 | 0.47 | 0.61 | 0.90 | 1.20 | 0.28 |
| | Other than above | | | | | | | |
| Process CPU | | 0.13 | 0.97 | 0.53 | 0.27 | 0.40 | 0.53 | 0.26 |
| Redundant CPU | | | | | | | | |
| Universal model QCPU | Q02UCPU | 0.16 | 0.97 | 0.39 | | | | |
| | Q03UD/Q03UDE CPU | 0.09 | 0.97 | 0.39 | | | | |
| | Other than above | 0.09 | 0.97 | 0.33 | | | | |

2) Safety CPU

[Link refresh time]

$$\alpha T, \alpha R = \left\{ 1.85 \times \left(\frac{LB + LX + LY + SB}{16} + LW \right) + 1000 \right\} \times 10^{-3} \text{ [ms]}$$

 αT : Link refresh time (sending station) αR : Link refresh time (receiving station)

LB : Total points of link relays (LB) refreshed by the corresponding station *1

LW : Total points of link registers (LW) refreshed by the corresponding station *1

LX : Total points of link inputs (LX) refreshed by the corresponding station *1

LY : Total points of link outputs (LY) refreshed by the corresponding station *1

SB : Number of points of the link special relay (SB)

SW : Number of points of the link special register (SW)

*1: Total points are the sum of link devices set in refresh parameter settings and network range settings.

The points assigned for reserved station are not included.

Refer to Section
3.3.3.

POINT

The values in this section are calculated on the basis that data are received from all stations during one sequence scan.

When the link scan is long or when the sequence scan is short, data from all stations may not be received within one sequence scan.

If this occurs, the actual link refresh time is less than the calculated value shown in this section.

REMARKS

(1) Data link transfer time (for Universal model QCPU)

Universal model QCPUs transfer interlink data in several batches.

The following are the calculation formulas for the data link transfer time.

(a) Data link transfer time taken in one END

$$\alpha L = \left[\frac{LB}{16} + LW \right]^{*1} \times KM3 + KM1 + (KM2 \times n1) \quad [\text{ms}]$$

*1: The number of words that can be transferred in one1 END (N) is restricted as follows:

N = Sequence scan time (under no interlink transmission parameter setting)
(μs) \times 0.05

(b) Data link transfer time required for transferring data of all the set points

$$\alpha L1 = KM4 \times \left[\frac{LB}{16} + LW \right] \quad [\text{ms}]$$

αL : Data link transfer time taken in one END

$\alpha L1$: Data link transfer time

LB : Total points for transfer source LB, which are set with interlink transmission parameters

LW : Total points for transfer source LW, which are set with interlink transmission parameters

n1 : Number of lines where interlink transmission parameters are set

KM1, KM2, KM3 and KM4: Constants

| CPU type | $KM1(\times 10^{-3})$ | $KM2(\times 10^{-3})$ |
|------------------|-----------------------|-----------------------|
| Q02UCPU | 120 | 11 |
| Q03UD/Q03UDECPU | 34 | 4 |
| Other than above | 25 | 4 |

| CPU type | $KM3(\times 10^{-3})$ | | | |
|------------------|--|---|---|--|
| | Network module installation location | | | |
| | Source (main base) \rightarrow Target (main base) | Source (main base) \rightarrow Target (extension base) | Source (extension base) \rightarrow Target (main base) | Source (extension base) \rightarrow Target (extension base) |
| Q02UCPU | 0.76 | 1.27 | 1.37 | 1.79 |
| Q03UD/Q03UDECPU | 0.73 | 1.27 | 1.37 | 1.77 |
| Other than above | 0.73 | 1.25 | 1.35 | 1.78 |

| CPU type | $KM4(\times 10^{-3})$ | | | |
|------------------|--|---|---|--|
| | Network module installation location | | | |
| | Source (main base) \rightarrow Target (main base) | Source (main base) \rightarrow Target (extension base) | Source (extension base) \rightarrow Target (main base) | Source (extension base) \rightarrow Target (extension base) |
| Q02UCPU | 25.00 | 25.20 | 25.20 | 25.50 |
| Q03UD/Q03UDECPU | 22.10 | 22.50 | 22.70 | 23.10 |
| Other than above | 22.10 | 22.50 | 22.70 | 23.00 |

(e) Link scan time

The link scan time is obtained by the equation below using the following variables:

- Network type
- Number of assignment points of the link device
- Number of connected stations

1) MELSECNET/H mode

a) With a communication speed of 10Mbps

[Link scan time]

$$LS = KB + (0.45 \times \text{total number of stations}) + \left\{ \frac{LB + LY + (LW \times 16)}{8} \times 0.001 \right\} + (T \times 0.001) + (F \times 4) \text{ [ms]}$$

b) With a communication speed of 25Mbps

[Link scan time]

$$LS = KB + (0.40 \times \text{total number of stations}) + \left\{ \frac{LB + LY + (LW \times 16)}{8} \times 0.0004 \right\} + (T \times 0.0004) + (F \times 4) \text{ [ms]}$$

LS : Link scan time

KB : Constant

| Total number of stations | 1 to 8 | 9 to 16 | 17 to 24 | 25 to 32 | 33 to 40 | 41 to 48 | 49 to 56 | 57 to 64 |
|--------------------------|--------|---------|----------|----------|----------|----------|----------|----------|
| KB | 4.0 | 4.5 | 4.9 | 5.3 | 5.7 | 6.2 | 6.6 | 7.0 |

LB : Total points of link relays (LB) used in all stations *1

LW : Total points of link registers (LW) used in all stations *1

LX : Total points of link inputs (LX) used in all stations *1

LY : Total points of link outputs (LY) used in all stations *1

Refer to Section 3.3.3.

T : Maximum number of bytes sent by the transient transmission in one link scan. *2

F : Number of stations returned to the network (Only if there are faulty stations. : Maximum number of stations returned to the network in 1 scan (set value))

*1: Total link device points set up in Network range assignment.

Note that the points assigned to reserved stations are excluded.

*2: "0" when not used.

REMARK

For the link scan time in MELSECNET/10 mode, refer to For QnA/Q4AR MELSECNET/10 Network System Reference Manual.

2) MELSECNET/H Extended mode

a) With a communication speed of 10Mbps

[Link scan time]

$$LS = KB + (0.45 \times SP) + \left\{ \frac{LB + LY + (LW \times 16)}{8} \times 0.001 \right\} + (T \times 0.001) + (F \times 4) \text{ [ms]}$$

b) With a communication speed of 25Mbps

[Link scan time]

$$LS = KB + (0.40 \times SP) + \left\{ \frac{LB + LY + (LW \times 16)}{8} \times 0.0004 \right\} + (T \times 0.0004) + (F \times 4) \text{ [ms]}$$

LS : Link scan time

KB : Constant

| Total number of stations | 1 to 8 | 9 to 16 | 17 to 24 | 25 to 32 | 33 to 40 | 41 to 48 | 49 to 56 | 57 to 64 |
|--------------------------|--------|---------|----------|----------|----------|----------|----------|----------|
| KB | 4.0 | 4.5 | 4.9 | 5.3 | 5.7 | 6.2 | 6.6 | 7.0 |

$$SP = \sum_{i=1}^n \left\{ \frac{\text{Number of bytes sent by station No. (i)}}{2000} \right\} * 1$$

n=Total number of stations

Number of bytes sent = {(LY + LB) / 8 + (2 × LW)}

*1: The number after the decimal point is rounded up. 0 is handled as 1.

The calculation example of SP in the setting example (a) is shown in (b).

(a) Setting example

| Station No. | Number of bytes sent by each station |
|---------------|--------------------------------------|
| Station No. 1 | 8000 bytes |
| Station No. 2 | 7800 bytes |
| Station No. 3 | 0 bytes |
| Station No. 4 | 2000 bytes |

(b) Calculation example of SP

$$SP = \frac{8000}{2000} + \frac{7800}{2000} + \frac{0}{2000} + \frac{2000}{2000}$$

\uparrow \uparrow \uparrow \uparrow
 0 is handled as 1.
 Number after decimal point is rounded up.

$$= 4 + 4 + 1 + 1$$

$$= 10$$

LB : Total points of link relays (LB) used in all stations *2

LW : Total points of link registers (LW) used in all stations *2

LX : Total points of link inputs (LX) used in all stations *2

LY : Total points of link outputs (LY) used in all stations *2

Refer to Section 3.3.3.

T : Maximum number of bytes sent by the transient transmission in one link scan. *3

F : Number of stations returned to the network (Only if there are faulty stations. : Maximum number of stations returned to the network in 1 scan (set value))

*2: From the beginning to the end of the device assigned with a common parameter (free areas in between are also included in the number of points).

*3: "0" when not used.

(2) Transmission delay time between multiple networks using the inter-link data transfer function

The following shows the cyclic transmission delay time for the case where link device data are transferred to another network with the interlink transfer function.

[Inter-link data transfer]

(Transmission delay time)

$$T_D = (S_T + \alpha_T) + (L_{ST} \times 1) + \alpha_{MR} + K_M + \alpha_{MT} + (L_{SR} \times 1) + (S_R \times 2) + \alpha_R \text{ [ms]}$$

(Transmission delay time)...For Universal model QCPU

$$T_D = (S_T + \alpha_T) + (L_{ST} \times 1) + \alpha_{MR} + \alpha_{MT} + (L_{SR} \times 1) + (S_R \times 2) + \alpha_R \text{ [ms]}$$

S_T : Scan time of the sending station (except link refresh time)

S_R : Scan time of the receiving station (except link refresh time)

α_T : Link refresh time of the transmitting station *1

α_{MT} : Link refresh time of the relay station and the sending station (for transfer) *1

α_{MR} : Link refresh time of the relay station and the receiving station (for transfer) *1

α_R : Link refresh time of the receiving station *1

L_{ST} : Link scan time of the sending station

L_{SR} : Link scan time of the receiving station

K_M : Transmission processing time of the CPU module of the relay station

*1: Total for the network modules mounted

$$K_M = K_{M6} \times \left(\frac{LB}{16} + LW \right) \div 1000 + K_{M7} \text{ [ms]}$$

LB : Total of transfer source LB points that are set with interlink transmission parameters.

LW : Total of transfer source LW points that are set with interlink transmission parameters.

K_{M6} : Constant

K_{M7} : 4.5 (Worst value: 60)

| Module location | | $K_{M6} (\times 10^{-3})$ |
|------------------------|------------------------|---------------------------|
| Transfer source module | Transfer target module | |
| Main base unit | Main base unit | 6.7 |
| Main base unit | Extension base unit | 10.00 |
| Extension base unit | Main base unit | 10.00 |
| Extension base unit | Extension base unit | 12.00 |

POINT

Although K_{M7} is usually 4.5ms, it can be 60ms if monitoring or a dedicated instruction is executed from GX Developer or any other station.

Depending on the monitoring timing from GX Developer or another station, the time may be longer than that.

If the time increase may cause a system problem, use link direct devices in the sequence program to transfer data.

(3) Example of the transmission delay time calculation

The following example calculates the transmission delay time with the following system configuration and under the following conditions:

(System configuration and conditions)

- 1) CPU module: Q06HCPU
- 2) Network type: MELSECNET/H mode
- 3) Communication speed: 10Mbps
- 4) Total number of stations: 8 stations (1 control station, 7 normal stations)
- 5) Number of link device points: LB = 1024 points, LW = 1024 points, LX = LY = 0 points, SB = SW = 512 points
- 6) Scan time of the CPU module for all stations: 1 ms
- 7) The file register is not used.
- 8) The data inter-link transfer and the transient transmission are not used.
- 9) The network modules are installed on the basic base unit on all stations.

<Constants used when network modules are installed on main base unit>

| Constants CPU type | KM1 | KM2 ($\times 10^{-3}$) | KM3 ($\times 10^{-3}$) | KM4 | | | KM5 ($\times 10^{-6}$) |
|-----------------------|------|-----------------------------|-----------------------------|-----------|-----------|-----------|-----------------------------|
| | | | | 2 modules | 3 modules | 4 modules | |
| Q06HCPU | 0.13 | 0.41 | 0.53 | 0.25 | 0.38 | 0.51 | 0.13 |

(a) Link refresh time

$$\text{Link refresh time} = \text{KM1} + \text{KM2} \times \left\{ \frac{\text{LB} + \text{LX} + \text{LY} + \text{SB}}{16} + \text{LW} + \text{SW} \right\} + \alpha_E + \alpha_L$$

The link refresh time on the sending station $\alpha_T = 0.13 + 0.41 \times 10^{-3}$

$$\begin{aligned} & \times \left\{ \frac{1024 + 0 + 0 + 512}{16} + 1024 + 512 \right\} + 0 + 0 \\ & \approx 0.80 \text{ (ms)} \end{aligned}$$

The link refresh time on the receiving station $\alpha_R \approx 0.80 \text{ (ms)}$

(b) Link scan time

$$\begin{aligned} \text{Link scan time LS} &= \text{KB} + (0.45 \times \text{total number of stations}) \\ &+ \left\{ \frac{(\text{LB} + \text{LY} + (\text{LW} \times 16))}{8} \times 0.001 \right\} \\ &= 4.0 + (0.45 \times 8) \\ &+ \left\{ \frac{1024 + 0 + (1024 \times 16)}{8} \times 0.001 \right\} \\ &\approx 9.776 \text{ (ms)} \end{aligned}$$

(c) Cyclic transmission delay

$$\begin{aligned} \text{Transmission delay time } T_{D1} &= S_T + \alpha_T + (\text{LS} \times 0.5) + (\text{S}_R + \alpha_R) \times 1.5 \\ &= 1 + 0.80 + (9.776 \times 0.5) + (1 + 0.80) \times 1.5 \\ &\approx 9.39 \text{ (ms)} \end{aligned}$$

3.3.3 Reducing the link refresh time

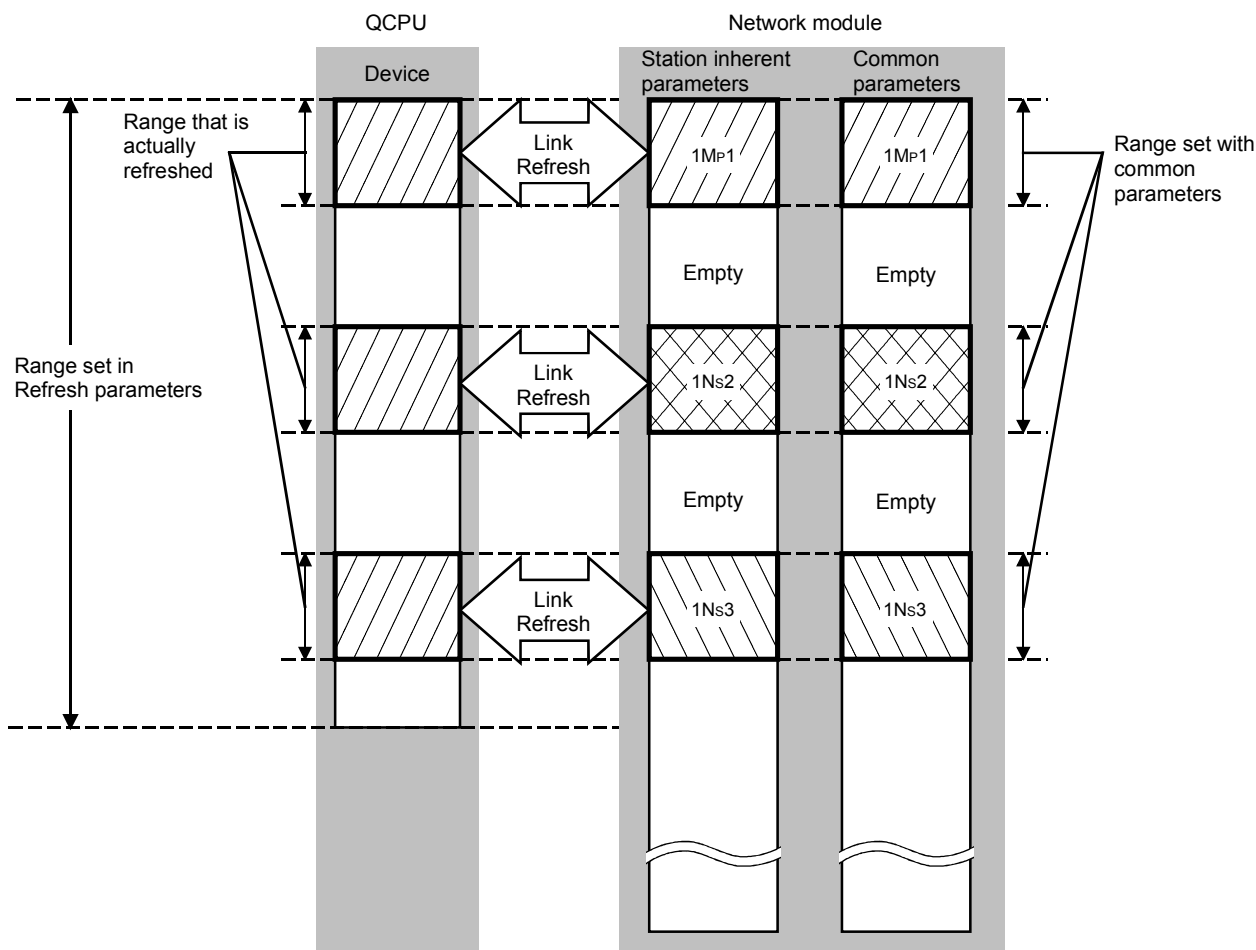
The link refresh time can be reduced by decreasing the number of refresh points to the CPU module.

Reduce the refresh points by any of the following:

- Refresh parameters
- Common parameters
- Direct access to link devices
- Station inherent parameters

(1) Concept of the refresh range (number of points)

The ranges set with common parameters and within the set range of Refresh parameters are refreshed.



POINT

- (1) During the initial settings (to return to the initial settings, click the default button of GX Developer) of the refresh parameters, the range from the start to end addresses is set, which can be viewed with the assignment image diagram of the refresh parameters.
- (2) The initial settings of the station inherent parameters are the same as the setting range of the common parameters.

(2) How to decrease the number of refresh points

(a) Using the refresh parameters

66 refresh ranges can be set on the High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU.

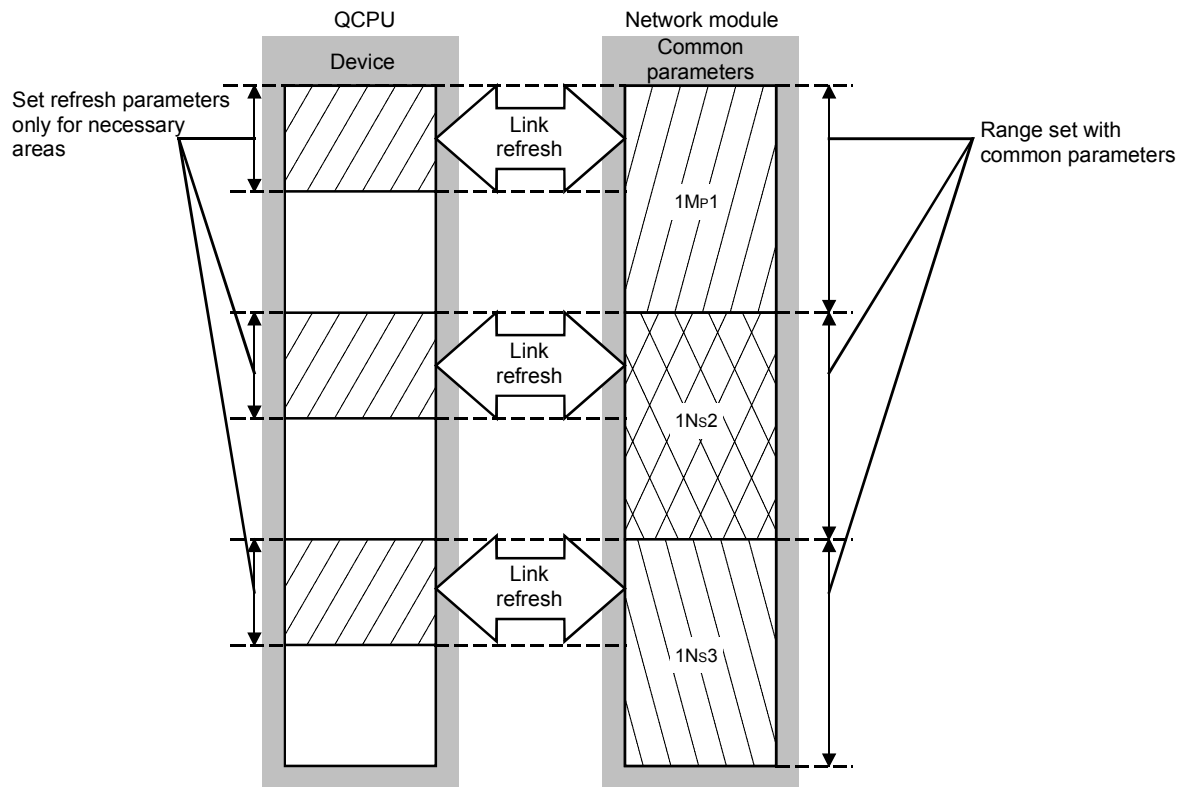
66 ranges (for 64 stations + for SB + for SW)

10 refresh ranges can be set on the Basic model QCPU and safety CPU.

10 ranges (for 8 stations + for SB + for SW)

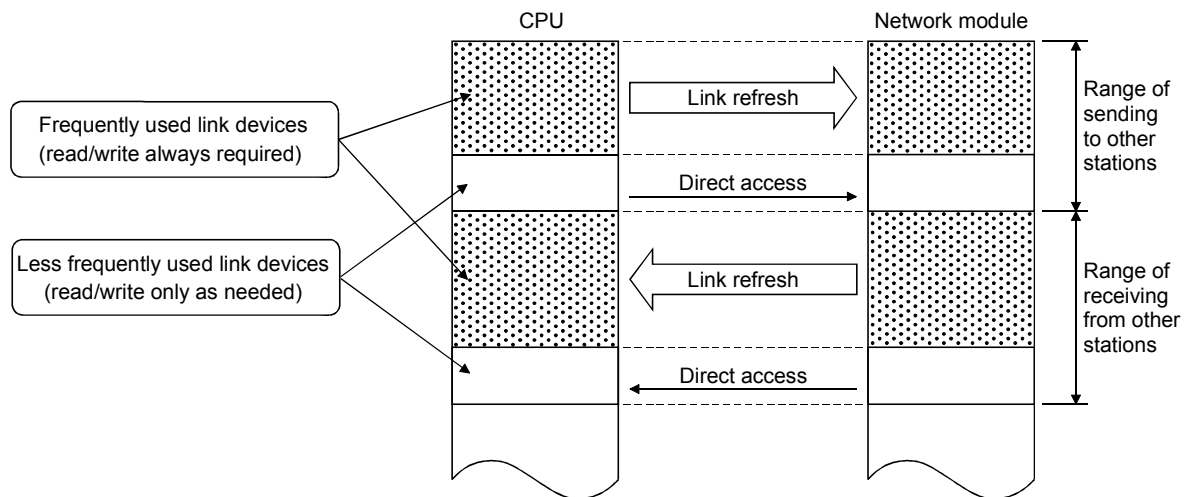
Set the values so that only the required parts are refreshed.

For more details, refer to Section 5.7.1.



(b) Using direct access to link devices

The refresh time can be reduced by directly accessing link devices that are less frequently used by the host and excluding them from the refresh range. (Refer to Section 7.1)



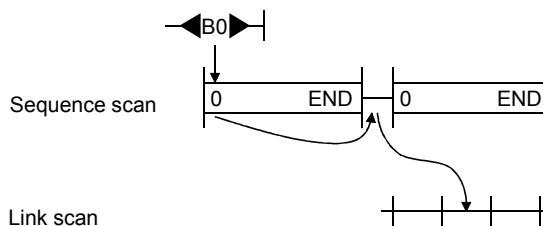
The link refresh is executed by the END processing of the CPU module, but reading from/writing to the network module is directly performed when an instruction is executed; thus the transmission delay time can be reduced.

1) Direct access to the sending station

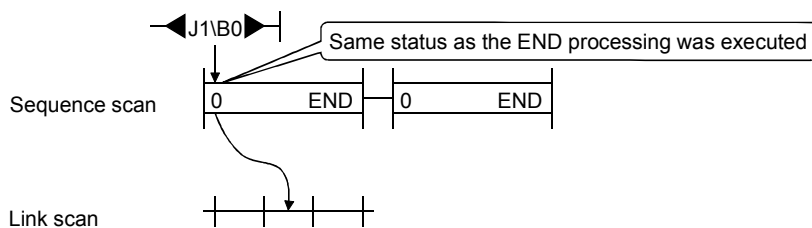
a) When close to step 0

The direct access is faster by a maximum of one scan of a sequence program when compared with the link refresh.

(Link refresh)



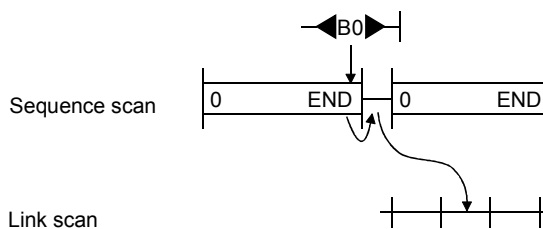
(Direct access)



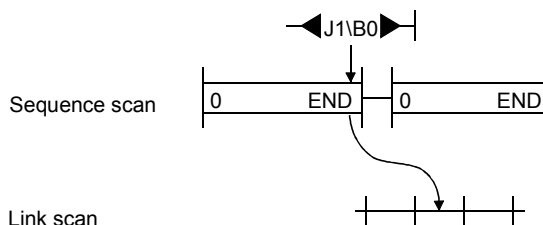
b) When close to END

The link refresh and the direct access occur at almost the same time.

(Link refresh)



(Direct access)

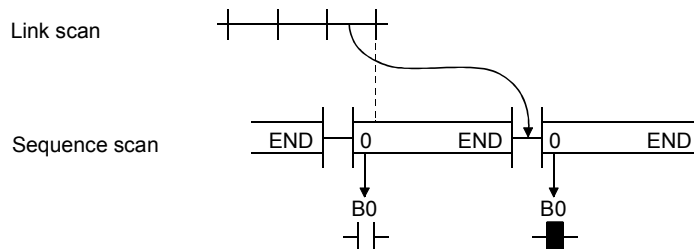


2) Direct access to the receiving station

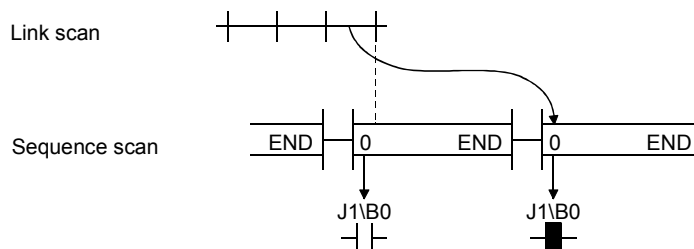
a) When close to step 0

The link refresh and the direct access occur at almost the same time.

(Link refresh)



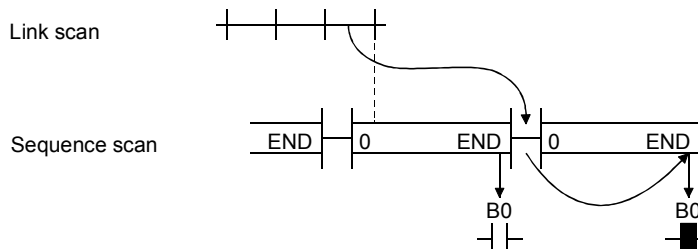
(Direct access)



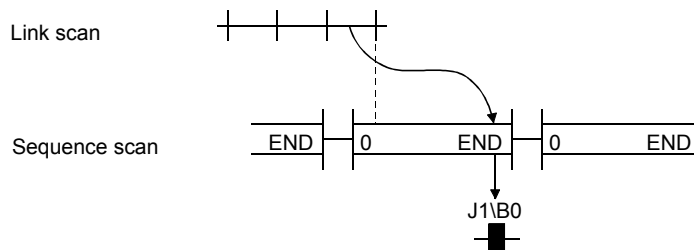
b) When close to END

The direct access is faster by a maximum of one scan of a sequence program when compared with the link refresh.

(Link refresh)



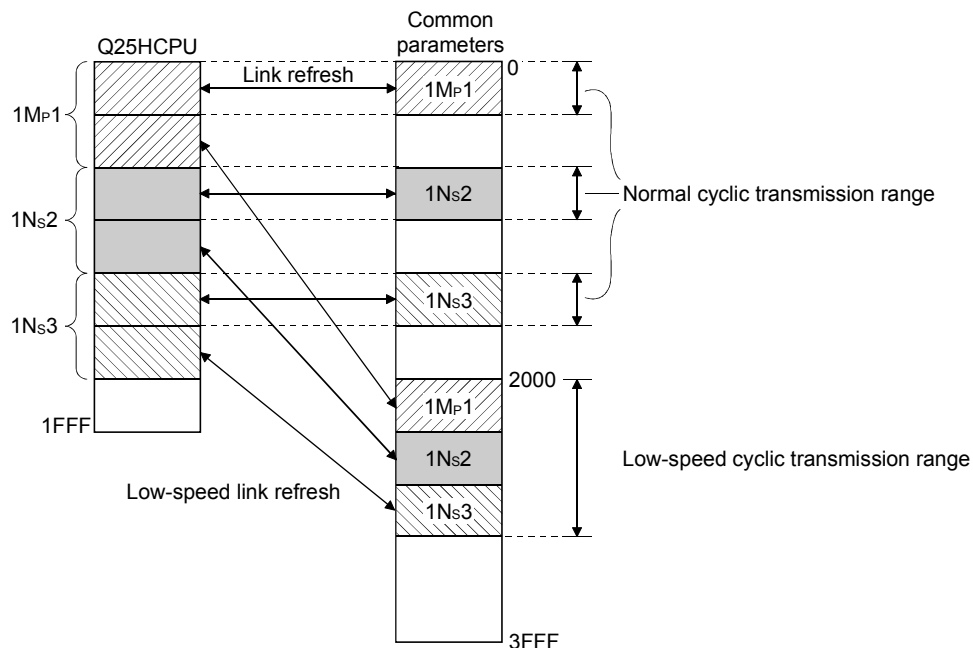
(Direct access)



3.3.4 Reduction of the link scan time

The amount of link refresh and link scan data (LB/LW) per END processing can be reduced by assigning the data in the link devices (LB/LW) for normal cyclic transmission, which does not require high-speed transmission, to the extension area (2000H to 3FFFH), and transmit it by the low-speed cyclic transmission.

(High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)



3.3.5 Control station shift time

The time required to shift the control station status (control station shift time) can be calculated from the following expression:

[Control station shift time (Csw)]

$$Csw = (a \times 12) + (b \times 11) + (c \times 3) + 450 \text{ [ms]}$$

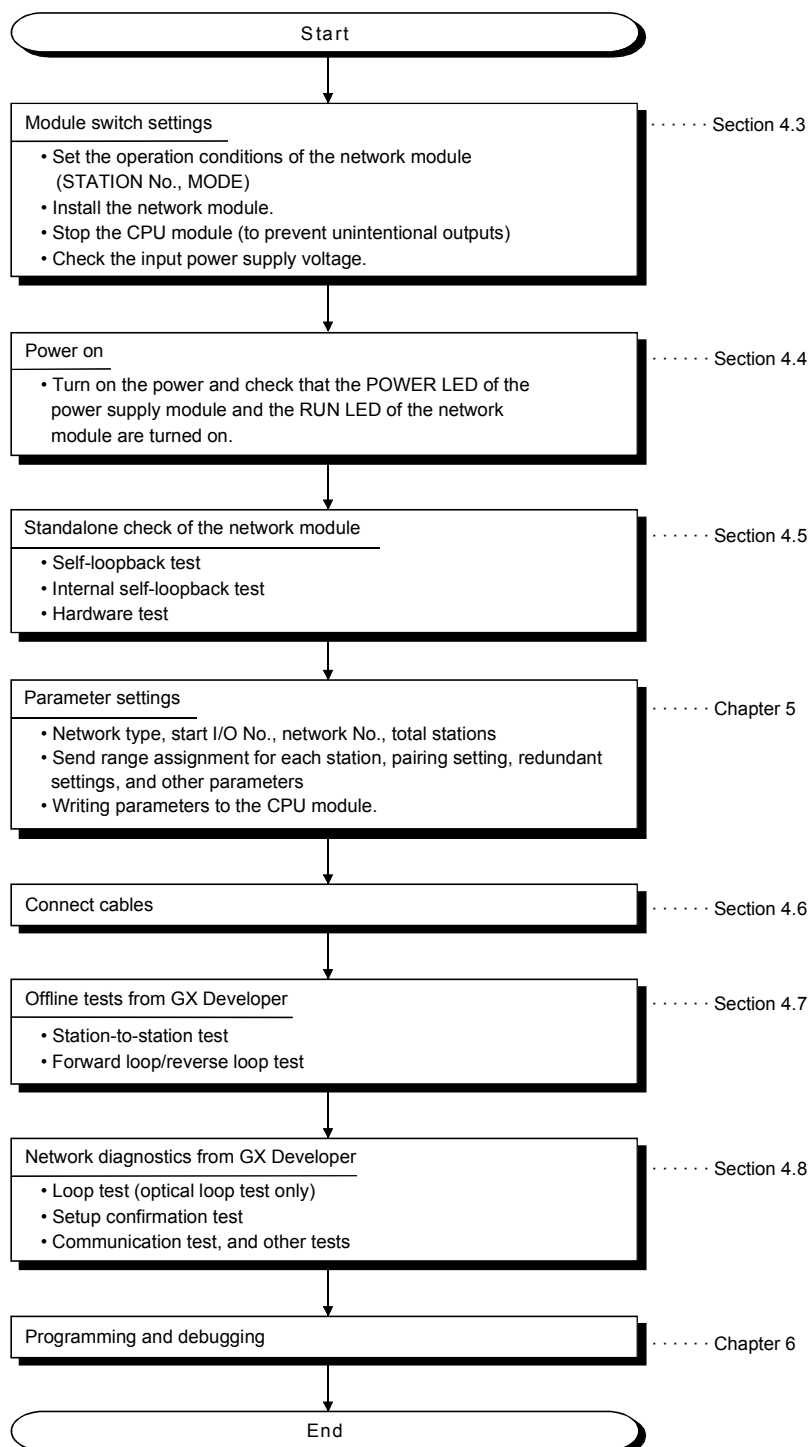
- Ⓐ : Number of normal stations after control station cut-off
- Ⓑ : Number of abnormal stations after control station cut-off
- Ⓒ : Set value of constant link scan (Refer to Section 5.4.)

4 SETUP AND PROCEDURES BEFORE STARTING THE OPERATION

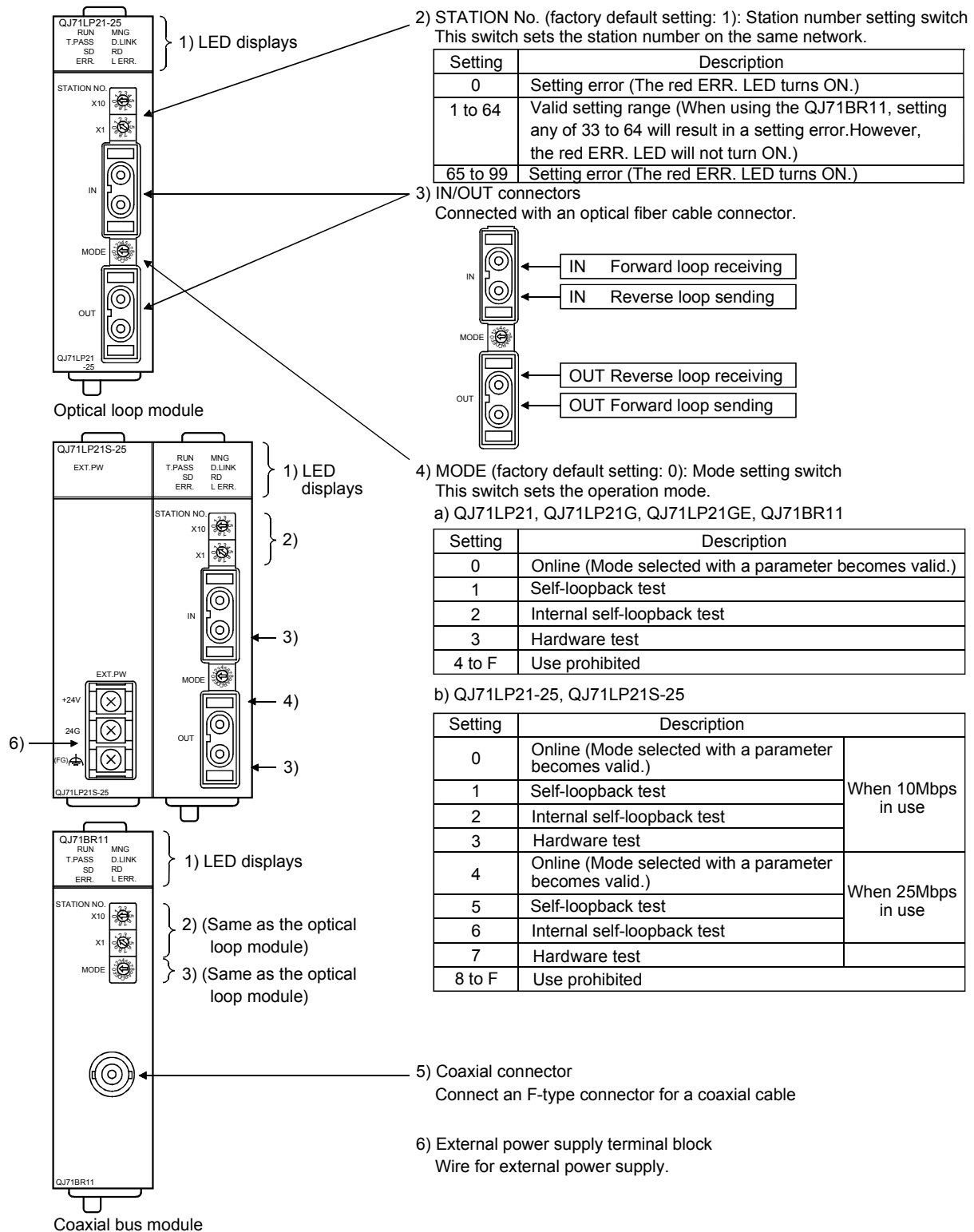
This chapter explains the procedures, settings, connections and testing that are required to start the data link operation.

4.1 Procedures Before Starting the Operation

The following flowchart shows the procedures that are required to perform the data link operation:



4.2 Component Names and Settings of the Network Module (QJ71LP21, QJ71LP21-25, QJ71LP21S-25, QJ71LP21G, QJ71LP21GE, QJ71BR11)



POINT

Set the mode setting switches in the same position on all network modules.

1) LED displays

| No. | Name | LED status | Description |
|-----|---------|-------------|--|
| 1 | RUN | Green on | Module operating normally |
| | | Off | Watchdog timer error occurred (hardware error) |
| 2 | MNG | Green on | Operating as a control station or sub-control station |
| | | Off | Normal station (not operating as a control station or sub-control station) |
| 3 | T.PASS | Green on | Executing baton pass (being joined in a network) |
| | | Green flash | Test is determined to have completed normally when this LED flashes 20 times or more (approximately 10 s) during the test. |
| | | Off | Baton pass not yet executed (the host is disconnected from the network) |
| 4 | D.LINK | Green on | Data link being executed (cyclic transmission is being executed) |
| | | Off | Data link not yet executed (parameter receiving not completed, host CPU error, data link stop instructed, etc.) |
| 5 | SD | Green on | Data being sent |
| | | Off | Data not yet sent |
| 6 | RD | Green on | Data being received |
| | | Off | Data not yet received |
| 7 | ERR. | Red on | <ul style="list-style-type: none"> An error occurred, for instance a station number setting error (other than 1 to 64), mode setting error (set to use prohibited), operation condition setting error (parameters), or an installed CPU type error (settings outside the range used, CPU type). A station with the same number already exists in the network. The host is designated as the control station even though a control station already exists in the network. Invalid parameter settings (contradicting settings). The parameters received from the sub-control station and the parameters retained by the host (received from the control station) are different. A moderate or fatal error occurred in the CPU module. |
| | | Flashing | <ul style="list-style-type: none"> An error was detected while testing the network module. The mode setting switch or the station number setting switch was changed during operation. *1 |
| | | Off | Normal status |
| 8 | L ERR. | Red on | <p>A communication error occurred (one of the following communication errors has occurred):</p> <p>CRC : Error generated by an abnormal cable, noise, etc.</p> <p>OVER : This error occurs when the next data is received before the last receive data is loaded into the module, and the data is overwritten. It is caused by a hardware error in the receive area of the network module.</p> <p>AB.IF : This error occurs when more than the specified number of bits are set to "1" among the receive data in the frame, or when the receive data is shorter than the specified data length.</p> <p>TIME : This error occurs when a baton pass was not handed to the host within the monitoring time.</p> <p>DATA : This error is caused when abnormal code data is received.</p> <p>UNDER : This error occurs when the internal processing of the send data was not executed at a fixed interval.</p> <p>LOOP : This error occurs when the forward or reverse loop line is faulty and the power to the adjacent station, which sends data to the host station, is turned OFF or the cable connector is faulty.</p> <p><Corrective action></p> <p>Check the cables and connectors (detached or loosened connectors, wrong IN/OUT connections, broken or damaged cables, improper cable routing, etc.)</p> <p>For more details, see the "Network Diagnostics" (Section 8.1).</p> |
| | | Off | No communication error |
| 9 | EXT. PW | Green on | External power being supplied (Host station power status (SB0042) is ON.) |
| | | Off | External power not supplied (Host station power status (SB0042) is OFF.) |

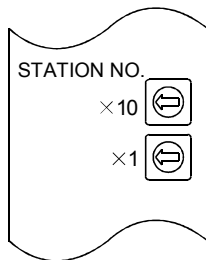
*1: The ERR. LED flashes on the following modules whose first five digits of the serial number is "02112" or later.

- QJ71LP21
- QJ71LP21-25
- QJ71BR11

4.3 Module Switch Settings

This section explains the preparations that should be made prior to powering on the network module.

4.3.1 Setting the station number (STATION NO.)



Set the station number of the network module in the network using the station number setting switches.

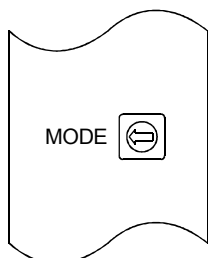
The upper switch is for setting a number of tens and the lower switch for setting a number of single units.

| Setting | Description |
|----------|---|
| 0 | With PLC to PLC networks: Setting error. With remote I/O networks: Valid setup range |
| 1 to 64 | Valid setting range |
| 65 to 99 | Setting error |

POINT

- 1) Duplicate station numbers cannot be used in the same network.
- 2) Any station can be set as the control station as long as the station number is in the valid setting range.
- 3) The station number setting does not need to be consecutive. However, when no number is set to a station, it must be set as a reserved station.
- 4) When setting, use a station number within the range set at the network parameter's "Total stations."

4.3.2 Setting the mode (MODE)



Set the operation mode of the network module using the mode setting switch.

Set to Online (setting 0 or 4) after the standalone check (self-loopback test, internal self-loopback test, and hardware test) of the network module is completed.

(a) QJ71LP21, QJ71LP21G, QJ71LP21GE, QJ71BR11

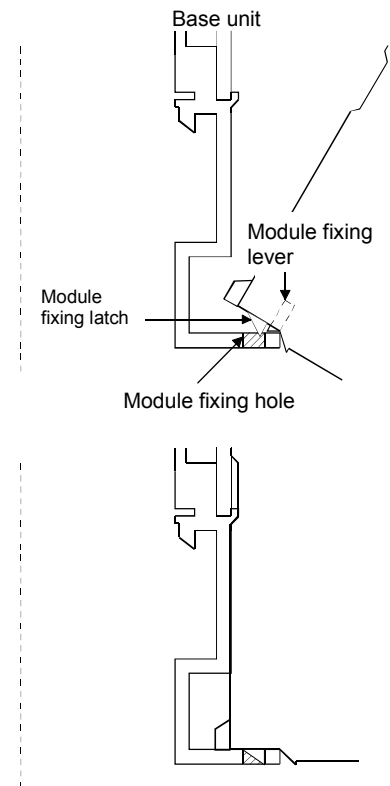
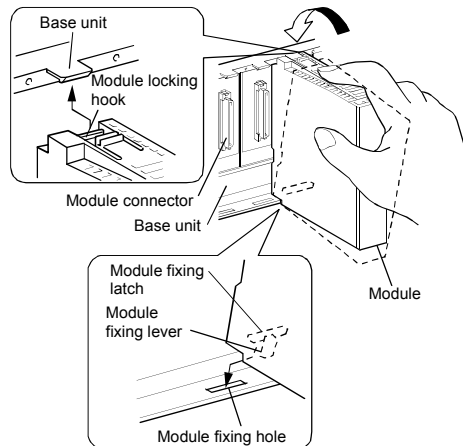
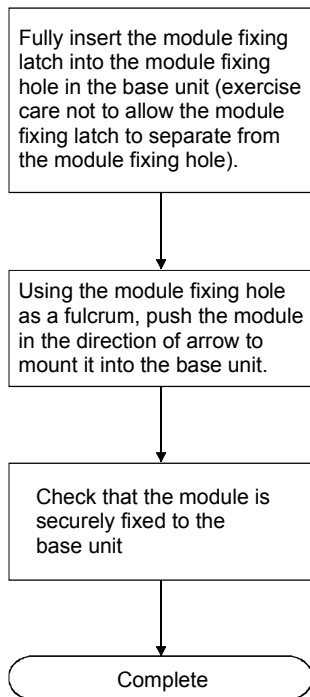
| Setting | Description |
|---------|--|
| 0 | Online (Mode selected with a network parameter becomes valid.) |
| 1 | Self-loopback test |
| 2 | Internal self-loopback test |
| 3 | Hardware test |
| 4 to F | Use prohibited |

(b) QJ71LP21-25, QJ71LP21S-25

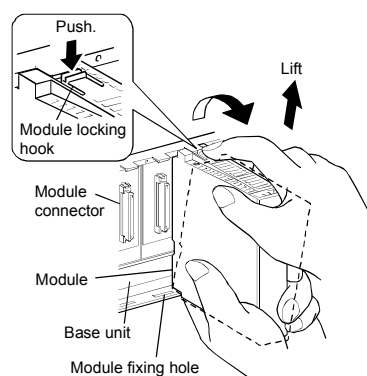
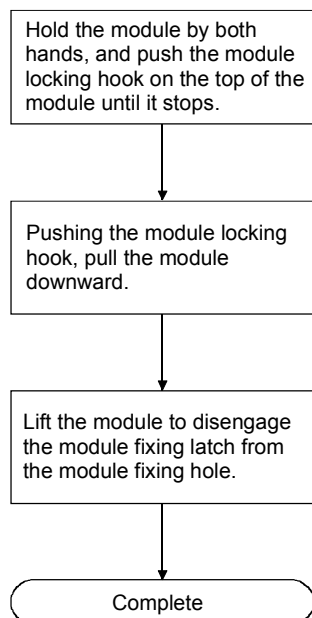
| Setting | Description | |
|---------|--|--------------------|
| 0 | Online (Mode selected with a network parameter becomes valid.) | When 10Mbps in use |
| 1 | Self-loopback test | |
| 2 | Internal self-loopback test | |
| 3 | Hardware test | |
| 4 | Online (Mode selected with a network parameter becomes valid.) | When 25Mbps in use |
| 5 | Self-loopback test | |
| 6 | Internal self-loopback test | |
| 7 | Hardware test | |
| 8-F | Use prohibited | |

4.3.3 Installing and uninstalling the module

(1) Installing the module



(2) Uninstalling the module



[Module handling precautions]

- Since the module case is made of resin, do not drop it or subject it to strong impacts.
- The module can be easily fixed onto the base unit using the hook at the top of the module. However, it is recommended to secure the module with the module mounting screw if the module is subject to significant vibration or shock. In that case, tighten the module fixing screws within the following range. Module fixing screws (M3): Tightening torque range is 0.36 to 0.48N·m.
- The following range must be applied when tightening the external supply power terminal screws for the QJ71LP21S-25. For specifications of the external supply power terminal screws, refer to section 3.1.1.
External supply power terminal screws (M3): Tightening torque range is 0.42 to 0.58 N·m.

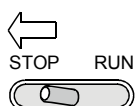
DANGER

- Do not touch the terminals and the connectors while the power to the module is on. Doing so may cause electric shocks or malfunctions.
- If the module is not mounted properly and fastened with the screws, it may cause the module to malfunction, break down or fall off. If the screws are tightened excessively, it may damage the module and the screws, and cause the module to short-circuit, malfunction or fall off.

CAUTION

- Be careful not to let foreign particles such as chaff or wire chips enter the module. They may cause fire, breakdowns or malfunctions.
- Never disassemble or modify the module.
It may cause breakdowns, malfunctions, injuries or fire.

4.3.4 Stopping the CPU (unintentional output prevention)



Set the RUN/STOP switch *1 of the CPU module to STOP.

*1: Use the RESET/STOP/RUN switch for the Basic model QCPU, Universal model QCPU, and safety CPU.

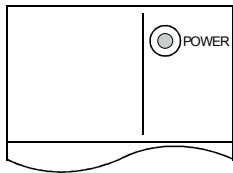
4.3.5 Checking the input power supply voltage

Check that the supply power voltage to the power supply module is within the specifications.

4.4 Powering On

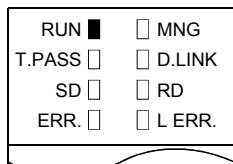
Check the power supply to the network module.

4.4.1 Checking the on status of the POWER LED of the power supply module



The POWER LED lights up at the same time when the programmable controller system is powered on.

4.4.2 Checking the on status of the RUN LED of the network module



The RUN LED lights up in green when the network module is operating normally. If this LED does not light up, see Chapter 8, "Troubleshooting."

4.5 Standalone Check of the Network Module (Offline Tests)

Before executing the data link operation, check the network module and the cables.
Select a test using the mode setting switch on the front of the network module.

The following three test are available for the offline tests:

(1) Self-loopback test (mode setting switch: 1 or 5)

This test checks the hardware of the internal circuits, including the send/receive circuit of the network module, as well as the cables.

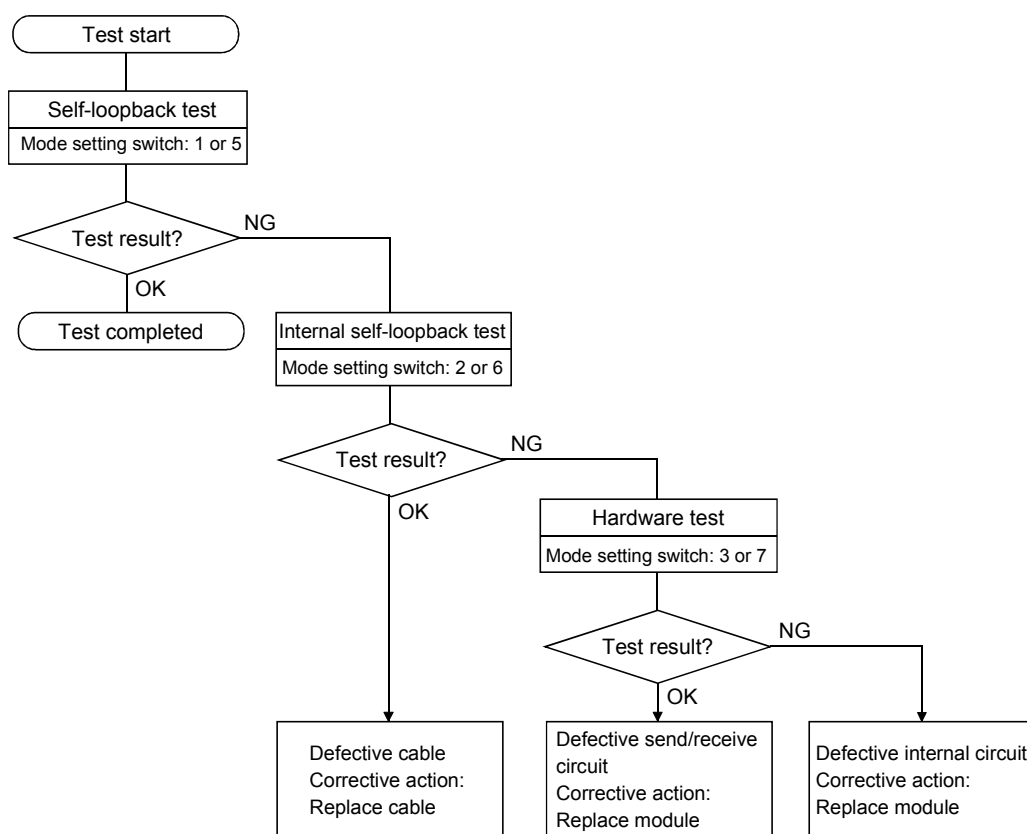
(2) Internal self-loopback test (mode setting switch: 2 or 6)

This test checks the hardware of the internal circuits, including the send/receive circuit of the network module.

(3) Hardware test (mode setting switch: 3 or 7)

This test checks the hardware inside the network module.

Flow of offline tests



REMARKS

The data link operation cannot be executed normally if at least one station is placed in the test mode (offline, MODE switches 1 to 3 or 5 to 7) during data linking (online).

4.5.1 Self-loopback test

This test checks the hardware of a standalone network module, including the send/receive circuit and cable of the transmission system.

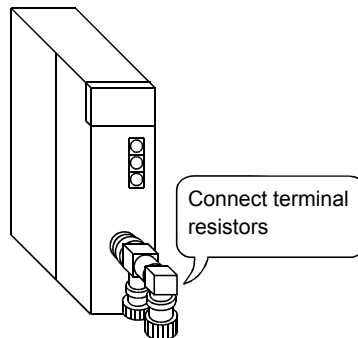
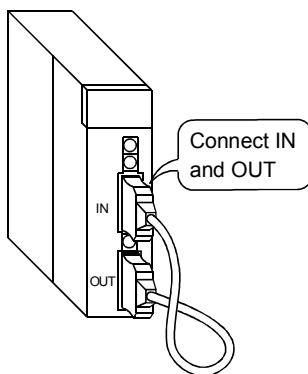
POINT

To perform the self-loopback test, be sure to connect the cable or terminal resistor. Do not connect or disconnect the cable or terminal resistor during execution of the test. (Doing so will result in test failure.)

- (1) Connect the OUT and IN terminals of the QJ71LP21 network module (for the optical loop system) with an optical fiber cable. Connect a terminal resistor to both of the F-type connectors for the QJ71BR11 network module (for the coaxial bus system).

For QJ71LP21
(optical loop system)

For QJ71BR11
(coaxial bus system)



MODE



- (2) Set the mode setting switch of the network module to "1". Set it to "5" when using the QJ71LP21-25 at 25Mbps. The self-loopback test is selected.
- (3) Switch power on. The self-loopback test is executed; check the execution status on the network module display. The T. PASS LED flashes during the test. When the T. PASS LED flashes 20 times or more and if the ERR.LED does not flash, this condition indicates normal completion. If the test is abnormally completed, the ERR. LED flashes. Upon detection of an error, the test will be terminated (abnormal termination).

| | |
|---------------------------------|---------------------------------|
| RUN <input type="checkbox"/> | <input type="checkbox"/> MNG |
| T.PASS <input type="checkbox"/> | <input type="checkbox"/> D.LINK |
| SD <input type="checkbox"/> | <input type="checkbox"/> RD |
| ERR. <input type="checkbox"/> | <input type="checkbox"/> L ERR. |

| | | |
|---------------------------------------|--|--|
| Before test | During test | Normal completion of test |
| T.PASS <input type="checkbox"/> : Off | ⇒ <input checked="" type="checkbox"/> : Flashing | ⇒ <input checked="" type="checkbox"/> : Flashing 20 times (approx. 10 seconds) or more |
| | | Abnormal completion of test |
| | | ERR. <input checked="" type="checkbox"/> : Flashing |

If an error is detected in the QJ71LP21 (for the optical loop system), check the error in GX Developer and replace the cable to identify a faulty part.

For an error in the QJ71BR11 (for the coaxial bus system), check the error in GX Developer and replace the terminal resistor to identify a faulty part.

| |
|---------|
| REMARKS |
|---------|

In the MELSECNET/H, a link refresh is executed even when the module is offline. Thus, the user can check the testing status and the result with GX Developer or a sequence program using the link special registers.

| | | | |
|--|--------|-------------|----------------------|
| Baton pass status (host) | SW0047 | → 1FH | : Offline test |
| Cause of baton pass interruption | SW0048 | → 2H | : Offline test |
| Offline test execution item/faulty station (requesting side) | SW00AC | → 7H | : Self-loopback test |
| Offline test result (requesting side) | SW00AD | → 0 | : Normal |
| | | 1 or larger | : Error code |

For details on how to check the error contents, see Chapter 8.

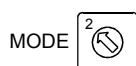
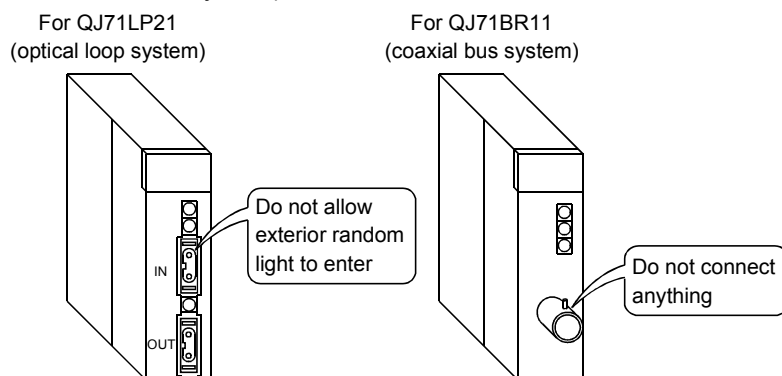
If two or more modules are installed, the testing status and the result of each module can be checked by adding 200H to the corresponding device number.

4.5.2 Internal self-loopback test

This test checks the hardware of a standalone network module, including the send/receive circuit of the transmission system.

- (1) Do not connect the optical fiber cable with the QJ71LP21 network module (for the optical loop system). However, make sure that the exterior random light does not enter from the connector.

Do not connect cables or terminal resistors if the QJ71BR11 network module (for the coaxial bus system) is used.



- (2) Set the mode setting switch of the network module to "2". Set it to "6" when using the QJ71LP21-25 at 25Mbps.

The internal self-loopback test is selected.

- (3) Switch power on.

The internal self-loopback test is executed; check the execution status on the network module display.

The T. PASS LED flashes during the test.

When the T. PASS LED flashes 20 times or more and if the ERR.LED does not flash, this condition indicates normal completion.

If the test is abnormally completed, the ERR. LED flashes.

Upon detection of an error, the test will be terminated (abnormal termination).

| | |
|---------------------------------|---------------------------------|
| RUN <input type="checkbox"/> | <input type="checkbox"/> MNG |
| T.PASS <input type="checkbox"/> | <input type="checkbox"/> D.LINK |
| SD <input type="checkbox"/> | <input type="checkbox"/> RD |
| ERR. <input type="checkbox"/> | <input type="checkbox"/> L ERR. |

Before test During test Normal completion of test
T.PASS ☐: Off ⇒ ☒: Flashing ⇒ ☒: Flashing 20 times (approx. 10 seconds) or more

Abnormal completion of test
ERR. ☒: Flashing

When an error occurs, the contents of the error should be checked with GX Developer. The faulty area can be examined by replacing the module.

REMARKS

In the MELSECNET/H, a link refresh is executed even when the module is offline. Thus, the user can check the testing status and the result with GX Developer or a sequence program using the link special registers.

| | | | |
|--|--------|-------------|-------------------------------|
| Baton pass status (host) | SW0047 | → 1FH | : Offline test |
| Cause of baton pass interruption | SW0048 | → 2H | : Offline test |
| Offline test execution item/faulty station (requesting side) | SW00AC | → 8H | : Internal self-loopback test |
| Offline test result (requesting side) | SW00AD | → 0 | : Normal |
| | | 1 or larger | : Error code |

For details on how to check the error contents, see Chapter 8.

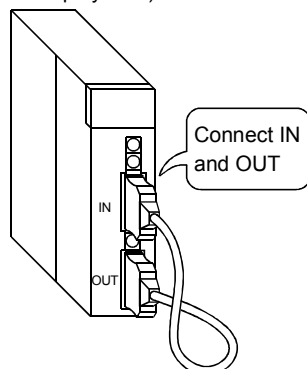
If two or more modules are installed, the testing status and the result of each module can be checked by adding 200H to the corresponding device number.

4.5.3 Hardware test

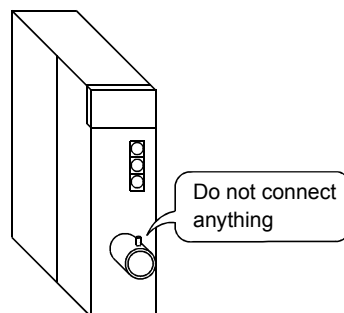
This test checks the hardware inside the network module.

- (1) Connect the IN and OUT terminals of the QJ71LP21 network module (for the optical loop system) with an optical fiber cable.
Do not connect cables or terminal resistors if the QJ71BR11 network module (for the coaxial bus system) is used.

For QJ71LP21
(optical loop system)



For QJ71BR11
(coaxial bus system)



- (2) Set the model setting switch of the network module to "3". Set it to "7" when using the QJ71LP21-25 at 25Mbps.
The hardware test is selected.
- (3) Switch power on.
The hardware test is executed; check the execution status on the network module display.
The T. PASS LED flashes during the test.
When the T. PASS LED flashes 20 times or more and if the ERR.LED does not flash, this condition indicates normal completion.
If the test is abnormally completed, the ERR. LED flashes.
Upon detection of an error, the test will be terminated (abnormal termination).

| | | | |
|--------|---|---|--------|
| RUN | □ | □ | MNG |
| T.PASS | □ | □ | D.LINK |
| SD | □ | □ | RD |
| ERR. | □ | □ | L ERR. |

| | | | | |
|---------------|---|-------------|---|---|
| Before test | | During test | | Normal completion of test |
| T.PASS □: Off | ⇒ | ■: Flashing | ⇒ | ■: Flashing 20 times (approx. 10 seconds) or more |
| | | | | Abnormal completion of test |
| | | | | ERR. ■: Flashing |

When an error occurs, the contents of the error should be checked with GX Developer. The faulty area can be examined by replacing the cable or module.

REMARKS

In the MELSECNET/H, a link refresh is executed even when the module is offline. Thus, the user can check the testing status and the result with GX Developer or a sequence program using the link special registers.

| | | | |
|--|--------|-------------|-----------------|
| Baton pass status (host) | SW0047 | → 1FH | : Offline test |
| Cause of baton pass interruption | SW0048 | → 2H | : Offline test |
| Offline test execution item/faulty station (requesting side) | SW00AC | → 9H | : Hardware test |
| Offline test result (requesting side) | SW00AD | → 0 | : Normal |
| | | 1 or larger | : Error code |

For details on how to check the error contents, see Chapter 8.

If two or more modules are installed, the testing status and the result of each module can be checked by adding 200H to the corresponding device number.

4.6 Cable Connection

4.6.1 Optical loop system

(1) Precautions in connecting

- (a) The types of optical fiber cables that can be used vary depending on the distance between stations.

| Type | | Distance between stations | | | |
|--|--------|--|--------------------------------------|-------------------|-------------------|
| | | QJ71LP21, QJ71LP21-25, QJ71LP21S-25: 10Mbps | QJ71LP21-25, QJ71LP21S-25: 25Mbps | QJ71LP21G | QJ71LP21GE |
| SI optical fiber cable (Old type: A-2P-□) | L type | 500 m (1641 ft.) | 200 m (656 ft.) | Must not be used | Must not be used |
| | H type | 300 m (984 ft.) | 100 m (328 ft.) | | |
| SI optical fiber cable | | 500 m (1641 ft.) | 200 m (656 ft.) | | |
| H-PCF optical fiber cable | | 1000 m (3281 ft.) | 400 m (1312 ft.) | | |
| Broad-band H-PCF optical fiber cable | | 1000 m (3281 ft.) | 1000 m (3281 ft.) | | |
| QSI optical fiber cable | | 1000 m (3281 ft.) | 1000 m (3281 ft.) | | |
| GI-50/125 optical fiber cable | | Must not be used | Must not be used | 2000 m (6562 ft.) | Must not be used |
| GI-62.5/125 optical fiber cable | | Must not be used | Must not be used | Must not be used | 2000 m (6562 ft.) |

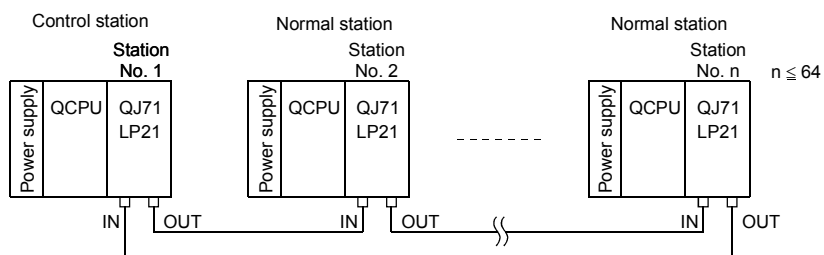
- (b) When connecting an optical fiber cable, the following restrictions on the bending radius should be observed.
For details, check the specifications of the cable to be used.
- (c) Maintain the bending radius of the optical fiber cable within the allowable range using a tool for securing the optical fiber cable bending radius.
This tool may be purchased from Mitsubishi Electric System Service, Inc, or your nearest dealer. Please inquire for more information.
- (d) When laying the optical fiber cables, do not touch the fiber cores of the cable and module connectors, and do not let dust or particles collect on them.
If oil from hands, dust or particles adhere to the cores, the accumulated transmission loss may cause malfunctions in the data link.
Also, do not remove the cover from the module-side connector until the optical fiber cable is ready to be installed.
- (e) When connecting or disconnecting an optical fiber cable, hold the connector part of the cable.
- (f) Connect the cable and module connectors securely until you hear a "click" sound.
- (g) Be sure to shut off all phases of the external power supply used in the system before connecting or disconnecting optical fiber cables.

(2) Cable connection

(a) How to connect the cable

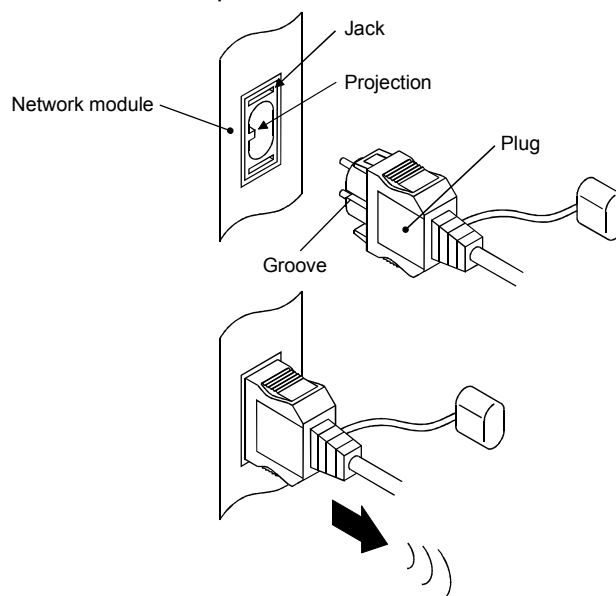
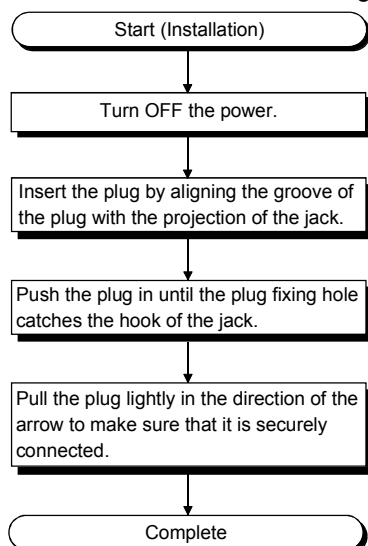
Connect the OUT and IN terminals with optical fiber cables as shown below. Note that there is no need to connect the cables in the order of station numbers.

Any station number can be assigned as the control station.



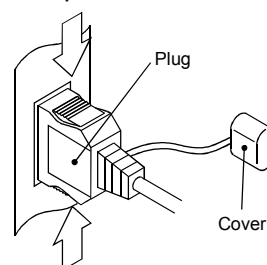
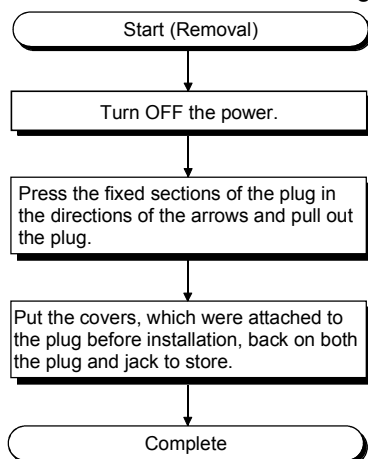
(b) Installing the optical fiber cable

The following shows how to install the optical fiber cable:



(c) Removing the optical fiber cable

The following shows how to remove the optical fiber cable:



| POINT | |
|-------|---|
| | <p>Data link operation may be executed even if IN and IN or OUT and OUT are connected with an optical fiber cable. However, the loopback function, the network diagnostic function and some of other functions do not operate normally. So, make sure to connect OUT and IN.</p> <p>The wiring status can be checked by either of the following methods.</p> <p>(1) When checking by stopping data link Conduct a loop test in the network diagnostics of GX Developer. (Refer to Section 4.8.1.)</p> <p>(2) When checking without stopping data link Check the status of SW009C to 009F. (Refer to Section 8.2.9.)</p> |

4.6.2 Coaxial bus system

(1) Precautions in connecting

(a) Restrictions on the cable length between the stations

- 1) When connecting between the network modules, the cable lengths indicated in the table below should be used according to the number of stations connected.

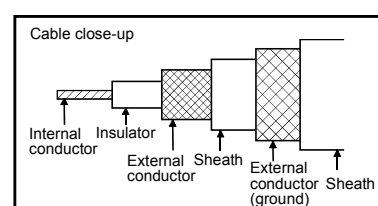
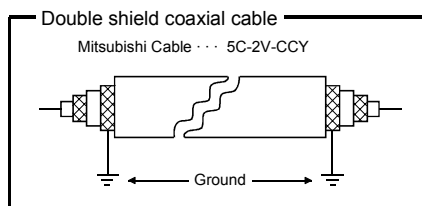
A communication error may occur if a cable length other than the lengths indicated in the table is used.

| Number of stations connected Station-to-station cable length | 2 to 9 stations | | 10 to 33 stations | |
|---|---|---------|-------------------|---------|
| | 3C - 2V | 5C - 2V | 3C - 2V | 5C - 2V |
| Cable type | | | | |
| 0 to 1 m (3.28 ft.) | × (cable less than 1m (3.28 ft.) in length cannot be used.) | | | |
| 1 (3.28 ft.) to 5 m (16.41 ft.) | ○ | ○ | ○ | ○ |
| 5 (16.41 ft.) to 13 m (42.65 ft.) | ○ | ○ | × | × |
| 13 (42.65 ft.) to 17 m (55.78 ft.) | ○ | ○ | ○ | ○ |
| 17 (55.78 ft.) to 25 m (82.03 ft.) | ○ | ○ | × | × |
| 25 (82.03 ft.) to 300 m (984.3 ft.) | ○ | ○ | ○ | ○ |
| 300 (984.3 ft.) to 500 m (1640.5 ft.) | × | ○ | × | ○ |

○: Allowed ×: Not allowed

- 2) If there is a possibility of adding more stations to expand the existing system, the cables should be installed by considering restriction 1) mentioned above in advance.
 - 3) When using a repeater module (models A6BR10 or A6BR10-DC), use the station-to-station cable length for "10 to 33" stations, regardless of the number of stations connected or the number of repeater modules.
- (b) Cable installation precautions

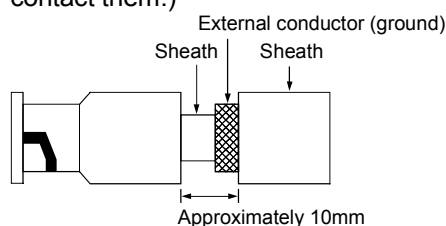
- 1) Install the coaxial cables at least 100 mm (3.94 in.) away from other power cables and control cables.
- 2) Consider to use double shield coaxial cables in locations where there is excessive noise.



5C-2V connector plug can be applied to double-shielded coaxial cable. Connect the plug to the coaxial cable inside the double shield coaxial cable.

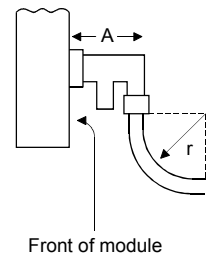
Ground the shielded section, external part of the double shield coaxial cable, as shown above.

Locate external conductor (grounding) of the double shielded cable approximately 10mm away from the connector plug for 5C-2V. (Do not contact them.)



- (c) When connecting a coaxial cable, the following restrictions on the bending radius must be observed.

| Cable type | Allowable bending radius r | Connector A |
|------------|---------------------------------|------------------|
| 3C – 2V | 23 mm (0.91 in.) | 55 mm (2.17 in.) |
| 5C – 2V | 30 mm (1.18 in.) | |



- (d) Do not pull any of the connected coaxial cables.
This may cause a faulty contact and cable disconnection, or damage the module.
- (e) Make sure to connect a terminal resistor to both terminal stations of the coaxial bus type network system.
- (f) Depending on the usage environment, some white oxidation deposits may be seen on the F type connector. However, oxidation will not occur on the connection area, so there will be no problems with the function of the unit.
- (g) Be sure to shut off all phases of the external power supply used in the system before connecting or disconnecting coaxial cables.

(2) Cable connection

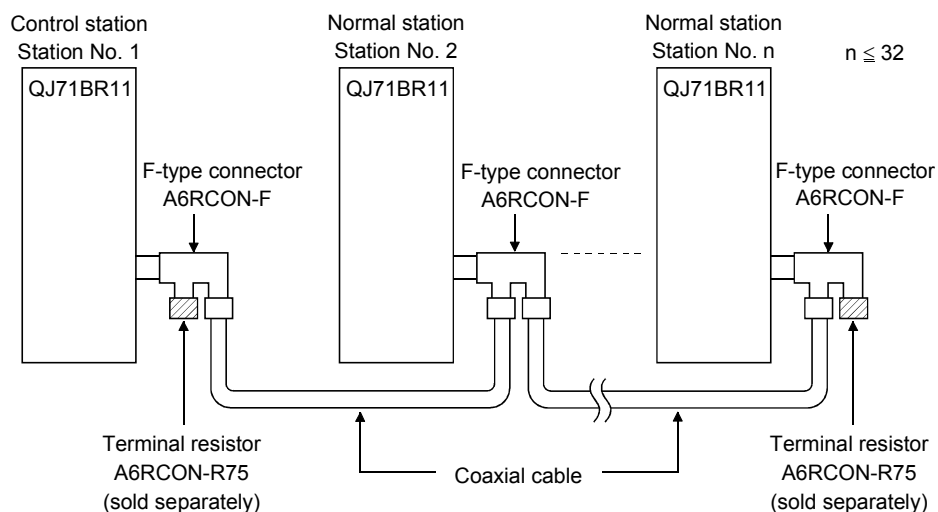
(a) Connection method

Connect the coaxial cable as shown below.

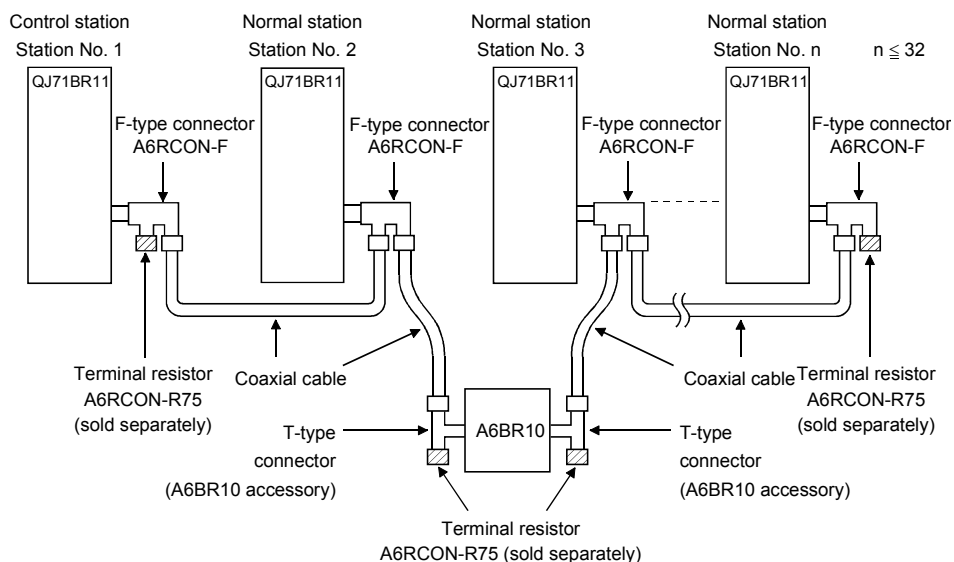
Always install a terminal resistor (sold separately: A6RCON-R75) to the stations connected at both ends.

The F-type connector (A6RCON-F) comes with the module.

1) Without a repeater module



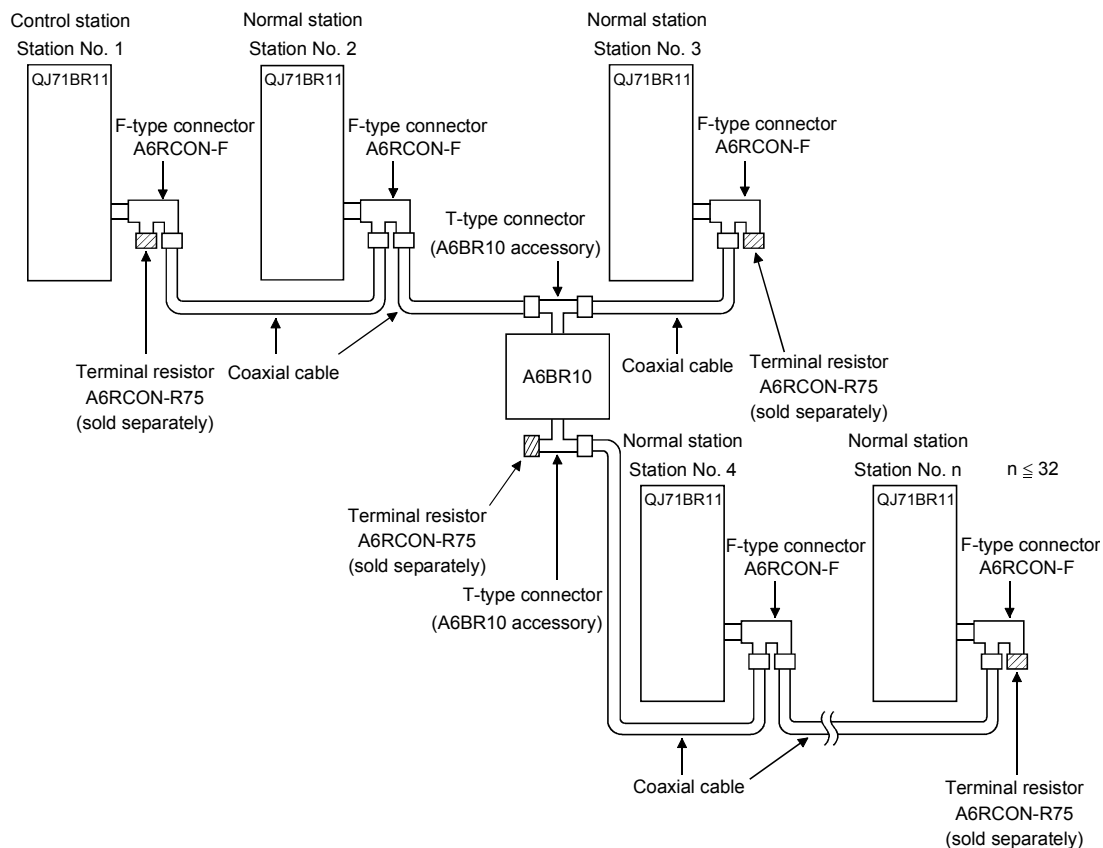
2) With a repeater module (series connection)

**REMARKS**

For details about the repeater module (A6BR10), see the following user's manual attached to the product:

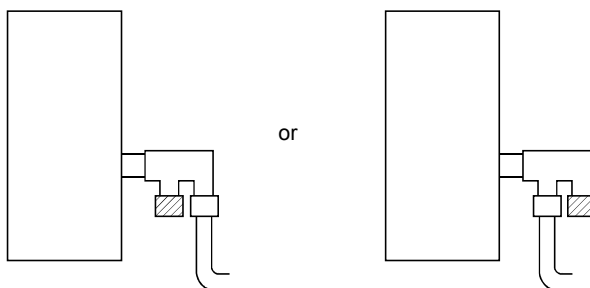
Model A6BR10/A6BR10-DC MELSECNET/10 Coaxial Bus System
Repeater Module User's Manual (IB-66499)

3) With a repeater module (branch connection)



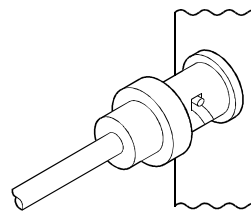
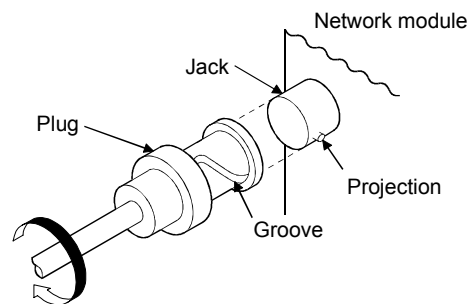
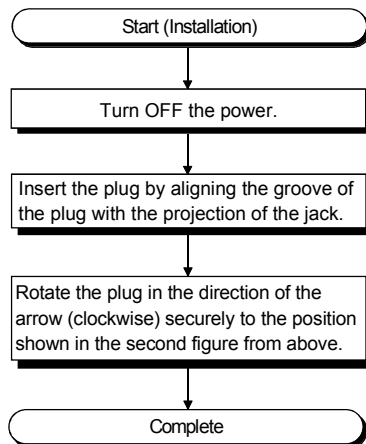
POINT

- (1) By setting stations that will be connected in future (stations that are included in the number of stations but not actually connected) as reserved stations, a communication error can be prevented and the link scan time will not be affected.
- (2) The two connectors of the F-type connector are not dedicated to IN and OUT. A coaxial cable can be connected to either of them.
- (3) A terminal resistor can be placed on either side of the F-type connector.



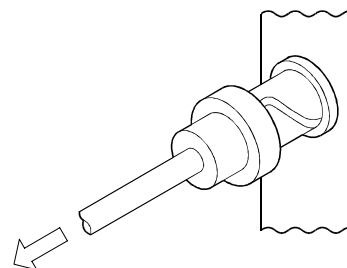
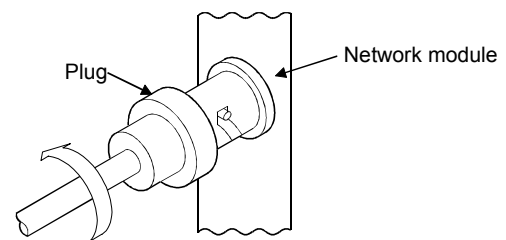
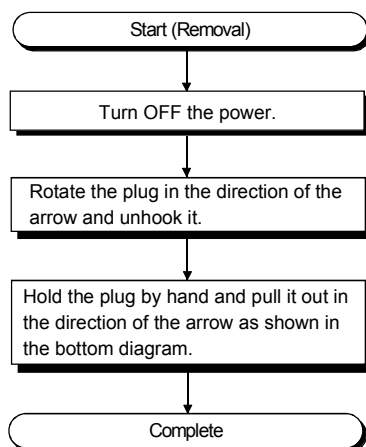
(b) Installing the coaxial cable

The following shows how to install the coaxial cable:



(c) Removing the coaxial cable

The following shows how to remove the coaxial cable:



4.7 Offline Tests from GX Developer

The offline tests check the cable connection status using the network parameters of GX Developer.

4.7.1 Station-to-station test

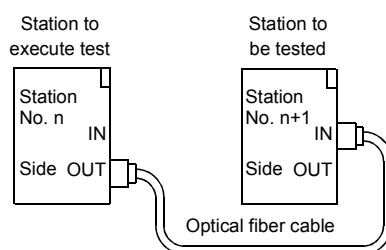
In the station-to-station test, the hardware of the network modules and cables between two adjacent stations can be checked.

The following explains how to conduct the station-to-station test:

(1) Connecting the cable

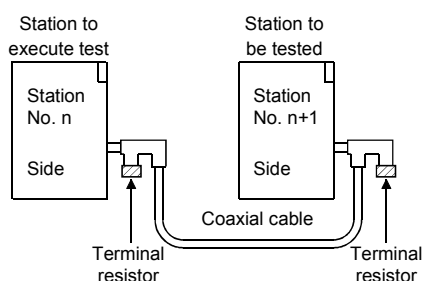
[Optical loop system]

Connect OUT and IN of two network modules with an optical fiber cable.



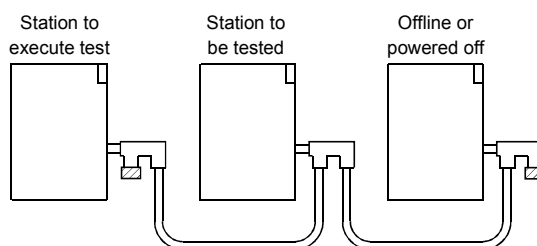
[Coaxial bus system]

Connect two network modules with a coaxial cable.



REMARKS

Before conducting the station-to-station test when three or more stations are connected by the coaxial bus system, any stations that are not tested should be switched to offline or powered off.



(2) Setting the test mode

- (a) Mode setting for the station-to-station test on a non-redundant system station
- Set the mode network parameters for station number n and station number n + 1 to "Test between master station" and "Test between slave station" respectively, and write the parameter settings to the CPU module.

Station to execute test (station No. n)

| | |
|--------------------------|-------------------------------|
| Module 1 | |
| Network type | MNET/H mode (Control station) |
| Starting I/O No. | 0000 |
| Network No. | 1 |
| Total stations | 2 |
| Group No. | 0 |
| Station No. | |
| Mode | Test between master station |
| Network range assignment | |

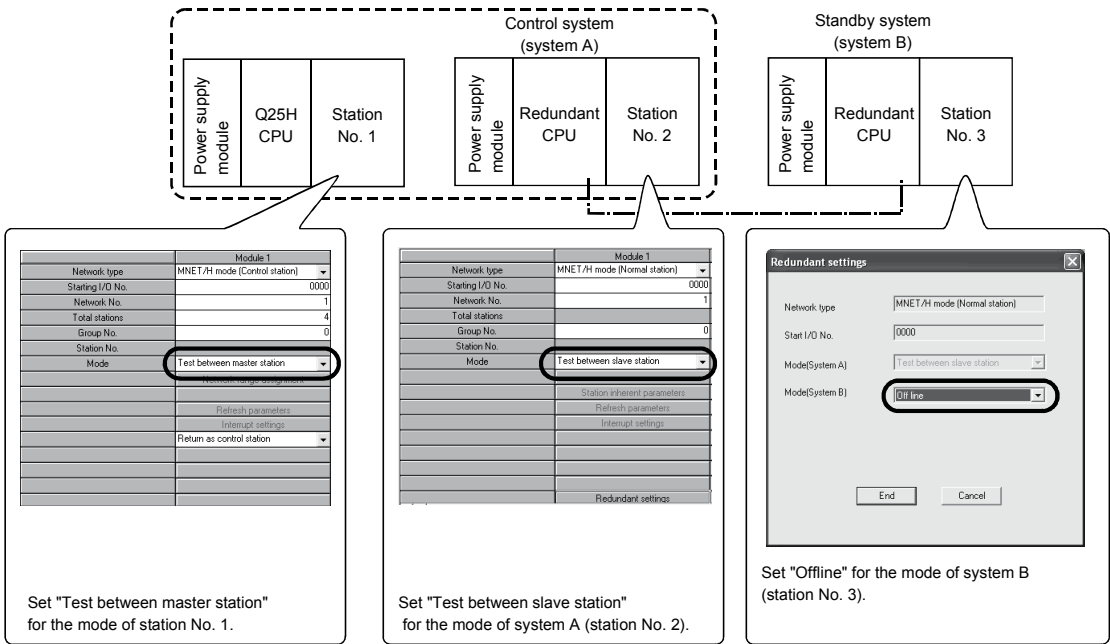
Station to be tested (station No. n + 1)

| | |
|-----------------------------|------------------------------|
| Module 1 | |
| Network type | MNET/H mode (Normal station) |
| Starting I/O No. | 0000 |
| Network No. | 1 |
| Total stations | |
| Group No. | 0 |
| Station No. | |
| Mode | Test between slave station |
| Station inherent parameters | |

- (b) Mode setting for the station-to-station test in the redundant system
- To perform the station-to-station test in the redundant system, set the operation mode of the redundant CPU to backup mode.
- If the power to both systems cannot be turned on or off, perform the station-to-station test in separate mode.
- The table below shows the mode settings available for the station-to-station test in the redundant system.

| Set station | | Description of setting |
|---------------------------------|------------------|--------------------------------------|
| Station performing the test | In backup mode | Set "Test between master station" or |
| | In separate mode | "Test between slave station." |
| Station not performing the test | In backup mode | Set "Offline." |
| | In separate mode | Set "Online." |

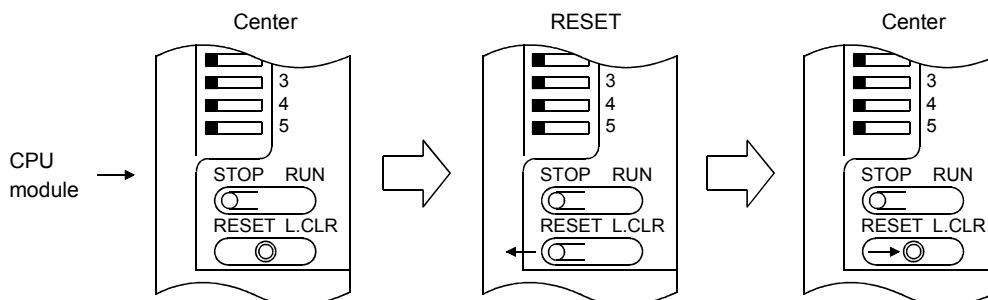
The following shows a case where a non-redundant system (station No. 1) is set as a testing station and system A (station No. 2) of the redundant system (in backup mode) is set as a tested station.



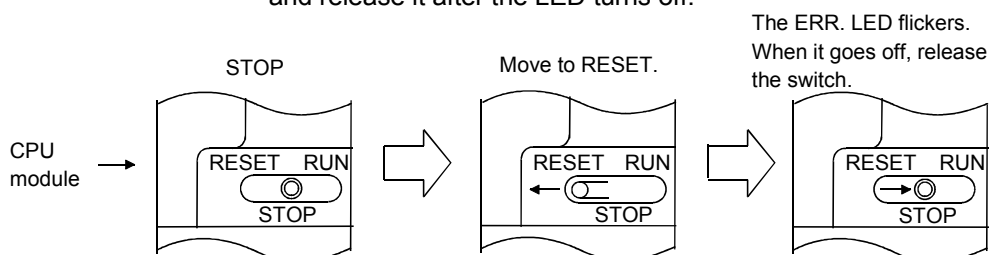
(3) Starting the station-to-station test

Perform the following on the other station first, and then the station executing the test.

- (a) High Performance model QCPU, Process CPU, and Redundant CPU
Set the RUN/STOP switch to STOP, and reset with the RESET/L.CLR switch.



- (b) Basic model QCPU, Universal model QCPU, and safety CPU
Reset with the RESET/STOP/RUN switch.
Hold the switch in the RESET position until the ERR LED starts flashing, and release it after the LED turns off.

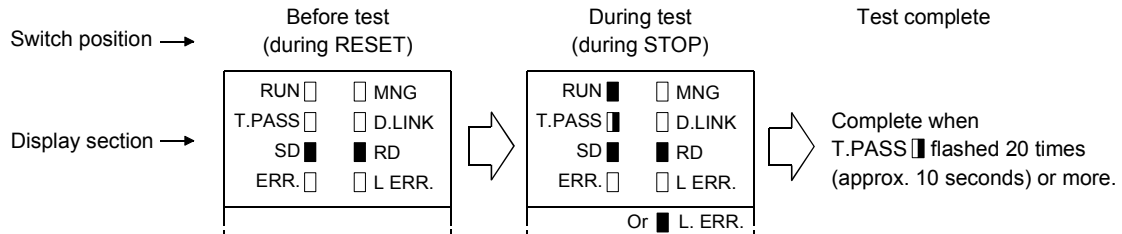
**POINT**

To execute the station-to-station test, connect the cable correctly to OUT and IN. Also, do not connect or disconnect the cable during execution of the test. (Doing so will result in test failure.)

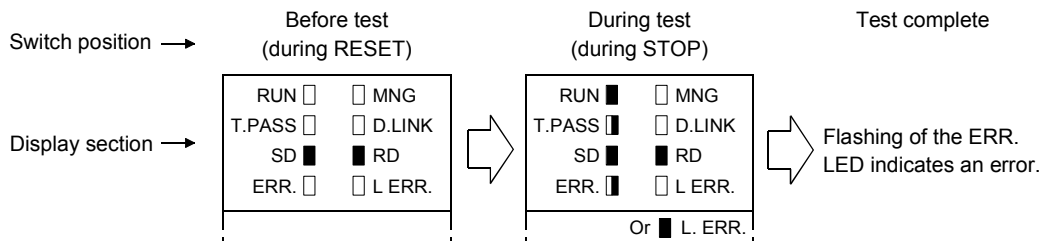
(4) Checking the test result

The T.PASS LED of the network module flashes at approximately 0.5 s intervals. When the T. PASS LED flashes 20 times or more and if the ERR.LED does not flash, this condition indicates normal completion. When the test has failed, the ERR. LED flashes.

[Normal test result]



[Abnormal test result]



Upon detection of an error, the test will be terminated (abnormal termination).

(a) Possible causes of errors in the optical loop system

- 1) Forward loop error
 - The cable of the forward loop is disconnected.
 - The sending and receiving stations of the forward loop are not connected with a cable.
 - The sending stations of the forward and reverse loops, or the receiving stations of the forward and reverse loops are connected.
- 2) Reverse loop error
 - The cable of the reverse loop is disconnected.
 - The sending and receiving stations of the reverse loop are not connected with a cable.
- 3) Defective cable
- 4) The cable was detached or broken during the test
- 5) Hardware error

(b) Possible causes of errors in the coaxial bus system

- 1) The cable is broken or defective
- 2) The cable was detached or broken during the test
- 3) A terminal resistor was detached
- 4) Hardware error

| |
|---------|
| REMARKS |
|---------|

The status during the test and the test result can be checked by link special registers or GX Developer.

| | | | |
|--|--------|-------------|---------------------------|
| Baton pass status (host) | SW0047 | → 1FH | : Offline test |
| Cause of baton pass interruption | SW0048 | → 2H | : Offline test |
| Offline test execution item/faulty station (requesting side) | SW00AC | → □□05H | : Station-to-station test |
| | | or | |
| | | □□06H | |
| Offline test result (requesting side) | SW00AD | → 0 | : Normal |
| | | 1 or larger | : Error code |

For details on how to check the error contents, refer to Chapter 8.

If two or more modules are installed, the testing status and the result of each module can be checked by adding 200H to the corresponding device number.

4.7.2 Forward loop/reverse loop test

The forward loop/reverse loop test checks the hardware of the network modules and cables after all stations are connected with optical fiber cables. It also checks whether the cables are connected between OUT and IN connections properly.
The following explains how to conduct the forward loop/reverse loop test:

- (1) Setting the test mode
- (a) Mode setting for the forward loop/reserve loop test on stations in other than the redundant system

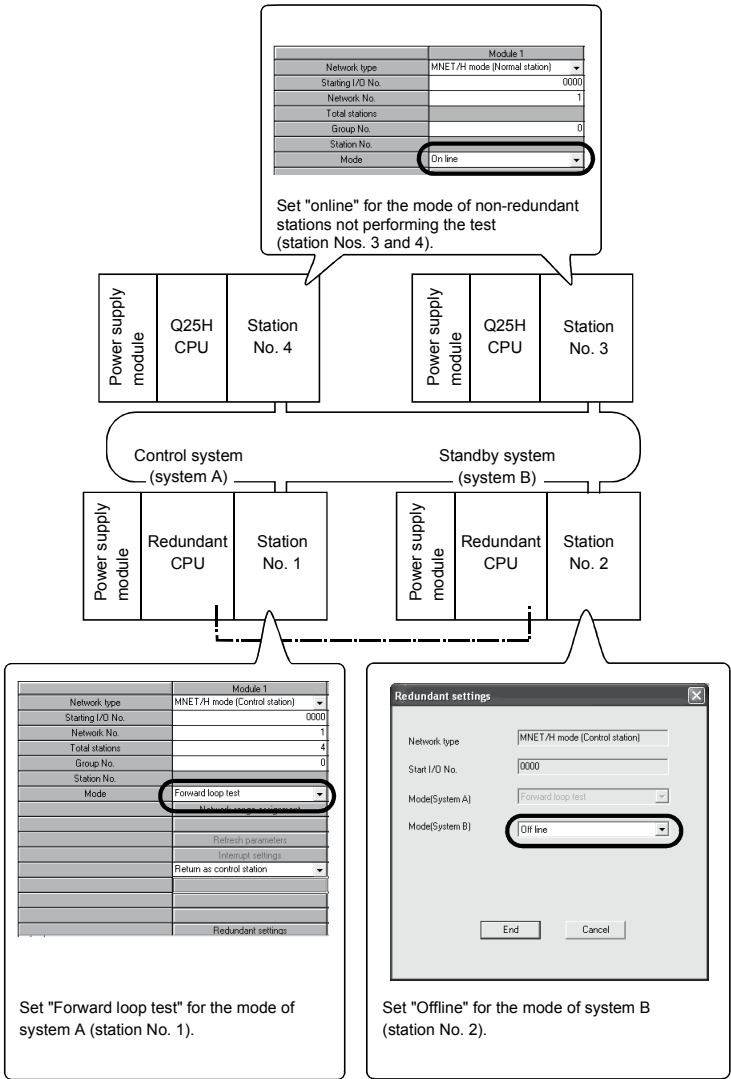
When conducting the forward loop test, set the mode network parameter of the station that will be executing the forward loop test to "Forward loop test" with GX Developer and write the parameter setting to the CPU module.
Set the mode for all other stations than the testing station to "Online."
When conducting the reverse loop test, set the mode network parameter of the station that will be executing the reverse loop test to "Reverse loop test" with GX Developer and write the parameter setting to the CPU module.

| Station to execute the forward loop test | | Other stations | |
|--|-------------------------------|----------------|------------------------------|
| | Module 1 | | Module 1 |
| Network type | MNET/H mode (Control station) | | MNET/H mode (Normal station) |
| Starting I/O No. | 0000 | | 0000 |
| Network No. | 1 | | 1 |
| Total stations | 2 | | |
| Group No. | 0 | | 0 |
| Station No. | | | |
| Mode | Forward loop test | | On line |
| | Network range assignment | | |

- (b) Mode setting for the forward loop/reverse loop test on the redundant system
- To perform the forward loop/reverse loop test on the redundant system, set the operation mode of the redundant CPU to backup mode.
- If the power to both systems cannot be turned on or off, perform the forward loop/reverse loop test in separate mode.
- 1) When designating the redundant system as the testing station
- The table below shows the mode settings for the case where the redundant system is designated as a testing station.

| Set station | | | Description of setting |
|---------------------------------|------------------------------|------------------|----------------------------|
| Station performing the test | Redundant system | In backup mode | Set "Forward loop test" or |
| | | In separate mode | "Reverse loop test." |
| Station not performing the test | Redundant system | In backup mode | Set "Offline." |
| | | In separate mode | Set "Online." |
| | Non-redundant system station | | Set "Online." |

The following shows the setting where system A (station No. 1) of the redundant system (in backup mode) is designated as a station performing the forward loop test.



- 2) When designating a station in other than the redundant system as a testing station

The settings are the same as those for the usual forward loop/reverse loop test (see (1) (a) of this section).

Set "Online" to the redundant system modes of both systems A and B.

<Settings for system A>

| Module 1 | |
|---------------------------|-------------------------------|
| Network type | MNET/H mode (Control station) |
| Starting I/O No. | 0000 |
| Network No. | 1 |
| Total stations | 4 |
| Group No. | 0 |
| Station No. | |
| Mode | On line |
| Network loop assignment | |
| Refresh parameters | |
| Interrupt settings | |
| Return as control station | |
| Redundant settings | |

<Settings for system B>

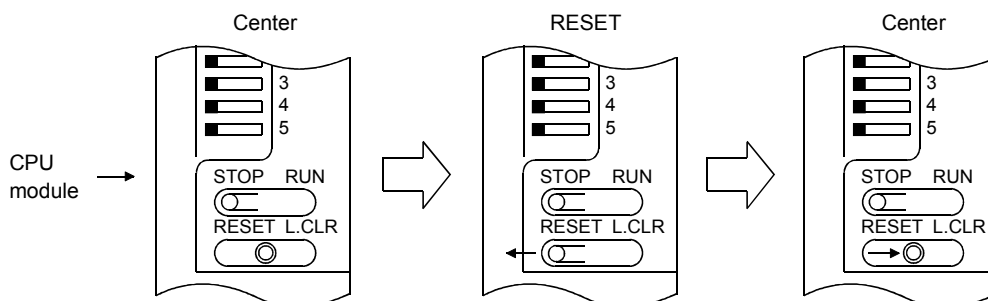
| Redundant settings | |
|--------------------|-------------------------------|
| Network type | MNET/H mode (Control station) |
| Start I/O No. | 0000 |
| Mode(System A) | On line |
| Mode(System B) | On line |
| End Cancel | |

Set "Online" for the mode of both systems A and B.

(2) Starting the test

Perform the following on the other station first, and then the station executing the test.

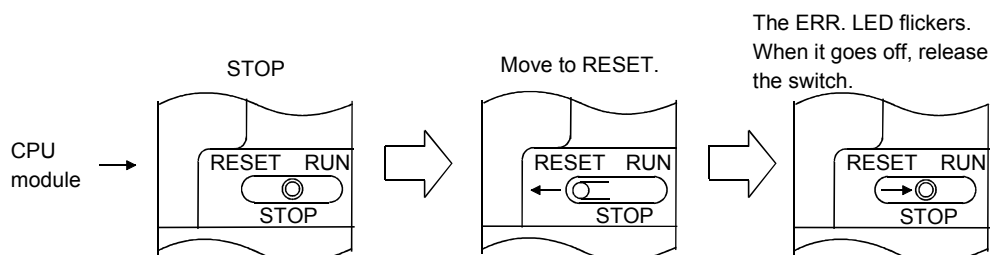
- (a) High Performance model QCPU, Process CPU, and Redundant CPU
Set the RUN/STOP switch to STOP, and reset with the RESET/L.CLR switch.



- (b) Basic model QCPU, Universal model QCPU, and Safety CPU

Reset with the RESET/STOP/RUN switch.

Hold the switch in the RESET position until the ERR LED starts flashing, and release it after the LED turns off.



POINT

To execute the forward loop/reverse loop test, connect the cable correctly to OUT and IN. Also, do not connect or disconnect the cable during execution of the test. (Doing so will result in test failure.)

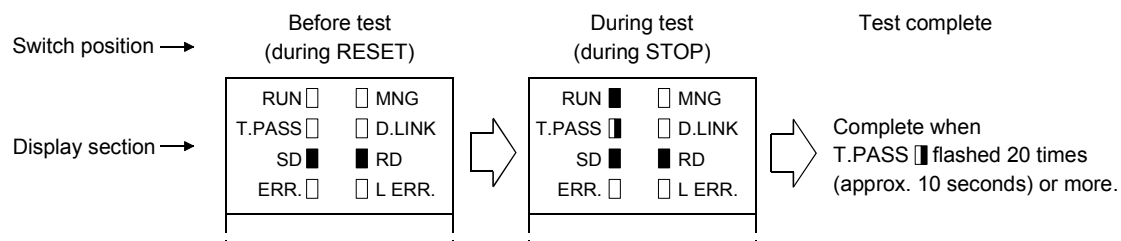
(3) Checking the test result

The T.PASS LED of the network module flashes at approximately 0.5 s intervals. When the T. PASS LED flashes 20 times or more and if the ERR.LED does not flash, this condition indicates normal completion.

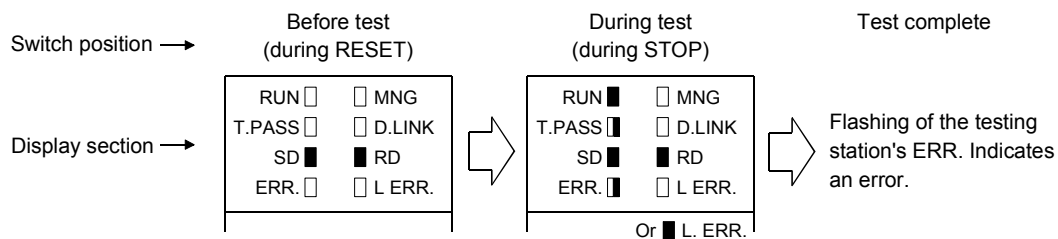
When the test has failed, the ERR. LED flashes.

Check the test result with the LEDs of the testing station.

[Normal test result]



[Abnormal test result]



Upon detection of an error, the test will be terminated (abnormal termination).

<Possible causes of errors>

A loopback was executed because of a wiring error, a faulty optical fiber cable or abnormality was detected in other station.

- 1) If wiring is incorrect
Check the connections of IN and OUT connectors and other connectors.
If an incorrect connection is found, connect properly.
- 2) If an optical fiber cable is faulty or other station is abnormal
Replace the defective cable or module.

| |
|---------|
| REMARKS |
|---------|

The status during the test and the test result can be checked by link special registers or GX Developer.

| | | | |
|--|--------|-------------|----------------|
| Baton pass status (host) | SW0047 | → 1FH | : Offline test |
| Cause of baton pass interruption | SW0048 | → 2H | : Offline test |
| Offline test execution item/faulty station (requesting side) | SW00AC | → □□03H | : Loop test |
| | | or | |
| | | □□04H | |
| Offline test result (requesting side) | SW00AD | → 0 | : Normal |
| | | 1 or larger | : Error code |

For details on how to check the error contents, refer to Chapter 8.

If two or more modules are installed, the testing status and the result of each module can be checked by adding 200H to the corresponding device number.

4.8 Network Diagnostics from GX Developer (Online Tests)

With the network diagnostic function of GX Developer, the line status can easily be checked and diagnosed.

To conduct the network diagnostics, the network parameters (station number setting switch, mode setting switch, number of modules, network settings, and common parameters) must be set.

However, even if not all the parameters were set, the loop test can be performed while the "T.PASS" LED is on.

The network diagnostics function allows the diagnostics of the network module while maintaining it in the online status when a problem occurs during system operation.

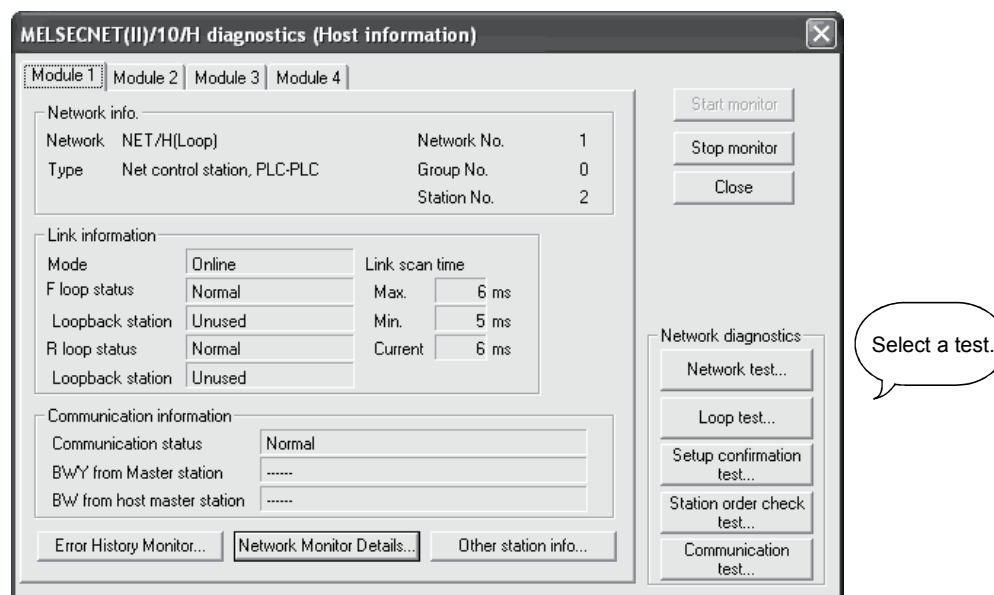
The following table lists the tests that can be conducted for each network system:

| Test item | Optical loop system | Coaxial bus system | Data link status of cyclic and transient transmissions | Reference section |
|--------------------------|---------------------|--------------------|--|-------------------|
| Network test | ○ | ○ | Continue | Section 7.8 |
| Loop test | ○ | × | Pause | Section 4.8.1 |
| Setup confirmation test | ○ | ○ | Pause | Section 4.8.2 |
| Station order check test | ○ | × | Pause | Section 4.8.3 |
| Communication test | ○ | ○ | Continue | Section 4.8.4 |

○: Execution allowed ×: Execution not allowed

For details on the operations of each function, see the GX Developer Operating Manual.

The following screen is displayed when the network diagnostics is selected with GX Developer. Select the button for the network diagnostic item that will be conducted.

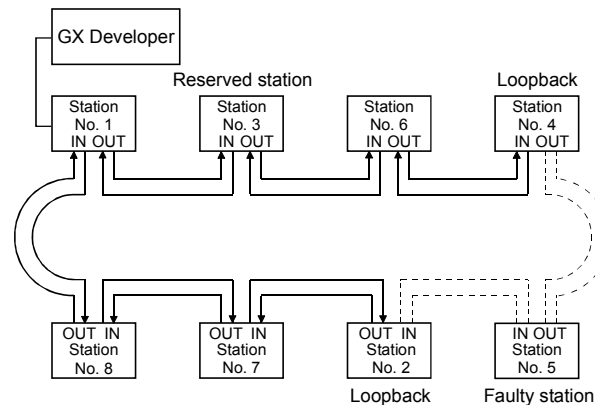


4.8.1 Loop test (optical loop system only)

This test checks the line status of the forward and reverse loops upon completion of the wiring of the optical loop system. Also, when a loopback is being executed, it checks the station that executes the loopback.

For example, in the system shown below, where the IN/OUT connectors of station number 5 are connected in reverse, conduct a loop test using the GX Developer connected to station number 1.

The monitor screen shown below appears after the loop test has been executed, and station No. 5 is detected as the station with a receiving direction error.



Loop test

Network info.
 Network: NET/H(Loop) Network No. 1
 Type: Net control station, PLC-PLC Group No. 0
 Module No. 1 Station No. 1
 Total No. of stations 8
 Loop status: orward/revers Receive direction error station No. 1
 Forward direction Station Reverse direction Station Number of stations not responding 0

Loop test
 Test method Object module
☒ Parameter designation ☒ Module 1
☐ All stations designation ☐ Module 2
☐ Module 3
☐ Module 4
 Execute

Execution results
☐ NORMAL ☒ INVALID

R:Reserved Station

| | | | | | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Receive direction error | | | R | | X | | | | | | | | | | | |
| Non-responding station | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|-------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| Receive direction error | | | | | | | | | | | | | | | | |
| Non-responding station | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|-------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| Receive direction error | | | | | | | | | | | | | | | | |
| Non-responding station | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | |
|-------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
| Receive direction error | | | | | | | | | | | | | | | | |
| Non-responding station | | | | | | | | | | | | | | | | |

Close

POINT

In the loop test, data link is stopped to check the wiring status.

To check the wiring status without stopping data link, make the check by SW009C to 009F.

Refer to Section 8.2.9 for details.

4.8.2 Setup confirmation test

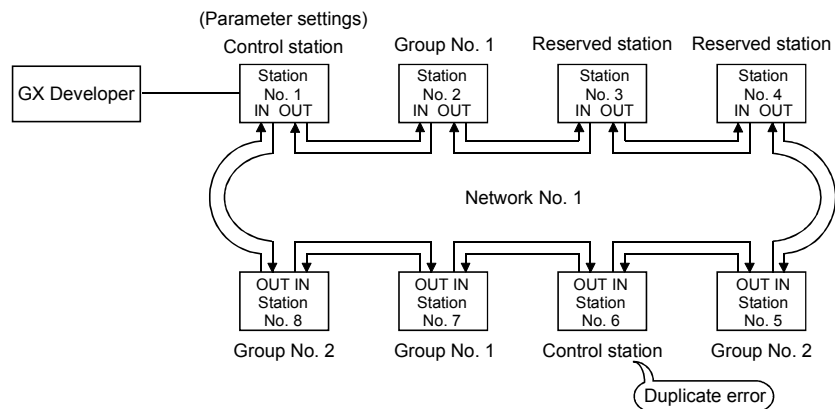
The switch settings of the network module can be checked with this test.

The following three types of items can be checked:

- 1) Control station duplicate check
- 2) Station number duplicate check
- 3) Matching between the network number set for the station to which GX Developer is connected and the network number set with a network parameter of the host

For example, in the following system, when the Setup confirmation test is conducted by the GX Developer connected to station number 1, the monitor screen shown below is displayed and the setting status of each station can be checked.

Station number 6 displays a duplicate control station setting error, and station numbers 2, 5, 7 and 8 display the network numbers and group numbers because there are no setting errors.



Setup confirmation test

Network info.

Network NET/H(Loop) Network No. 1

Type Net control station, PLC-PLC Group No. 0

Module No. 1 Station No. 1

Control station No. 1 Total No. of stations 8

Setting check test

Test method

☒ Parameter designation ☒ Object module

☐ All stations designation ☐ Module 2

☐ Module 3

☐ Module 4

Execute

Execution results

| | Control station duplication | Station No. duplication | Network No. |
|----|-----------------------------|-------------------------|-------------|
| 1 | | | 1 |
| 2 | | | 1 |
| 3 | | | |
| 4 | | | |
| 5 | | | 1 |
| 6 | X | | 1 |
| 7 | | | 1 |
| 8 | | | 1 |
| 9 | | | |
| 10 | | | |
| 11 | | | |

Close

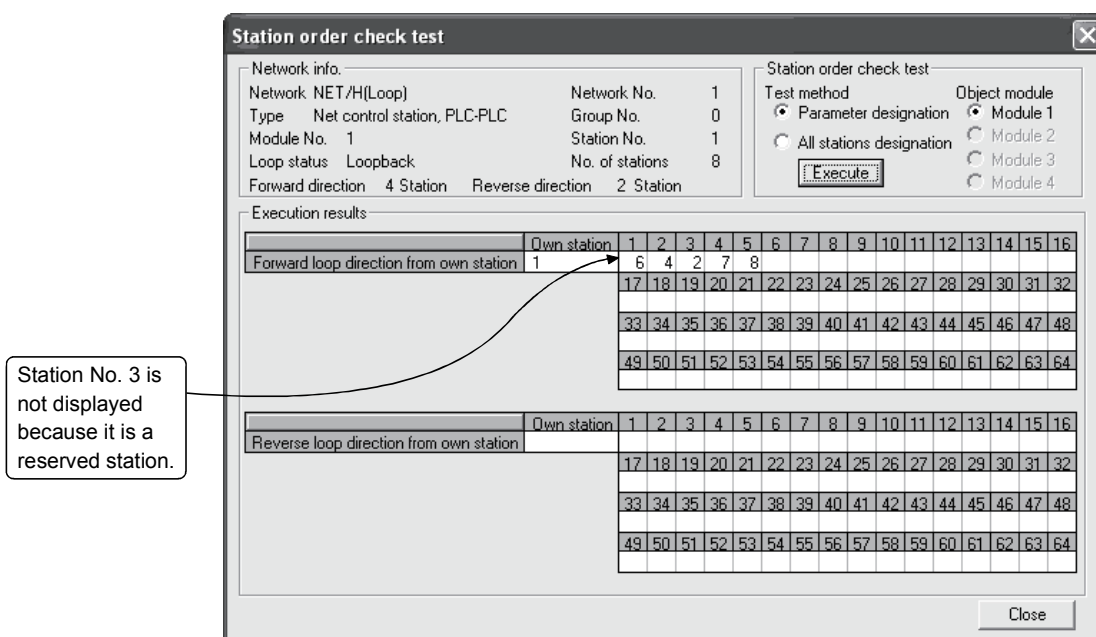
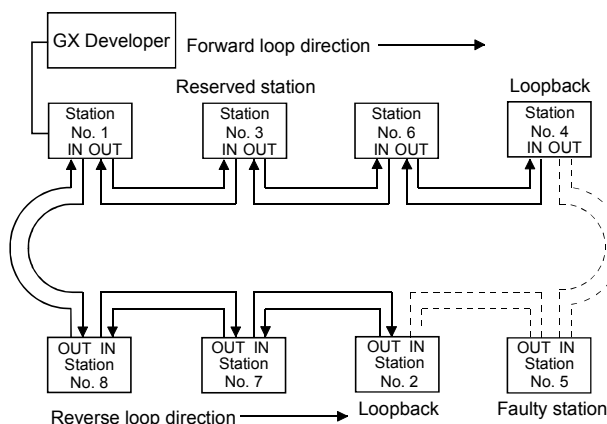
4.8.3 Station order check test (optical loop system only)

This test checks the connected station numbers in the optical loop system.

The following connection orders can be checked by the loop status (displayed on the station order check test result screen. See the monitor screen below.) when this test is conducted.

| Loop status | Display |
|---------------------------|--|
| Forward and reverse loops | The station numbers connected in the direction of the forward loop from the host as well as the station numbers connected to the direction of the reverse loop from the host |
| Forward loop | Only the station numbers connected in the direction of the forward loop from the host |
| Reverse loop | Only the station numbers connected in the direction of the reverse loop from the host |
| Loop back | Only the station numbers connected in the direction of the forward loop from the host |

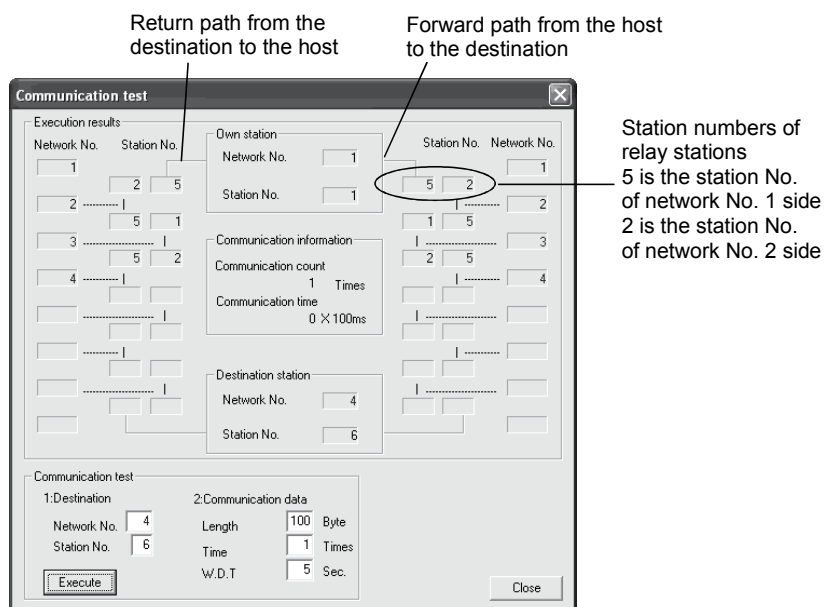
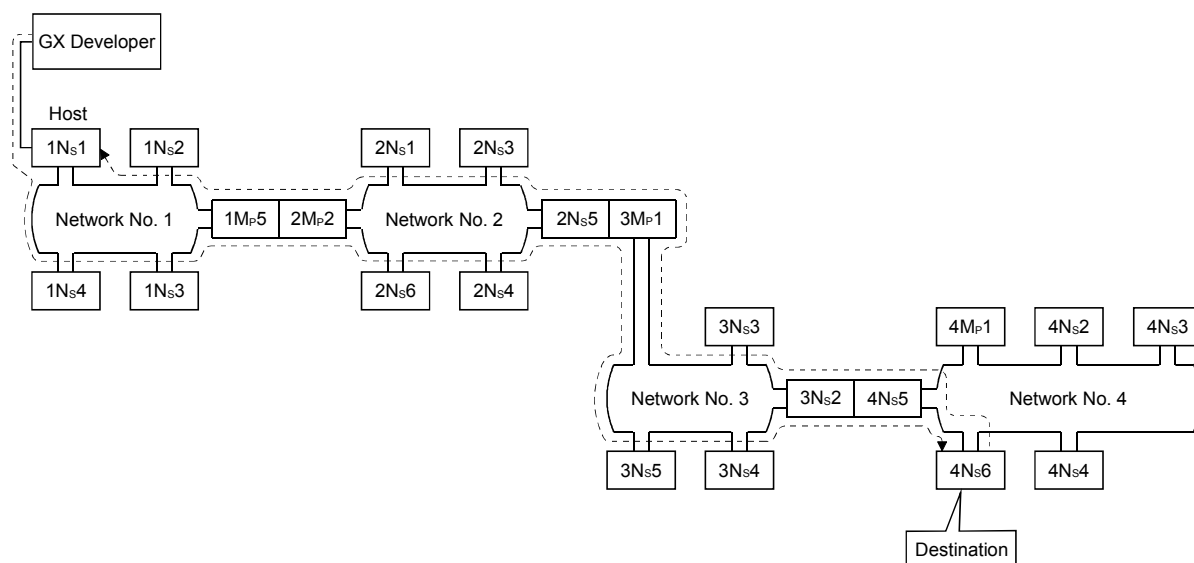
For example, in the following system, when the station order check test is conducted by the GX Developer connected to station number 1, the monitor screen shown below is displayed to verify that a loopback is being executed between station numbers 4 and 2 that are connected in the direction of the forward loop.



4.8.4 Communication test

This test checks whether or not data communication can normally be performed between the host and a destination station (designated with network number and station number). Especially when the destination has another network number, the relay network and station numbers are displayed. So, make sure that the routing parameters are properly set.

In the following system, when the communication test is conducted to 4Ns6 of network number 4 by the GX Developer connected to 1Ns1 of network number 1, the monitor screen shown below is displayed to verify that normal communication can be performed with the contents of the routing parameter settings.

**REMARKS**

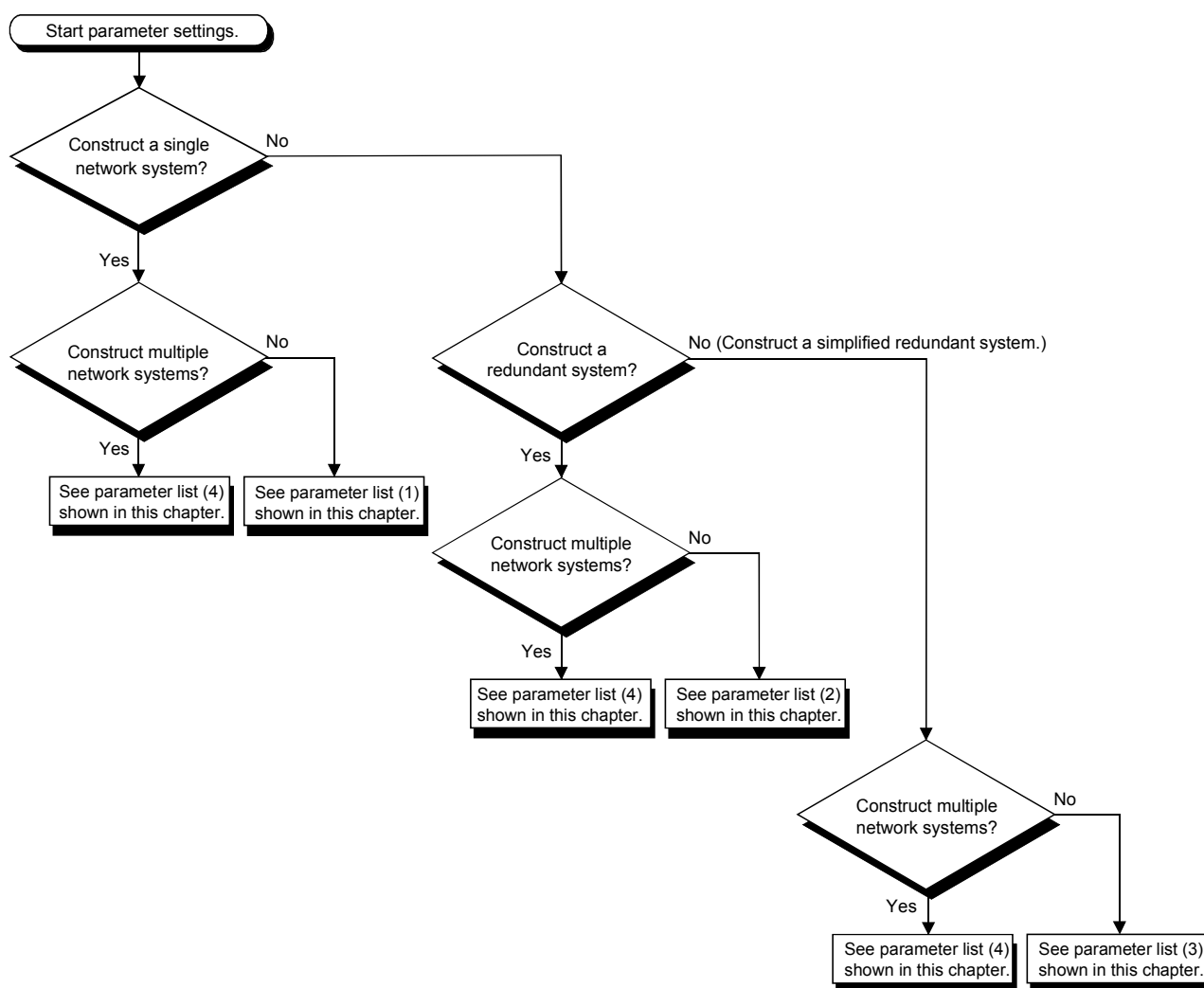
If the routing parameters are not properly set, the message "Cannot communicate with PLC" is displayed and the communication result is not displayed.

5 PARAMETER SETTINGS

To run the MELSECNET/H, the parameters for the network module loaded to the programmable controller CPU must be set with GX Developer.

Some parameters must be set, some must be set as appropriate, and some do not need to be set depending on the network configuration.

The subsequent pages provide lists of parameters settings required for each network configuration.



(1) List of parameter settings for a single network system

| Parameter setting item | | | Necessity for setting by station type | | Reference section |
|--|--------------------------------|---|--|--|--------------------------|
| | | | Control station | Normal station | |
| Network type | | | ○ (MNET/H mode (control station), MNET/H EX (control station)) | ○ (MNET/H mode (normal station), MNET/H EX (normal station)) | Section 5.1 |
| Starting I/O No. | | | ○ | ○ | Section 5.2.1 |
| Network No. | | | ○ | ○ | Section 5.2.2 |
| Total stations | | | ○ | × | Section 5.2.3 |
| Group No. | | | △ | △ | Sections 5.2.4 and 7.4.3 |
| Mode | | | ○ | ○ | Section 5.2.5 |
| Network range assignment (common parameters) | Monitoring time | | ● | × | Section 5.4 |
| | LB/LW settings | Send range of each station (LB/LW) | ○ | × | Section 5.3.1 |
| | | Send range of each station (low speed LB/LW) | △ | × | Section 7.3 |
| | | Pairing setting | × | × | Section 7.10.3 |
| | | LX/LY settings | | △ | × |
| | I/O master station designation | | △ | × | Section 5.3.3 |
| | Reserved station designation | | △ | × | Section 5.3.4 |
| | Supplement ary settings | Constant link scan | △ | × | Section 5.4 |
| | | Maximum No. of returns to system stations in 1 scan. | ● | × | Section 5.4 |
| | | Multiplex transmission designation | △ | × | Section 5.4 |
| | | Control station shift setting | ● | × | Section 5.4 |
| | | Block send data assurance per station | △ * 1 | × | Section 5.4 |
| | | Block receive data assurance per station | △ * 1 | × | Section 5.4 |
| | | Transient setting | ● | × | Section 5.4 |
| | | Low speed cyclic transmission designation | △ | × | Section 5.4 |
| Station inherent parameters | | | △ | △ | Section 5.6 |
| Refresh parameters | | | ● * 2 * 3 | ● * 2 * 3 | Section 5.7 |
| Interrupt settings | | | △ | △ | Section 7.5.1 |
| Control station return setting | | | ○ | × | Section 5.5 |
| Standby station compatible module | | | × | × | Section 5.9 |
| Redundant settings | | | × | × | Section 7.10.4 |
| Interlink transmission parameters | | | × | × | Section 7.2 |
| Routing parameters | | | × | × | Section 7.4.2 |
| Valid module during other station access | | | △ | △ | Section 5.8 |

* 1: In the MELSECNET/H Extended mode, the default check mark is displayed.

* 2: Default values are not set for LX/LY. Set refresh parameters.

* 3: Default values are preset for LB/LW.

Any CPU other than Universal model QCPU may operate even if refresh parameters have not been set.

For the operation and precautions, refer to Section 5.7.2 (3).

○: Set at all times (no default setting).

●: Set at all times (default setting provided).

△: Set as appropriate.

×: Setting unnecessary.

(2) List of parameter settings for a redundant system

| Parameter setting item | | | Necessity for setting by station type | | Reference section |
|--|--------------------------------|---|---------------------------------------|-------------------------------------|--------------------------|
| | | | Control station | Normal station | |
| Network type | | | ○ (MNET/H mode (control station)) | ○ (MNET/H mode (normal station)) | Section 5.1 |
| Starting I/O No. | | | ○ | ○ | Section 5.2.1 |
| Network No. | | | ○ | ○ | Section 5.2.2 |
| Total stations | | | ○ | × | Section 5.2.3 |
| Group No. | | | △ | △ | Sections 5.2.4 and 7.4.3 |
| Mode | | | ○ | ○ | Section 5.2.5 |
| Network range assignment (common parameters) | Monitoring time | | ● | × | Section 5.4 |
| | LB/LW settings | Send range of each station (LB/LW) | ○ | × | Section 5.3.1 |
| | | Send range of each station (low speed LB/LW) | △ | × | Section 7.3 |
| | | Pairing setting | ○ | × | Section 7.10.3 |
| | | LX/LY settings | | △ | × |
| | I/O master station designation | | △ | × | Section 5.3.3 |
| | Reserved station designation | | △ | × | Section 5.3.4 |
| | Supplement ary settings | Constant link scan | △ | × | Section 5.4 |
| | | Maximum No. of returns to system stations in 1 scan. | ● | × | Section 5.4 |
| | | Multiplex transmission designation | △ | × | Section 5.4 |
| | | Control station shift setting | ● | × | Section 5.4 |
| | | Block send data assurance per station | △ | × | Section 5.4 |
| | | Block receive data assurance per station | △ | × | Section 5.4 |
| | | Transient setting | ● | × | Section 5.4 |
| | | Low speed cyclic transmission designation | △ | × | Section 5.4 |
| Station inherent parameters | | | △ | △ | Section 5.6 |
| Refresh parameters | | | ● * 2 * 3 | ● * 2 * 3 | Section 5.7 |
| Interrupt settings | | | △ | △ | Section 7.5.1 |
| Control station return setting | | | ○ | × | Section 5.5 |
| Standby station compatible module | | | × | × | Section 5.9 |
| Redundant settings | | | △ * 1 | △ * 1 | Section 7.10.4 |
| Interlink transmission parameters | | | × | × | Section 7.2 |
| Routing parameters | | | × | × | Section 7.4.2 |
| Valid module during other station access | | | △ | △ | Section 5.8 |

* 1: This setting is necessary when the CPU module installed with a network module is a Redundant CPU.

* 2: Default values are not set for LX/LY. Set refresh parameters.

* 3: Default values are preset for LB/LW.

The system may operate even if refresh parameters have not been set.

For the operation and precautions, refer to Section 5.7.2 (3).

○: Set at all times (no default setting).

●: Set at all times (default setting provided).

△: Set as appropriate.

×: Setting unnecessary.

(3) List of parameter settings for a simplified redundant system

| Parameter setting item | | | Necessity for setting by station type | | | Reference section |
|--|---|--|--|--|----------------------------|--------------------------|
| | | | Control station | Normal station | Standby station | |
| Network type | | | ○ (MNET/H mode (control station), MNET/H EX (control station)) | ○ (MNET/H mode (normal station), MNET/H EX (normal station)) | ○ (MNET/H standby station) | Section 5.1 |
| Starting I/O No. | | | ○ | ○ | ○ | Section 5.2.1 |
| Network No. | | | ○ | ○ | ○ | Section 5.2.2 |
| Total stations | | | ○ | × | × | Section 5.2.3 |
| Group No. | | | △ | △ | ○ | Sections 5.2.4 and 7.4.3 |
| Mode | | | ○ | ○ | ○ | Section 5.2.5 |
| Network range assignment (common parameters) | Monitoring time | | ● | × | × | Section 5.4 |
| | LB/LW settings | Send range of each station (LB/LW) | ○ | × | × | Section 5.3.1 |
| | | Send range of each station (low speed LB/LW) | △ | × | × | Section 7.3 |
| | | Pairing setting | × | × | × | Section 7.10.3 |
| | LX/LY settings | | △ | × | × | Section 5.3.2 |
| | I/O master station designation | | △ | × | × | Section 5.3.3 |
| | Reserved station designation | | △ | × | × | Section 5.3.4 |
| | Supplement ary settings | Constant link scan | △ | × | × | Section 5.4 |
| | | Maximum No. of returns to system stations in 1 scan. | ● | × | × | Section 5.4 |
| | | Multiplex transmission designation | △ | × | × | Section 5.4 |
| | | Control station shift setting | ● | × | × | Section 5.4 |
| | | Block send data assurance per station | △ * 1 | × | × | Section 5.4 |
| | | Block receive data assurance per station | △ * 1 | × | × | Section 5.4 |
| | | Transient setting | ● | × | × | Section 5.4 |
| | Low speed cyclic transmission designation | | △ | × | × | Section 5.4 |
| Station inherent parameters | | | △ | △ | × | Section 5.6 |
| Refresh parameters | | | ● * 2 * 3 | ● * 2 * 3 | × | Section 5.7 |
| Interrupt settings | | | △ | △ | × | Section 7.5.1 |
| Control station return setting | | | ○ | × | × | Section 5.5 |
| Standby station compatible module | | | × | × | ○ | Section 5.9 |
| Redundant settings | | | × | × | × | Section 7.10.4 |
| Interlink transmission parameters | | | × | × | × | Section 7.2 |
| Routing parameters | | | × | × | × | Section 7.4.2 |
| Valid module during other station access | | | △ | △ | △ | Section 5.8 |

* 1: In the MELSECNET/H Extended mode, the default check mark is displayed.

* 2: Default value is not set in LX/LY. Set refresh parameters.

* 3: Default values are preset for LB/LW.

The system may operate even if refresh parameters have not been set.

For the operation and precautions, refer to Section 5.7.2 (3).

○: Set at all times (no default setting).

●: Set at all times (default setting provided).

△: Set as appropriate.

×: Setting unnecessary.

(4) List of parameter settings for multiple network systems

| Parameter setting item | | | Necessity for setting by station type | | | Reference section |
|--|---|--|--|--|----------------------------|--------------------------|
| | | | Control station | Normal station | Standby station * 1 | |
| Network type | | | ○ (MNET/H mode (control station), MNET/H EX (control station)) | ○ (MNET/H mode (normal station), MNET/H EX (normal station)) | ○ (MNET/H standby station) | Section 5.1 |
| Starting I/O No. | | | ○ | ○ | ○ | Section 5.2.1 |
| Network No. | | | ○ | ○ | ○ | Section 5.2.2 |
| Total stations | | | ○ | × | × | Section 5.2.3 |
| Group No. | | | △ | △ | ○ | Sections 5.2.4 and 7.4.3 |
| Mode | | | ○ | ○ | ○ | Section 5.2.5 |
| Network range assignment (common parameters) | Monitoring time | | ● | × | × | Section 5.4 |
| | LB/LW settings | Send range of each station (LB/LW) | ○ | × | × | Section 5.3.1 |
| | | Send range of each station (low speed LB/LW) | △ | × | × | Section 7.3 |
| | | Pairing setting | △ * 2 | × | × | Section 7.10.3 |
| | LX/LY settings | | △ | × | × | Section 5.3.2 |
| | I/O master station designation | | △ | × | × | Section 5.3.3 |
| | Reserved station designation | | △ | × | × | Section 5.3.4 |
| | Supplement ary settings | Constant link scan | △ | × | × | Section 5.4 |
| | | Maximum No. of returns to system stations in 1 scan. | ● | × | × | Section 5.4 |
| | | Multiplex transmission setting | △ | × | × | Section 5.4 |
| | | Control station shift designation | ● | × | × | Section 5.4 |
| | | Block send data assurance per station | △ * 3 | × | × | Section 5.4 |
| | | Block receive data assurance per station | △ * 3 | × | × | Section 5.4 |
| | | Transient setting | ● | × | × | Section 5.4 |
| | Low speed cyclic transmission designation | | △ | × | × | Section 5.4 |
| Station inherent parameters | | | △ | △ | × | Section 5.6 |
| Refresh parameters | | | ● * 4 * 5 | ● * 4 * 5 | × | Section 5.7 |
| Interrupt settings | | | △ | △ | × | Section 7.5.1 |
| Control station return setting | | | ○ | × | × | Section 5.5 |
| Standby station compatible module | | | × | × | ○ | Section 5.9 |
| Redundant settings | | | △ * 6 | △ * 6 | × | Section 7.10.4 |
| Interlink transmission parameters | | | △ | △ | △ | Section 7.2 |
| Routing parameters | | | △ | △ | △ | Section 7.4.2 |
| Valid module during other station access | | | △ | △ | △ | Section 5.8 |

* 1: This setting is necessary to configure multiple networks using a simplified redundant system.

* 2: This setting is necessary to configure multiple networks using a redundant system.

* 3: In the MELSECNET/H Extended mode, the default check mark is displayed.

* 4: Default value is not set in LX/LY. Set refresh parameters.

* 5: Default values are preset for LB/LW.

Any CPU other than Universal model QCPU may operate even if refresh parameters have not been set.

For the operation and precautions, refer to Section 5.7.2 (3).

* 6: This setting is necessary when the CPU module installed with a network module is a Redundant CPU.

○: Set at all times (no default setting).

●: Set at all times (default setting provided).

△: Set as appropriate.

×: Setting unnecessary.

(5) When parameters have not been set (other than Universal model QCPU and safety CPU)

For network modules, parameters must be set.

If parameters have not been set, data link will be executed as described below.

(a) Operation

When network parameters have not been set

| Item | Description |
|--------------------|---|
| Network type | <p>Data link is executed with the setting as any of the following:</p> <ul style="list-style-type: none"> • Normal station in MELSECNET/H mode • Normal station in MELSECNET/10 mode <p>Data link is not executed in the following cases:</p> <ul style="list-style-type: none"> • No control station exists on the network. • The control station is in MELSECNET/H Ext. mode. (LINK PARA ERROR will occur.) |
| Network No. | Network No. 1 |
| Group No. | 0 (No group) |
| Station No. | Station No. set with the station No. switches on the network module |
| Mode | Mode set with the mode switch on the network module |
| Refresh parameters | Refer to the following *1. |

*1: Refresh parameters are assigned as shown below.

Devices and points assigned to one network module

| Network module side device | | LB | LW | SB | SW |
|-----------------------------------|---|-------------|-------------|-----------|-----------|
| Refresh target CPU side devices | | B | W | SB | SW |
| Number of network modules mounted | 1 | 8192 (2048) | 8192 (2048) | 512 (512) | 512 (512) |
| | 2 | 4096 | 4096 | 512 | 512 |
| | 3 | 2048 | 2048 | 512 | 512 |
| | 4 | 2048 | 2048 | 512 | 512 |

The values in parentheses are the points applied to the use of the Basic model QCPU.

The same assignments are given for the cases of three network modules and four network modules.

(b) Precautions

When B/W points less than the following are set in [Device] under [PLC parameter], set refresh parameters accordingly. Or, increase the B/W points to the following value or more in [Device].

Number of B/W points refreshed when parameters have not been set

| No. of modules | Device points in [Device] | |
|----------------|---------------------------|-----------------------|
| | B | W |
| 1 | 8K points (2K points) | 8K points (2K points) |
| 2 | 8K points | 8K points |
| 3 | 6K points | 6K points |
| 4 | 8K points | 8K points |

The values in parentheses are the points applied to the use of the Basic model QCPU.

5.1 Setting the Number of Modules (Network Type)

Set the network type and the station type for each module.

Up to four modules can be set for a combination of MELSECNET/H and CC-Link IE controller network, or for Ethernet.

Note that, however, there are restrictions on the number of modules mounted for one programmable controller CPU depending on the CPU model used. (Refer to Section 2.2.)

For the MELSECNET/H network system, select whether the station type should be the control station, normal station or standby station.

| | Module 1 | Module 2 | Module 3 | Module 4 |
|------------------|-------------------------------|------------------------------|------------------------------------|---|
| Network type | MNET/H mode [Control station] | MNET/H mode [Normal station] | MNET/H Stand by station | None |
| Starting I/O No. | 0000 | 0020 | 0040 | None |
| Network No. | 1 | 2 | 3 | CC IE Control[Control station] CC IE Control[Normal station] |
| Total stations | 4 | | | MNET/H mode [Control station] MNET/H mode [Normal station] |
| Group No. | 0 | 0 | 0 | MNET/TIO mode [Control station] MNET/TIO mode [Normal station] |
| Station No. | | | | MNET/H Stand by station MNET/H Remote master) |
| Mode | On line | On line | On line | MNET/H Ext. mode [Control station] MNET/H Ext. mode [Normal station] |
| | Network range assignment | Station inherent parameters | Stand by station compatible module | Ethernet |
| | Refresh parameters | Refresh parameters | | |
| | Interrupt settings | Interrupt settings | | |
| | Return as control station | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Necessary setting(No setting / Already set) Set if it is needed(No setting / Already set)

Valid module during other station access 1 ▾

Interlink transmission parameters Please input the starting I/O No. of the module in HEX[16 bit] form

| | | | | | | |
|---------------------------|--------------------|------------------|----------------|-------|-----|--------|
| Acknowledge XY assignment | Routing parameters | Assignment image | Group Settings | Check | End | Cancel |
|---------------------------|--------------------|------------------|----------------|-------|-----|--------|

(1) Selection type

Select from the following items:

| Item | Description |
|--------------------------------|---|
| MNET/H mode (Control station) | Set this item for a control station of the MELSECNET/H mode. |
| MNET/H mode (Normal station) | Set this item for a normal station of the MELSECNET/H mode. |
| MNET/10 mode (Control station) | Set this item for a control station of the MELSECNET/10 mode. |
| MNET/10 mode (Normal station) | Set this item for a normal station of the MELSECNET/10 mode. |
| MNET/H mode Stand by station | Set this item for a standby station of a simplified redundant system. |
| MNET/H EX (Control station) | Set this item for a control station of the MELSECNET/H Extended mode. |
| MNET/H EX (Normal station) | Set this item for a normal station of the MELSECNET/H Extended mode. |

(2) Precautions

(a) Network type within the same network

Set all network modules within the same network to the same network type. If there are different network types within the same network, some of the network modules may be disconnected from the system, for example, and normal data link is not executed. Refer to Section 8.2.10 for details.

(b) When the MELSECNET/H Extended mode is set

For use of the MELSECNET/H extended mode, use the following network modules and GX Developers.

| | | Network modules | GX Developer |
|---|---------------------|--|------------------------|
| Q00J/Q00/Q01CPU | Single CPU system | Function version D or later (First 5 digits of serial No. are "06092" or later) | Version 8.20W or later |
| | Multiple CPU system | | |
| Q02/Q02H/Q06H/ Q12H/Q25HCPU | Single CPU system | | |
| | Multiple CPU system | | |
| Q02PH/Q06PHCPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) | Version 8.68W or later |
| | Multiple CPU system | | |
| Q12PH/Q25PHCPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) | Version 8.20W or later |
| | Multiple CPU system | | |
| Q12PRH/Q25PRHCPU | Redundant system | Function version D or later (First 5 digits of serial No. is "07102" or later) | Version 8.29F or later |
| Q02U/Q03UD/Q04UDH/ Q06UDHCPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) | Version 8.48A or later |
| | Multiple CPU system | | |
| Q13UDH/ Q26UDHCPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) | Version 8.62Q or later |
| | Multiple CPU system | | |
| Q03UDE/Q04UDEH/ Q06UDEH/Q13UDEH/ Q26UDEHCPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) | Version 8.68W or later |
| | Multiple CPU system | | |
| QS001CPU | Single CPU system | Function version D or later (First 5 digits of serial No. is "06092" or later) | Version 8.40S or later |

5.2 Network Settings

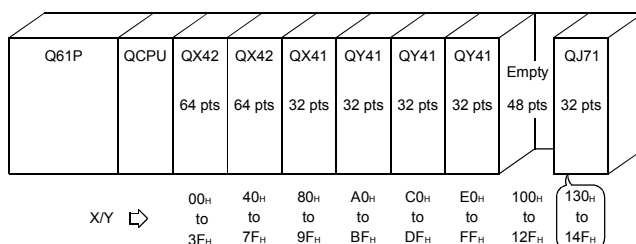
These parameters are used to configure the MELSECNET/H network.

Set the start I/O No., network No., total stations, group No. and mode for each of the module model names set in the number of modules settings.

5.2.1 Starting I/O No.

Set the start I/O No. to which the module is loaded in 16-point units in hexadecimal for each applicable network module.

For example, set 130 when the network module is loaded onto X/Y130 to 14F.



(1) Valid setting range

0H to 0FE0H (The I/O point range of the CPU module)

(2) Precaution

Unlike the setting method for the AnUCPU (where the higher two digits of the 3-digit value should be set), here all three digits should be set as is.

5.2.2 Network No.

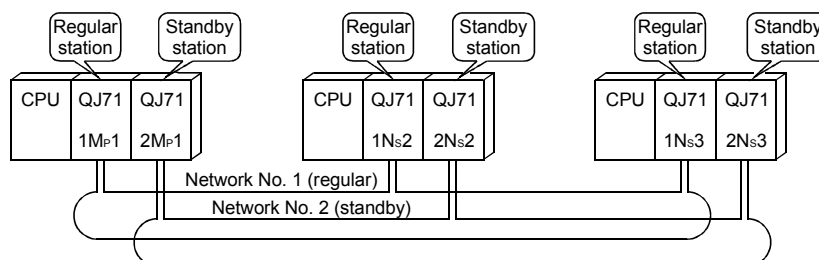
Set the network number to which the applicable network module is connected.

(1) Valid setting range

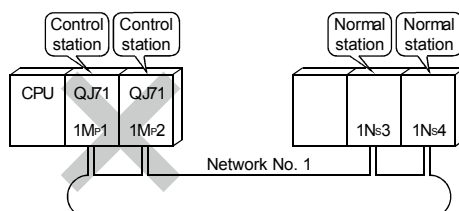
1 to 239

(2) Precautions

(a) For standby stations, set the network numbers that are differently from regular stations.



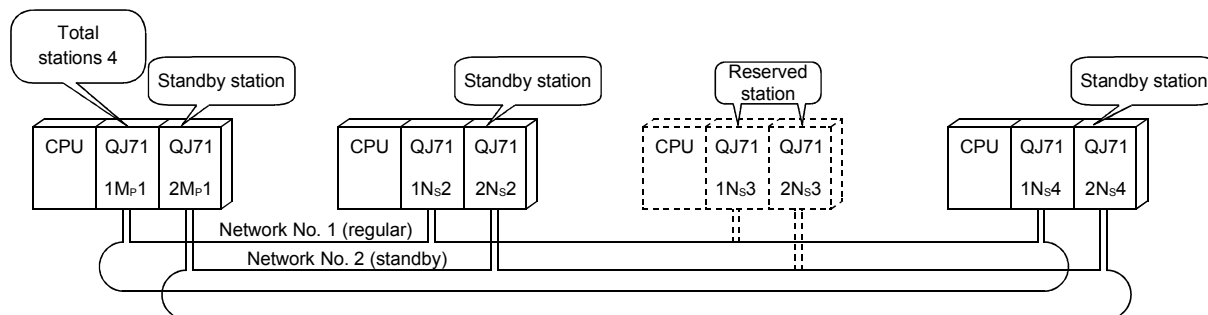
(b) The same network number cannot be set except for normal stations.



5.2.3 Total stations

Set the total number of stations including the control station, normal stations and reserved stations in one network.

This setting is required only when "MNET/H mode (control station)" is selected.



(1) Valid setting range

2 to 64

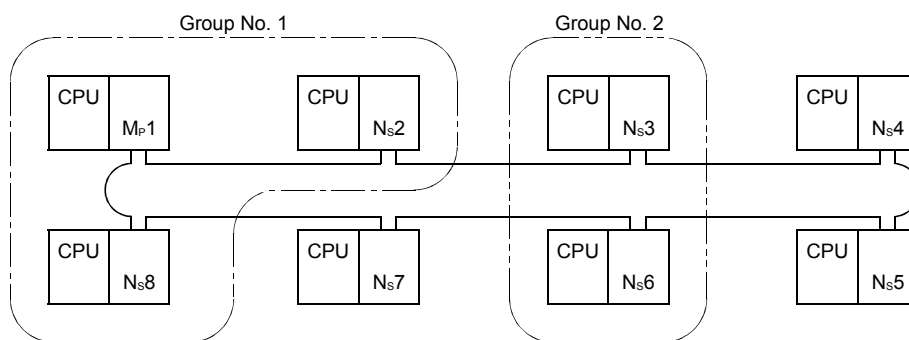
(2) Precaution

Do not include standby station in the total number because their network numbers are different.

5.2.4 Group No.

In the group number designation, set the group number for sending data to multiple stations at the same time in transient transmission.

For more details, refer to Section 7.4.3.



(1) Valid setting range

0 : No group specification (default)

1 to 32 : Group No.

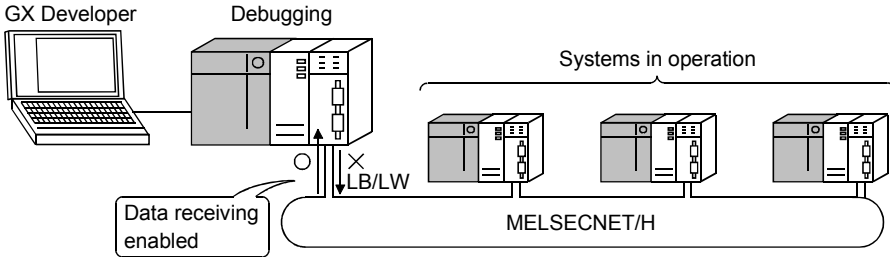
(2) Precaution

The difference from the message sending function using logical channel numbers (Refer to Section 7.4.4) is that the groups can be changed by modifying the parameters from GX Developer. Note that only one group number can be set per station.

5.2.5 Mode

Set the operation mode of the network module.

The mode selection with this parameter becomes valid when the mode setting switch of the network module is set to 0 or 4.

| Selection item | Description | | | | | | | | | |
|--|---|---------|------|---------|------------------------|---|---|----------------|---|---|
| Online (Default) | This mode performs normal operations (the station returns to the network). Starts data communication at startup and executes automatic return operation. etc. | | | | | | | | | |
| Online debug mode | <p>This mode places the online station in the send stop status. The station is recognized as a normal station from other stations and data communication is performed in the following manner: ○: Allowed ×: Not allowed</p> <table><tr><td></td><td>Send</td><td>Receive</td></tr><tr><td>Cyclic data (LY/LB/LW)</td><td>×</td><td>○</td></tr><tr><td>Transient data</td><td>○</td><td>○</td></tr></table> <p>When a programmable controller is being added to the existing system as shown in the figure below, the debugging can be executed without stopping the network system in operation. When the debugging is completed, cancel the debug mode to execute data linking. This function is convenient when performing the system expansion while running the system.</p>  | | Send | Receive | Cyclic data (LY/LB/LW) | × | ○ | Transient data | ○ | ○ |
| | Send | Receive | | | | | | | | |
| Cyclic data (LY/LB/LW) | × | ○ | | | | | | | | |
| Transient data | ○ | ○ | | | | | | | | |
| Offline | This mode stops operations (disconnecting the station). Baton pass and data communication with other stations are not executed. | | | | | | | | | |
| Forward loop test | This mode is to select the hardware test operation that checks the connection status and the optical fiber cables on the forward loop side. For details on how to conduct the hardware test, refer to Section 4.7.2. | | | | | | | | | |
| Reverse loop test | This mode is to select the hardware test operation that checks the connection status and the optical fiber cable on the reverse loop side. For details on how to conduct the hardware test, refer to Section 4.7.2. | | | | | | | | | |
| Station-to-station test (station to execute test) | This mode selects the station to execute the hardware test for checking a line between two stations. For details on how to conduct the station-to-station test refer to Section 4.7.1. | | | | | | | | | |
| Station-to-station test (station to be tested) | This mode selects the station on which the hardware test for checking a line between two stations is executed. For details on how to conduct the station-to-station test refer to Section 4.7.1. | | | | | | | | | |

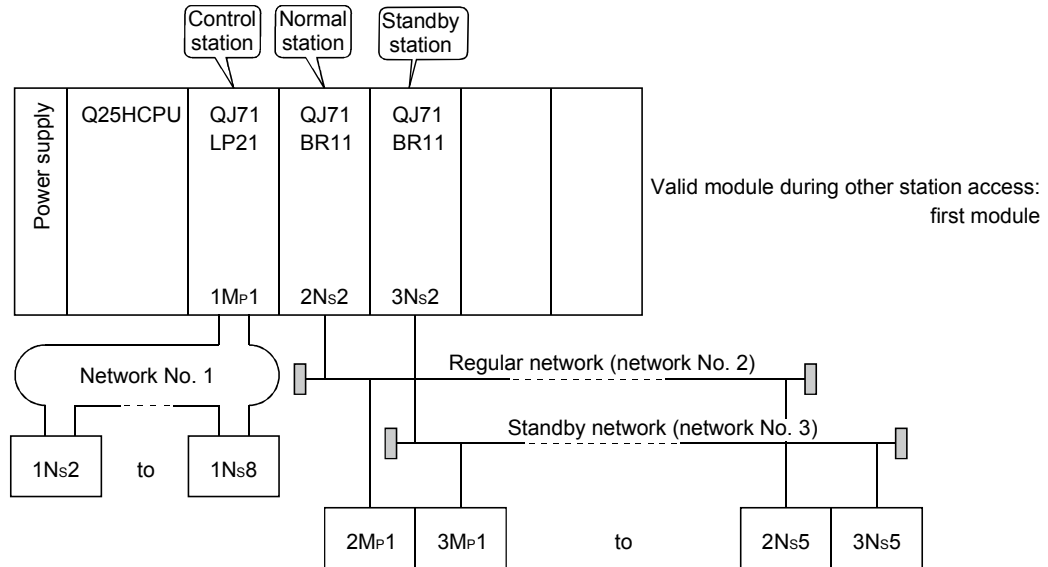
REMARKS

The mode set in the network parameters for the redundant system must be the same as the operation mode of the network module mounted on system A.
Set the operation mode of the network module mounted on system B in the mode selection of the redundant settings (system B).
For further information on the redundant settings, refer to Section 7.10.4.

5.2.6 Example of parameter settings

The following example shows the parameter settings for a system that include a control station, a normal station, and a standby station.

[System configuration]



[Screen settings]

[illegible]

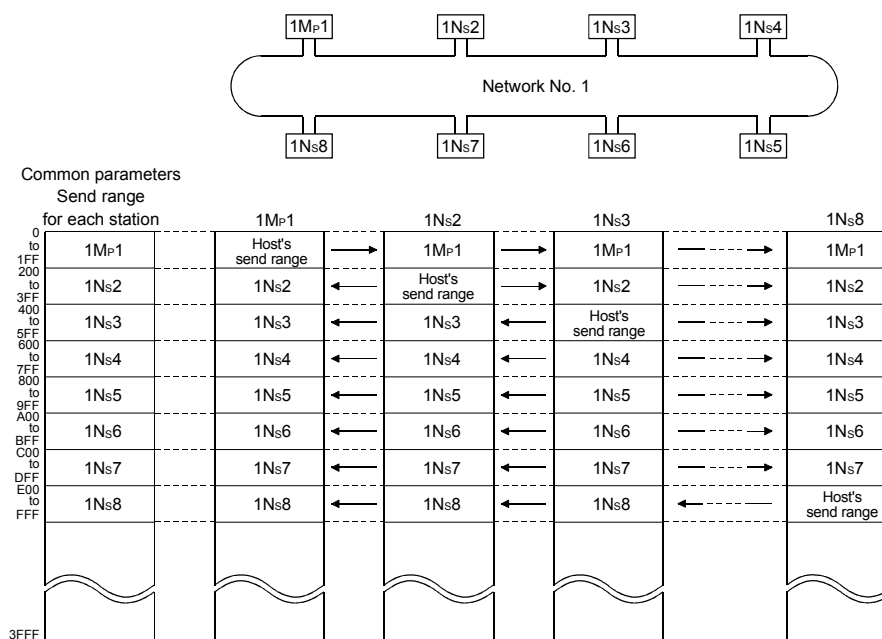
5.3 Common Parameters (Network Range Assignment Screen)

The common parameters are used to set the cyclic transmission ranges of LB, LW, LX and LY that can be sent by each station in a single network. The common parameter settings are required only for the control station. The data of the common parameters are sent to the normal stations when the network starts up.

5.3.1 Send range for each station (LB/LW settings)

Assign the send ranges of the link devices (LB/LW) for each station in 16-point units for LB (start 0000 to end 000F) and in one-point unit for LW.

The following example shows send range for each station (LB/LW settings) when each of 512 points is assigned to station numbers 1 to 8.



[Screen settings]

| Station No. | Send range for each station | | | Send range for each station | | |
|-------------|-----------------------------|-------|------|-----------------------------|-------|------|
| | Points | Start | End | Points | Start | End |
| 1 | 512 | 0000 | 01FF | 512 | 0000 | 01FF |
| 2 | 512 | 0200 | 03FF | 512 | 0200 | 03FF |
| 3 | 512 | 0400 | 05FF | 512 | 0400 | 05FF |
| 4 | 512 | 0600 | 07FF | 512 | 0600 | 07FF |
| 5 | 512 | 0800 | 09FF | 512 | 0800 | 09FF |
| 6 | 512 | 0A00 | 0BFF | 512 | 0A00 | 0BFF |
| 7 | 512 | 0C00 | 0DFF | 512 | 0C00 | 0DFF |
| 8 | 512 | 0E00 | 0FFF | 512 | 0E00 | 0FFF |

POINT

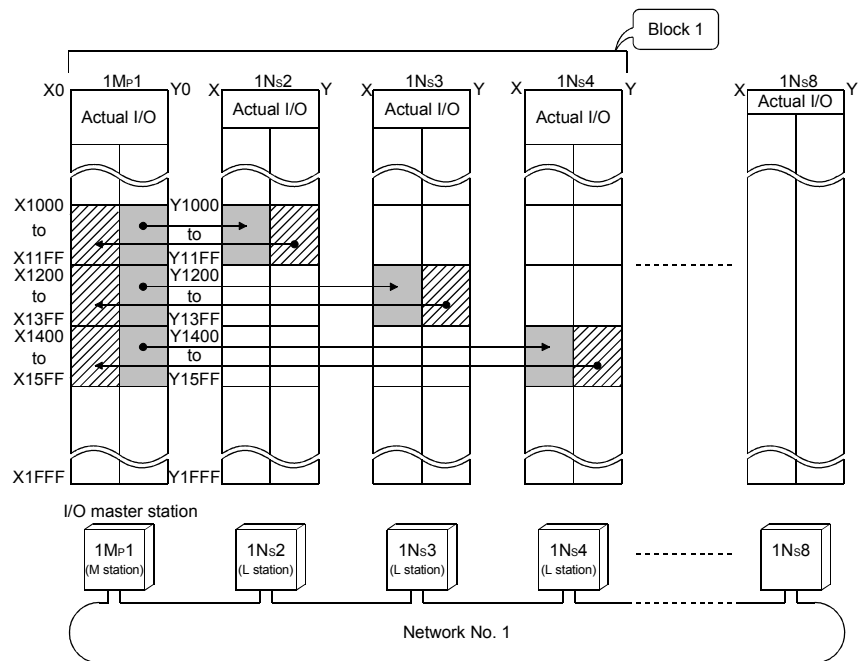
- (1) In order to enable 32-bit data guarantee, it is necessary to set the number of points of send range for each station in such a way that LB is a multiple of 20H and LW is multiple of 2. Also, each station's head device number must be set in a similar way so that LB is a multiple of 20H and LW is a multiple of 2. (For details about the 32-bit data guarantee, refer to Section 6.2.1.)
- (2) For the assignment of the same points only to LB and LW, use the identical point assignment setting. For the identical point assignment to LBs and LWs, including low speed LB and low speed LW, use equal assignment.

5.3.2 Send range for each station (LX/LY settings)

Set send ranges for each station of LX/LY, which represent the amount of data that can be sent by each station in a single network in one (two) block units.

The link devices (LX/LY) between the I/O master station (M station) and other station (L station) are assigned 1:1.

The following example shows send ranges for each station (LX/LY settings) when each of 512 points of link devices (LX/LY) is assigned to station numbers 2 to 4, using station number 1 (host) as the I/O master station of block 1.



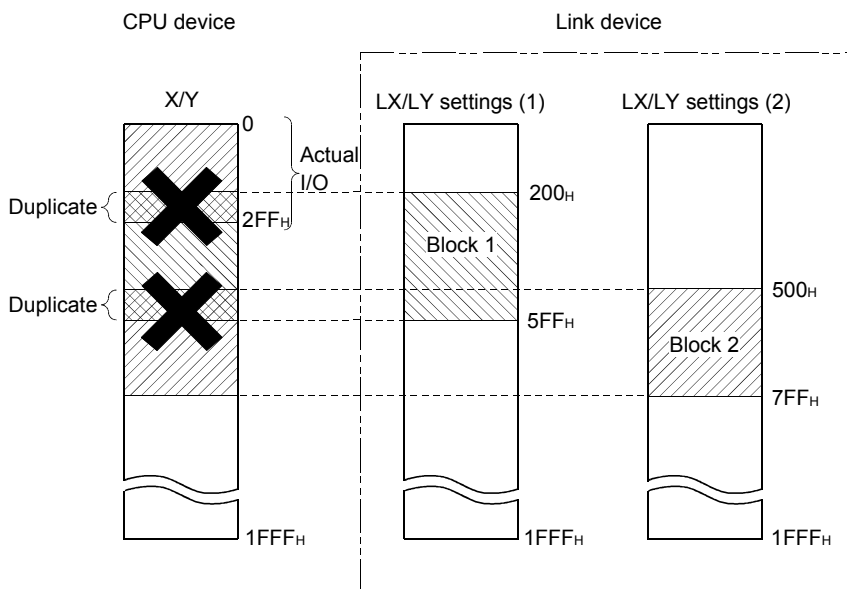
[Screen settings]

| Station No. | M station -> L station | | | | | | M station <- L station | | | | | |
|-------------|------------------------|-------|------|--------|-------|------|------------------------|-------|------|--------|-------|------|
| | LY | | | LX | | | LX | | | LY | | |
| | Points | Start | End | Points | Start | End | Points | Start | End | Points | Start | End |
| 1 | 512 | 1000 | 11FF | 512 | 1000 | 11FF | 512 | 1000 | 11FF | 512 | 1000 | 11FF |
| 2 | 512 | 1200 | 13FF | 512 | 1200 | 13FF | 512 | 1200 | 13FF | 512 | 1200 | 13FF |
| 3 | 512 | 1400 | 15FF | 512 | 1400 | 15FF | 512 | 1400 | 15FF | 512 | 1400 | 15FF |
| 4 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | |

[Precaution]

Duplicate link device ranges cannot be assigned to each station between block 1 and block 2.

In addition, they must be different from the actual I/O (the range of input/output numbers to which the actual module is installed).



5.3.3 Designation of the I/O master station

The master station (the control station) can be set in each block for 1:1 communication using LX/LY regardless of the station type (either the control station or the normal station).

Each of block 1 and block 2 has one I/O master station, which is set by the send range (LX/LY) of each station in each block.

5.3.4 Designation of the reserved station

The reserved station designation function is used to prevent stations to be connected in future (stations that are not actually connected but included in the total stations of a network) from being treated as faulty stations.

The reserved stations do not affect the link scan time; they do not slow down the network even if used as reserved stations.

5.3.5 Pairing setting

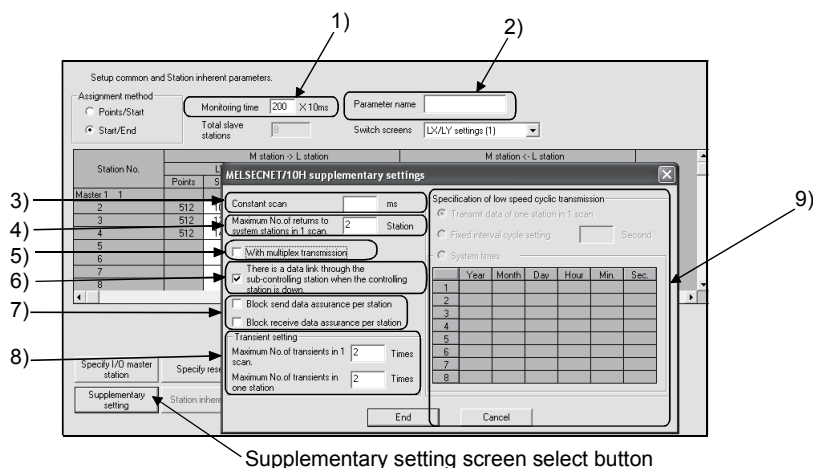
In the pairing setting, set a combination of network module station numbers comprising the redundant system.

For further information on the pairing setting, refer to Section 7.10.3.

5.4 Supplementary Settings

The supplementary settings are included in the common parameter settings. They can be used when more specific applications are required. The default settings should normally be used.

The supplementary settings (common parameter settings) are required only for the control station. The parameters are sent from the control station to normal stations when the network starts up.



[Setting item]

1) Monitoring time

This is used to monitor the status of the cyclic transmission between the control station (sub-control station) and normal stations. Set the time to determine whether or not the cyclic transmission is performed normally.

Set a smaller value if the control time is short, the cyclic data error detection is shorter than the default (2 s) monitoring time, and the actual link scan time is sufficient.

Set a larger value if there are large amounts of cyclic data and the link scan time is more than the default monitoring time due to the effect of noise.

Set a value greater than the link scan time in 10 ms units.

If a value smaller than the link scan time is set, the data link is disabled; thus, check the current value and set a sufficient value without making it unnecessarily shorter.

- Valid setting time : 1 to 200×10 ms
- Default : 200×10 ms (2 s)

2) Parameter name

The parameter name function is used to register the names of parameters to make it easy to understand for which system each parameter is used.

Choose the names in such a way that the parameter to be set can easily be recognized later.

- Number of input characters: Up to eight alphabetic characters

3) Constant scan

The constant link scan function is used to maintain the link scan time constant.

Set a value in the following range to use a constant scan time:

| Setting time | Constant scan |
|--------------|-----------------------------|
| Blank | Not executed (default) |
| 1 to 500 ms | Executed using the set time |

4) Maximum No. of return to system stations in 1 scan (Refer to Section 3.2.2)

Set the number of faulty stations that can return to the network in one link scan.

- Valid number of stations : 1 to 64 stations
- Default : 2 stations

5) With multiplex transmission (Refer to Section 7.6)

Set this item when executing the multiplex transmission function.

The multiplex transmission function is used when both the forward and reverse loops are in the normal status to speed up the transmission rate using both loops at the same time.

- Default: No multiplex transmission

6) There is a data link through the sub-controlling station when the controlling station is down (Refer to Section 3.2.2)

Set this item to enable other normal station in the network to continue cyclic transmission as a substitute station (sub control station) (control station shift function) if the designated control station is cut off from the network due to an error.

- Default: Control station switch function enabled

7) Block send data assurance per station/Block receive data assurance per station (Refer to Section 6.2.2)

Set these items when executing the link data separation prevention per station in the cyclic transmission.

This allows multiple word data manipulation without interlocks.

However, the separation prevention *1 is valid only for the refresh processing between the CPU module and the network module.

The default varies depending on the network type.

| Network type | Default |
|---------------------------|---------------------------------|
| MELSECNET/H mode | "No" for both send and receive |
| MELSECNET/10 mode | |
| MELSECNET/H Extended mode | "Yes" for both send and receive |

*1: The separation prevention refers to a prevention of link data with double word precision (32 bits), such as the current value of the positioning module, from being separated into new data and old data in one word (16 bits) units due to the cyclic transmission timing.

- 8) Transient setting (Refer to Section 7.4.1)
 Set the execution conditions for the transient transmission.
- "Maximum no. of transients in 1 scan"
 Set the number of transients (total for one entire network) that a single network can execute in one link scan.
- Valid setting count : 1 to 255 times
 - Default : 2 times
- "Maximum no. of transients in one station"
 Set the number of transients that a single station can execute in one link scan.
- Valid setting count : 1 to 10 times
 - Default : 2 times
- 9) Specification of low speed cyclic transmission (Refer to Section 7.3)
 Set the execution conditions under which the link data (LB/LW) is sent at a low frequency (low-speed cyclic transmission) separately from the normal cyclic transmission.
- (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)
- The following selections can be made when the send ranges (low-speed LB, low-speed LW) of each station are set for the low-speed cyclic transmission.
- "Transmit data of one station in 1 scan"
 Set this item when sending data to be communicated in a batch mode to other stations at the rate of one station per link scan.
- Default: Disabled
- "Fixed term cycle interval setting"
 The low-speed cyclic transmission is executed at the set frequency.
- Valid setting frequency : 1 to 65535 s
 (18 h, 12 min and 15 s)
 - Default : Disabled
- "System times"
 The low speed cyclic transmission is executed according to the set time.
- Hour/minute/second of the system timer cannot be omitted.
- Setting : 1 to 8 points (year/month/date/hour/minute/second)
 - Default : Disabled

POINT

Low-speed cyclic transmission cannot be set on the Basic model QCPU and safety CPU. Hence, low-speed cyclic transmission cannot be executed.

5.5 Control Station Return Setting

This parameter is used to designate the type of station used by the control station when returning to the network in the control station return control function (Refer to Section 3.2.2).

Select this parameter to make the control station return as a normal station without stopping the baton pass in the system in operation.

The control station return setting is required only for the control station.

(1) When "Return as control station" is selected (default)

The baton pass (cyclic transmission, transient transmission, etc.) temporarily stops because the control station sends the parameters to the normal stations and returns to the network.

(2) When "Return as normal station" is selected

The control station returns to the network as a normal station, without stopping the baton pass in the network.

[Setting screen]

| Module 1 | |
|--------------------------|---------------------------------|
| Network type | MNET/H mode (Control station) ▼ |
| Starting I/O No. | 0000 |
| Network No. | 1 |
| Total stations | 2 |
| Group No. | 0 |
| Station No. | |
| Mode | On line ▼ |
| Network range assignment | |
| Refresh parameters | |
| Interrupt settings | |
| | Return as control station ▼ |
| | Return as control station |
| | Return as normal station |

| |
|---------|
| REMARKS |
|---------|

- When "Return as control station" is selected, the network stop time becomes longer because the baton pass is stopped, but the common parameters can easily be changed only by resetting the CPU of the control station.
- If "Return as normal station" is selected, the network does not stop because the control station returns to the network without stopping the baton pass. However, it is necessary to reset the CPUs of all the stations after changing the common parameters of the control station while the network is in operation. If only the CPU of the control station is reset, a parameter mismatch error is detected in the control station and it is disconnected from the network.

5.6 Station Inherent Parameters (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)

The station inherent parameters are used for rearranging each station's transmission ranges (LB, LW).

Rearrangement of the each station transmission ranges (LB, LW) eliminates the need for program modification even if link device settings are expanded during operation. Also, it can remove unnecessary transmission ranges, keeping only necessary ranges.

(1) Setting items

(a) Display of the setting screen

1) For the control station

Click the **Station inherent parameters** button on the [Network assignment] screen (common parameters) to display the following screen.

The settings assigned with common parameters are shown in the Network range assignment area.

| Station No. | Setting 1 | | | Setting 2 | | | Network range assignment | | | Pairing |
|-------------|-----------|-------|-----|-----------|-------|-----|--------------------------|-------|------|---------|
| | Points | Start | End | Points | Start | End | Points | Start | End | |
| 1 | | | | | | | 512 | 0000 | 01FF | Disable |
| 2 | | | | | | | 256 | 0200 | 02FF | Disable |
| 3 | | | | | | | 256 | 0300 | 03FF | Disable |
| 4 | | | | | | | 256 | 0400 | 04FF | Disable |
| 5 | | | | | | | 256 | 0500 | 05FF | Disable |
| 6 | | | | | | | 256 | 0600 | 06FF | Disable |

2) For the normal station

The screen appears when the **Station inherent parameters** button is clicked.

From [Reference network range assignment], common parameters of the control station can be read. ([Reference] -> [Select project] -> [Read])

This is useful for setting station inherent parameters with the control station's network range assignments being viewed.

Values can be set even if no values are displayed in the network range assignment fields.

The network range assignment fields are merely used as a reference for Setting 1 and Setting 2.

(b) Setting items

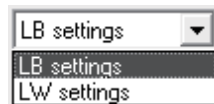
1) Parameter name

Set the parameter name to make it easy to understand for which system each parameter is used.

- Number of input characters: Up to eight alphabetic characters

2) Switch screens

The windows can be switched using the selection dialogue box (LB settings, LW settings).



3) Setting 1 and setting 2

- The send ranges of all station numbers can be divided into two: Setting 1 and Setting 2.
- Any values can be set as long as they are within the network assignment range (including all stations) of the common parameters.
- Note that even if the ranges are set with the common parameters, the assigned ranges become invalid for the station numbers for which nothing is set with Setting 1 and Setting 2 of the station inherent parameters.

4) Reference network range assignment (Normal station only)

This is used when station inherent parameters are set with the control station's network range assignments being viewed.

With the **Reference** button, select the project of the control station.

In the Project Name box, select the position of the control station.

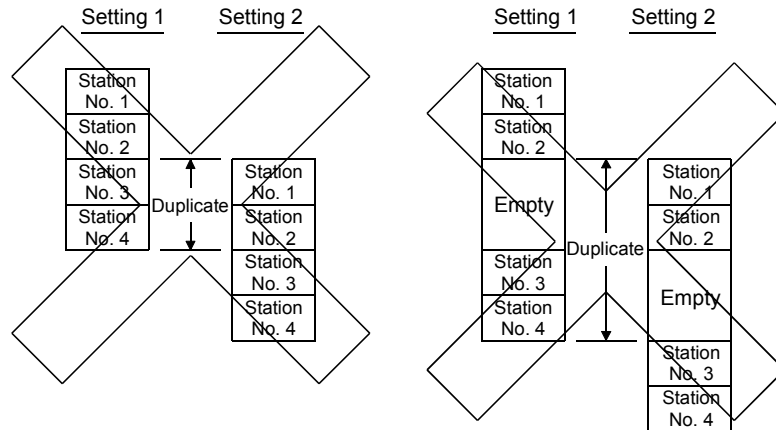
A click on the **Read** button displays the control station's network range assignments in the Network range assignment area.

POINT

- (1) Set values for Setting 1 and Setting 2 within the device range designated with a common parameter.

If a value outside the range is selected, a mismatch error occurs.

Also, duplicate ranges cannot be specified for Setting 1 and Setting 2.



- (2) The station without setting 1 cannot be set setting 2.
- (3) The setting number for setting 2 must be larger than the last number in the whole station of setting 1.
- (4) For low-speed cyclic transmission, station inherent parameters cannot be set.
- (5) The station inherent parameters cannot be set on the Basic model QCPU and safety CPU.

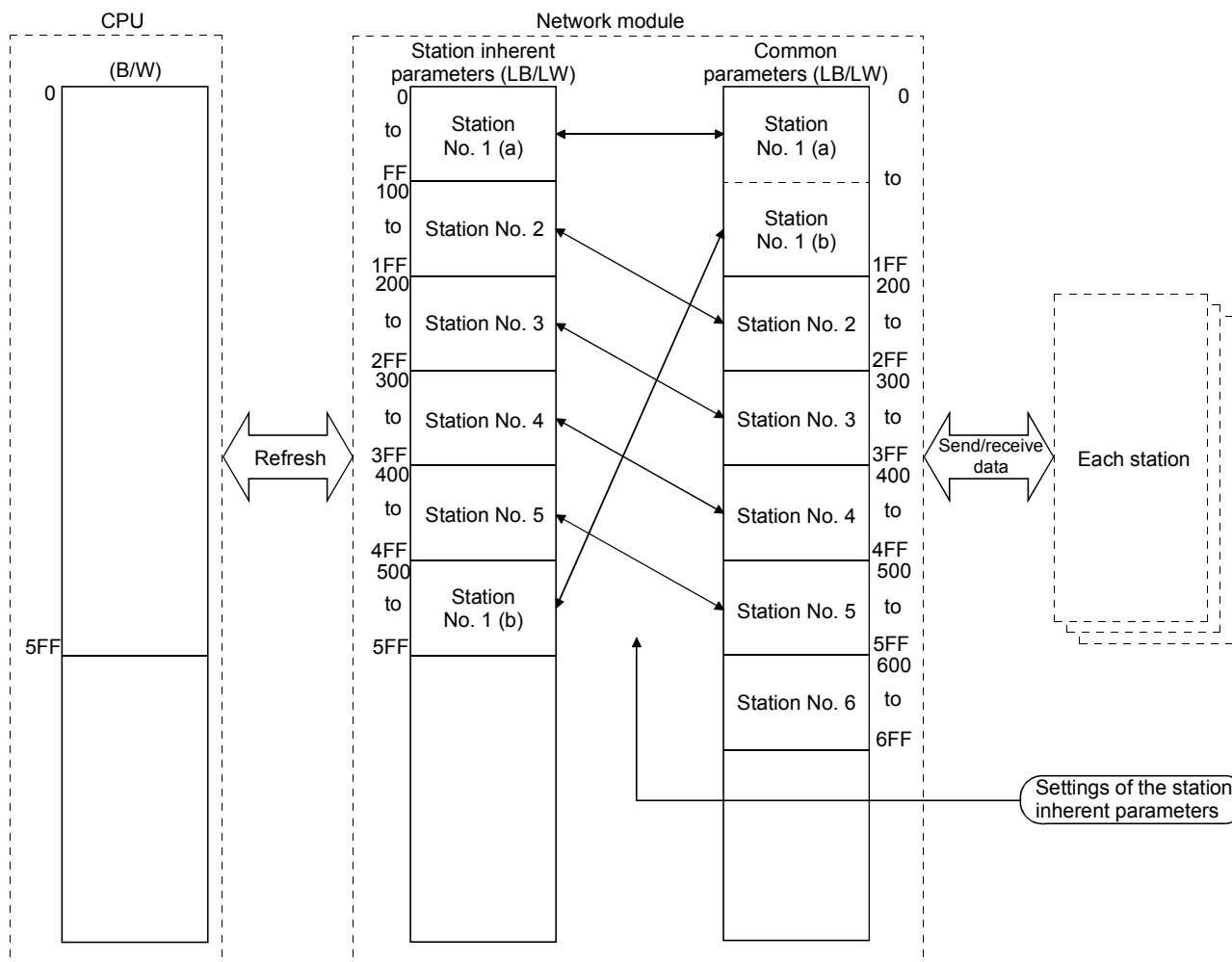
(2) Example of settings

The settings shown below are displayed on the screen when the common parameters (network range assignments) are changed as follows:

- 1) Move the devices of station number 1. B100 to B1FF → B500 to B5FF
- 2) Lump the devices of station number 2 to 5 together so that they are contiguous.
- 3) Cancel the assignments of station number 6.

[Example of station inherent parameter settings]

| Station No. | Setting 1 | | | Setting 2 | | | Network range assignment | | | Pairing |
|-------------|-----------|-------|------|-----------|-------|------|--------------------------|-------|------|-----------|
| | LB | | | LB | | | LB | | | |
| | Points | Start | End | Points | Start | End | Points | Start | End | |
| 1 | 256 | 0000 | 00FF | 256 | 0500 | 05FF | 512 | 0000 | 01FF | Disable ▼ |
| 2 | 256 | 0100 | 01FF | | | | 256 | 0200 | 02FF | Disable ▼ |
| 3 | 256 | 0200 | 02FF | | | | 256 | 0300 | 03FF | Disable ▼ |
| 4 | 256 | 0300 | 03FF | | | | 256 | 0400 | 04FF | Disable ▼ |
| 5 | 256 | 0400 | 04FF | | | | 256 | 0500 | 05FF | Disable ▼ |
| 6 | | | | | | | 256 | 0600 | 06FF | Disable ▼ |

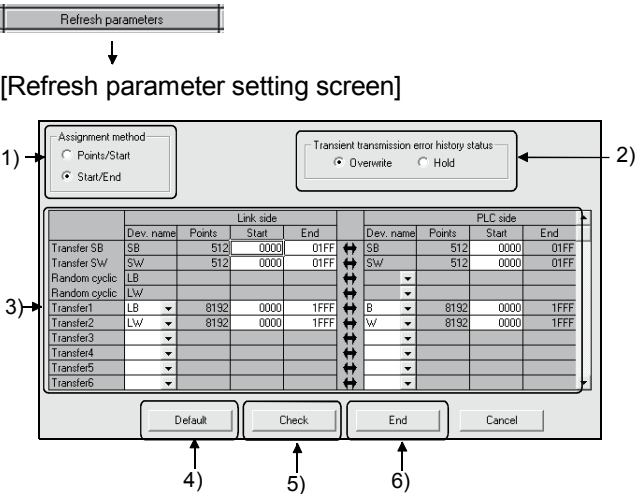


5.7 Refresh Parameters

The refresh parameters are used to transfer the link device data (LB, LW, LX, LY) of the network module to the devices (X, Y, M, L, T, B, C, ST, D, W, R, ZR) of the CPU module for operation of the sequence programs.

By eliminating the network refresh of those link devices that are not used by the sequence programs, the scan time can also be reduced.

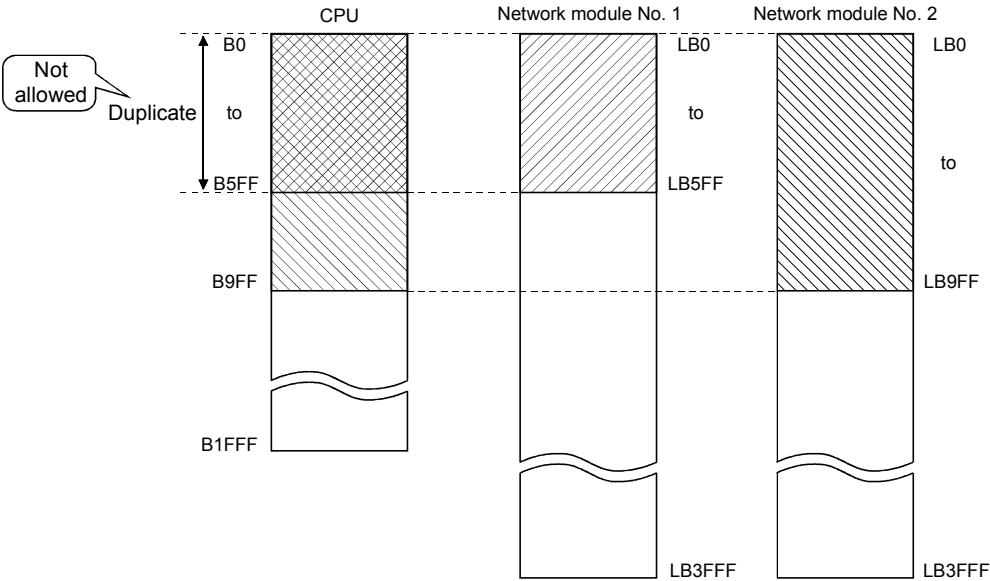
Because it is not necessary to transfer the link devices to different devices with the sequence programs, the number of program steps is reduced and easy-to-understand programs can be created.



The assignment status of the above refresh parameters can be checked with the assignment image diagram.

The assignment image diagram shows the device assignments made between the CPU module and the modules set for the No. of module setting.

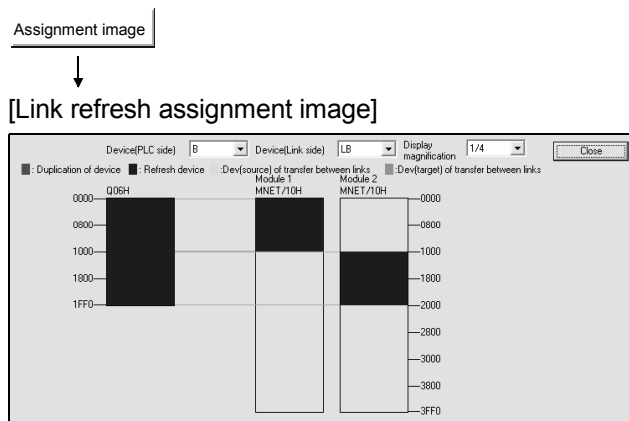
The refresh parameters cannot be duplicated in the CPU's device settings.



Using the assignment image diagram, assignment errors and duplicate settings between the modules can also be checked.

It is a convenient tool to view the assignment status when setting or changing the network refresh parameters.

It also displays the interlink transmission parameters; thus, complicated settings among the network modules can be verified.



POINT

- (1) The assignment image diagram can display schematic images of CC-Link IE controller network and MELSECNET/H (network modules on controller networks, PLC to PLC networks, and remote I/O networks).
- (2) Avoid any duplicate settings of the programmable-controller-side devices that are used for the following.
 - Auto refresh parameters of CC-Link modules
 - Auto refresh parameters of intelligent function modules
 - Auto refresh using the CPU-shared memory in the multiple CPU system
- (3) Do not set the link refresh range that does not exceed the range of the internal user devices to the expansion data register(D) or to expansion link register(W) respectively.

- 1) Assignment method
Select the device range input method from either Points/Start or Start/End.
 - Default: Start/End
- 2) Transient transmission error history status
Select whether to overwrite or retain the error history.
 - Default: Overwrite
- 3) Transfer settings on the Link side and the PLC side
Select the device names from the following:
 - Link side : LX, LY, LB, LW
 - PLC side : X, Y, M, L, T, B, C, ST, D, W, R, ZR
 However, if the link side is LX, any of C, T and ST cannot be selected on the CPU side.
Set the values for Points/Start/End in 16-point units.

4) button

Select this button to automatically assign the default link devices according to the number of installed modules.

5) button

Select this button to check if there are any duplicate parameter data settings.

6) button

Click this button to return to the network setting screen after completing the data settings.

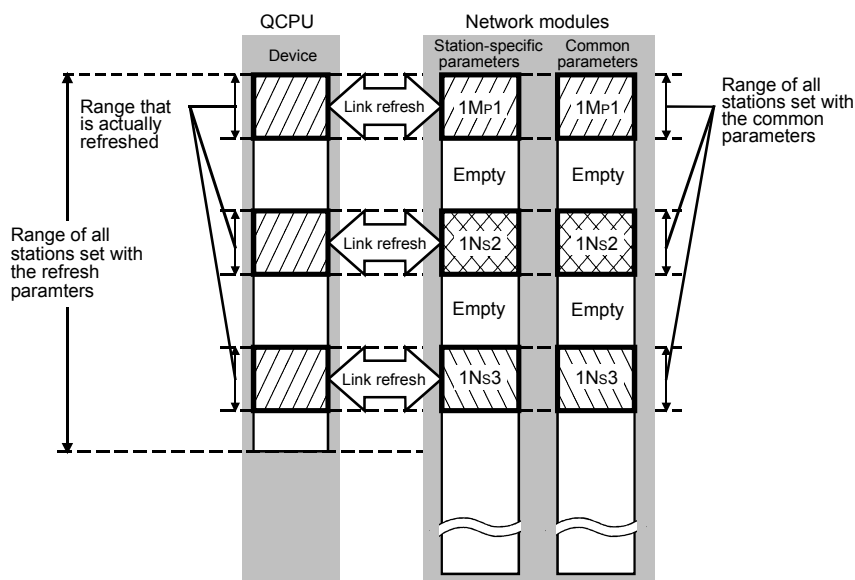
| |
|---------|
| REMARKS |
|---------|

[Random cyclic] is for future use. An error will not occur even if it is selected, but no processing will be performed.

5.7.1 Concept of the link refreshing

(1) Link refresh ranges

The ranges that are set in Refresh parameters and that are set with common parameters are refreshed.



(2) Devices for which link refreshing can be executed

Sixty-four transfer settings (LX, LY, LB, LW), one SB transfer setting and one SW transfer setting for each network module can be set on the High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU.

The Basic model QCPU and safety CPU allows you to make eight transfer settings (LX, LY, LB, LW), one SB transfer setting and one SW transfer setting for each network module.

It is possible to transfer to different devices.

SB, LB, B, LX, LY, X, Y, M, L, T, C and ST can be set in 16-point units, and SW, LW, W, D, R and ZR can be set in one-point units.

[List of devices for which the refresh combination transfer can be executed]

| Setting item | Devices for which transfer is allowed | | |
|--------------|---------------------------------------|---|--|
| | Link side device | ↔ | PLC side device |
| SB transfer | SB | ↔ | SB |
| SW transfer | SW | ↔ | SW |
| Transfer 1 | LX, LY, LB, LW | ↔ | X, Y, M, L, B, T, C, ST, D, W, R, ZR*1 |
| : | : | ↔ | : |
| Transfer 64 | LX, LY, LB, LW | ↔ | X, Y, M, L, B, T, C, ST, D, W, R, ZR*1 |

*1: C, T or ST cannot be selected as the refresh destination of LX.

POINT

To use the entire device range (16K points) of LB/LW, either of the following settings must be made:

- 1) Change the number of device points of B/W.
- 2) In the refresh parameters, use devices other than B/W for the refresh target device of LB/LW.

[Example]

To change [Device] of [PLC parameter] in order to use all 16K points of the LB and LW device range

Note the following points when assigning device points:

- 1) The total number of device points is 29K words for the High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU or 16.4K words for the Basic model QCPU.
- 2) The total number of bit devices must be 64K bits.

[In the case of Q25HCPU]

| | [Default] | | [After change] |
|-----------------------|-----------|---|----------------|
| Input relay | X 8K | | 8K |
| Output relay | Y 8K | | 8K |
| Internal relay | M 8K | | 8K |
| Latch relay | L 8K | → | 4K |
| Link relay | B 8K | → | 16K |
| Annunciator | F 2K | | 2K |
| Link special relay | SB 2K | | 2K |
| Edge relay | V 2K | | 2K |
| Step relay | S 8K | | 8K |
| Timer | T 2K | | 2K |
| Retentive timer | ST 0K | | 0K |
| Counter | C 1K | | 1K |
| Data register | D 12K | → | 4K |
| Link register | W 8K | → | 16K |
| Link special register | SW 2K | | 2K |
| Device total | 28.8K | | 29.0K |
| Word device total | 26.0K | | 26.0K |
| Bit device total | 44.0K | | 48.0K |

[Default]

X:8K

Y:8K

M:8K

L:8K

B:8K

F:2K

[After change]

X:8K

Y:8K

M:8K

L:4K

B:16K

F:2K

→

→

→

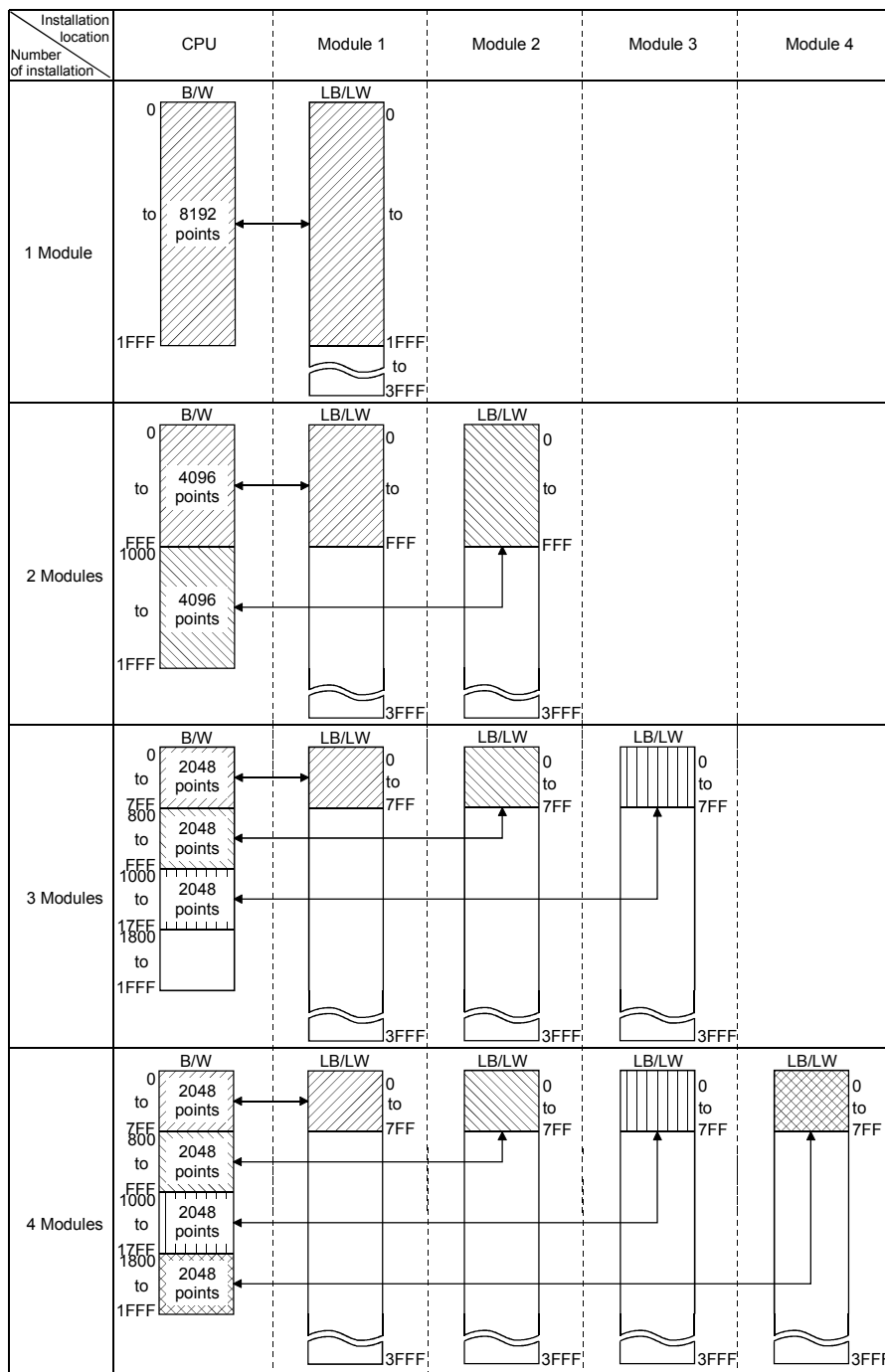
→

5.7.2 How to set the refresh parameters

(1) Automatic setting with the **Default** button

(a) High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU

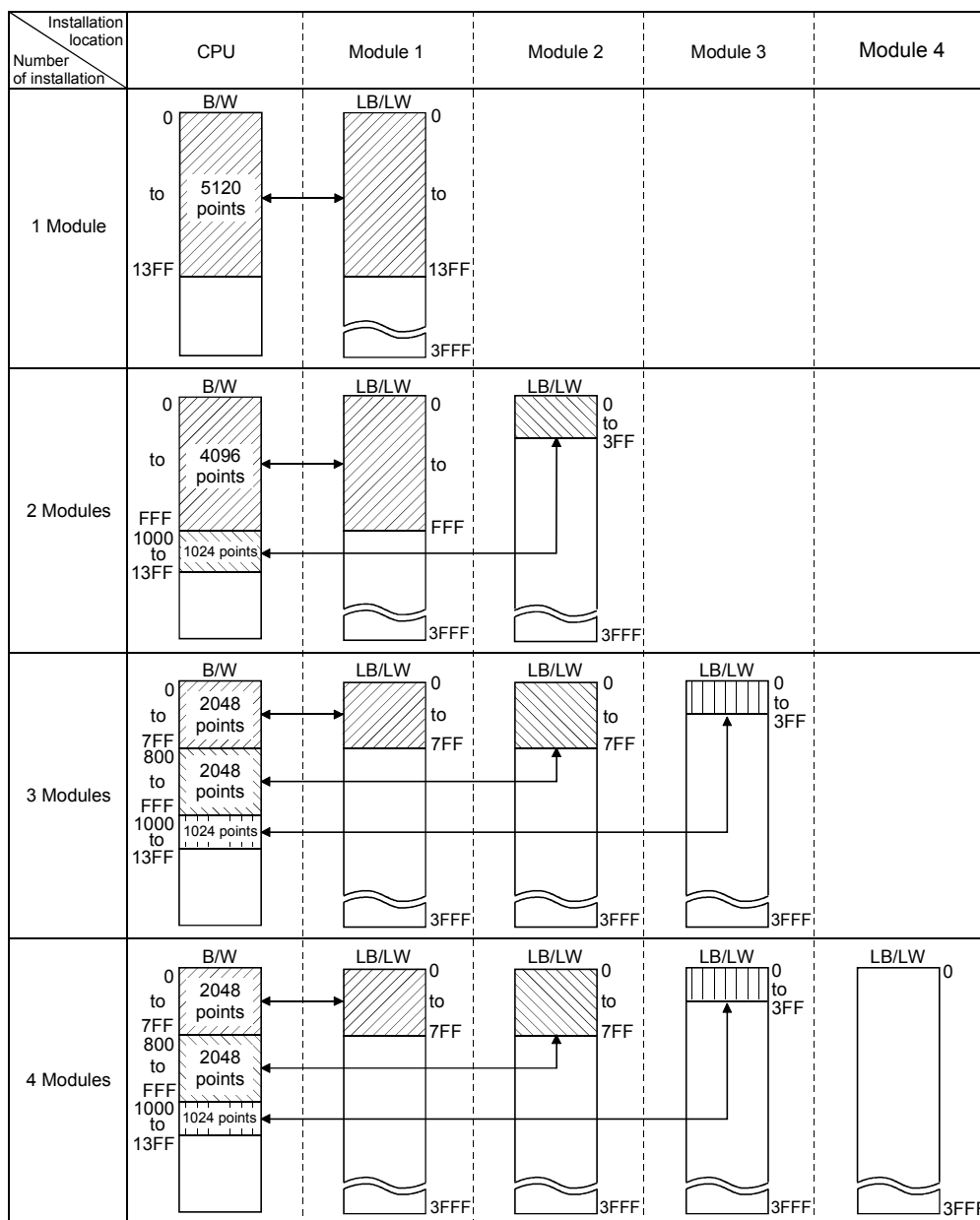
- 1) When B/W points set in [Device] under [PLC parameter] are 8K points or more (6K points or more when three modules are mounted)
Link devices are assigned as shown below.



- 2) When B/W points set in [Device] under [PLC parameter] are less than 8K points (less than 6K points when three modules are mounted) Link devices equivalent to the B/W points set in [Device] are assigned, up to the following points for each module.

| No. of modules | Maximum points assignable per module |
|----------------|--------------------------------------|
| 1 | B/W points set in [Device] |
| 2 | 4K points |
| 3 | 2K points |
| 4 | |

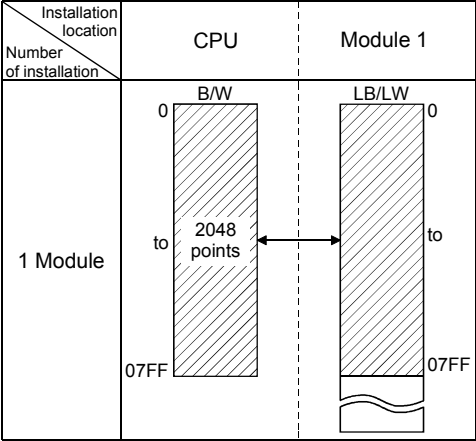
Example: When B/W points set in [Device] are 5K points



(b) Basic model QCPU and safety CPU

- 1) When B/W points set in [Device] under [PLC parameter] are 2K points or more

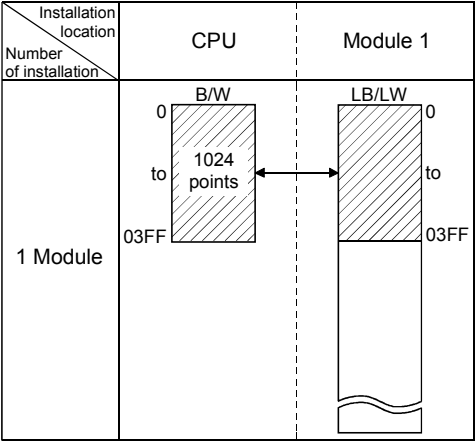
Link devices are assigned as shown below.



- 2) When B/W points set in [Device] under [PLC parameter] are less than 2K points

The B/W points set in [Device] are assigned.

Example: When B/W points set in [Device] are 1K points



(2) Manual setting by direct input

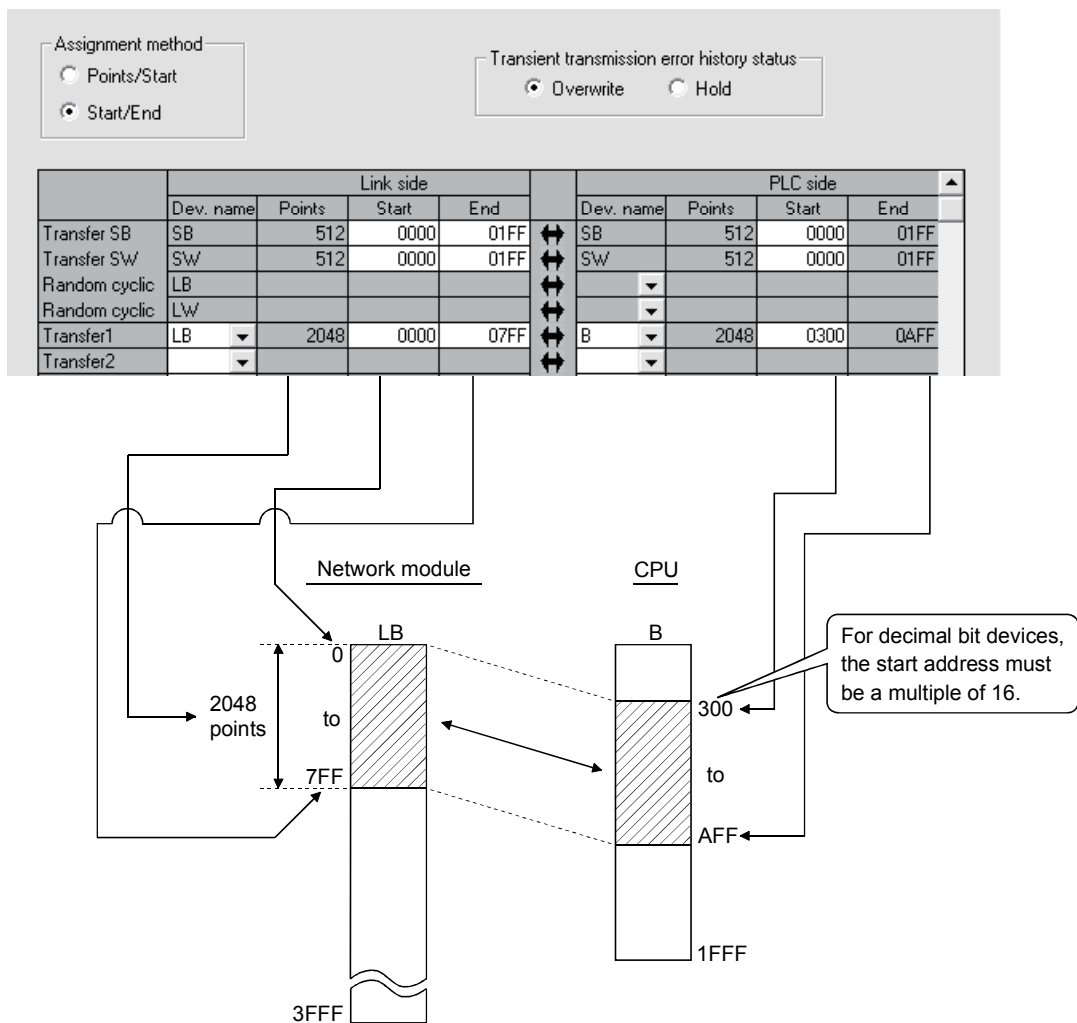
1) Select "Assignment method".

Select "Points/Start" when entering link device points and start addresses.

Select "Start/End" when entering start and end addresses of link devices.

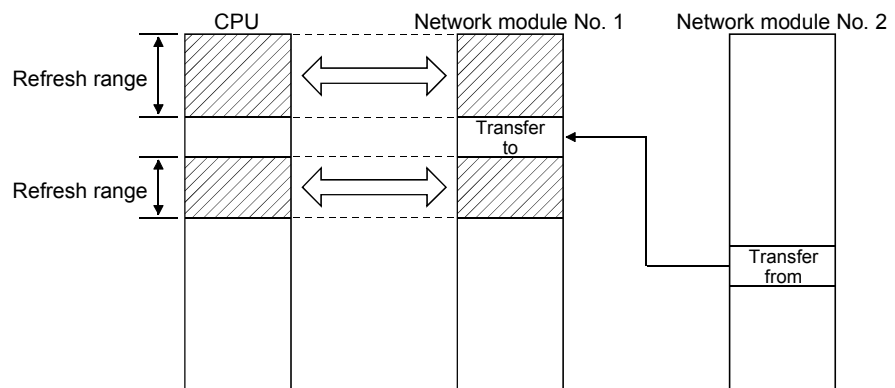
2) Configure the settings for the link side and CPU side devices.

Example: When "Start/End" is selected



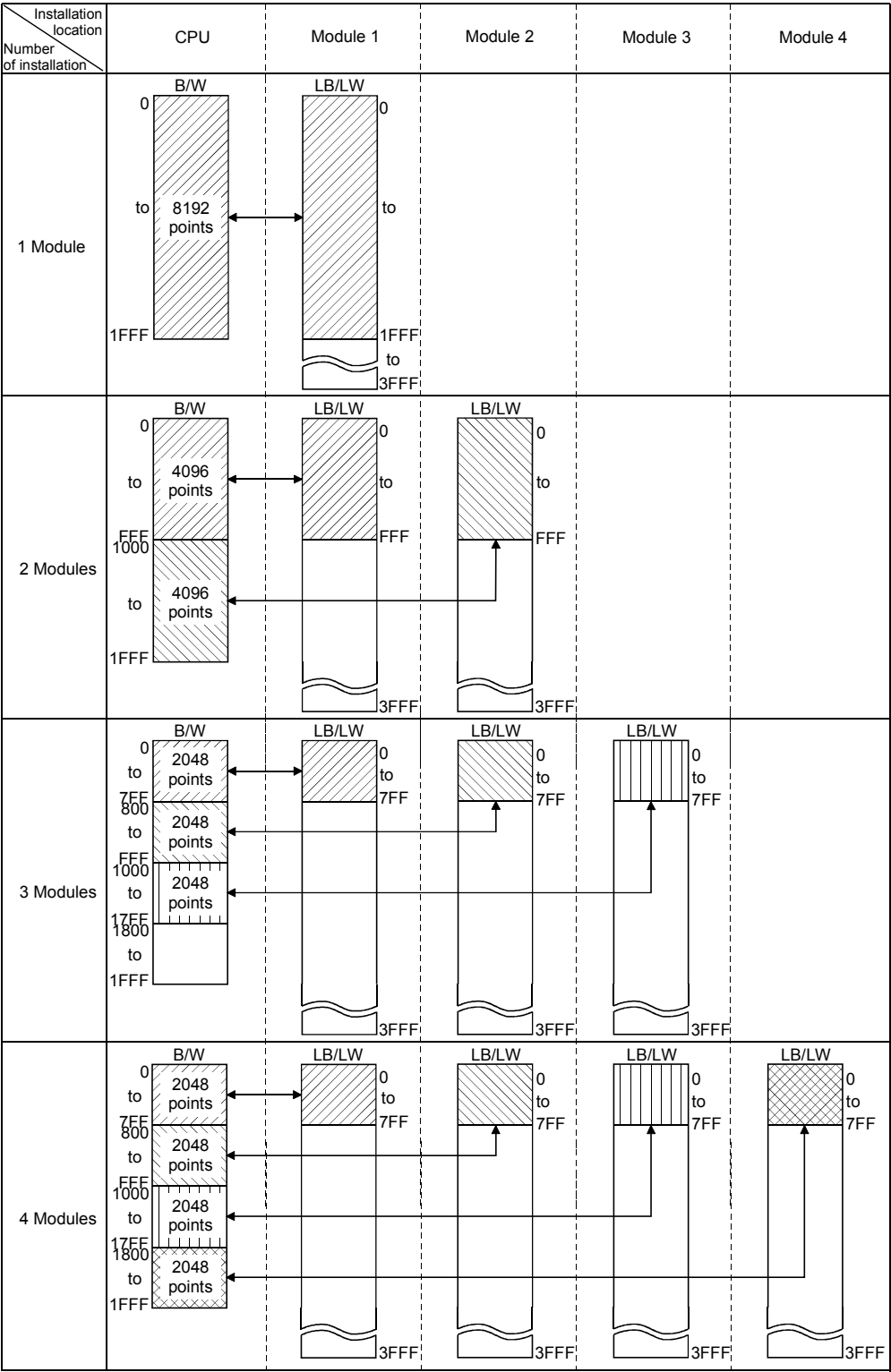
POINT

- (1) When setting the CPU side device range, check if:
- The refresh range does not overlap with any other range (e.g. actual I/O).
 - The CPU side device range is within the range set in [Device] of [PLC parameter].
- Device ranges can be checked by selecting [Tools] – [Check parameters] in GX Developer.
- (2) When the interlink transmission parameters are set, do not set the device range of the transfer destination in a refresh range. Otherwise, the correct data cannot be sent to other stations.



- (3) When no refresh parameters are set
(Other than Universal model QCPU and safety CPU)
- (a) High Performance model QCPU, Process CPU, and Redundant CPU

Link devices are assigned as shown below.



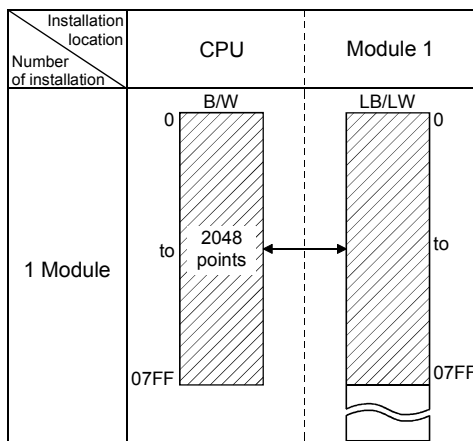
POINT

When B/W points less than the following are set in [Device] under [PLC parameter], set refresh parameters accordingly. Or, increase the B/W points to the following value or more in [Device].

| No. of modules | Device points in [Device] | |
|----------------|---------------------------|-----------|
| | B | W |
| 1 | 8K points | 8K points |
| 2 | 8K points | 8K points |
| 3 | 6K points | 6K points |
| 4 | 8K points | 8K points |

(b) Basic model QCPU

Link devices are assigned as shown below.

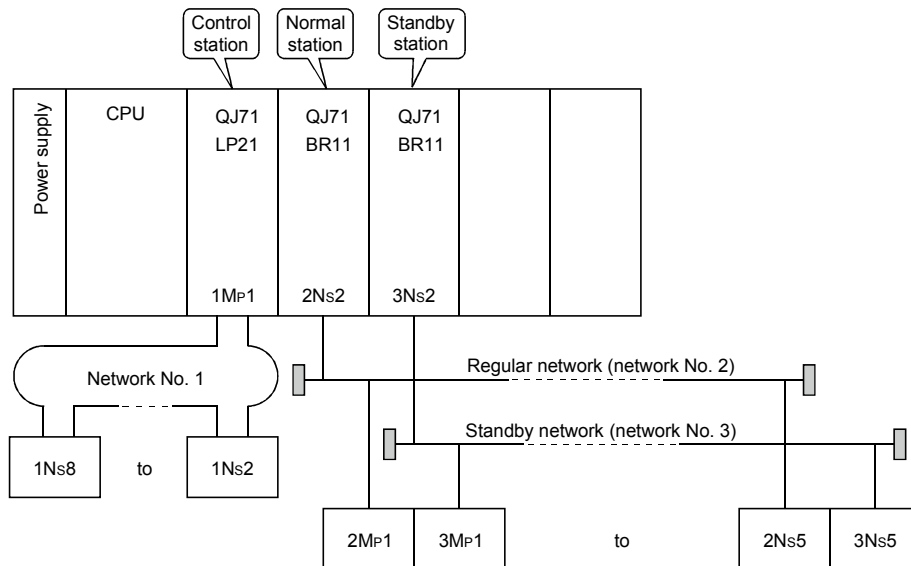
**POINT**

When B/W points set in [Device] under [PLC parameter] are less than 2K points, set refresh parameters accordingly. Or, increase the B/W points to 2K points or more in [Device].

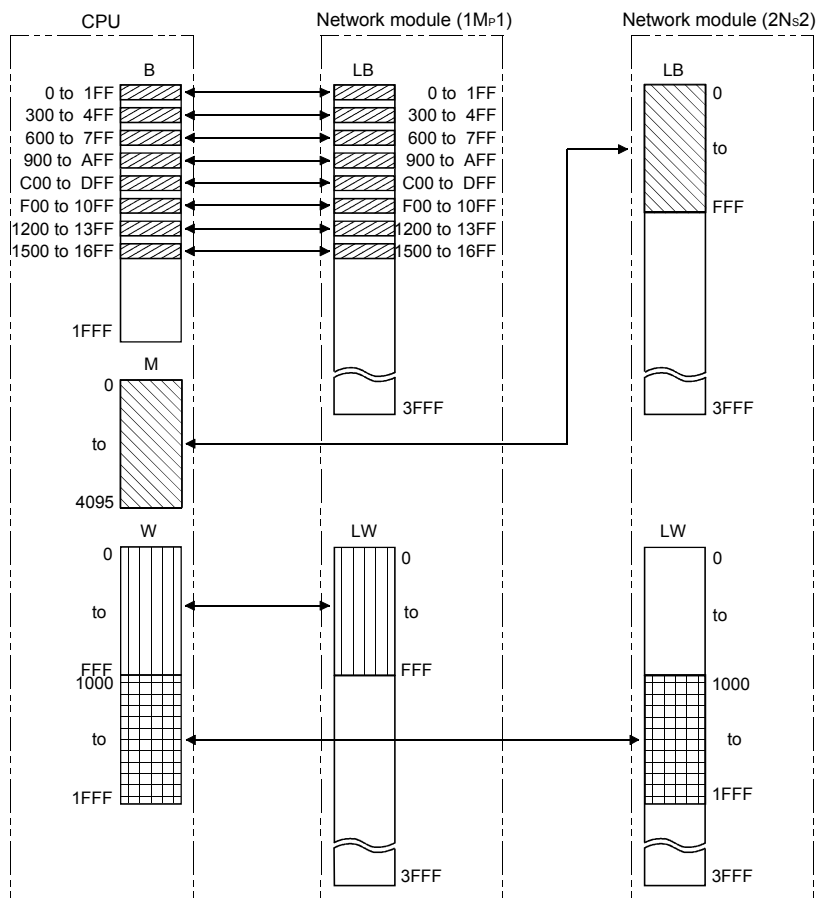
(4) Setting example

The following shows an example of the refresh parameter settings:

[System configuration]



[Parameter assignments]



[Setting screen]

The following shows the settings of the refresh parameters for each module that are displayed on the screen.

Settings of module 1 (1M_P1) (transfer SB, transfer SW, transfers 1 to 6)

| | 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 S/W | S/W | 512 | 0000 | 01FF | ↔ | S/W | 512 | 0000 | 01FF |
| Random cyclic | LB | | | | ↔ | | | | |
| Random cyclic | LW | | | | ↔ | | | | |
| Transfer1 | LB ▼ | 512 | 0000 | 01FF | ↔ | B ▼ | 512 | 0000 | 01FF |
| Transfer2 | LB ▼ | 512 | 0300 | 04FF | ↔ | B ▼ | 512 | 0300 | 04FF |
| Transfer3 | LB ▼ | 512 | 0600 | 07FF | ↔ | B ▼ | 512 | 0600 | 07FF |
| Transfer4 | LB ▼ | 512 | 0900 | 0AFF | ↔ | B ▼ | 512 | 0900 | 0AFF |
| Transfer5 | LB ▼ | 512 | 0C00 | 0DFF | ↔ | B ▼ | 512 | 0C00 | 0DFF |
| Transfer6 | LB ▼ | 512 | 0F00 | 10FF | ↔ | B ▼ | 512 | 0F00 | 10FF ▼ |

(Transfers 7 to 9)

| | Link side | | | | | PLC side | | | |
|------------|-----------|--------|-------|------|---|-----------|--------|-------|------|
| | Dev. name | Points | Start | End | | Dev. name | Points | Start | End |
| Transfer7 | LB ▼ | 512 | 1200 | 13FF | ↔ | B ▼ | 512 | 1200 | 13FF |
| Transfer8 | LB ▼ | 512 | 1400 | 15FF | ↔ | B ▼ | 512 | 1500 | 16FF |
| Transfer9 | LW ▼ | 4096 | 0000 | 0FFF | ↔ | W ▼ | 4096 | 0000 | 0FFF |
| Transfer10 | | | | | ↔ | | | | |
| Transfer11 | | | | | ↔ | | | | |
| Transfer12 | | | | | ↔ | | | | |
| Transfer13 | | | | | ↔ | | | | |
| Transfer14 | | | | | ↔ | | | | |
| Transfer15 | | | | | ↔ | | | | |
| Transfer16 | | | | | ↔ | | | | |

Settings of module 2 (2N_s2) (transfer SB, transfer SW, transfers 1 and 2)

| | Link side | | | | | PLC side | | | |
|---------------|-----------|--------|-------|------|---|-----------|--------|-------|------|
| | Dev. name | Points | Start | End | | Dev. name | Points | Start | End |
| Transfer SB | SB | 512 | 0000 | 01FF | ↔ | SB | 512 | 0200 | 03FF |
| Transfer S/W | S/W | 512 | 0000 | 01FF | ↔ | S/W | 512 | 0200 | 03FF |
| Random cyclic | LB | | | | ↔ | | | | |
| Random cyclic | LW | | | | ↔ | | | | |
| Transfer1 | LB ▼ | 4096 | 0000 | 0FFF | ↔ | M ▼ | 4096 | 0 | 4095 |
| Transfer2 | LW ▼ | 4096 | 1000 | 1FFF | ↔ | W ▼ | 4096 | 1000 | 1FFF |
| Transfer3 | | | | | ↔ | | | | |
| Transfer4 | | | | | ↔ | | | | |
| Transfer5 | | | | | ↔ | | | | |
| Transfer6 | | | | | ↔ | | | | |

5.8 Valid Module During Other Station Access

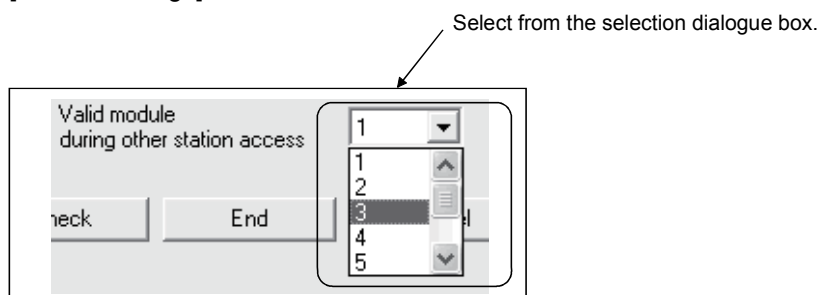
This parameter is used to specify any of the following modules to be relayed when a data communication request for which the network number of the access target programmable controller station cannot be specified from the host (access from the serial communication module (A compatible 1C frame), the Ethernet module (A compatible 1E frame), etc. to other stations) is issued.

- CC-Link IE controller network, MELSECNET/H, MELSECNET/10 module
- Ethernet module

This setting is not required when a data communication request for which the network number can be specified, such as the serial communication module (QnA compatible 3C frame, QnA compatible 4C frame) or Ethernet module (QnA compatible 3E frame), is used. Leave it as the default (1) setting.

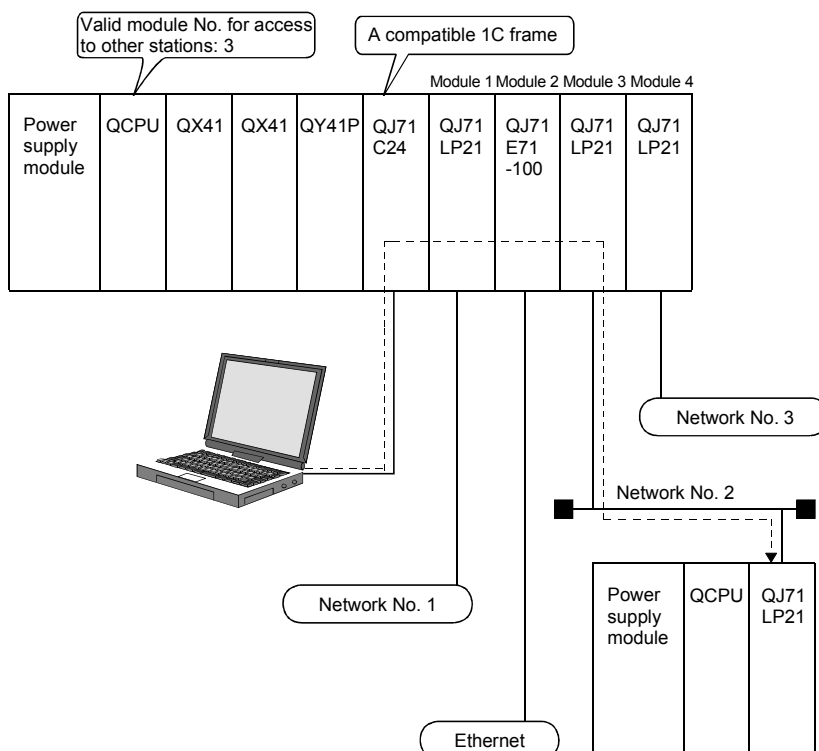
For details of the serial communication module or Ethernet module protocol, refer to the Q Corresponding MELSEC Communication Protocol Reference Manual.

[Screen settings]



(Example)

In the example below, the personal computer connected to the serial communication module (QJ71C24) can communicate with the station on network number 2 where the network module 3 is connected.



5.9 Standby Station Compatible Module (High Performance model QCPU and Process CPU)

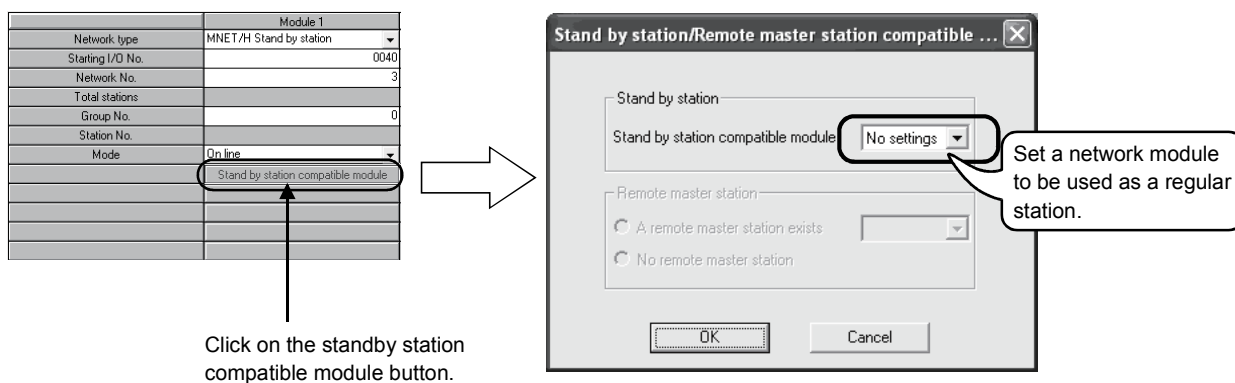
This parameter is set to construct a simple dual-structured system.

Designate a regular station to be paired with the standby station.

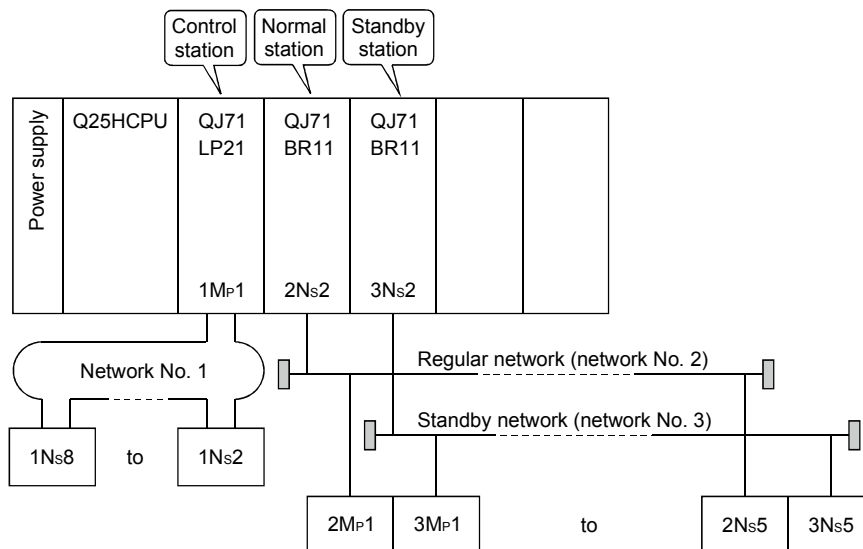
If the set regular network is down, the network of the wait station (standby station) is enabled.

Click the **Standby station compatible module** button to display the "Stand by station /Remote master station compatible module" window, and select the corresponding module.

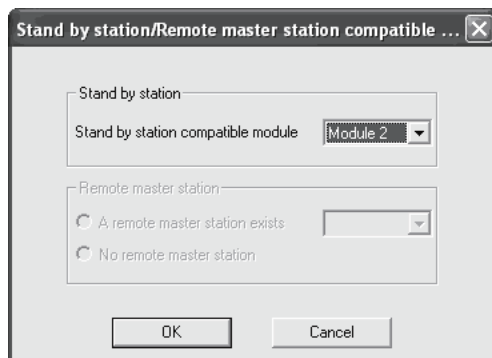
- Default: No setting



[Setting example]



To use the 3N_s2 station as the standby station for the normal station 2N_s2 as shown in the figure above, select "Module 2" in the "Standby station compatible module" window below.

**POINT**

Since the Basic model QCPU, Redundant CPU, Universal model QCPU, and safety CPU are not compatible with a simple dual-structured system, this setting is not available.

5.10 Writing the Parameters to the CPU

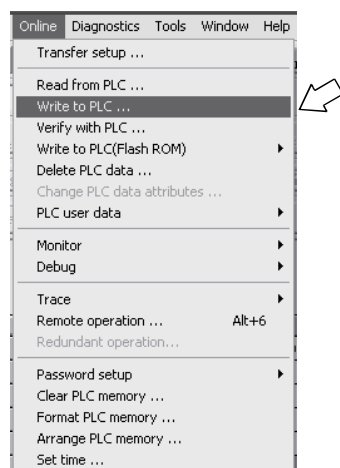
To enable the network parameter settings, they must be written to the CPU using the Write to PLC function of GX Developer.

The PLC parameters are written as well when the network parameters are written.

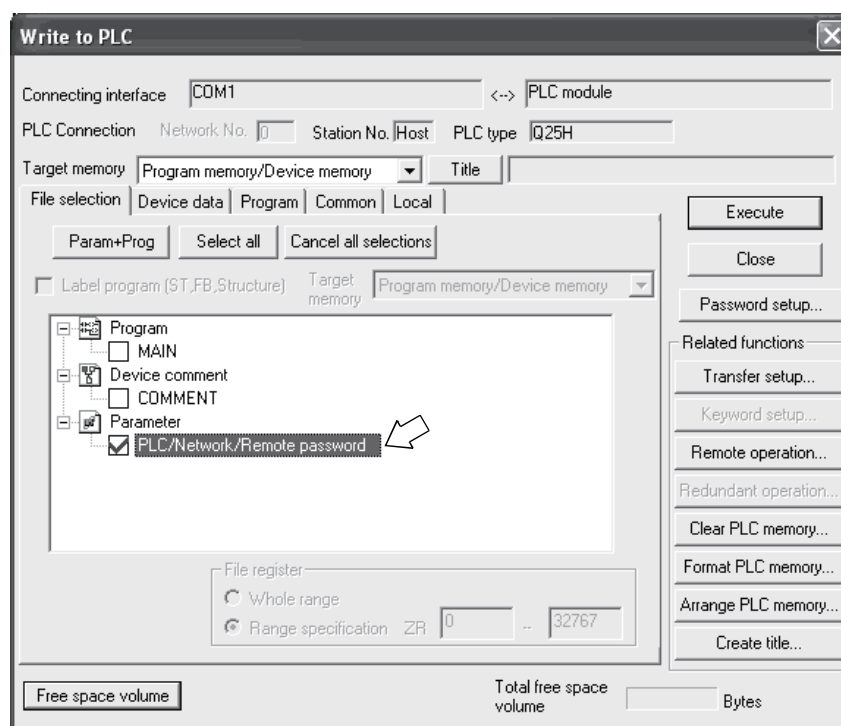
To write the parameters to a programmable controller of other station than the one that connects GX Developer via the MELSECNET/H, change the designation of the connection destination of GX Developer.

For more information on how to use this function, see the GX Developer Operating Manual.

(1) Select the Write to PLC function



(2) Select the parameter as a file to be written, and then execute.



6 PROGRAMMING

When applying any of the program examples introduced in this chapter to the actual system, verify the applicability and confirm that no problems will occur in the system control.

6.1 Programming Precautions

This section explains the precautions in creating programs using data on the network.

6.1.1 Interlock related signals

A list of the interlock signal devices used in the sequence programs is provided below. See Appendix 3, "List of the Link Special Relays (SB)" and Appendix 4, "List of the Link Special Registers (SW)" for other explanations, such as the operation status and setting status of the host and other stations.

When multiple network modules are installed, the interlock signal devices are refreshed to the devices on the CPU side at 512 points (0H to 1FFH) intervals according to the default settings as shown below.

| POINT |
|--|
| The Q series uses the link special relays (SB) and the link special registers (SW) in the entire intelligent function module. Therefore, it is important to manage SB/SW properly so that duplicate SBs and SWs are not used in a program. |

6

Assignments of the link special relay (SB) and the link special register (SW) when multiple modules are installed

| Device \ Mounting Position | 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 |

List of Interlock Devices

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SB0020 (32) | Module status | Indicates the network module status. Off: Normal On: Abnormal | ○ | ○ | ○ | ○ | ○ | ○ | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SB0047 (71) | Baton pass status (host) | Indicates the host's baton pass status (transient transmission enabled). Off: Normal On: Abnormal When an error is identified, the cause of the error can be checked in Baton pass status (host) (SW0047) and Cause of baton pass interruption (SW0048). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SB0049 (73) | Host data link status | Indicates the host's data link operation status. Off: Normal On: Abnormal When an error is identified, the cause of the error can be checked in Cause of data link stop (SW0049). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 1 SB0070 (112) | Baton pass status of each station | Indicates the baton pass status of each station. (Not applicable to reserved stations and the station with the maximum station number or higher) 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 (SW0070 to SW0073). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 1 SB0074 (116) | Cyclic transmission status of each station | Indicates the cyclic transmission status of each station. (Not applicable to reserved stations and the station with the maximum station number or higher) Off: All stations are executing data linking On: Stations that are not executing data linking exist When any non-executing station exists, each station status can be checked in Cyclic transmission status of each station (SW0074 to SW0077). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 1 SW0070 (112)/ SW0071 (113)/ SW0072 (114)/ SW0073 (115) | Baton pass status of each station | Stores the baton pass status of each station (Including the host). <Online> 0: Normal (including the stations with the maximum station number and smaller numbers as well as reserved stations) 1: Abnormal <Offline test> 0: Normal 1: Abnormal (including the stations with the maximum station number and smaller numbers as well as reserved stations) <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0070</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0071</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0072</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0073</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> Numbers 1 to 64 in the above table indicate the station numbers. | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0070 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0071 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0072 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0073 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0070 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0071 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0072 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0073 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[Availability column] Optical: optical loop, Coaxial: coaxial bus

○: Available, ×: Not available

* 1: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

List of Interlock Devices (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 1 SW0074 (116)/ SW0075 (117)/ W0076 (118)/ SW0077 (119) | Cyclic transmission status of each station | Stores the cyclic transmission status of each station (including the host). 0: Executing cyclic transmission (including the station with the maximum station number and smaller number as well as reserved stations) 1: Cyclic transmission not executed <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0074</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0075</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0076</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0077</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> If a CPU module installed together with QJ71LP21S-25 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. (Refer to Section 6.2.3) | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0074 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0075 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0076 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0077 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0074 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0075 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0076 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0077 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 1 SW01FC (508)/ SW01FD (509)/ SW01FE (510)/ SW01FF (511) | Redundant system status (3) | Indicates the operation status of each station's CPU (control system/standby system). 0: The host station CPU is on the control system (including the single CPU system) (including stations exceeding the maximum station number and reserved stations). 1: The host system CPU is on the standby system. <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW01FC</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW01FD</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW01FE</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW01FF</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW01FC | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW01FD | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW01FE | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW01FF | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | × | × | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FC | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FD | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FE | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FF | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

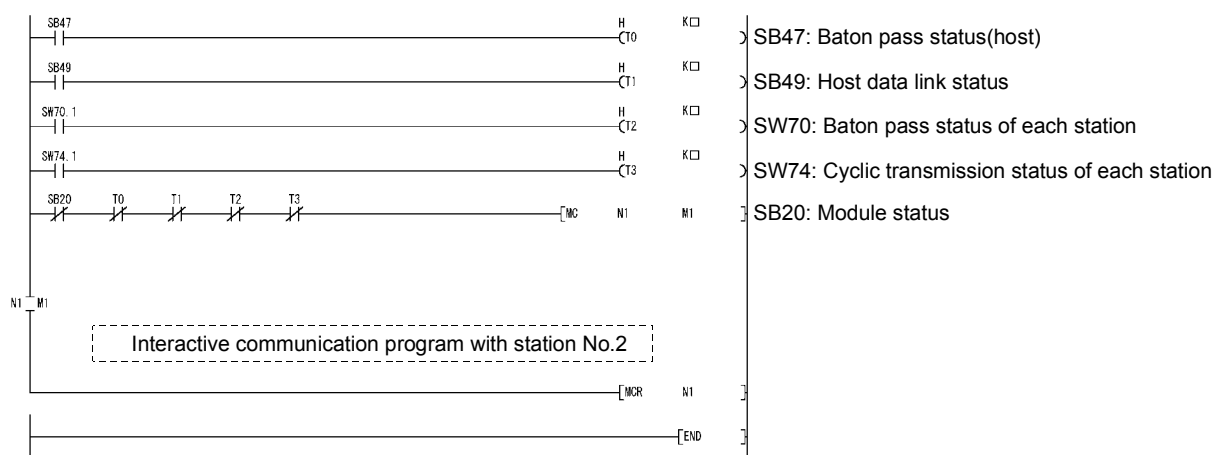
* 1: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

6.1.2 Program example

Interlocks should be applied to the programs according to the link status of the host and other stations.

The following example shows an interlock in the communication program that uses the link status of the host (SB0047, SB0049) and the link status of station number 2 (SW0070 bit 1, SW0074 bit 1).

(Example)



Set the following values for the timer constant K□.

| | |
|--|--|
| Baton pass status (T0, T2) | More than (link scan time × 6) + (target station CPU sequence scan time × 2) |
| Cyclic transmission status (T1, T3) | More than (link scan time × 3) |

Reason: This way the control is not stopped even if the network detects an instantaneous error due to a faulty cable condition and noise interference.
Also, the multipliers of 6, 2 and 3 should only be considered as a guideline.

| |
|---------|
| REMARKS |
|---------|

For further information on interlocks for special link instructions, refer to Section 7.4.5.

6.2 Cyclic Transmission

The link scan of MELSECNET/H and the sequence scan of the programmable controller operate asynchronously.
Thus, the link refresh executed per sequence scan is asynchronous with the link scan. Depending on the timing of the link refresh, link data with data types of more than 32 bits (two words), such as the ones below, may be broken up into new and old data, which may coexist in 16-bit (one word) units.

- Floating point data
- Current values of positioning module, command speed.

The MELSECNET/H provides the following functions for making handling of the link data easy. However, when the conditions (32-bit data guarantee execution conditions) are not met, the program should be interlocked by seeing the example in Section 6.2.3.

- 32-bit data guarantee : Section 6.2.1
- Block guarantee of cyclic data per station : Section 6.2.2

6.2.1 32-bit data guarantee

32-bit data precision is guaranteed automatically by setting parameters so that the following conditions 1) to 4) are satisfied.
If conditions 1) to 4) are not satisfied, a warning for 32-bit data separation is displayed during setting with GX Developer.

- 1) The start device number of LB is a multiple of 20H.
- 2) The number of assigned LB points per station is a multiple of 20H.
- 3) The start device number of LW is a multiple of 2.
- 4) The number of assigned LW points per station is a multiple of 2.

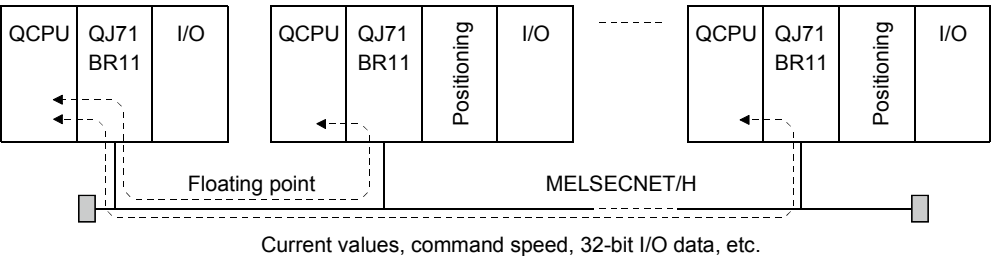
Parameter settings for network range assignments

| Station No. | Send range for each station | | | Send range for each station | | | Send range for each station | | | Send range for each station | | | Pairing |
|-------------|-----------------------------|-------|------|-----------------------------|-------|------|-----------------------------|-------|------|-----------------------------|-------|------|---------|
| | Points | Start | End | Points | Start | End | Points | Start | End | Points | Start | End | |
| 1 | 32 | 0000 | 001F | 2 | 0000 | 0001 | 32 | 2000 | 201F | 2 | 2000 | 2001 | Disable |
| 2 | 64 | 0020 | 005F | 4 | 0002 | 0005 | 64 | 2020 | 205F | 4 | 2002 | 2005 | Disable |
| 3 | 96 | 0060 | 00BF | 6 | 0006 | 000B | 96 | 2060 | 20BF | 6 | 2006 | 200B | Disable |

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

Refreshing link devices that satisfy the above conditions 1) to 4) ensures consistency of 32-bit data.

For the send data of less than 32 bits, an interlocked program is not required if the above conditions are satisfied.



| POINT | |
|-------|--|
| (1) | When handling data larger than 32 bits (two words), enable the block guarantee per station described in Section 6.2.2, or apply interlocks in the programs by seeing the interlock program example in Section 6.2.3. |
| (2) | When the network is set up in the MELSECNET/10 mode, 32-bit data guarantee is valid only stations with QCPU. For those with ACPU/QnACPU, set interlock referring to interlock program example in Section 6.2.3. |

6.2.2 Block guarantee of cyclic data per station

Since handshakes are performed between a CPU module and a network module for link refresh, consistency of cyclic data is guaranteed for each station (link data separation prevention per station *1).

As shown below, set the send and receive parameters as needed.

These settings can be made using the common parameters (supplementary settings) only for the control station.

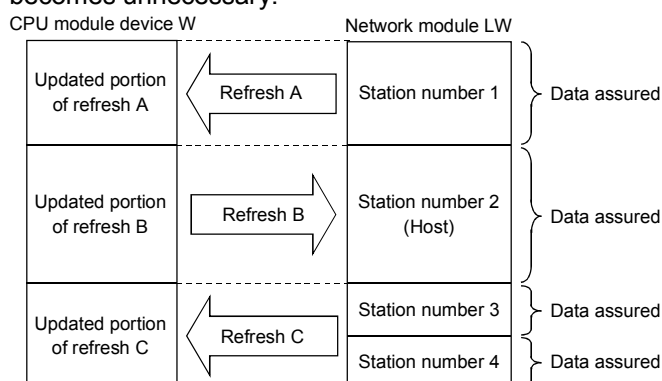
The default varies depending on the network type.

| Network type | Default |
|---------------------------|---------------------------------|
| MELSECNET/H mode | "No" for both send and receive |
| MELSECNET/10 mode | |
| MELSECNET/H Extended mode | "Yes" for both send and receive |

Network range assignments Supplementary settings

☐ Block send data assurance per station
☐ Block receive data assurance per station

By selecting both [Block send data assurance per station] and [Block receive data assurance per station], an interlock for the link data between the stations to be set becomes unnecessary.



<Precautions>

- (1) In order to enable the block guarantee per station, it is necessary to set the refresh parameters. (Refer to Section 5.7.)
- (2) It is not necessary to set the block guarantee of cyclic data per station for normal stations.

POINT

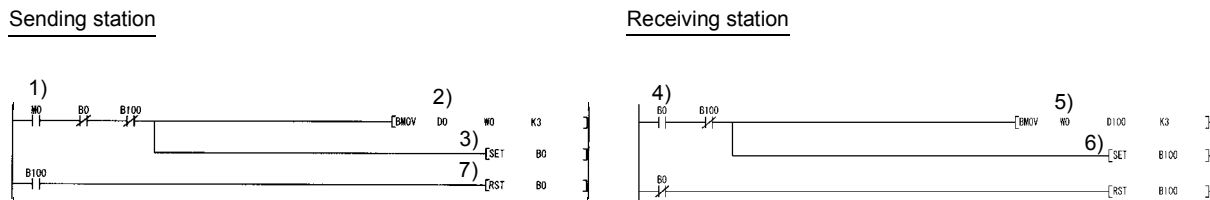
- (1) The block guarantee per station applies only to the refresh processing. To use the direct access (J□□ designation) of the link devices, the programs should be interlocked.
- (2) For the transmission delay time calculation for the case where the Block send/receive data assurance per station is set enabled, refer to Section 3.3.2 (1) (a) POINT.
- (3) When the network is set up in the MELSECNET/10 mode, block guarantee per station is valid only for stations with QCPU. For those with ACPU/QnACPU, set interlock referring to interlock program example in Section 6.2.3.

*1: The separation prevention refers to a prevention of link data with double word precision (32 bits), such as the current value of the positioning module, from being separated into new data and old data in one word (16 bits) units due to the cyclic transmission timing.

6.2.3 Interlock program example

When data larger than two words (32 bits) are transferred at one time with the 32-bit data guarantee function or the block guarantee per station function disabled, old and new data may be mixed in units of one word (16 bits).

As in the example below, the program should be interlocked using the oldest number of either the link relay (B).



- 1) The 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, the link relay (B) is sent after the link register (W), 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 is transmitted to the receiving station, B0 turns off.

POINT

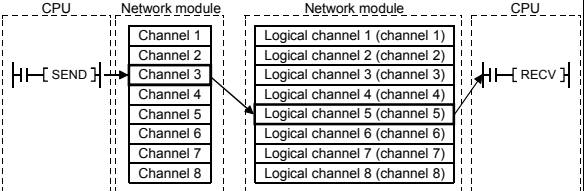
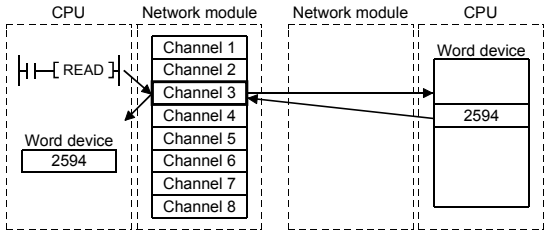
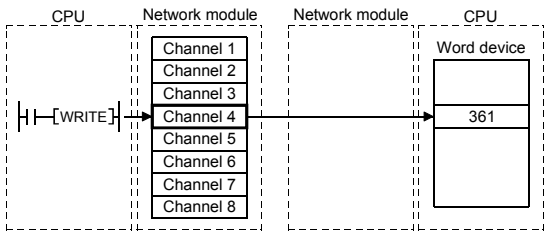
This interlock program example is not usable in the MELSECNET/H Extended mode. Use the block guarantee per station.

6.3 Link dedicated Instruction List

The following table outlines the instructions that can be used for the MELSECNET/H.
For details on the format and program examples of each instruction, see the applicable section listed in the Reference section column.

Link dedicated Instruction List

○: Can be used by both the control and normal stations ×: Cannot be used

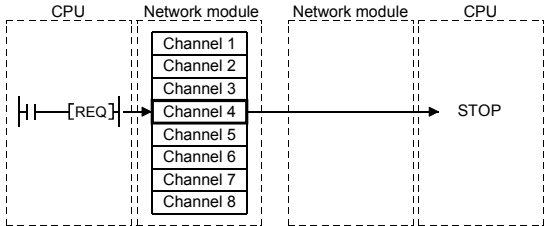
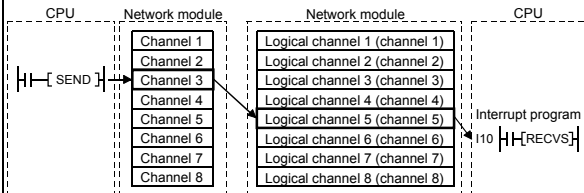
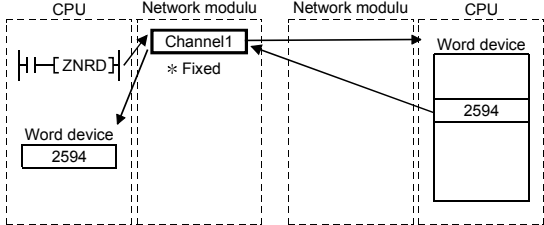
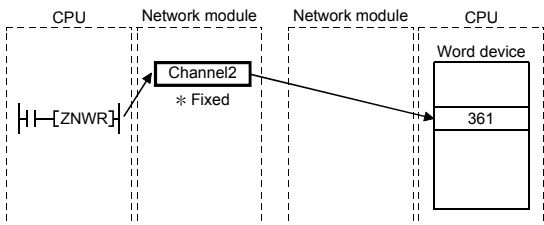
| Instruction | Name | Executing station | Description | Target station | | | Reference section |
|-----------------|-------------------------------------|-------------------|---|----------------|--------|--------|-------------------|
| | | QCPU | | QCPU | QnACPU | AnUCPU | |
| SEND | Send data | ○ | SEND : Writes data to the target station (network module) having the target network number. * 1 RECV : Reads data sent with SEND to the CPU device. * 1 | | | | |
| RECV | Receive data | ○ |  | ○ | ○ | × | Section 7.4.5 (1) |
| READ SREAD | Read word device from other station | ○ | <p>Reads the CPU device data (16-bit units) from the target station having the target network number.</p>  | ○ | ○ | × | Section 7.4.5 (2) |
| WRITE SWRITE | Write word device to other station | ○ | <p>Writes data (16-bit units) to the CPU device of the target station having the target network number. * 2 (SWRITE can turn on the device of the target station.)</p>  | ○ | ○ | × | Section 7.4.5 (2) |

* 1: Cannot be used if the executing station or target station is a safety CPU.

* 2: Writing to a safety CPU is not allowed from other stations.

Link dedicated Instruction List

○: Can be used by both the control and normal stations ×: Cannot be used

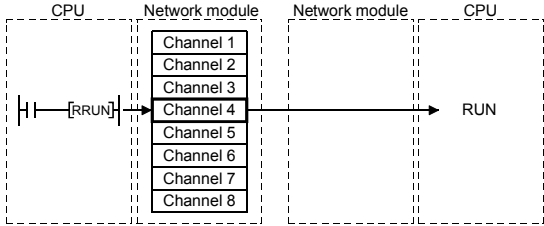
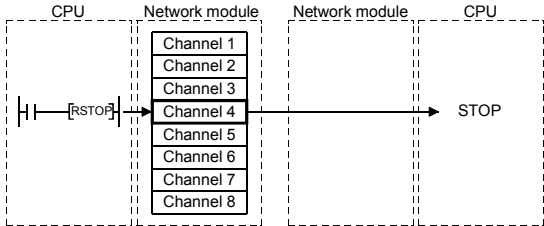
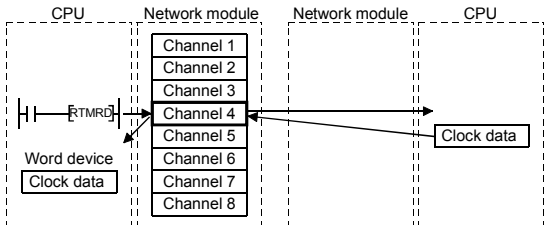
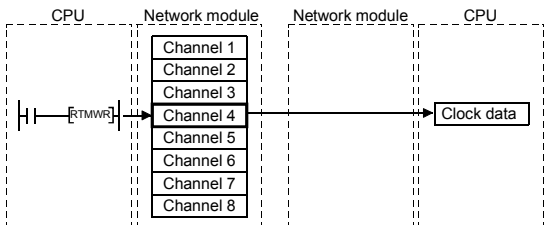
| Instruction | Name | Executing station | Description | Target station | | | Reference section |
|-------------|---------------------------------------|-------------------|--|----------------|--------|--------|-------------------|
| | | QCPU | | QCPU | QnACPU | AnUCPU | |
| REQ | Transient request to other station | ○ | <p>Issues "remote RUN/STOP" * 1 and "clock data read/write" * 2 requests to other stations.</p>  | ○ | ○ | × | Section 7.4.5 (3) |
| RECVS | Receive message (completed in 1 scan) | ○ | <p>Receives the channel data sent with SEND by the interrupt program and immediately reads it to the CPU device. The processing is completed when the instruction is executed. * 1</p>  | ○ | ○ | × | Section 7.5.5 |
| ZNRD | Read word device from other station | ○ | <p>[A-compatible instruction] Reads the CPU device data from the target station having the target network number. * 1</p>  | ○ | ○ | ○ | Section 7.4.5 (4) |
| ZNWR | Write word device to other station | ○ | <p>[A-compatible instruction] Writes data to the CPU device of the target station having the target network number. * 1</p>  | ○ | ○ | ○ | Section 7.4.5 (4) |

* 1: Cannot be used if the executing station or target station is a safety CPU.

* 2: Writing to a safety CPU is not allowed from other stations.

Link dedicated Instruction List

○: Can be used by both the control and normal stations ×: Cannot be used

| Instruction | Name | Executing station | Description | Target station | | | Reference section |
|-------------|----------------------------------|-------------------|--|----------------|--------|--------|-------------------|
| | | QCPU | | QCPU | QnACPU | AnUCPU | |
| RRUN | Remote RUN | ○ | <p>"Remote RUN" performed for other stations' CPU modules * 1</p>  | ○ | × | × | Section 7.4.5 (5) |
| RSTOP | Remote STOP | ○ | <p>"Remote STOP" performed for other stations' CPU modules * 1</p>  | ○ | × | × | Section 7.4.5 (5) |
| RTMRD | Other station clock data read | ○ | <p>"Read Clock Data" performed for other stations' CPU modules</p>  | ○ | × | × | Section 7.4.5 (6) |
| RTMWR | Other station clock data written | ○ | <p>"Write Clock Data" performed for other stations' CPU modules * 2</p>  | ○ | × | × | Section 7.4.5 (6) |

* 1: Cannot be used if the executing station or target station is a safety CPU.

* 2: Writing to a safety CPU is not allowed from other stations.

| POINT | |
|-------|--|
| (1) | Link dedicated instructions must be executed in online mode. Execution of the link dedicated instructions is not allowed in offline mode. |
| (2) | Turn off the executing link instruction after the completion device turns on. |
| (3) | When the link dedicated instruction is used to access the other station programmable controller during network diagnosis, the execution of the link dedicated instruction may be delayed. After taking the following measures, perform network diagnosis processing and execute the link dedicated instruction. <ul style="list-style-type: none">• Execute the COM instruction.• Secure the communication processing security time for 2 to 3ms. For the Basic model QCPU, High Performance model QCPU, Process CPU, and Redundant CPU, set it by the special register SD315. For the Universal model QCPU, set it by the service processing setting of the PLC parameter (PLC system) of GX Developer. |
| (4) | Do not execute any instruction that cannot be executed to AnUCPU stations. If executed, the AnUCPU may detect "MAIN CPU DOWN" or "WDT ERROR" and stop its operation. |
| (5) | To execute such an instruction to all of the network which contains an AnUCPU station, use group specification to exclude the AnUCPU station. |

6.4 Using the Link Special Relays (SB)/Link Special Registers (SW)

The data linking information is stored in the link special relays (SB)/link special registers (SW).

They can be used by the sequence programs, or used for investigating faulty areas and the causes of errors by monitoring them.

For details, refer to Appendixes 3 and 4.

(1) Cyclic transmission stop/restart

Cyclic transmission stop/restart is executed through the GX Developer network tests, but it also can be executed with link special relay (SB) and link special register (SW). Refer to Section 7.8)

(a) Cyclic transmission stop/restart

(Cyclic transmission stop)

- 1) In the following link special register (SW), specify a station for stopping cyclic transmission.
 - Specification of target station
Link stop/startup direction content (SW0000)
 - Specification of station No.
Link stop/startup direction content (SW0001 to SW0004)
- 2) Turn System link stop (SB0003) ON.
- 3) When the network module accepts a request, Cyclic transmission stop acknowledgment status (system) (SB0052) is turned ON.
- 4) When the cyclic transmission stop is completed, Cyclic transmission stop completion status (system) (SB0053) is turned ON.
- 5) The station No. of the station that performed the cyclic transmission stop request is stored in Data linking stop request station (SW004A). (Saved in the station which received the stop request.)
- 6) If the cyclic transmission stop is completed abnormally, an error code will be stored in Data linking stop status (entire system) (SW0053).
- 7) Turn System link stop (SB0003) OFF.

(Cyclic transmission restart)

- 8) In the following link special register (SW), specify a station for restarting cyclic transmission.
 - Specification of target station
Link stop/startup direction content (SW0000)
 - Specification of station No.
Link stop/startup direction content (SW0001 to SW0004)
- 9) Turn System link startup (SB0002) ON.
- 10) When the network module accepts a request, Cyclic transmission start acknowledgment status (system) (SB0050) is turned ON.
- 11) When the cyclic transmission restart is completed, Cyclic transmission start completion status (system) (SB0051) is turned ON.
- 12) If the cyclic transmission restart is completed abnormally, an error code will be stored in Data linking start status (entire system) (SW0051).
- 13) Turn System link startup (SB0002) OFF.

| No. | Description | No. | Description |
|--------|--|------------------|---|
| SB0002 | System link startup | SW0000 | Link stop/startup direction content |
| SB0003 | System link stop | SW0001 to SW0004 | |
| — | | SW004A | Data linking stop request station |
| SB0050 | Cyclic transmission start acknowledgment status (system) | — | |
| SB0051 | Cyclic transmission start completion status (system) | SW0051 | Data linking start status (entire system) |
| SB0052 | Cyclic transmission stop acknowledgment status (system) | — | |
| SB0053 | Cyclic transmission stop completion status (system) | SW0053 | Data linking stop status (entire system) |

(b) Cyclic transmission stop/restart of the host

(Cyclic transmission stop)

- 1) Turn Link stop (host) (SB0001) ON.
- 2) When the network module accepts a request, Cyclic transmission stop acknowledgment status (host) (SB004E) is turned ON.
- 3) When the cyclic transmission stop is completed, Cyclic transmission stop completion status (host) (SB004F) is turned ON.
- 4) If the cyclic transmission stop is completed abnormally, an error code will be stored in Data linking stop status (host) (SW004F).
- 5) Turn Link stop (host) (SB0001) OFF.

(Cyclic transmission restart)

- 6) Turn Link startup (host) (SB0000) ON.
- 7) When the network module accepts the request, Cyclic transmission start acknowledgment status (host) (SB004C) is turned ON.
- 8) When the cyclic transmission restart is completed, Cyclic transmission start completion status (host) (SB004D) is turned ON.
- 9) If the cyclic transmission restart is completed abnormally, an error code will be stored in Data linking start status (host) (SW004D).
- 10) Turn Link startup (host) (SB0000) OFF.

| No. | Description | No. | Description |
|--------|--|--------|----------------------------------|
| SB0000 | Link startup (host) | — | |
| SB0001 | Link stop (host) | | |
| SB004C | Cyclic transmission start acknowledgment status (host) | | |
| SB004D | Cyclic transmission start completion status (host) | SW004D | Data linking start status (host) |
| SB004E | Cyclic transmission stop acknowledgment status (host) | — | |
| SB004F | Cyclic transmission stop completion status (host) | SW004F | Data linking stop status (host) |

(2) Checking data link

The data link status is checked through the GX Developer network diagnostics, but it also can be checked with link special relay (SB) and link special register (SW). (Refer to Sections 8.1.1 and 8.1.2.)

(a) Check the data link status of other stations

- 1) Link scan time etc., can be checked in SW005A to SW005B and SW006B to SW006D.
- 2) If an error occurs to data link, either of the following link special relays (SB) will be turned ON.
 - Baton pass status of each station (SB0070)
 - Cyclic transmission status of each station (SB0074)
- 3) When Baton pass status of each station (SB0070) is turned ON, the station No. of a station where an error has occurred is stored in Baton pass status of each station (SW0070 to SW0073).
When Cyclic transmission status of each station (SB0074) is turned ON, the station No. of a station where an error has occurred is stored in Cyclic transmission status of each station (SW0074 to SW0077).
- 4) The details of the cause of an error can be checked with the link special relay (SB) and link special register (SW) of the station No. for a station where the error has occurred. (Refer to (2)(b) in this Section)

| No. | Description | No. | Description |
|--------|--|------------------|--|
| — | | SW005A | Maximum baton pass station |
| | | SW005B | Maximum cyclic transmission station |
| | | SW006B | Maximum link scan time |
| | | SW006C | Minimum link scan time |
| | | SW006D | Current link scan time |
| SB0070 | Baton pass status of each station | SW0070 to SW0073 | Baton pass status of each station |
| SB0074 | Cyclic transmission status of each station | SW0074 to SW0077 | Cyclic transmission status of each station |

(b) Checking data link status of the host

- 1) Link scan time etc., can be checked in SW005A to SW005B and SW006B to SW006D.
- 2) If an error occurs to data link, either of the following link special relays (SB) will be turned ON.
 - Baton pass status (host) (SB0047)
 - Host data link status (SB0049)
- 3) The cause of an error is stored in the following link special registers (SW).
 - Baton pass status (host) (SW0047)
 - Cause of baton pass interruption (SW0048)
 - Cause of data link stop (SW0049)

| No. | Description | No. | Description |
|--------|--------------------------|--------|-------------------------------------|
| SB0047 | Baton pass status (host) | SW0047 | Baton pass status (host) |
| | — | SW0048 | Cause of baton pass interruption |
| SB0049 | Host data link status | SW0049 | Cause of data link top |
| | | SW005A | Maximum baton pass station |
| | | SW005B | Maximum cyclic transmission station |
| | | SW006B | Maximum link scan time |
| | | SW006C | Minimum link scan time |
| | | SW006D | Current link scan time |

(3) Checking transient transmission errors

Transient transmission errors are checked through the GX Developer network diagnostics, but they also can be checked with link special relays (SB) and link special registers (SW). (Refer to Section 8.1.4)

- 1) When a transient transmission error occurs, Transient error (SB00EE) is turned ON.
- 2) An error code is stored in Transient transmission error history (SW00F0 to SW00FF).
- 3) The number of transient transmission errors is stored in Transient transmission error (SW00EE).
- 4) An exact error code storage area in Transient transmission error history (SW00F0 to SW00FF) is stored in Transient transmission error pointer (SW00EF).
- 5) If Transient transmission error area setting (SB000B) is turned ON, the error code stored in Transient transmission error history (SW00F0 to SW00FF) is retained. (Not overwritten even if another error occurs.)
- 6) Turning ON Clear transient transmission errors (SB000A) will clear the following areas:
 - Transient transmission error (SW00EE)
 - Transient transmission error pointer (SW00EF)

| No. | Description | No. | Description |
|--------|---|------------------|--------------------------------------|
| SB000A | Clear transient transmission errors | — | |
| SB000B | Transient transmission error area setting | | |
| SB00EE | Transient error | SW00EE | Transient transmission error |
| — | | SW00EF | Transient transmission error pointer |
| | | SW00F0 to SW00FF | Transient transmission error history |

(4) Checking the low-speed cyclic transmission status

The status of the low-speed cyclic transmission can be checked with link special relays (SB) and link special registers (SW).

- 1) When cyclic transmission settings are configured with common parameters, Low-speed cyclic designation (SB0059) turns ON.
- 2) If an error occurs at start of low-speed cyclic transmission, an error code is stored in Low-speed cyclic transmission start execution results (SW00EC).
- 3) An execution of low-speed cyclic transmission will turn ON Low-speed cyclic communication status (SB007A or SB007B).
- 4) The scan time of the low-speed cyclic transmission is stored in Low-speed cyclic scan time (SW006E).

| No. | Description | No. | Description |
|---------------------|---------------------------------------|--------|---|
| SB0059 | Low-speed cyclic designation | — | |
| — | | SW006E | Low-speed cyclic scan time |
| SB007A to SB007B | Low-speed cyclic communication status | — | |
| — | | SW00EC | Low-speed cyclic transmission start execution results |

(5) Checking cables for faults

The cable condition can be checked not only in the network diagnostics of GX Developer but also with link special relays (SB) and link special registers (SW). (Refer to Section 8.1.4.)

- 1) When a communication error occurs due to a cable fault, the error count is stored in any of the link special registers (SW) in the table below.
- 2) Turning ON Clear retry count (SB0005) will clear Number of retries (SW00C8 and SW00C9).
Turning ON Clear communication error count (SB0006) will clear Communication errors (SW00B8 to SW00C7).
Turning ON Clear forward loop transmission errors (SB0007) will clear Line error on the forward loop side (SW00CC).
Turning ON Clear reverse loop transmission errors (SB0008) will clear Line error on the reverse loop side ON (SW00CD).

| No. | Description | No. | Description |
|--------|--|--------|--|
| SB0005 | Clear retry count | | — |
| SB0006 | Clear communication error count | | |
| SB0007 | Clear forward loop transmission errors | | |
| SB0008 | Clear reverse loop transmission errors | | |
| — | | SW00B8 | UNDER on the forward loop side/coaxial bus UNDER |
| | | SW00B9 | CRC on the forward loop side/coaxial bus CRC |
| | | SW00BA | OVER on the forward loop side/coaxial bus OVER |
| | | SW00BB | Short frame on the forward loop side/coaxial bus short frame |
| | | SW00BC | Abort on the forward loop side (AB, IF)/coaxial bus abort (AB, IF) |
| | | SW00BD | Timeout on the forward loop side (TIME)/coaxial bus timeout (TIME) |
| | | SW00BE | Receiving 2k bytes or more on forward loop side (DATA)/coaxial bus receiving 2k bytes or more (DATA) |
| | | SW00BF | DPLL error on the forward loop side/coaxial bus DPLL error |
| | | SW00C0 | UNDER on the reverse loop side |
| | | SW00C1 | CRC on the reverse loop side |
| | | SW00C2 | OVER on the reverse loop side |
| | | SW00C3 | Short frame on the reverse loop side |
| | | SW00C4 | Abort on the reverse loop side (AB, IF) |
| | | SW00C5 | Timeout on the reverse loop side (TIME) |
| | | SW00C6 | Receiving 2k bytes or more on reverse loop side (DATA) |
| | | SW00C7 | DPLL error on reverse loop side |
| | | SW00C8 | Number of retries on the forward loop side/coaxial bus retries error |
| | | SW00C9 | Number of retries on the reverse loop side |
| | | SW00CC | Line error on the forward loop side |
| | | SW00CD | Line error on the reverse loop side |

(6) Checking the forward/reverse loop in the optical loop system

The forward/reverse loop in the optical loop system can be checked not only in the network diagnostics of GX Developer but also with link special relays (SB) and link special registers (SW). (Refer to Sections 8.1.1 and 8.1.2.)

(a) Checking the forward/reverse loop of another station

- 1) When an error occurs on the forward or reverse loop, the following link special relay (SB) is turned ON.
 - Forward loop status (SB0091)
 - Reverse loop status (SB0095)
- 2) The station where an error occurred can be identified with the following link special registers (SW).
 - Forward loop status of each station (SW0091 to SW0094)
 - Reverse loop status of each station (SW0095 to SW0098)
- 3) If loop switching occurs, the cause of the loop switching is stored in Loop switch data (SW00D0 to SW00DF).
The position of the loop switch data storage can be checked with Loop switch data pointer (SW00CF).
- 4) Cable disconnection or station failure causes loopback.
When loopback occurs, any of the following link special relays (SB) is turned ON.
 - Forward loop loopback (SB0099)
 - Reverse loop loopback (SB009A)
- 5) The station where loopback occurred can be identified with the following link special registers (SW).
 - Loopback station (forward loop side) (SW0099)
 - Loopback station (reverse loop side) (SW009A)
- 6) The forward/reverse loop condition of each station can be checked with Loop usage status of each station (SW009C to SW009F).
- 7) The count of loop switching can be checked with Number of loop switches (SW00CE).
- 8) Turning ON Clear loop switch count (SB0009) can clear SW00CE to SW00DF.

| No. | Description | No. | Description |
|--------|-------------------------|------------------|--------------------------------------|
| SB0009 | Clear loop switch count | — | |
| SB0091 | Forward loop status | SW0091 to SW0094 | Forward loop status of each station |
| SB0095 | Reverse loop status | SW0095 to SW0098 | Reverse loop status of each station |
| SB0099 | Forward loop loopback | SW0099 | Loopback station (forward loop side) |
| SB009A | Reverse loop loopback | SW009A | Loopback station (reverse loop side) |
| — | | SW009C to SW009F | Loop usage status of each station |
| | | SW00CE | Number of loop switches |
| | | SW00CF | Loop switch data pointer |
| | | SW00D0 to SW00DF | Loop switch data |

(b) Checking the forward/reverse loop of the host

- 1) When an error occurs on the forward or reverse loop, Host loop status (SB0090) turns ON.
- 2) If loopback occurs, the cause of the loopback is stored in Loop switch data (SW00D0 to SW00DF).
The position of the loop switch data storage can be checked with Loop switch data pointer (SW00CF).
- 3) The loop status of the host can be checked with Loopback information (SW0090).
- 4) The count of loop switching can be checked with Number of loop switches (SW00CE).
- 5) Turning ON Clear loop switch count (SB0009) can clear SW00CE to SW00DF.

| No. | Description | No. | Description |
|--------|-------------------------|------------------|--------------------------|
| SB0009 | Clear loop switch count | — | |
| SB0090 | Host loop status | SW0090 | Loopback information |
| — | | SW00CE | Number of loop switches |
| | | SW00CF | Loop switch data pointer |
| | | SW00D0 to SW00DF | Loop switch data |

(7) Checking the offline test status

The test status is checked through the LEDs on the network module, but it also can be checked with link special relays (SB) and link special registers (SW).
(Refer to Sections 4.5 and 4.7.)

(a) Requesting side

- 1) When the offline test is instructed, Offline test instruction (SB00AC) is turned ON.
An offline test item and a faulty station number are stored in Offline test execution item/faulty station (requesting side) (SW00AC).
- 2) Upon completion of the offline test, Offline test completion (SB00AD) is turned ON.
The offline test result is stored in Offline test result (requesting side) (SW00AD).

| No. | Description | No. | Description |
|--------|--------------------------|--------|--|
| SB00AC | Offline test instruction | SW00AC | Offline test execution item/faulty station (requesting side) |
| SB00AD | Offline test completion | SW00AD | Offline test result (requesting side) |

(b) Responding side (the forward/reverse loop test only)

- 1) When a response is made to an offline test request from the requesting side, Offline test response (SB00AE) is turned ON.
An offline test item is stored in Offline test execution item (responding side) (SW00AE).
- 2) Upon completion of the offline test, Offline test response completion (SB00AF) is turned ON.
The offline test result is stored in Offline test result (responding side) (SW00AF).

| No. | Description | No. | Description |
|--------|----------------------------------|--------|---|
| SB00AE | Offline test response | SW00AE | Offline test execution item (responding side) |
| SB00AF | Offline test response completion | SW00AF | Offline test result (responding side) |

(8) Checking the online test status

The test status is checked through LED of the network module main frame, but it also can be checked with link special relay (SB) and link special register (SW).
(Refer to Section 4.8.)

(a) Requesting side

- 1) When the online test is instructed, Online test instruction (SB00A8) is turned ON.
An online test item and a faulty station number are stored in Online test execution item/faulty station (requesting side) (SW00A8).
- 2) Upon completion of the online test, Online test completion (SB00A9) is turned ON.
The online test result is stored in Online test result (requesting side) (SW00A9).

| No. | Description | No. | Description |
|--------|-------------------------|--------|---|
| SB00A8 | Online test instruction | SW00A8 | Online test execution item/faulty station (requesting side) |
| SB00A9 | Online test completion | SW00A9 | Online test result (requesting side) |

(b) Responding side

- 1) When a response is made to an online test request from the requesting side, Online test response (SB00AA) is turned ON.
An online test item is stored in Online test execution item (responding side) (SW00AA).
- 2) Upon completion of the online test, Online test response completion (SB00AB) is turned ON.
The online test result is stored in Online test result (responding side) (SW00AB).

| No. | Description | No. | Description |
|--------|---------------------------------|--------|--|
| SB00AA | Online test response | SW00AA | Online test execution item (responding side) |
| SB00AB | Online test response completion | SW00AB | Online test result (responding side) |

(9) Checking parameter status

The reflection status and setting contents of parameters can be checked with link special relay (SB) and link special register (SW).

(a) Checking parameter status of other stations

- 1) Check the following link special relay (SB) and link special register (SW) with the master station.
 - When receiving parameters is completed, Parameter communication status of each station (SB0078) is turned OFF.
 - Stations that are still communicating parameters can be checked with Parameter communication status of each station (SW0078 to SW007B).
- 2) Check the following link special relay (SB) and link special register (SW) with the master station.
 - When parameters have an error, Parameter status of each station (SB007C) is turned ON.
 - The station No. of the faulty station is stored in Parameter error status of each station (SW007C to SW007F).
- 3) When the network type of the control station is different from that of a normal station, Network type consistency check (SB01E0) is turned ON.
The station number of different network type is stored in Network type consistency check (SW01E0 to SW01E3).
- 4) Details of the parameters for each station can be checked with the link special relay (SB) and link special register (SW) of each station. (Refer to (9)(b) in this Section)

| No. | Description | No. | Description |
|--------|--|------------------|--|
| SB0078 | Parameter communication status of each station | SW0078 to SW007B | Parameter communication status of each station |
| SB007C | Parameter status of each station | SW007C to SW007F | Parameter error status of each station |
| SB01E0 | Network type consistency check | SW01E0 to SW01E3 | Network type consistency check |

(b) Checking the parameter status of the host (including the switch setting on the network module)

- 1) Upon completion of receiving parameters, Parameter receive status (SB0054) is turned OFF.
- 2) If any error is found in the parameters, the following link special relays (SB) are turned ON.
 - Setting information (host) (SB0045)
 - Received parameter error (SB0055)
- 3) An error code is stored in Parameter setting status (SW0055).
- 4) The presence or absence of parameters can be checked with Parameter information (SW0054).

| No. | Description | No. | Description |
|--------|----------------------------|--------|--------------------------|
| SB0045 | Setting information (host) | — | |
| SB0054 | Parameter receive status | SW0054 | Parameter information |
| SB0055 | Received parameter error | SW0055 | Parameter setting status |

- 5) When the parameters are reflected in the network module, contents of parameters are stored in the following link special relay (SB) and link special register (SW).

| No. | Description | No. | Description |
|--------|---|------------------|-------------------------------|
| SB0040 | Network type (host) | SW0040 | Network No. |
| — | — | SW0041 | Group No. |
| | | SW0042 | Station No. |
| SB0043 | Online switch (host) | SW0043 | Mode status |
| SB0044 | Station setting (host) | SW0044 | Station setting |
| SB0046 | Data link operation designation result (host) | SW0046 | Module type |
| SB0048 | Control station status (host) | — | |
| SB0056 | Communication status | SW0056 | Current control station |
| SB0057 | Parameter type | SW0057 | Designated control station |
| SB0058 | Operation designation at fault of control station | — | |
| SB0059 | Low-speed cyclic designation | SW0059 | Total number of link stations |
| SB005A | Parameter type 2 | — | |
| SB005C | I/O master station (Block 1) | SW005C | I/O master station (block 1) |
| SB005D | I/O master station (Block 2) | SW005D | I/O master station (block 2) |
| SB0064 | Reserved station designation | SW0064 to SW0067 | Reserved station designation |
| SB0068 | Communication mode | SW0068 | Communication mode |
| SB0069 | Multiplex transmission designation | — | |

(10) Checking CPU module status

The CPU module status is checked through the GX Developer network diagnostics, but it also can be checked with link special relay (SB) and link special register (SW). (Refer to Sections 8.1.2 and 8.1.3.)

(a) Checking the CPU module status of other stations

- 1) Whether the CPU module is in RUN status or STOP status can be checked with the following link special relay (SB) and link special register (SW).
 - CPU RUN status of each station (SB0084)
 - CPU RUN status of each station (SW0084 to SW0087)
- 2) When a continuation error occurs with the CPU module, CPU operation status of each station (2) (SB0088) is turned ON.
The station No. of the station where a continuation error is occurring is stored in CPU operation status of each station (2) (SW0088 to SW008B).
- 3) When a stop error occurs with the CPU module, CPU operation status of each station (1) (SB0080) is turned ON.
The station No. of the station where a stop error is occurring is stored in CPU operation status of each station (1) (SW0080 to SW0083).

| No. | Description | No. | Description |
|--------|--|------------------|--|
| SB0080 | CPU operation status of each station (1) | SW0080 to SW0083 | CPU operation status of each station (1) |
| SB0084 | CPU RUN status of each station | SW0084 to SW0087 | CPU RUN status of each station |
| SB0088 | CPU operation status of each station (2) | SW0088 to SW008B | CPU operation status of each station (2) |

(b) Checking the CPU module status of the host

- 1) When a continuation error occurs with the CPU module, Host CPU status (1) (SB004A) is turned ON.
When a stop error occurs with the CPU module, Host CPU status (2) (SB004B) is turned ON.
- 2) The CPU module status can be checked with Host CPU status (SW004B).

| No. | Description | No. | Description |
|--------|---------------------|--------|-----------------|
| SB004A | Host CPU status (1) | | — |
| SB004B | Host CPU status (2) | SW004B | Host CPU status |

(11) Checking the multiplex transmission status

The multiplex transmission status is checked through the GX Developer network diagnostics, but it also can be checked with link special relay (SB) and link special register (SW). (Refer to Section 8.1.3.)

- 1) If the "With multiplex transmission" box is checked in the supplementary settings of common parameters, Multiplex transmission designation (SB0069) is turned ON.
- 2) An execution of the multiplex transmission function turns ON Multiplex transmission status (SB006A).
- 3) Data showing the forward and reverse loop states during multiplex transmission are stored in the following link special registers (SW).
 - Multiplex transmission status (1) (SW00B0 to SW00B3)
 - Multiplex transmission status (2) (SW00B4 to SW00B7)

| No. | Description | No. | Description |
|--------|------------------------------------|------------------|-----------------------------------|
| SB0069 | Multiplex transmission designation | — | |
| SB006A | Multiplex transmission status | | |
| — | | SW00B0 to SW00B3 | Multiplex transmission status (1) |
| | | SW00B4 to SW00B7 | Multiplex transmission status (2) |

(12) Checking the redundant system status

The redundant system status can be checked with link special relays (SB) and link special registers (SW).

(a) Checking the redundant system support and setting

- 1) When the network module supports the redundant system, Host station's redundant function support information (SB0041) is ON.
- 2) To set the time taken from detection of a data link stop until system switching is requested in the redundant system, set a time value in System switching monitoring time setting (SW0018).
- 3) If System switching monitoring time setting valid flag (SB0018) is turned ON, System switching monitoring time setting (SW0018) is enabled.

| No. | Description | No. | Description |
|--------|---|--------|--|
| SB0018 | System switching monitoring time setting valid flag | SW0018 | System switching monitoring time setting |
| SB0041 | Host station's redundant function support information | — | |

(b) Checking the redundant system status

- 1) When a Redundant CPU in separate mode exists, Redundant system status (1) (SB01F4) is ON.

The operation mode of a redundant CPU can be checked in Redundant system status (1) (SW01F4 to SW01F7).

- 2) When any pairing setting exists, Redundant system status (2) (SB01F8) is ON.

Stations for which the pairing setting is done can be checked in Redundant system status (2) (SW01F8 to SW01FB).

- 3) When a station operating on the standby system exists, Redundant system status (3) (SB01FC) is ON.

The control or standby status of a Redundant CPU can be confirmed with Redundant system status (3) (SW01FC to SW01FF).

| No. | Description | No. | Description |
|--------|-----------------------------|------------------|-----------------------------|
| SB01F4 | Redundant system status (1) | SW01F4 to SW01F7 | Redundant system status (1) |
| SB01F8 | Redundant system status (2) | SW01F8 to SW01FB | Redundant system status (2) |
| SB01FC | Redundant system status (3) | SW01FC to SW01FF | Redundant system status (3) |

(13) Setting a link dedicated instruction and checking the processing result

With link special relays (SB) and link special registers (SW), link dedicated instructions can be set and the processing results can be checked.

- 1) Link dedicated instructions can be set with the following link special registers (SW).
 - Logical channel setting (SW0008 to SW000F)
 - Number of retries (SW001C)
 - Retry interval (SW001D)
 - Number of gates (SW001E)
- 2) When data are stored in the host's channel area, the corresponding RECV execution request flag (SB00A0 to SB00A7) turns ON. Upon completion of the RECV instruction, the RECV instruction execution request flag (SB00A0 to SB00A7) turns OFF.
- 3) Processing results of link dedicated instructions can be checked with Send/receive instruction processing results (SW0031 to SW003F).

| No. | Description | No. | Description |
|--------|---|--------|--|
| | — | SW0008 | Logical channel setting (channel 1) |
| | | SW0009 | Logical channel setting (channel 2) |
| | | SW000A | Logical channel setting (channel 3) |
| | | SW000B | Logical channel setting (channel 4) |
| | | SW000C | Logical channel setting (channel 5) |
| | | SW000D | Logical channel setting (channel 6) |
| | | SW000E | Logical channel setting (channel 7) |
| | | SW000F | Logical channel setting (channel 8) |
| | | SW001C | Number of retries |
| | | SW001D | Retry interval |
| | | SW001E | Number of gates |
| | | SW0031 | ZNRD instruction processing result Send/receive instruction (1) processing result |
| | | SW0033 | ZNWR instruction processing result Send/receive instruction (2) processing result |
| | | SW0035 | Send/receive instruction (3) processing result |
| | | SW0037 | Send/receive instruction (4) processing result |
| | | SW0039 | Send/receive instruction (5) processing result |
| | | SW003B | Send/receive instruction (6) processing result |
| | | SW003D | Send/receive instruction (7) processing result |
| | | SW003F | Send/receive instruction (8) processing result |
| SB00A0 | RECV instruction execution request flag (1) | | — |
| SB00A1 | RECV instruction execution request flag (2) | | |
| SB00A2 | RECV instruction execution request flag (3) | | |
| SB00A3 | RECV instruction execution request flag (4) | | |
| SB00A4 | RECV instruction execution request flag (5) | | |
| SB00A5 | RECV instruction execution request flag (6) | | |
| SB00A6 | RECV instruction execution request flag (7) | | |
| SB00A7 | RECV instruction execution request flag (8) | | |

(14) Checking the network module status

The network module status is checked through the network diagnostics, but it also can be checked with link special relay (SB) and link special register (SW). (Refer to Section 8.1)

(a) Checking the error details

- 1) When an error occurs to the network module, Module status (SB0020) is turned ON.
- 2) An error code is stored in Module status (SW0020).

| No. | Description | No. | Description |
|--------|---------------|--------|---------------|
| SB0020 | Module status | SW0020 | Module status |

(b) Checking the module type

The module type data are stored in the following link special relays (SB) and link special registers (SW).

| No. | Description | No. | Description |
|--------|-----------------------------|------------------|-----------------------------|
| SB008D | Module type of each station | — | |
| — | | SW00E8 to SW00EB | Module type of each station |

(c) Checking the external power supply status

- 1) When external power is supplied, External power supply information (SB008C) is turned ON.
The status of the host can be also checked with Power supply status of host (SB0042).
- 2) Station numbers of the stations to which external power is supplied are stored in Power supply status of each station (SW008C to SW008F).

| No. | Description | No. | Description |
|--------|-----------------------------------|------------------|-------------------------------------|
| SB0042 | Power supply status of host | — | |
| SB008C | External power supply information | SW008C to SW008F | Power supply status of each station |

7 APPLICATION FUNCTIONS

When applying any of the program examples introduced in this chapter to the actual system, verify the applicability and confirm that no problems will occur in the system control.

Chapter 3

| | | | |
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| Basic functions | Cyclic transmission function (Periodical communication) | Communication using LB/LW | Section 3.2.1 (1) |
| | | Communication using LX/LY | Section 3.2.1 (2) |
| | RAS function | Automatic return function | Section 3.2.2 (1) |
| | | Control station switch function | Section 3.2.2 (2) |
| | | Control station return control function | Section 3.2.2 (3) |
| | | Loopback function (optical loop system) | Section 3.2.2 (4) |
| | | Prevention of station failure by using external power supply (Optical loop system) | Section 3.2.2 (5) |
| | | Station detach function (coaxial bus system) | Section 3.2.2 (6) |
| | | Transient transmission enabled even at CPU module error | Section 3.2.2 (7) |
| | | Checking transient transmission abnormal detection time | Section 3.2.2 (8) |
| | Diagnostic function | Section 3.2.2 (9) | |

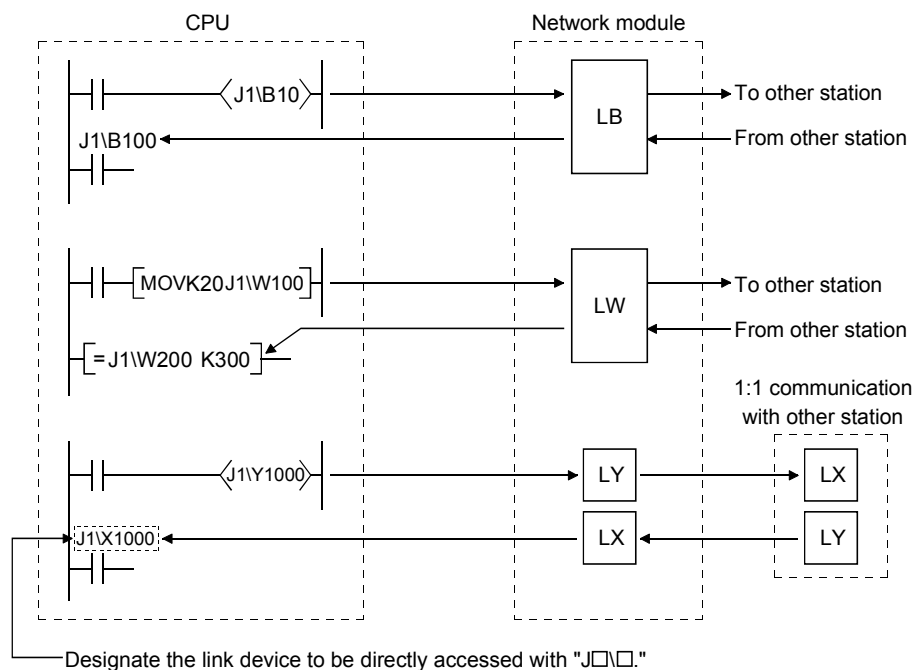
Chapter 7

| | | | |
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| Application functions | Direct access to link devices ······ | | Section 7.1 |
| | Cyclic transmission function (Periodical communication) | Inter-link data transfer function ······ | Section 7.2 |
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7.1 Direct Access to the Link Devices

The link devices (LB, LW, LX, LY, SB, SW) of the network module can be directly read or written by sequence programs regardless of the link refresh of the CPU module.

With direct access, link devices that are not set within the range of the link refresh with the refresh parameters can also be read or written.

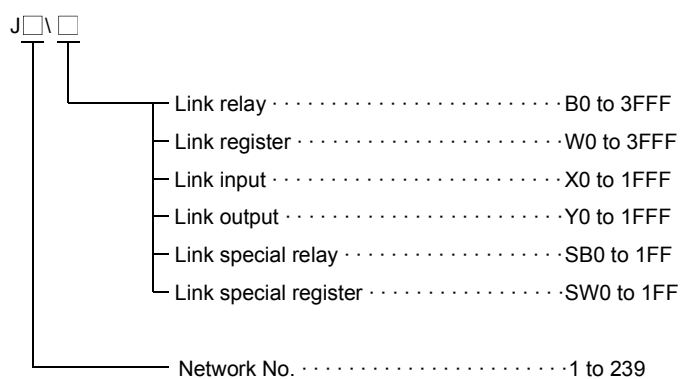


POINT

- (1) The direct access of the link devices LX/LY is limited to the communication with the block I/O master station set with the communication parameters. By limiting the communication, data cannot be shared among multiple stations, such as LB/LW, but 1:1 communication between predefined stations is allowed.
- (2) 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.
- (3) Since the link direct device reads or writes data directly to the link devices of the network module at the time of the instruction execution, the transmission delay time can be reduced.

(1) How to designate J□\□

Designate the network number and link device to be read or written.



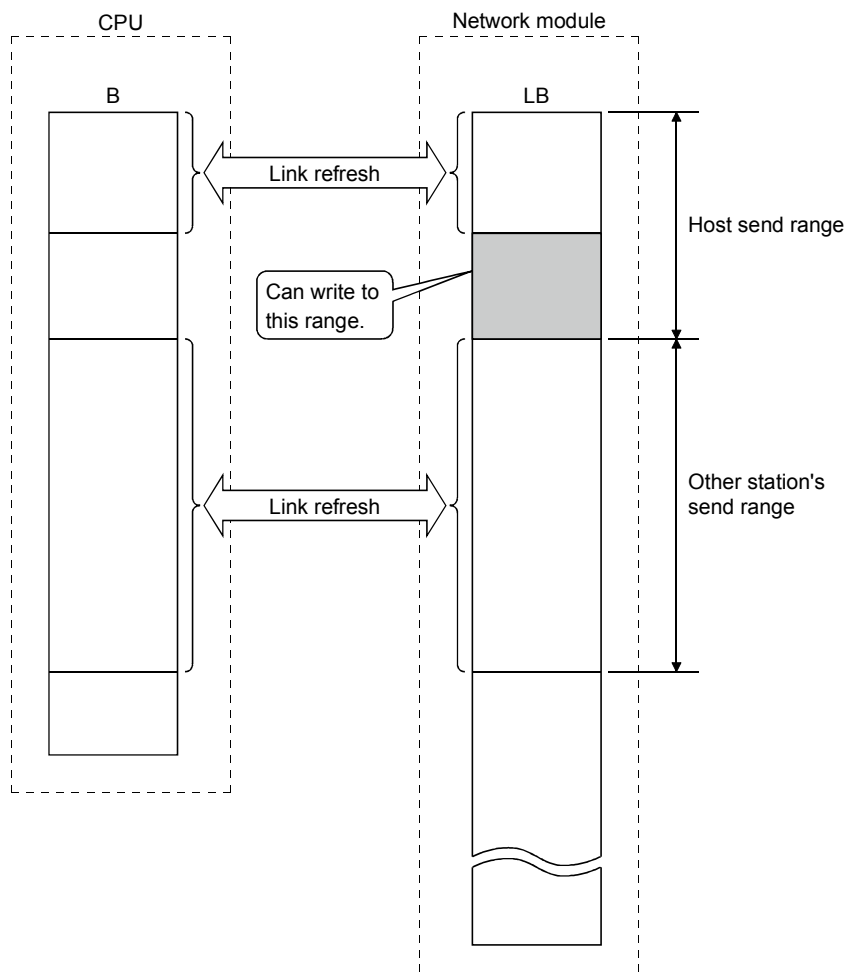
(2) Address designation range of the link devices

(a) When reading

Read the entire range of link device addresses of the network module.

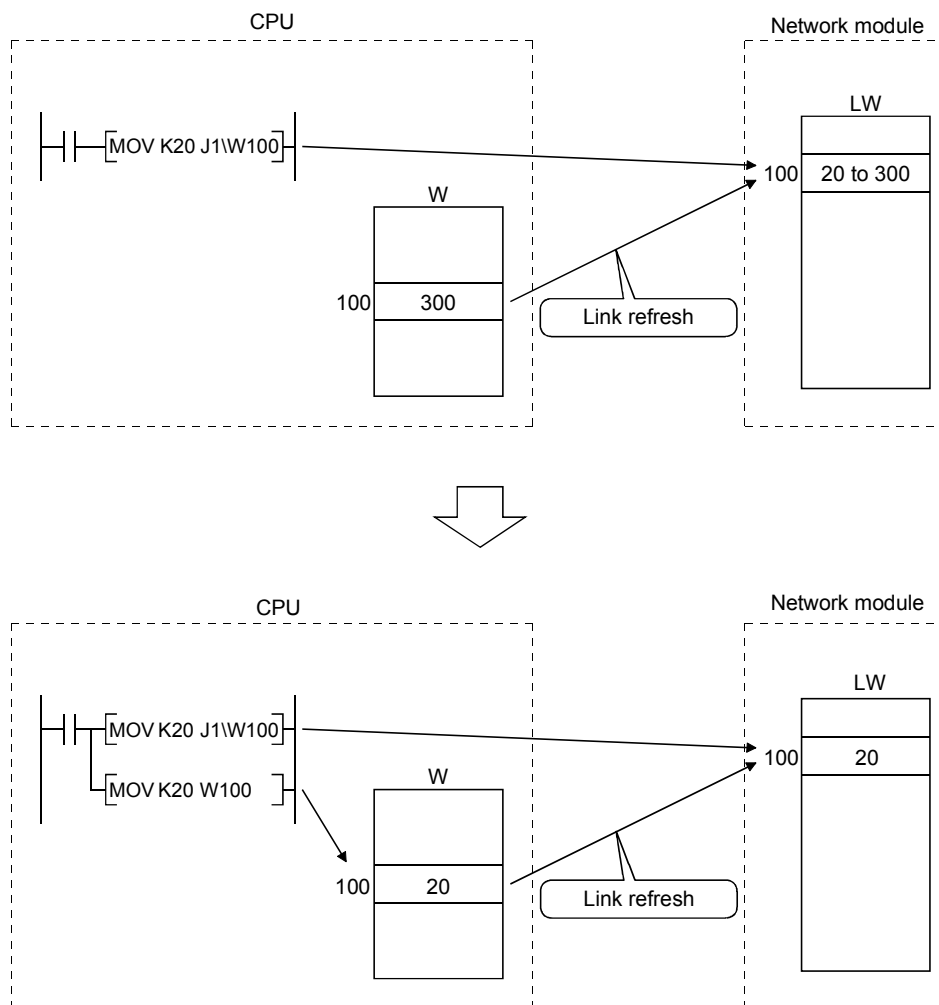
(b) When writing

- 1) Make sure to write into a range of link device addresses within the host's send range that has not been set as a link refresh range.



- 2) If an address in the link refresh range is designated, data is written to that address when the instruction is executed, but the link device of the network module is overwritten by the link device data of the CPU module by the link refresh.

Make sure to write the same data to the link device of the CPU module as well when writing by direct access (same for B, Y, SB and SW).



(3) Differences from the link refresh

The following table shows how the direct access to link devices is different from the link refresh.

For further details, see the QCPU User's Manual (Function Explanation, Program Fundamentals).

| Access method | Link refresh | Direct access |
|--------------------------------------|-----------------------|----------------------------|
| Item | | |
| Number of steps | 1 step | 2 steps |
| Processing speed (LD BO – –) * 1 | High speed (0.034 μs) | Low speed (several 10 μs) |
| Data reliability | Per station * 2 | 2-word units (32 bits) * 3 |

*1: For Q02HCPU

*2: When the parameter of the block guarantee per station is enabled.

*3: When the 32-bit data guarantee conditions are satisfied.

7.2 Inter-Link Data Transfer Function (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)

This function transfers link data to different networks in a batch mode using parameters when multiple networks are connected to one programmable controller.

Interlink transfer is executable between CC-Link IE controller network and MELSECNET/H.

POINT

Only one network module can be accepted on the Basic model QCPU and safety CPU.

Hence, the inter-link data transfer function cannot be used.

(1) Inter-link data transfer function

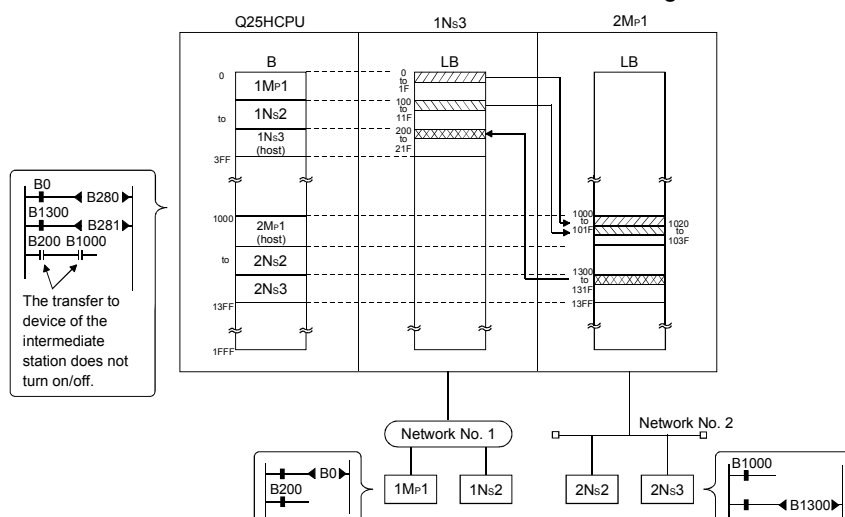
- (a) By using this function, it becomes unnecessary to transfer data between networks with the sequence programs using the MOV instruction, etc.
- (b) It is necessary to set the "Interlink transmission parameters" in order to execute the inter-link data transfer function.
- (c) The devices whose data can be transferred by the inter-link data transfer are the link relay (LB) and link register (LW) of each network module (data link module). The data of the link input (LX) and link output (LY) devices cannot be transferred between data links.
- (d) When sending data, set the device range within the host's send range of the transfer from network module.
- (e) When sending one batch of data to multiple networks, the same numbers can be set for the device range of the transfer source. For example, when transferring the data received from network number 1 (module 1) to both network number 2 (module 2) and number 3 (module 3), the same transfer from device range can be set for the interlink transmission parameters, "Module 1 → 2" and "Module 1 → 3."

The diagram below shows an example of transfer between network number 1 and network number 2.

Set the "Interlink transmission parameters" for the programmable controller that serves as the relay station.

In this example, the data of B0, which was turned on by station's 1M_P1 of network number 1, is received by relay station 1N_s3 of network number 1. Then, the data is transferred to the range (LB1000) assigned for relay station 2M_P1 of network number 2.

Stations 2N_s2 and 2N_s3 of network number 2 can thus check the on/off status of B0 of station 1M_P1 of network number 1 through the data of B1000.



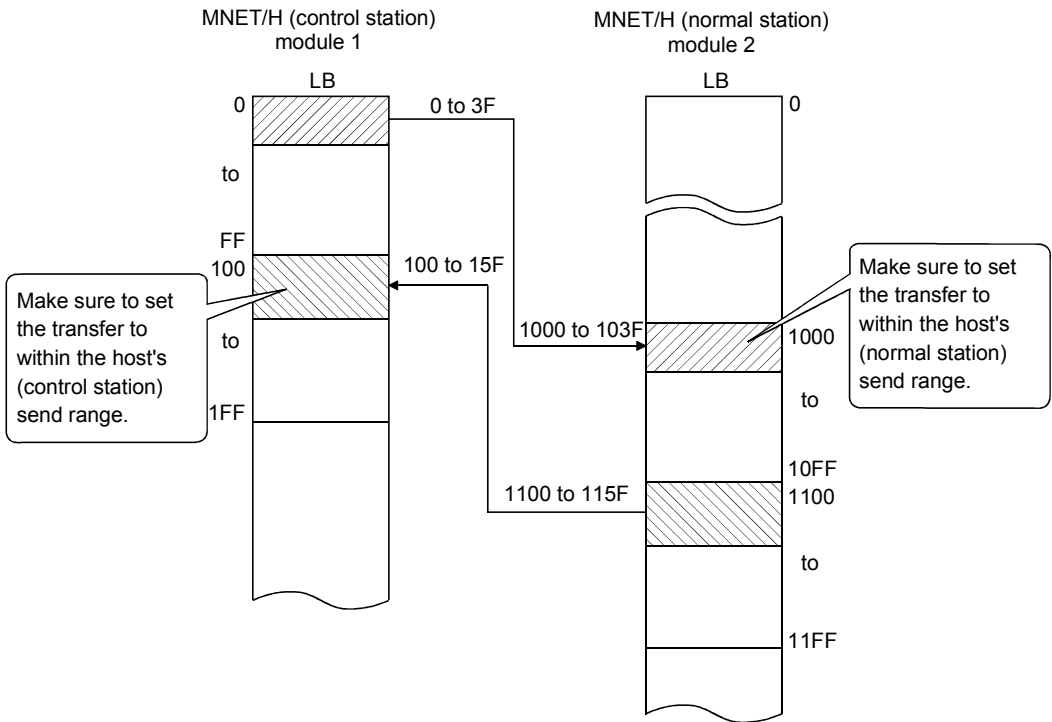
(2) Interlink transmission parameters

When transferring data to other network, up to 64 transfer ranges can be set between the network modules. Note that, when data from a given device range is transferred to multiple network numbers, as many setting ranges must be set as the number of transfer to networks.

[Setting example]

Module 1 (0H to 3FH) → Module 2 (1000H to 103FH)

Module 2 (1100H to 115FH) → Module 1 (100H to 15FH)



Click the **Interlink transmission parameters** button.

Transfer from Module1: MNET/H mode (Control station) → Transfer to Module2: MNET/H mode (Normal station)

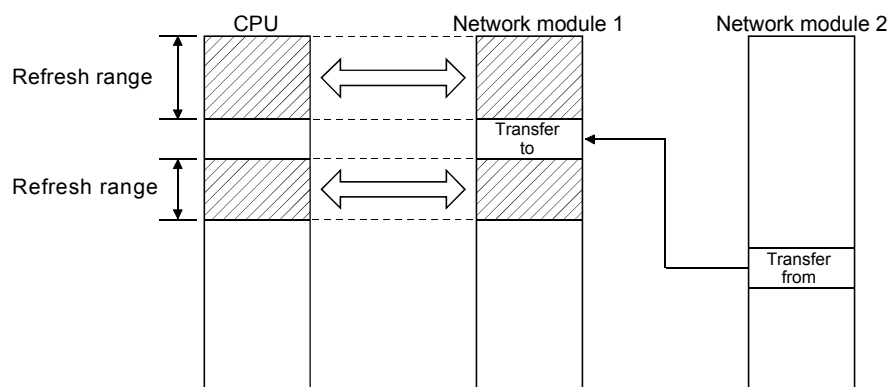
| No | Transfer from | | | Transfer to | | | Transfer from | | | Transfer to | | |
|----|---------------|-------|------|-------------|-------|------|---------------|-------|-----|-------------|-------|-----|
| | Points | Start | End | Points | Start | End | Points | Start | End | Points | Start | End |
| 1 | 64 | 0000 | 003F | 64 | 1000 | 103F | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | |

Transfer to Module1: MNET/H mode (Control station) ← Transfer from Module2: MNET/H mode (Normal station)

| No | Transfer from | | | Transfer to | | | Transfer from | | | Transfer to | | |
|----|---------------|-------|------|-------------|-------|------|---------------|-------|-----|-------------|-------|-----|
| | Points | Start | End | Points | Start | End | Points | Start | End | Points | Start | End |
| 1 | 96 | 1100 | 115F | 96 | 0100 | 015F | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | |

Precautions

- 1) Do not set the Transfer to device range of the network module within the refresh range of the network. Otherwise, the correct data cannot be sent to other stations.



- 2) The transfer data is sent to the transfer to network via the network module; it is not stored in the transfer to device range of the network module. When using the transfer data in the relay station, the transfer to data should be transferred to the device on the CPU side by link refreshing.

POINT

When it is necessary to set 65 or more transfer ranges for the inter-link data transfer function, the data should be transferred from the transfer from to the destination in the sequence programs using the MOV instruction, etc.

(3) Available inter-link data transfer stations

As shown in the table below, the control stations and normal stations are available.

| Transfer to / Transfer from | | MELSECNET/H | | |
|-----------------------------|-----------------|-----------------|----------------|-----------------|
| | | Control station | Normal station | Standby station |
| MELSEC NET/H | Control station | ○ | ○ | × |
| | Normal station | ○ | ○ | × |
| | Standby station | × | × | × |

○: Available ×: Not available

7.3 Low-Speed Cyclic Transmission Function (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)

The low-speed cyclic transmission function is convenient when sending data that does not require high-speed transfer to other stations in a batch mode using the link devices (LB/LW).

The performance of the low-speed cyclic transmission function is almost the same as that of the transient transmission function.

For further details of the performance, refer to Section 7.4.

A station can transmit data only once in a single link scan. To send data from multiple stations concurrently, the link scan time should be longer than the total transmission time for all the sending stations.

In the low-speed cyclic transmission, send range for each station is set with the common parameters of the control station.

Low-speed cyclic send range for each station

| Station No. | Send range for each station LB | | | Send range for each station LW | | | Send range for each station Low speed LB | | | Send range for each station Low speed LW | | | Pairing |
|-------------|--------------------------------|-------|------|--------------------------------|-------|------|--|-------|------|--|-------|------|---------|
| | Points | Start | End | Points | Start | End | Points | Start | End | Points | Start | End | |
| 1 | 256 | 0000 | 00FF | 256 | 0000 | 00FF | 768 | 2000 | 22FF | 768 | 2000 | 22FF | Disable |
| 2 | 256 | 0100 | 01FF | 256 | 0100 | 01FF | 768 | 2300 | 25FF | 768 | 2300 | 25FF | Disable |
| 3 | 256 | 0200 | 02FF | 256 | 0200 | 02FF | 768 | 2600 | 28FF | 768 | 2600 | 28FF | Disable |
| 4 | 256 | 0300 | 03FF | 256 | 0300 | 03FF | 768 | 2900 | 2BFF | 768 | 2900 | 2BFF | Disable |

The sending to other stations can be activated by three methods: 1) Transmit data of one station in 1 scan (default), 2) Fixed term cycle interval setting, and 3) System times. These methods can be designated through by the supplementary settings, and only one of them can be selected.

The screen shown below is the supplemental screen where the activation method can be selected.

1) Transmit data of one station in 1 scan

2) Fixed interval cycle setting (Second)

3) System times

| | Year | Month | Day | Hour | Min | Sec |
|---|------|-------|-----|------|-----|-----|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |

POINT

The Basic model QCPU and safety CPU does not support the low-speed cyclic transmission function.

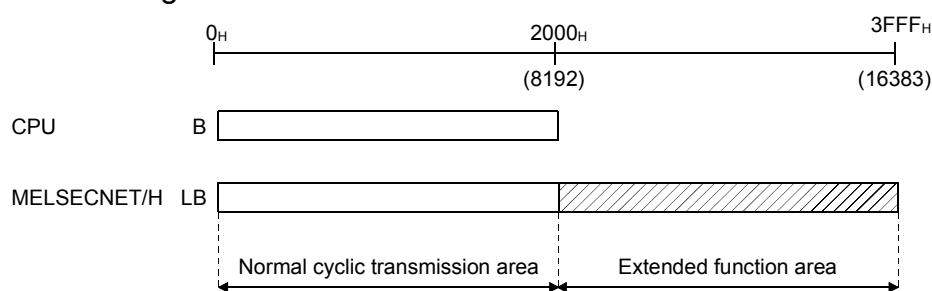
7.3.1 Send range settings

Each station's send range of link devices (low-speed LB, low-speed LW) is assigned to the extended area (2000 to 3FFF) in 16-point units for LB (start : □ □ □ 0 to end □ □ □ F) and in one-point units for LW.

Each station's send range can also be assigned using a random station number assignment sequence.

The B/W device numbers on the CPU side that correspond to the extended area are not assigned.

(1) Device range



(2) Screen settings

On the following screen that is displayed by clicking the

Network range assignment button, 768 points are assigned to the send range for each station (low-speed LB, low-speed LW).

| Station No. | Send range for each station | | | Send range for each station | | | Send range for each station | | | Send range for each station | | | Pairing |
|-------------|-----------------------------|-------|------|-----------------------------|-------|------|-----------------------------|-------|------|-----------------------------|-------|------|---------|
| | Points | Start | End | Points | Start | End | Points | Start | End | Points | Start | End | |
| 1 | 256 | 0000 | 00FF | 256 | 0000 | 00FF | 768 | 2000 | 22FF | 768 | 2000 | 22FF | Disable |
| 2 | 256 | 0100 | 01FF | 256 | 0100 | 01FF | 768 | 2300 | 25FF | 768 | 2300 | 25FF | Disable |
| 3 | 256 | 0200 | 02FF | 256 | 0200 | 02FF | 768 | 2600 | 28FF | 768 | 2600 | 28FF | Disable |
| 4 | 256 | 0300 | 03FF | 256 | 0300 | 03FF | 768 | 2900 | 2BFF | 768 | 2900 | 2BFF | Disable |

Send range
(2000 to 3FFF)

Send points
(LB/16-point, LW/1-point units)

POINT

- (1) To use 2-word (32-bit) data, set appropriate send points and send range that satisfy the conditions for the 32-bit data guarantee.
For details, refer to Section 6.2.1.
- (2) The device points (B, W) of the CPU module can be increased by changing the PLC parameters (8 k to 16 k). However, there are restrictions for the device points, such as that the total must be less than 28.8 k words.
- (3) Link devices in the Extended function area (2000H to 3FFFH) can be also used for normal cyclic transmission (when link devices of 8193 points or more are used for normal cyclic transmission).
For low-speed transmission, use link devices in the Extended function area, which are not used for normal cyclic transmission.
- (4) The total of the send ranges per station must not exceed 2000 bytes in the low-speed cyclic transmission. (The send range for the normal cyclic transmission is not included.)
- (5) LX and LY cannot be set as link devices for low-speed cyclic transmissions.

7.3.2 Send timing

The low-speed cyclic transmission is executed separately from the normal cyclic transmission. This section describes the setting, processing interval and link cycle of the low-speed cyclic transmission.

(1) Transmission setting

The link cycle of the low-speed cyclic transmission varies depending on its transmission setting.

The setting can be made at "Specification of low speed cyclic transmission" on "Supplementary setting". (Refer to Section 7.3.3.)

The following lists the setting options.

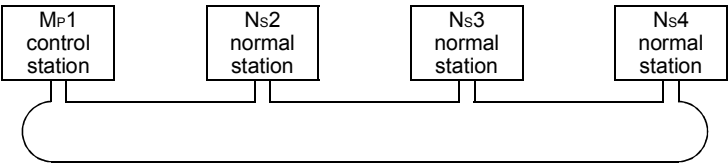
| Setting item | Description |
|---|--|
| Transmit data of one station in 1 link scan | Low-speed cyclic data of max. one station are sent during one link scan of normal cyclic transmission. |
| Fixed term cycle interval setting | Low-speed cyclic data are sent at a specified time interval. * 1 |
| System times | Low-speed cyclic data are sent at a specified time. * 1 |

* 1: Maximum no. of stations capable of sending data during 1 link scan of normal cyclic transmission varies depending on the "Maximum no. of transients in 1 scan" setting.

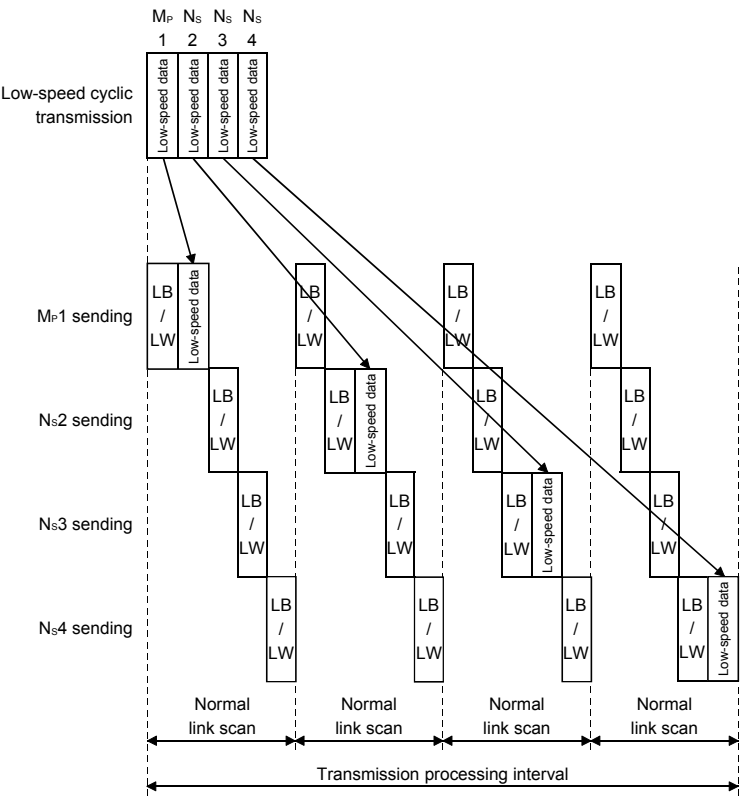
Refer to Section 7.4.1 for the "Maximum no. of transients in 1 scan" setting.

(2) Transmission processing interval

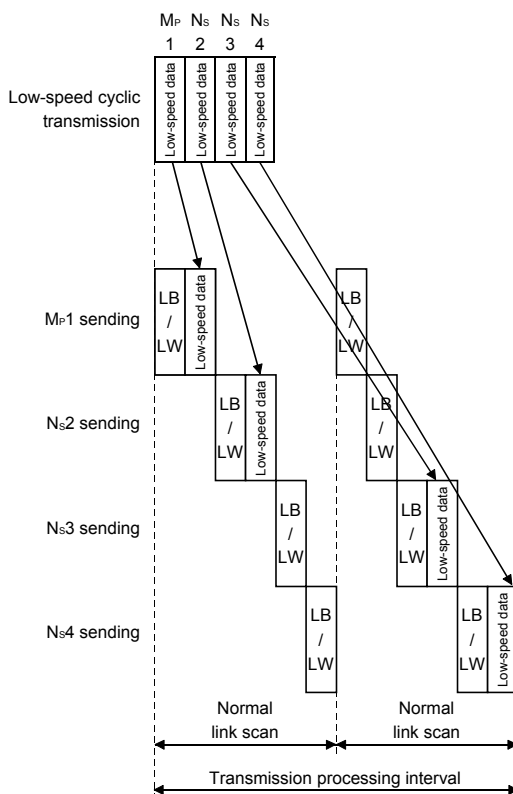
The following system configuration example is used for subsequent explanations.



- (a) When "Transmit data of one station in 1 link scan", "Fixed term cycle interval setting (Maximum no. of transients: 1)" and "System times (Maximum no. of transients: 1)" are set



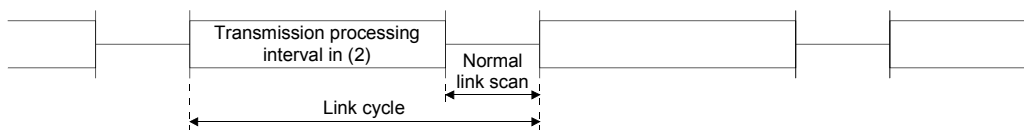
- (b) When "Fixed term cycle interval (Maximum no. of transients: 2)" and "System times (Maximum no. of transients: 2)" are set



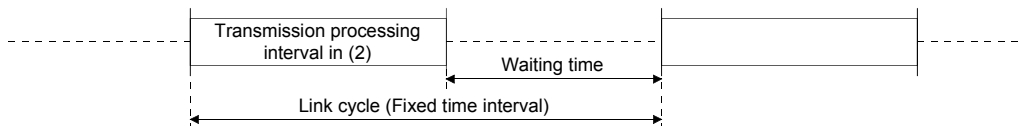
(3) Link cycle

Link cycle examples of the low-speed transmission are as shown below.

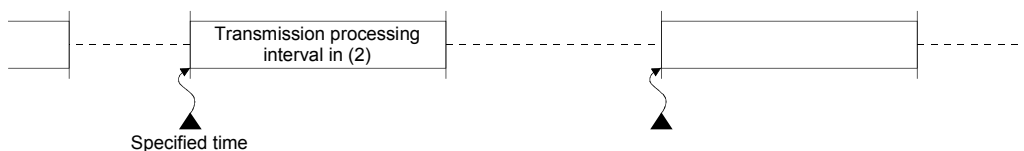
- (a) When "Transmit data of one station in 1 link scan" is set



- (b) When "Fixed term cycle interval setting" is set



- (c) When "System times" is set



7.3.3 Startup

(1) Sending of data for one station per link scan (default)

The low-speed cyclic data for a maximum of one station is sent in one link scan of the normal cyclic transmission.

[Setting method]

- 1) Click (●) [Transmit data of one station in 1 scan] to select.

Specification of low speed cyclic transmission

☒ Transmit data of one station in 1 scan

☐ Fixed interval cycle setting Second

☐ System times

| | Year | Month | Day | Hour | Min. | Sec. |
|---|------|-------|-----|------|------|------|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |

POINT

The fastest link scan time in the low-speed cyclic transmission can be calculated by the following equation:

$$\begin{aligned} \text{LSL} &= \text{LS} \times \text{number of stations} + \text{LS} \\ &= \text{LS} \times (\text{number of stations} + 1) \end{aligned}$$

LSL : The fastest link scan time in the low-speed cyclic transmission

LS : Normal link scan time

(2) Fixed term cycle interval setting

The low-speed cyclic data is sent in the link cycle of the designated time frequency.

Valid setting frequency: 1 to 65535 s (18 h, 12 min and 15 s)

[Setting method]

- 1) Click (●) [Fixed interval cycle setting] to select.
- 2) Set the time in seconds (the screen shows a value of 600).

Specification of low speed cyclic transmission

☐ Transmit data of one station in 1 scan

☒ Fixed interval cycle setting Second

☐ System times

| | Year | Month | Day | Hour | Min. | Sec. |
|---|------|-------|-----|------|------|------|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |

(3) System timer interval

The low-speed cyclic data is sent in the link cycle at the designated time. By omitting year, month, and date, the low-speed cycle transmission can be activated yearly (or monthly, or daily). Hour, minute and second cannot be omitted.

Setting points: 1 to 8 points

[Setting method]

- 1) Click (●) [System times] to select.
- 2) Set year, month, date, hour, minute and second to the designated time.

In the following screen example:

Points 1 to 3 : By omitting year, month and date, data is sent every day at the designated time.

Points 4 and 5 : By omitting year and month, data is sent at the designated time monthly.

Point 6 : By omitting the year, data is sent at the designated time every year.

Points 7 to 8 : Data is sent only once at the designated time.

| | Year | Month | Day | Hour | Min. | Sec. |
|---|------|-------|-----|------|------|------|
| 1 | | | | 9 | 0 | 0 |
| 2 | | | | 11 | 59 | 50 |
| 3 | | | | 21 | 0 | 10 |
| 4 | | | 1 | 8 | 30 | 0 |
| 5 | | | 16 | 8 | 30 | 0 |
| 6 | | 6 | 1 | 8 | 0 | 0 |
| 7 | 2003 | 12 | 31 | 23 | 59 | 50 |
| 8 | 2004 | 1 | 1 | 0 | 0 | 10 |

POINT

- (1) The system timer operates based on the host's clock. If used without matching the clocks on the sending station and receiving station, there may be a time gap between the stations.
- (2) When handling multiple data without the block guarantee per station function, new and old data may coexist. Apply interlocks in the programs (refer to Section 6.2.3).

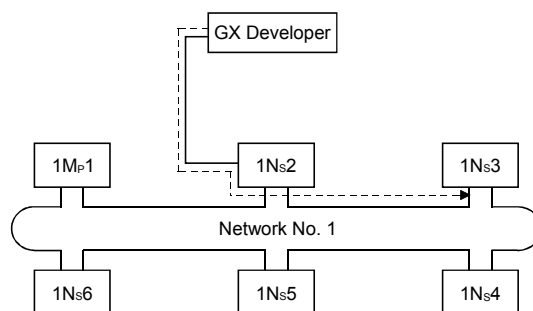
7.4 Transient Transmission Function (Non-Periodical Communication)

The transient transmission function performs data communication only when it is requested between stations.

The transient transmission function can be requested with the dedicated link instructions (SEND, RECV, READ, SREAD, WRITE, SWRITE, REQ, ZNRD, ZNWR, RECVS, RRUN, RSTOP, RTMRD and RTMWR), GX Developer, the intelligent function module, etc.

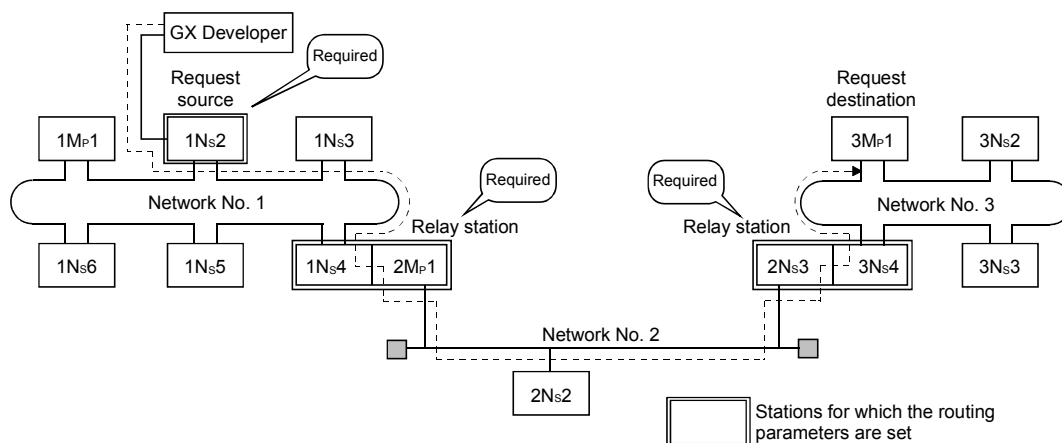
In the MELSECNET/H, data communication can be performed with other stations having the same network number (the same network as where the host is connected), as well as with stations having other network numbers.

1) Transient transmission function to a station on the same network



2) Transient transmission to stations on other networks (routing function)

In this case, the routing parameters must be set for the request source and relay stations.



7.4.1 Communication function

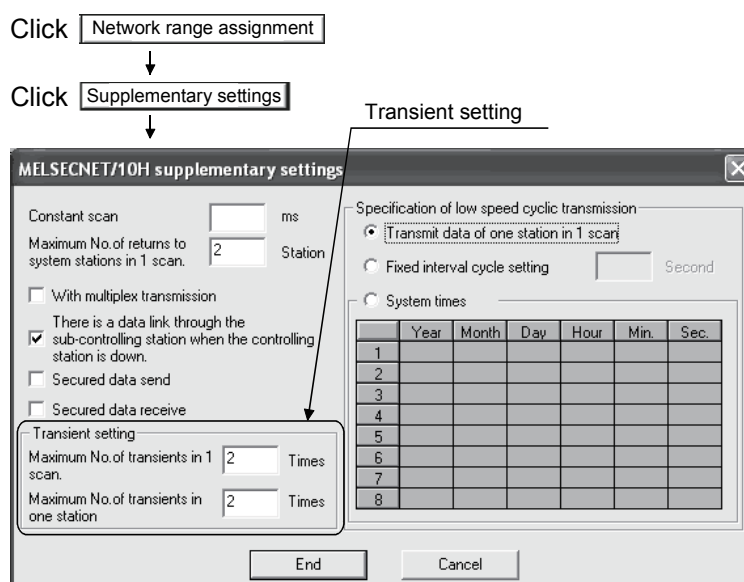
(1) Parameter settings

Set the execution conditions for the transient transmission with the parameters listed below.

In the default settings, both the number of transients that one network can execute in one link scan ([Maximum no. of transients in 1 scan]) and the number of transients that one station can execute in one link scan ([Maximum no. of transients in one station]) are set to 2 times. Change the number of transients that can be executed in a link scan as necessary (see Points below).

| Setting item | Setting value | Valid setting times | Default setting |
|--|---------------|---------------------|-----------------|
| Maximum no. of transients in 1 scan | | 1 to 255 times | Twice |
| Maximum no. of transients in one station | | 1 to 10 times | Twice |

[Screen display]



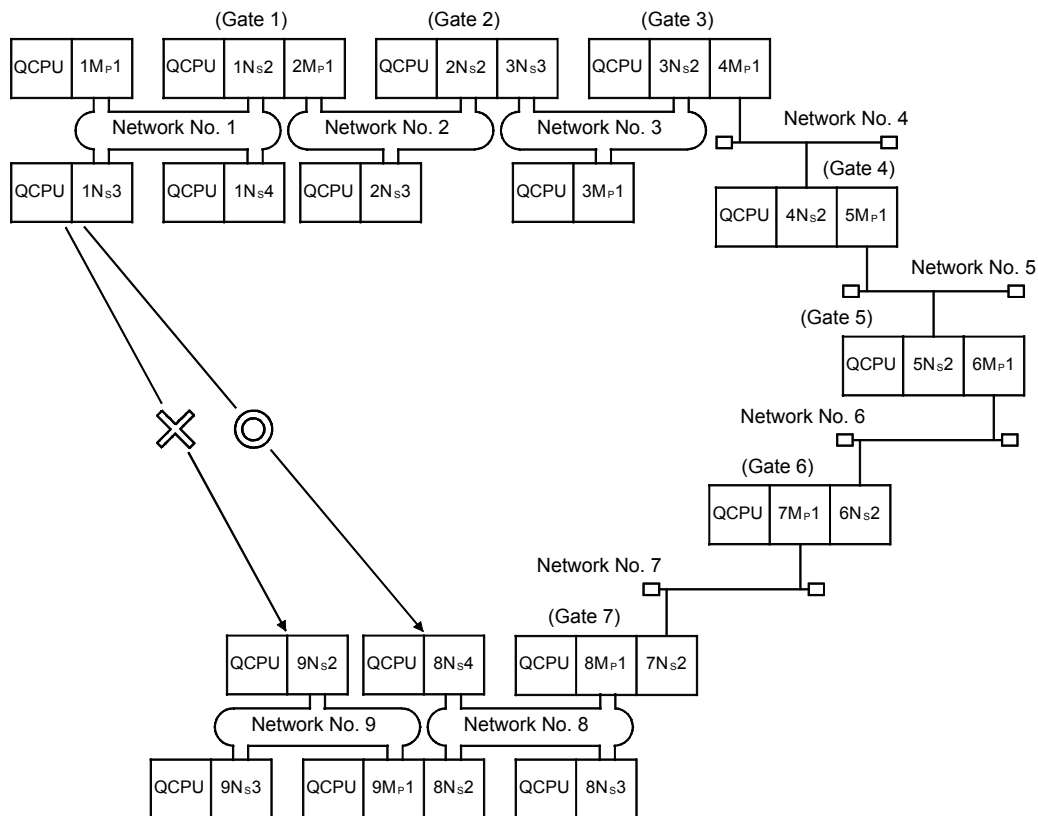
POINT

- (1) By increasing the number of transients, multiple transient instructions can be executed at the same time (in one link scan).
- (2) If the number of transients is increased and the transient request was issued in each station at the same time, the link scan time becomes temporarily longer and the cyclic transmission is also affected. Do not set unnecessarily large values.
- (3) When the transient transmission and the low-speed cyclic transmission are used at the same time, these transient setting parameters limit the total number of transient and low-speed cyclic transmissions.

(2) Transient transmission range

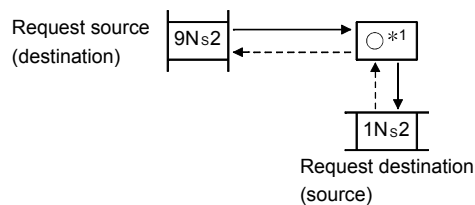
In a multiple network system of the MELSECNET/H, communication can be performed with stations in a maximum of eight networks by setting the routing parameters described in Section 7.4.2.

The following diagram illustrates the transient transmission range using an example where the destinations are limited to eight networks.

**POINT**

- (1) Since only one network module can be installed with the Basic model QCPU and safety CPU, it cannot be used as a relay station.
- (2) For access via a redundant system, the routing parameters of the request source or relay station(s) must be changed with the RTWRITE instruction if system switching occurs in the redundant system.
For further information, refer to Section 7.10.8.

For example, the valid range between 9Ns2 of network number 9 and 1Ns2 of network number 1 is indicated by $\bigcirc * 1$ (communication is possible by designating a network module that is close to the request source of the same programmable controller).



*1: Communication is possible by designating a network module that is close to the request source of the same programmable controller

[illegible]

7.4.2 Routing function

The routing function is used to execute transient transmissions to stations having other network numbers in a multiple network system.

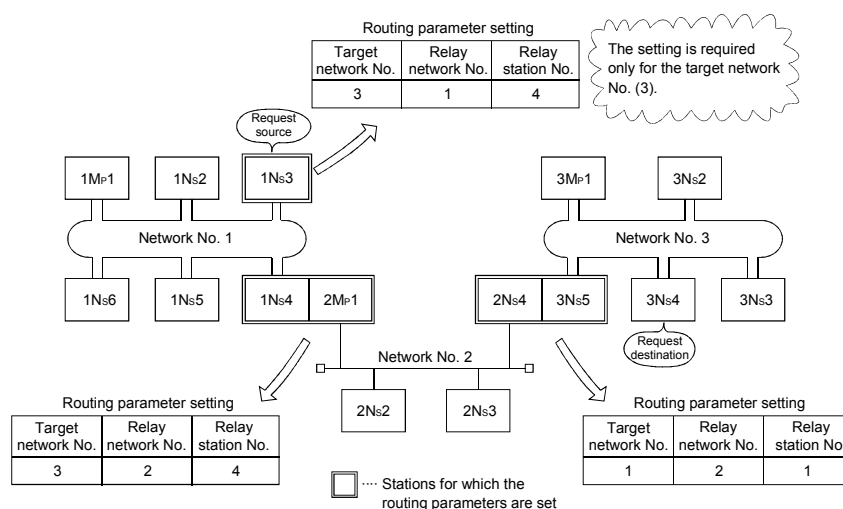
In order to execute the routing function, it is necessary to set the "routing parameters" to associate the network numbers of the request source and the station that will function as a bridge between the networks. *1

(1) Stations that require routing parameter setting

- (a) The setting is required for both the transient transmission request source and relay stations.
- (b) For the relay stations, two routing settings are required: one from the request source to the request destination, and the other from the request destination back to the request source.
- (c) The setting is not required for the request destination.

In the example shown in the diagram below where the transient transmission is executed from 1Ns3 to 3Ns4, the setting is required for the following three stations:

- 1) Setting for 1Ns3 that requests the transient transmission
Target network No. (3) of the Transfer to, the relay station (1Ns4), and the relay network No. (1) to the relay station.
- 2) Setting for 1Ns4 that functions as a bridge
Target network No. (3) of the Transfer to, the relay station (2Ns4), and the relay network No. (2) to the relay station. It is not necessary to set the return route because it is designated in the setting for 2Ns4.
- 3) Setting for 2Ns4 that function as a bridge
It is not necessary to set the routing to the Transfer to because the host is on the same network as the destination transfer (3). However, it is necessary to set the Transfer from network No. (1) as the Target network No. and to designate the relay station (2Mp1) and the relay network No. (2) to the relay station in order to trace a route back to the request source.



*1: The bridge function refers to sending data via an adjacent network.

(2) Routing parameter settings

(a) Setting screen

On the following screen, up to 64 pieces of "Target network No." can be set for the High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU, or up to eight pieces for the Basic model QCPU and safety CPU.

Note that the same target network No. cannot be designated more than once. Therefore, the host can become the request source or can be relayed through when accessing other stations on up to 64 or 8 networks with different "transfer designation network numbers."

| Setting item | Valid setting range |
|--|---------------------|
| Transfer network No. | 1 to 239 |
| Relay network No. (Relay destination network No.) | 1 to 239 |
| Relay station No. (Relay destination station No.) | 1 to 64 |

[Screen display]

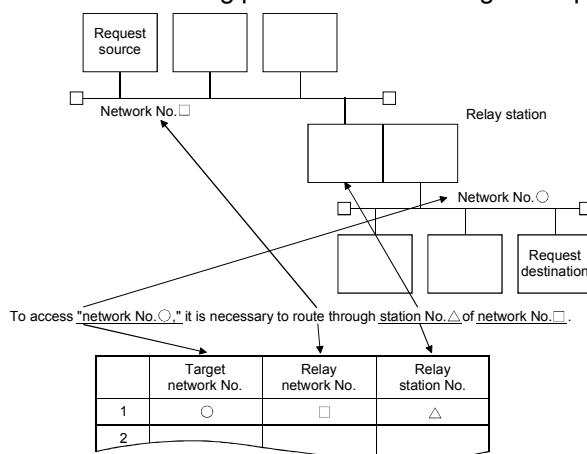
Click Routing parameters

| | Target network No. | Relay network No. | Relay station No. | |
|----|--------------------|-------------------|-------------------|--|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |

Clear Check End Cancel

(b) Setting method

Set the routing parameters according to the procedure described below.

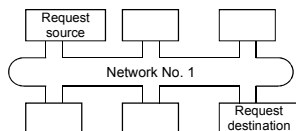


(3) Settings for different network system configurations and setting contents

The stations to set for the transient transmission and the contents of the routing parameters vary depending on the system configuration.

(a) Single network system

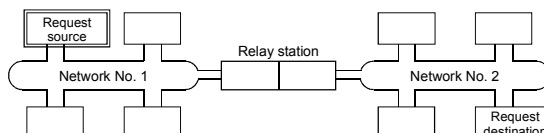
It is not necessary to set the routing parameters for the transient transmission to the same network.



(b) Multiple network system: two networks

Set the routing parameters only for the request source station.

The route for reaching the request destination (network number 2) must be set for the request source station.



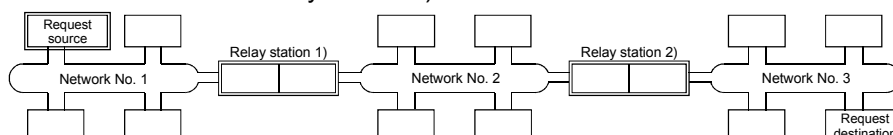
(c) Multiple network system: three networks

Set the routing parameters for the request source and the relay stations.

The route for reaching the request destination (network number 3) must be set for the request source.

The route for reaching the request destination (network number 3) must be set for relay station 1).

The route for reaching the request source (network number 1) must be set for relay station 2).



(d) Multiple network system: four networks

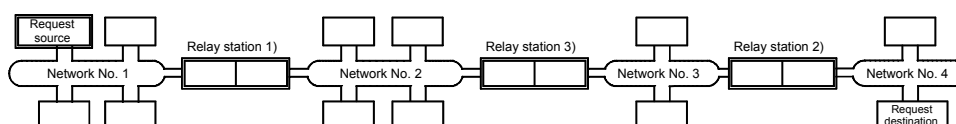
Set the routing parameters for the request source station and the relay stations.

The route for reaching the request destination (network number 4) must be set for the request source station.

The route for reaching the request destination (network number 4) must be set for relay station 1) (the relay station that is closest to the request source).

The route for reaching the request source (network number 1) must be set for relay station 2) (the relay station that is closest to the request destination).

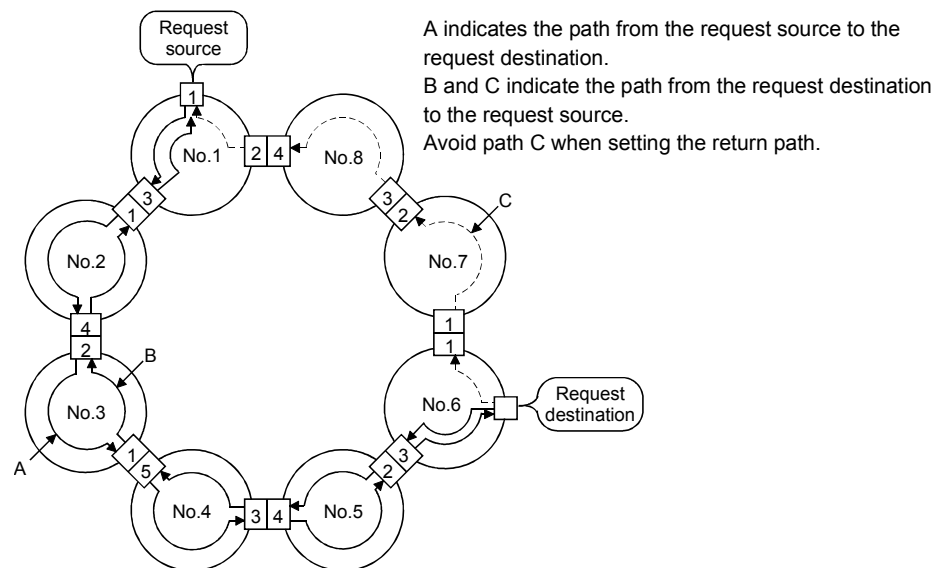
The routes for reaching the request destination (network 4) and the request source (network number 1) must be set for relay station 3) (relay station other than 1) and 2)).



POINT

- (1) When a network is connected in a loop as shown in the figure below, make sure to set the routing parameters so that the same relay station is routed for both the "route from request source to request designation" and the "route back from request destination to request source."

Do not set the destination and returning paths to circle the entire loop. The first relay station in the return path from the request destination is determined by the relay station in the forward path; thus, data cannot be transferred to a station beyond that relay station and an error occurs.



- (2) When data is sent to a remote network by transient transmission using the routing parameters, data is transferred through many networks; thus, the amount of transmission data and the number of transmissions may affect the entire system.
- For example, in network number 2 to 5 in the figure above, the link scan time may become temporarily longer and there may be delays in the transient transmission of the local station because of the transient transmissions from other networks.
- When using the routing parameters, design the transient transmission by considering the entire system.
- (3) When multiple network systems are connected with the routing function, the request source can send requests to destinations in up to eight network systems (the maximum number of relay stations is seven stations).

(4) Calculation of transmission delay time

The processing time of the transient transmission instruction to access a station on other network in a multiple network system can be obtained by adding the following transmission delay factors.

$$\begin{aligned} (\text{Routing transmission delay time}) = & (\text{processing time from request source to relay station}) \\ & + (\text{processing time from relay station to request destination}) \end{aligned}$$

(a) Processing time from request source to relay station

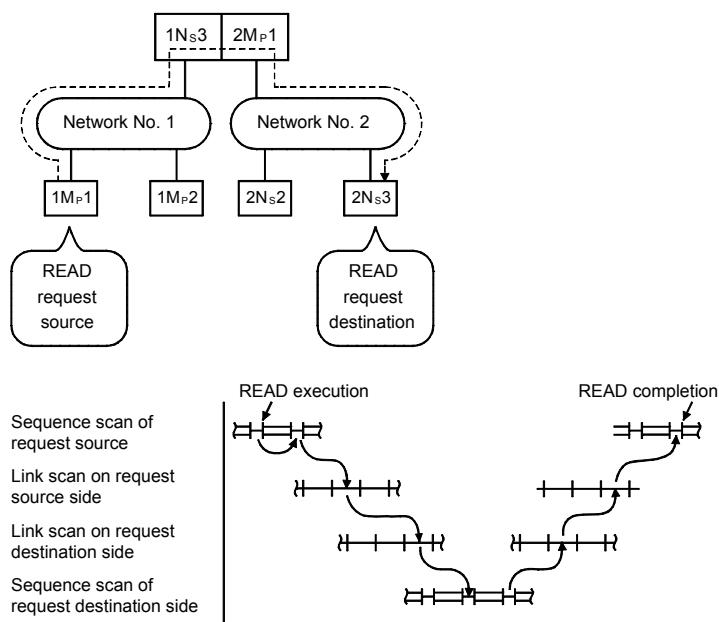
This is the transmission delay time from the request source (the station that executed the instruction) to the relay station that performs the routing. In the following example, it is the time required for the data to be transmitted from station 1M_P1 to station 1N_S3.

Use the equation for the transmission delay time described in Section 3.3.2 to calculate the delay time.

(b) Processing time from relay station to request destination

This is the transmission delay time from the relay station to the request destination (the station accessed with the instruction). In the following example, it is the time required for the data to be transmitted from station 2M_P1 to station 2N_S3.

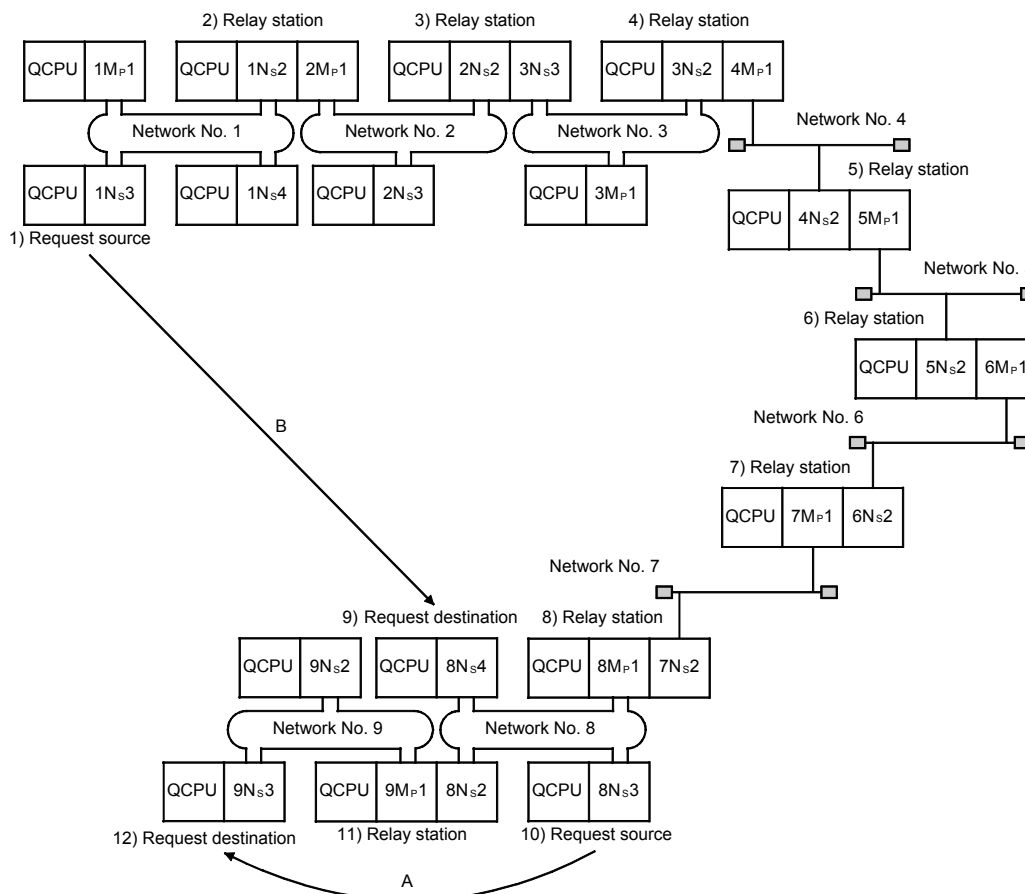
Use the equation for the transmission delay time described in Section 3.3.2 to calculate the delay time.

**REMARKS**

When three or more networks are relayed through by means of routing, add the processing time from one relay station to the other relay station to the routing transmission delay time.

(5) Setting example

The routing parameter setting examples (A, B) are explained using the following system configuration.

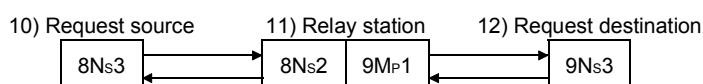


POINT

- (1) Since only one network module can be installed with the Basic model QCPU and safety CPU, it cannot be used as a relay station.
- (2) For access via a redundant system, the routing parameters of the request source or relay station(s) must be changed with the RTWRITE instruction if system switching occurs in the redundant system.
For further information, refer to Section 7.10.8.

(a) Setting example A

The routing parameter must be set for request source 10).



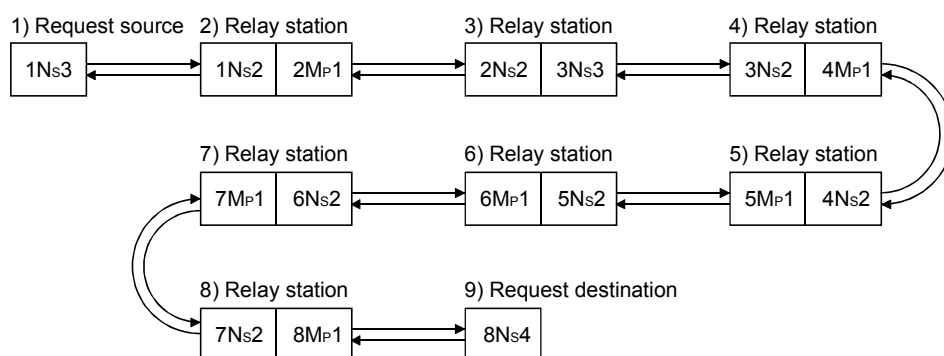
| No. | Target network No. | Relay network No. | Relay station No. |
|--------------------|--------------------|-------------------|-------------------|
| 10) Request source | 1 | [9] | [8] |
| | | | [2] |

(b) Setting example B

The routing parameters must be set for the request source1), relay station 2), relay station 3), relay station 4), relay station 5), relay station 6), relay station 7), and relay station 8).

In addition, there are two types of routing parameter settings; one is used when sending data from the request source to the request destination (when sending a request), and the other is used when returning from the request destination to the request source (when sending a response).

Either one of them or both must be set for each station.



| | No. | Target network No. | Relay network No. | Relay station No. | |
|-------------------|-----|--------------------|-------------------|-------------------|------------------------------|
| 1) Request source | 1 | [8] | [1] | [2] | Used when sending a request |
| 2) Relay station | 1 | [8] | [2] | [2] | Used when sending a request |
| 3) Relay station | 1 | [8] | [3] | [2] | Used when sending a request |
| | 2 | [1] | [2] | [1] | Used when sending a response |
| 4) Relay station | 1 | [8] | [4] | [2] | Used when sending a request |
| | 2 | [1] | [3] | [3] | Used when sending a response |
| 5) Relay station | 1 | [8] | [5] | [2] | Used when sending a request |
| | 2 | [1] | [4] | [1] | Used when sending a response |
| 6) Relay station | 1 | [8] | [6] | [2] | Used when sending a request |
| | 2 | [1] | [5] | [1] | Used when sending a response |
| 7) Relay station | 1 | [8] | [7] | [2] | Used when sending a request |
| | 2 | [1] | [6] | [1] | Used when sending a response |
| 8) Relay station | 1 | [1] | [7] | [1] | Used when sending a response |

POINT

If a transient transmission (SEND, READ, SREAD, WRITE, SWRITE or REQ) was terminated abnormally, the "Time" when an error was detected, "Abnormal detection network number," and "Abnormal detection station number" can be checked from the control data of the instruction used.

For detail on these instructions, refer to Section 7.4.5.

7.4.3 Group function

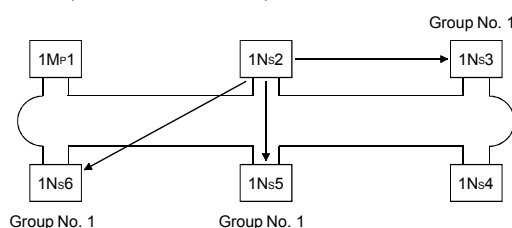
The group function is used to group the target stations of a transient transmission and send data to all of the stations in a group with a single instruction. One network may have a maximum of 32 groups.

By setting a group designation to the target station number in the control data of a dedicated link instruction, stations with the matching group number retrieve the transient data.

However, whether or not the transient transmission is normally completed cannot be verified because the data is transmitted to multiple stations.

(1) Visual representation of the function

The following figure shows an example of grouping. When a transient transmission is executed by designating group number 1, all of the three stations, 1Ns3, 1Ns5 and 1Ns6, retrieve the transient data.



(2) Setting method

Set the group number of the target network module using the following network parameters from GX Developer.

| | |
|----------------|---|
| Network No. | 1 |
| Total stations | 8 |
| Group No. | 3 |

Set the desired group number.

| Item | Setting | Valid setting range | Default |
|---------------------------------|---------|---------------------|--------------------------|
| Parameter screen Group No. | | 1 to 32 | 0 (no group designation) |
| Control data target station No. | | 81H(1) to A0H (32) | — |

(3) Transient transmission instructions that allows group designation

| No. | Instruction | Description | Reference |
|-----|-----------------|--|-------------------------------|
| 1 | SEND | Data sending | Section 7.4.5 (1) |
| 2 | (S)WRITE | Writes to word device of other station | Section 7.4.5 (2) |
| 3 | REQ | Requests transient transmission to other station | Section 7.4.5 (3) |
| 4 | ZNWR | Writes to word device of other station | Section 7.4.5 (4) |
| 5 | RRUN | Remote RUN | Section 7.4.5 (5) |
| 6 | RSTOP | Remote STOP | Section 7.4.5 (5) |
| 7 | RTMWR | Writes other station clock data | Section 7.4.5 (6) |
| 8 | Clock setting | GX Developer | Section 7.4.7 |
| 9 | Remote RUN/STOP | GX Developer | GX Developer Operating Manual |

POINT

The execution of the transient transmission using the group function cannot be verified.

When this mode of transient transmission is executed successively, a "No free area in the receive buffer" (error code: F222) may occur. Design the system thoroughly to allow for a sufficient interval between executions, and make sure to test (debug) to confirm that successive executions can be performed without generating any error.

7.4.4 Message sending function using the logical channel numbers

The message sending function using the logical channel numbers ^{*1} is useful when there are many kinds of information and the receiving station side needs to selectively receive only some of the send messages.

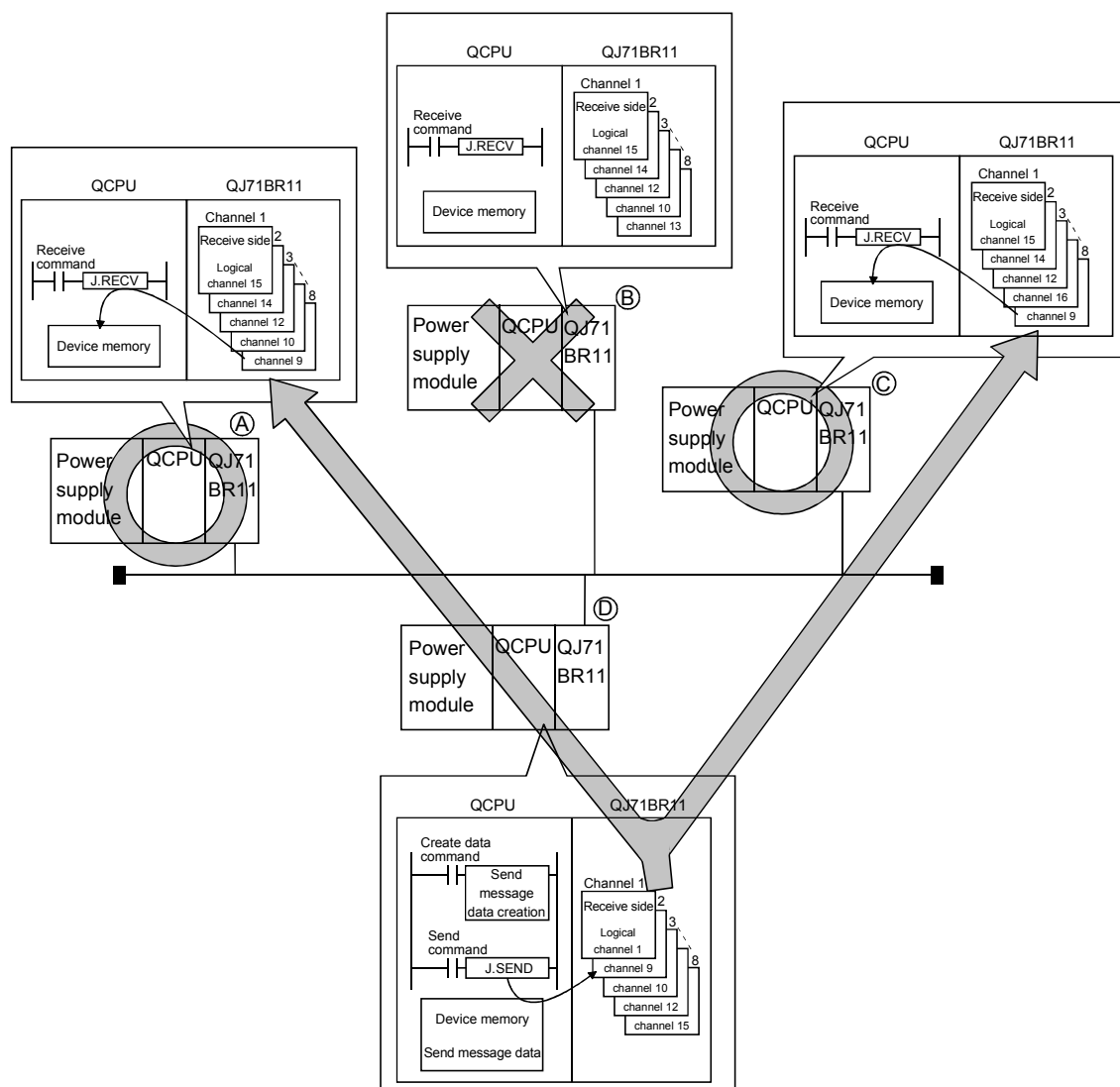
The sending station side is equivalent to a broadcast station that delivers messages to logical channels, and the receiving station side is equivalent to a television receiver in an ordinary household that can switch between logical channels.

The sending station side executes the transient transmission by attaching an address for a logical channel without designating a specific station number (although designation of station numbers is also possible). All the other stations on a single network receive the send data, and then the receiving stations delete the messages except for the messages whose logical channel number matches with the one set by the receiving stations.

^{*1}: The logical channel refers to an input channel that can be changed by the sequence program. There are eight physical input channels, but up to 64 channel numbers can be set by modifying the link special register value.

(1) Visual representation of the function

When the message is sent from the network module ④ to logical channel 9, only the network modules ①, ③ where logical channel 9 has been set can receive it. The network module ② does not receive it since logical channel 9 has not been set there.



POINT

Whether or not channel No.-specified transient transmission has been executed cannot be verified.

If it is executed consecutively, the no free area in the receive buffer error (error code: F222) may occur. Properly design the system to leave execution intervals and perform a test (debugging) so that transmission can be executed consecutively.

(2) Setting method

Set the logical channel numbers in the link special registers (SW0008 to SW000F) with the sequence program.

| SW No. | Name | Valid setting range | Default |
|--------|-------------------------------------|---------------------|---------------------------|
| SW0008 | Logical channel setting (channel 1) | 1 to 64 | 0: (Logical channel 1) *1 |
| SW0009 | Logical channel setting (channel 2) | 1 to 64 | 0: (Logical channel 2) *1 |
| SW000A | Logical channel setting (channel 3) | 1 to 64 | 0: (Logical channel 3) *1 |
| SW000B | Logical channel setting (channel 4) | 1 to 64 | 0: (Logical channel 4) *1 |
| SW000C | Logical channel setting (channel 5) | 1 to 64 | 0: (Logical channel 5) *1 |
| SW000D | Logical channel setting (channel 6) | 1 to 64 | 0: (Logical channel 6) *1 |
| SW000E | Logical channel setting (channel 7) | 1 to 64 | 0: (Logical channel 7) *1 |
| SW000F | Logical channel setting (channel 8) | 1 to 64 | 0: (Logical channel 8) *1 |

*1: The logical channel number is processed as the actual channel number when "0" is set.

(3) Transient transmission instruction that allows logical channel designation

| No. | Instruction | Description | Reference |
|-----|-------------|-------------|-----------------------|
| 1 | SEND | Sends data | Section 7.4.5 (1) (d) |

7.4.5 Programming

This section describes the formats of dedicated instructions available for network modules and program examples.

| |
|--------------|
| POINT |
|--------------|

| |
|--|
| <p>The descriptions in this section are based on the MELSECNET/H specifications. For access to CC-Link IE controller network, refer to the reference manual for the CC-Link IE controller network.</p> |
|--|

To perform the following processing in transient transmission, it is necessary to provide an interlock:

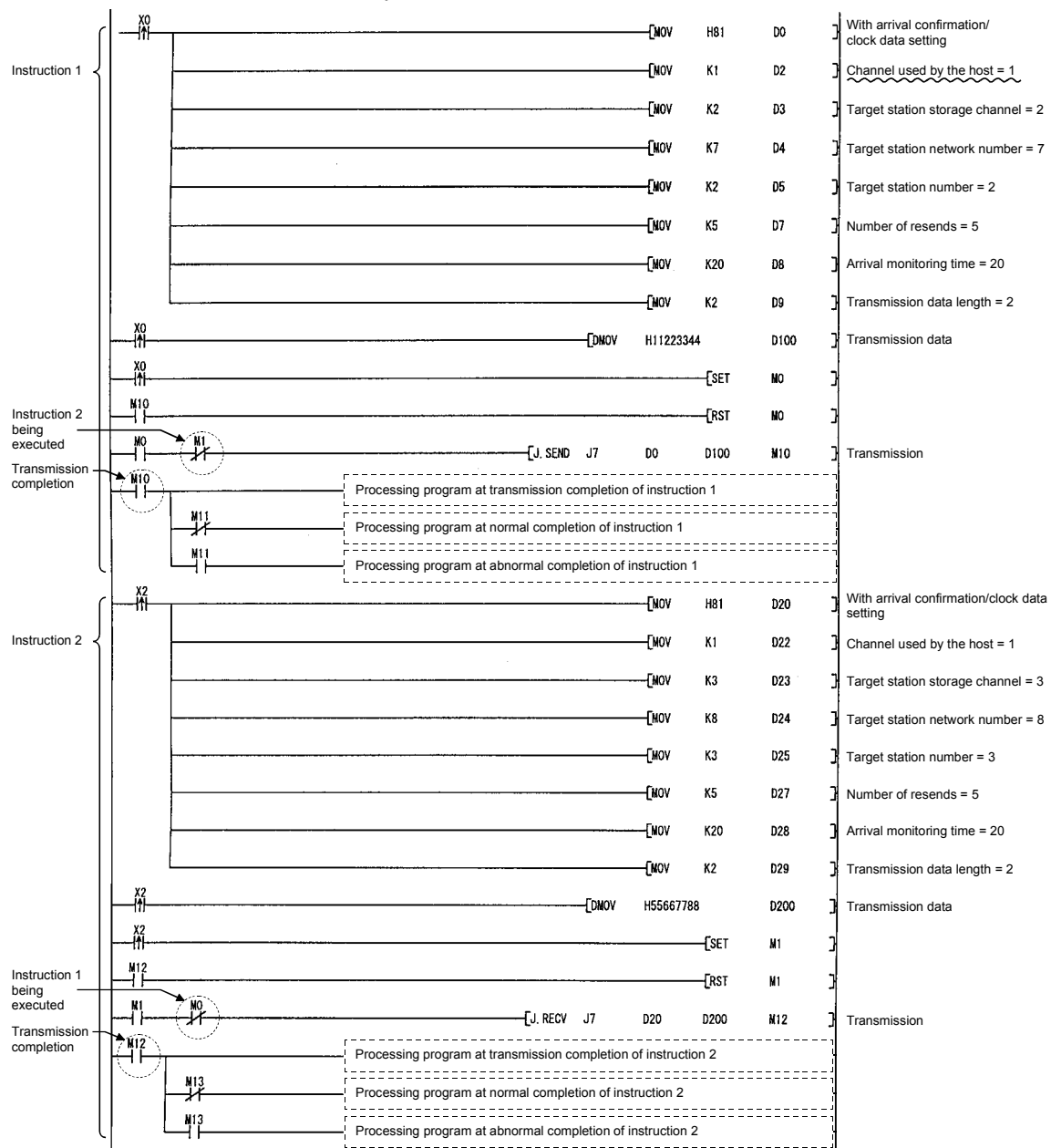
- When using the same channel with multiple instructions (See Example 1.)
- When executing instructions from a redundant system (See Example 2.)

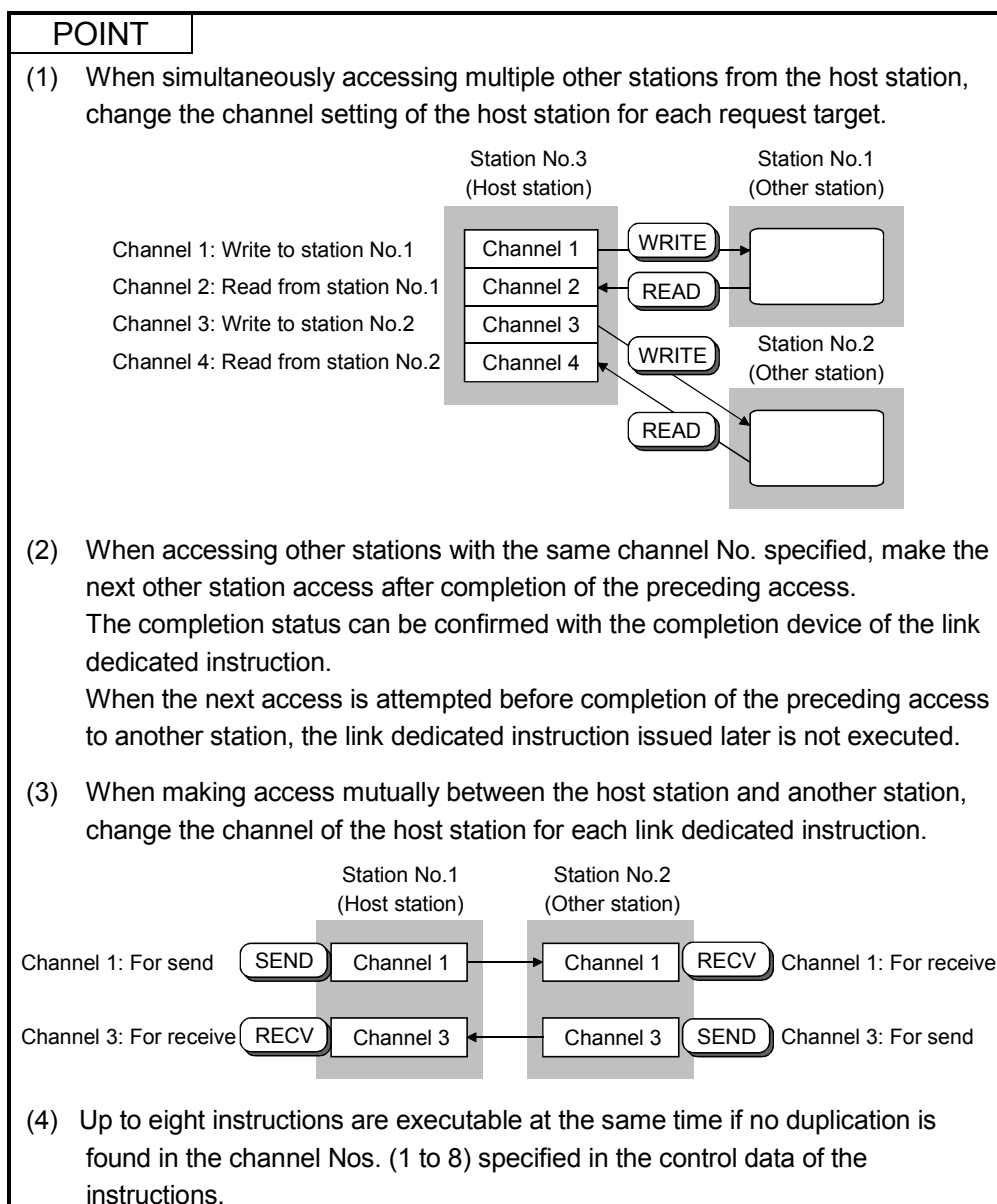
(Example 1) When using the same channel with multiple instructions

One network module has 8 channels for executing instructions.

Although these channels can be used at the same time, the same channel cannot be concurrently used for multiple instructions.

If execution of multiple instructions are attempted at the same time on the same channel, those to be executed later have to wait. For this reason, create a program so that a flag turns on until the previous instruction is completed, as shown below.





REMARKS

Do not use the same channel for link dedicated instructions of both the scan execution program and the interrupt program.

If a channel is being used for a link dedicated instruction of the scan execution program, the channel is not available for another link dedicated instruction of the interrupt program.

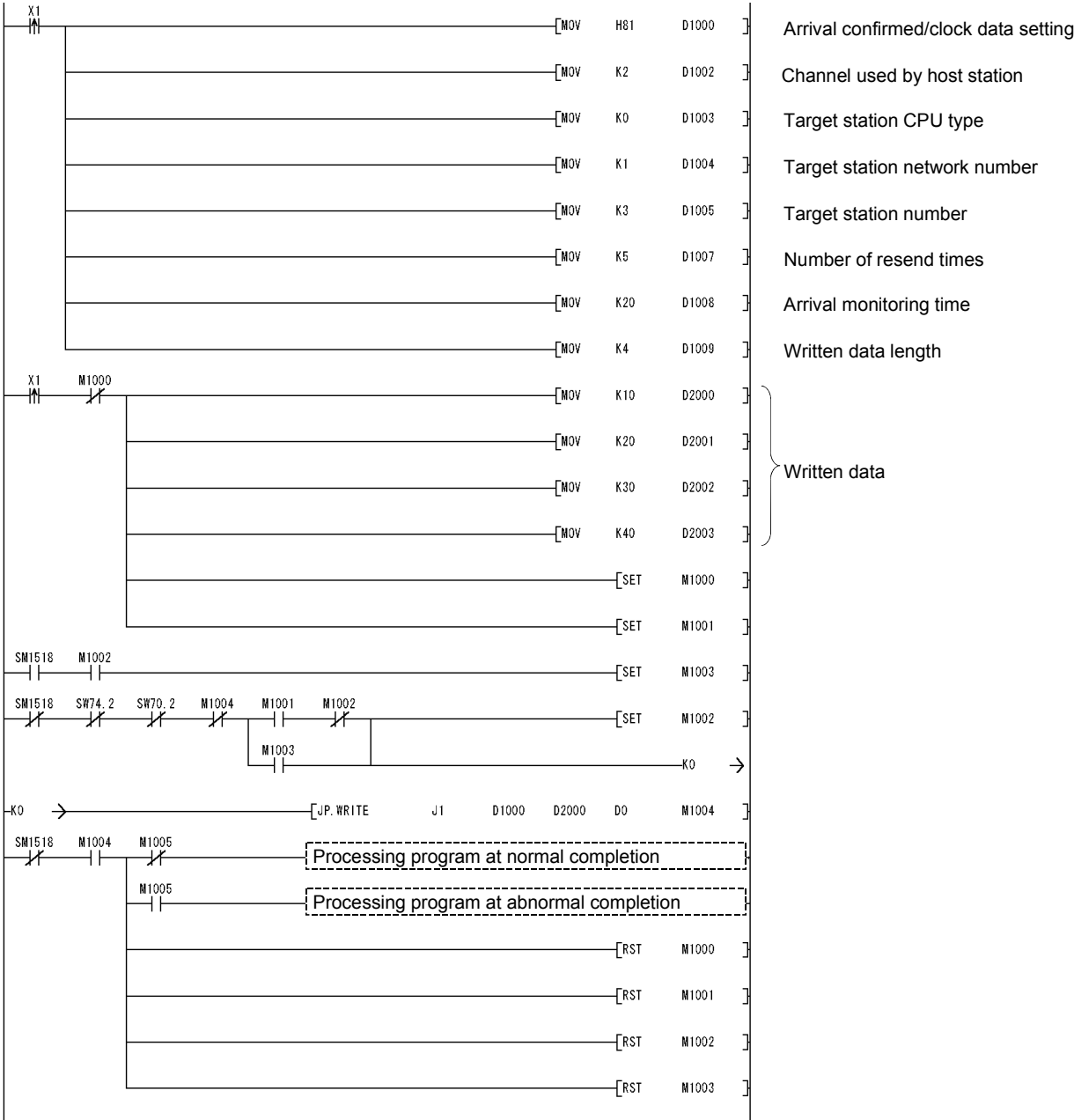
The instruction of the interrupt program is put in the wait status at this time, and will be executed at the next scan timing in this case.

If the link dedicated instruction of the interrupt program precedes that of the scan execution program, however, the latter cannot be executed because the next scan timing does not exist in the interrupt program.

(Example 2) When executing instructions from a redundant system

If system switching occurs in a redundant system during execution of an instruction, the instruction will be discontinued in the redundant CPU of the new control system and will not be completed.

Using SM1518 (one scan ON after system switching) and the complete signal, create a program so that any instruction being executed will be continued by the new control system even if system switching occurs in the redundant system.



7.4.5 (1) Data sending/receiving (JP/GP.SEND, JP/GP.RECV)

| Target station | | |
|----------------|--------|--------|
| QCPU | QnACPU | AnUCPU |
| ○* | ○ | × |

* : For link dedicated instruction for the safety CPU,

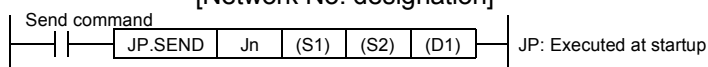
refer to Section 6.3

The following explains the SEND/RECV instruction format and a program example:

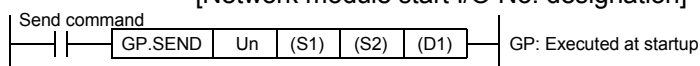
(a) Instruction format

1) JP/GP.SEND

[Network No. designation]



[Network module start I/O No. designation]



| | Description of setting | Setting range |
|------|---|--|
| Jn | Host's network No. | 1 to 239 254: Network number designated with valid module during other station access |
| Un | Start I/O number of the host's network module Designate the higher two digits of the 3-digit I/O number | 0 to FE _H |
| (S1) | Control data storage head device Designate the head device of the host that stores the control data. | Word device * 2 |
| (S2) | Send data storage head device Designate the head device of the host that stores the send data. | Word device * 2 |
| (D1) | Send completion device Designate a device to be turned on for one scan upon send completion (D1) Off : Not completed On : Complete (D1)+1 Off : Normal On : Abnormal | Bit device * 1 Bit designation of word device * 3 |

*1: Bit device

: X, Y, M, L, F, V, and B

*2: Word device

: T, C, D, W, ST, R, and ZR

(The Q00JCPU cannot use R and ZR.)

*3: Bit designation of word device : Word device. bit number

Detailed description of the control data

| Device | Item | Description | Setting side * 1 |
|--------|--|---|------------------|
| (S1) | Execution/abnormal completion type | <div style="text-align: center;"> </div> <p>1) Execution type (bit 0) 0: No arrival confirmation When the target station is on the local network: Completed when data is sent from the host.</p> <div style="text-align: center;"> </div> <p>When the target station is on other network: Completed when the data arrives at the relay station on the network of the local station.</p> <div style="text-align: center;"> </div> <p>1: With arrival confirmation Completed when the data is stored in the target station's designated channel.</p> <div style="text-align: center;"> </div> <p>2) Abnormal completion type (bit 7) Sets the clock data set status at abnormal completion. 0: Does not set clock data : Does not store the clock data at error occurrence in (S1) + 11 to (S1) + 17. 1: Sets clock data : Stores the clock data at error occurrence in (S1) + 11 to (S1) + 17.</p> | User |
| (S1)+1 | Completion status | Stores the status when an instruction is completed. 0 : Normal Other than 0 : Abnormal (Refer to Section 8.3 for error codes) | System |
| (S1)+2 | Channel used by the host | Designates the channel to be used by the host. 1 to 8 (channels) | User |
| (S1)+3 | Target station storage channel (logical channel No.) | Designates the target station's channel to store the data. 1 to 64 (logical channel) | User |
| (S1)+4 | Target station network No. | Designates the network No. of the target station. 1 to 239 : Network No. 254 : Specify this when 254 has been set in Jn. | User |

(Continued to the next page)

* 1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

Detailed description of the control data

| Device | Item | Description | Setting side * 1 | | | | |
|---|---|--|------------------|----------|---|---|--------|
| (S1)+5 | Target station number | Designates the target station number. 1 to 64 : Station number 81 _H to A0 _H : Group designation (Valid when the execution type designated in (S1) is "0: No arrival confirmation.") FF _H : All stations with the target network No. (Valid when the execution type designated in (S1) is "0: No arrival confirmation."); Excluding the host. When a group is designated, set the group No. of the target station with the network parameters from GX Developer. | User | | | | |
| (S1)+ 6 | (Use prohibited) | — | — | | | | |
| (S1)+7 | Number of resends (retry) | 1) At instruction execution Becomes valid when the execution type designated in (S1) is "1: With arrival confirmation." Set the number of resends when the instruction fails to complete within the monitoring time designated by (S1) + 8. 0 to 15 (times) 2) At instruction completion Store the number of resends executed (result). 0 to 15 (times) | User System | | | | |
| (S1)+8 | Arrival monitoring time | Becomes valid when the execution type designated in (S1) is "1: With arrival confirmation." Set the monitoring time until the instruction completion. When the instruction fails to complete within the monitoring time, it is resent for the number of resends designated in (S1) + 7. 0 : 10 s 1 to 32767 : 1 to 32767 s | User | | | | |
| (S1)+9 | Resend data length | Designates the length of data to be sent in (S2) to (S2) + n. (Refer to Section 2.2.1.) 1 to 960 (words) | User | | | | |
| (S1)+10 | (Use prohibited) | — | — | | | | |
| (S1)+11 | Clock set flag | Stores the valid/invalid status of the clock data in (S1) + 12 to (S1) + 17. 0: Invalid 1: Valid | System | | | | |
| (S1)+12 | Month/year (lower two digits) of abnormal completion | Month and year (the lower two digits of the 4-digit year) are stored as BCD codes. <table><tr><td>b15 to b8</td><td>b7 to b0</td></tr><tr><td>Month (01_H to 12_H)</td><td>Year (00_H to 99_H)</td></tr></table> | b15 to b8 | b7 to b0 | Month (01 _H to 12 _H) | Year (00 _H to 99 _H) | System |
| b15 to b8 | b7 to b0 | | | | | | |
| Month (01 _H to 12 _H) | Year (00 _H to 99 _H) | | | | | | |
| (S1)+13 | Hour/date of abnormal completion | Hour and date are stored as BCD codes. <table><tr><td>b15 to b8</td><td>b7 to b0</td></tr><tr><td>Hour (00_H to 23_H)</td><td>Date (01_H to 31_H)</td></tr></table> | b15 to b8 | b7 to b0 | Hour (00 _H to 23 _H) | Date (01 _H to 31 _H) | System |
| b15 to b8 | b7 to b0 | | | | | | |
| Hour (00 _H to 23 _H) | Date (01 _H to 31 _H) | | | | | | |
| (S1)+14 | Second/minute of abnormal completion | Second and minute are stored as BCD codes. <table><tr><td>b15 to b8</td><td>b7 to b0</td></tr><tr><td>Second (00_H to 59_H)</td><td>Minute (00_H to 59_H)</td></tr></table> | b15 to b8 | b7 to b0 | Second (00 _H to 59 _H) | Minute (00 _H to 59 _H) | System |
| b15 to b8 | b7 to b0 | | | | | | |
| Second (00 _H to 59 _H) | Minute (00 _H to 59 _H) | | | | | | |
| (S1)+15 | Year (higher two digits)/day of the week of abnormal completion | Year (the higher two digits of the 4-digit year) and day of the week are stored as BCD codes. <table><tr><td>b15 to b8</td><td>b7 to b0</td></tr><tr><td>Year (00_H to 99_H) *2</td><td>Day of the week (00_H to 06_H)</td></tr></table> 00 _H (Sunday) to 06 _H (Saturday) | b15 to b8 | b7 to b0 | Year (00 _H to 99 _H) *2 | Day of the week (00 _H to 06 _H) | System |
| b15 to b8 | b7 to b0 | | | | | | |
| Year (00 _H to 99 _H) *2 | Day of the week (00 _H to 06 _H) | | | | | | |
| (S1)+16 | Abnormal detection network No. | Stores the network No. of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 239 (network No.) | System | | | | |
| (S1)+17 | Abnormal detection station number | Stores the station number of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 64 (station number) | System | | | | |

*1: The setting side is as shown below.

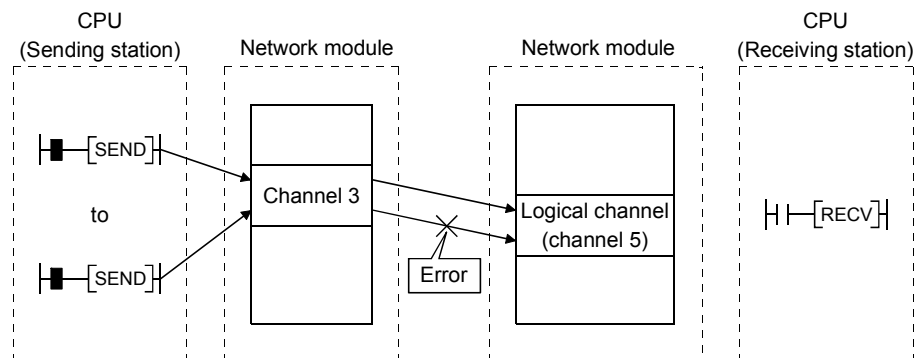
User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

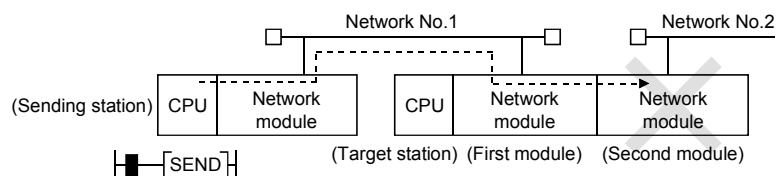
*2: [00_H] will be stored in the [Year] field (higher two digits) when the CPU targeted by link dedicated instructions is a QnACPU. (Clock data will not be stored when errors have been completed in the case of the ACPU.)

POINT

- (1) In order to improve the reliability of data, it is recommended to execute instructions by setting the execution type to "With arrival confirmation."
- (2) If the communication itself is normally completed when the execution type is set to "No arrival confirmation," the sending is considered as being normally completed by the sending station even if the contents of the send data are abnormal.
In addition, even if the contents of the send data are normal, when an instruction is executed to the same station from multiple stations, a "No free area in the receive buffer error (F222H)" may occur in the target station but the sending station completes normally.
- (3) When sending data to the same channel of the receiving station, execute the sending after the receiving station reads data using the RECV instruction.
If the sending station sends data to the same channel of the receiving station before the receiving station reads data using the RECV instruction, an error will occur.

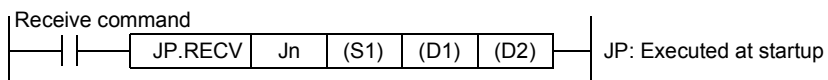


- (4) As the target station of data sending, specify the network number and station number of the network module or Ethernet module that will receive a request from the sending station.
*: In the following diagram, specify the network number and station number of the first network module.
You cannot execute the SEND instruction after specifying any module other than the network module or Ethernet module that will receive a request from the sending station.
*: In the following diagram, you cannot execute the SEND instruction after specifying the network number and station number of the second network module.

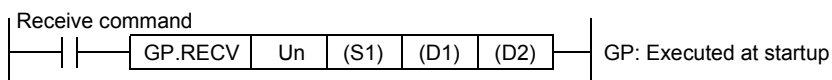


2) JP/GP.RECV

[Network No. designation]



[Network module start I/O No. designation]



| | Description of setting | Setting range |
|------|---|---|
| Jn | Host's network No. | 1 to 239 254: Network number designated by valid module during other station access. |
| Un | Start I/O number of the host's network module Designate the higher two digits of the 3-digit I/O number. | 0 to FE _H |
| (S1) | Control data storage head device Designate the head device of the host that stores the control data. | Word device * 2 |
| (D1) | Receive data storage head device Designate the head device of the host, from which the receive data are stored. | Word device * 2 |
| (D2) | Receive completion device Designate a device to be turned on for one scan upon receive completion. (D2) Off : Not completed On : Complete (D2)+1 Off : Normal On : Error | Bit device * 1 Bit designation of word device * 3 |

*1: Bit device

: X, Y, M, L, F, V, and B

*2: Word device

: T, C, D, W, ST, R, and ZR

(The Q00JCPU cannot use R and ZR.)

*3: Bit designation of word device : Word device. bit number

Detailed description of the control data

| Device | Item | Description | Setting side * 1 |
|---------|--|--|------------------|
| (S1) | Abnormal completion type | <div><div><div>b15to b8 b7 b6to b0</div><div>0to01)0to0</div></div><p>1) Abnormal completion type (bit 7) Sets the clock data set status at abnormal completion. 0: Does not set clock data : Does not store the clock data at error occurrence in (S1) + 11 to (S1) + 17. 1: Sets clock data : Stores the clock data at error occurrence in (S1) + 11 to (S1) + 17.</p></div> | User |
| (S1)+1 | Completion status | Stores the status when an instruction is completed. 0 : Normal Other than 0 : Abnormal (Refer to Section 8.3 for error codes) | System |
| (S1)+2 | Host storage channel | Specify the channel of the host station, where receive data are stored. 1 to 8 (channels) | User |
| (S1)+3 | Channel used by the sending station | Stores the channel used by the sending station. 1 to 8 (channels) | System |
| (S1)+4 | Sending station network No. | Stores the sending station's network No.. 1 to 239: Network No. | System |
| (S1)+5 | Sending station number | Stores the station number of the sending station. 1 to 64 : Station number | System |
| (S1)+6 | (Use prohibited) | — | — |
| (S1)+7 | (Use prohibited) | — | — |
| (S1)+8 | Arrival monitoring time | Sets the monitoring time until the instruction completion. When the instruction fails to complete within the monitoring time, it is abnormally completed. 0 : 10 s 1 to 32767 : 1 to 32767 s | User |
| (S1)+9 | Receive data length | Stores the word count of the receive data stored in (D1) to (D1) + n. 1 to 960 (words) | System |
| (S1)+10 | (Use prohibited) | — | — |
| (S1)+11 | Clock set flag | Stores the valid/invalid status of the clock data in ((S1) + 12 to (S1) + 17). 0: Invalid 1: Valid | System |
| (S1)+12 | Month/year (lower two digits) of abnormal completion | Month and year (the lower two digits of the 4-digit year) are stored as BCD codes. <div><div>b15to b8 b7to b0</div><div>Month (01_H to 12_H)Year (00_H to 99_H)</div></div> | System |
| (S1)+13 | Hour/date of abnormal completion | Hour and date are stored as BCD codes. <div><div>b15to b8 b7to b0</div><div>Hour (00_H to 23_H)Date (01_H to 31_H)</div></div> | System |
| (S1)+14 | Second/minute of abnormal completion | Second and minute are stored as BCD codes. <div><div>b15to b8 b7to b0</div><div>Second (00_H to 59_H)Minute (00_H to 59_H)</div></div> | System |

(Continued to the next page)

*1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

Detailed description of the control data

| Device | Item | Description | Setting side * 1 |
|---------|---|---|------------------|
| (S1)+15 | Year (higher two digits)/day of the week of abnormal completion | Year (the higher two digits of the 4-digit year) and day of the week are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;"> b15 to b8 Year (00_H to 99_H) </div> <div style="border: 1px solid black; padding: 2px;"> b7 to b0 Day of the week (00_H to 06_H) </div> </div> 00 _H (Sunday) to 06 _H (Saturday) | System |
| (S1)+16 | Abnormal detection network No. | Stores the network No. of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 239 (network No.) | System |
| (S1)+17 | Abnormal detection station number | Stores the station number of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 64 (station number) | System |

*1: The setting side is as shown below.

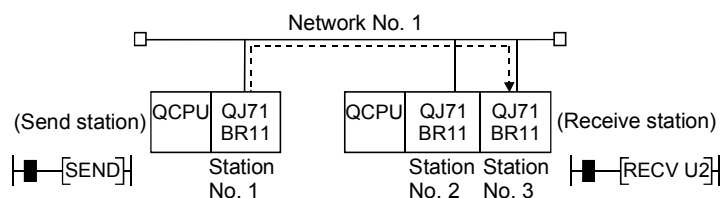
User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

POINT

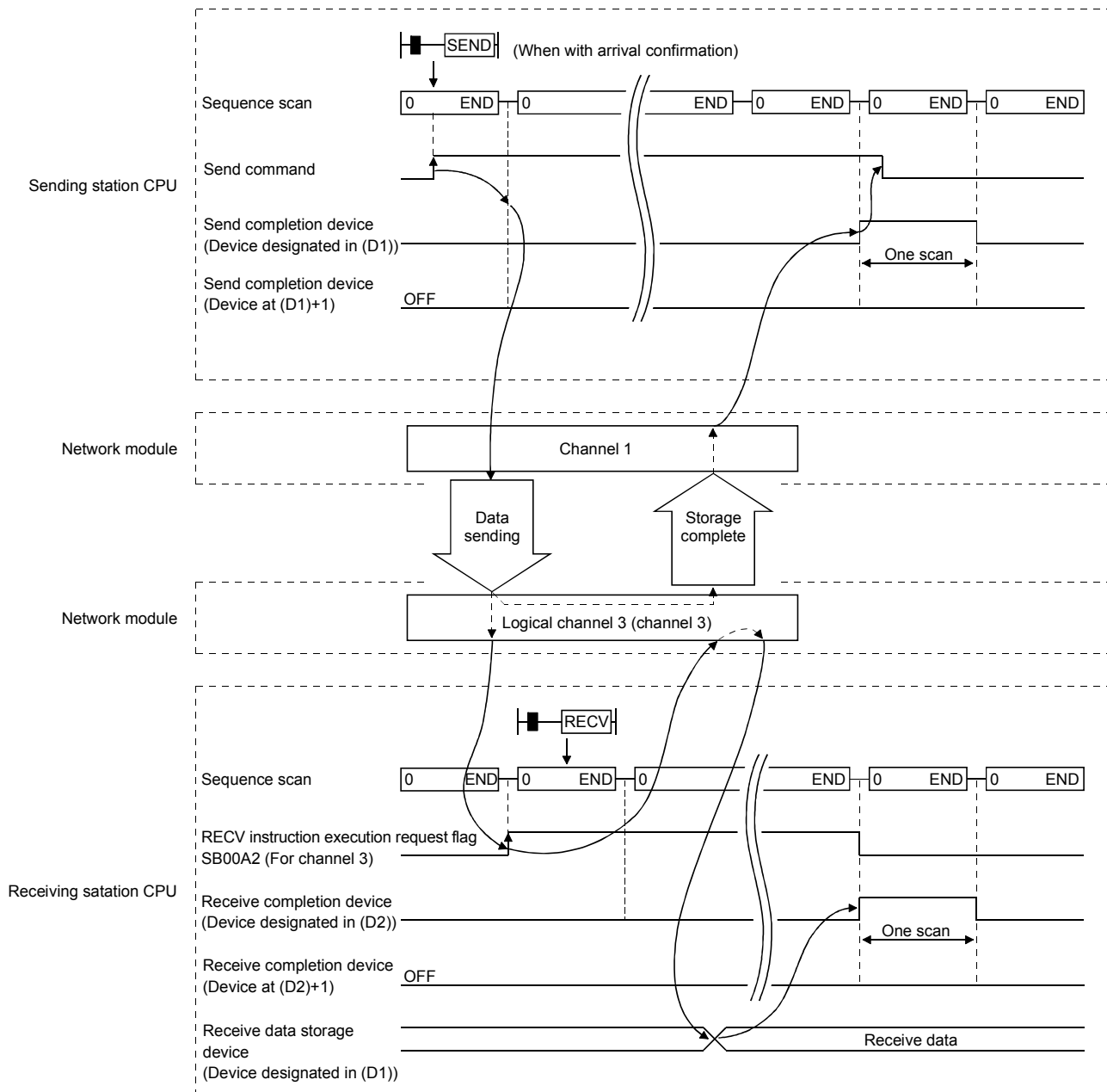
- (1) When the network modules on the same network are installed at the receive station, execute RECV instruction by specifying Un of the network module which stores the data sent by SEND instruction.
Specifying Jn does not execute RECV instruction.

(Example) Specify "U2" when executing the RECV instruction at station No. 3 in response to the SEND instruction from station No. 1.

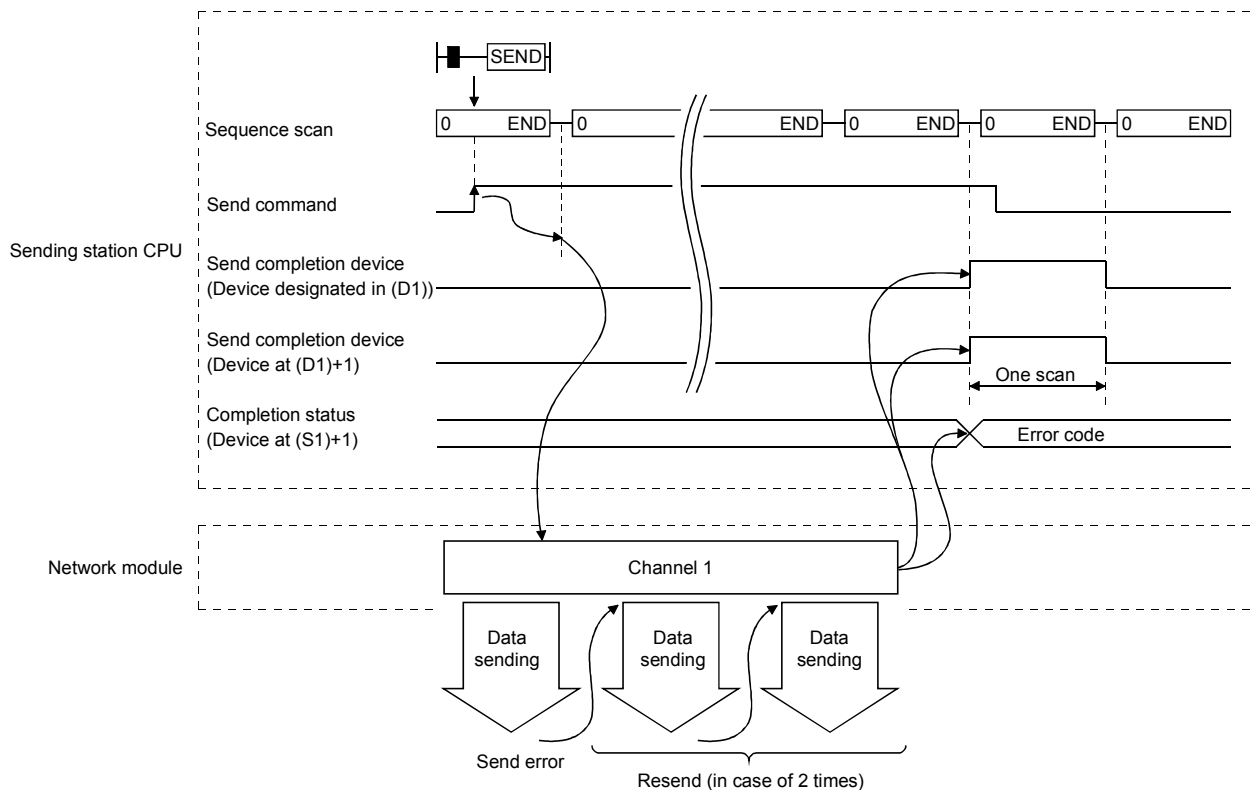


(b) Instruction execution timing

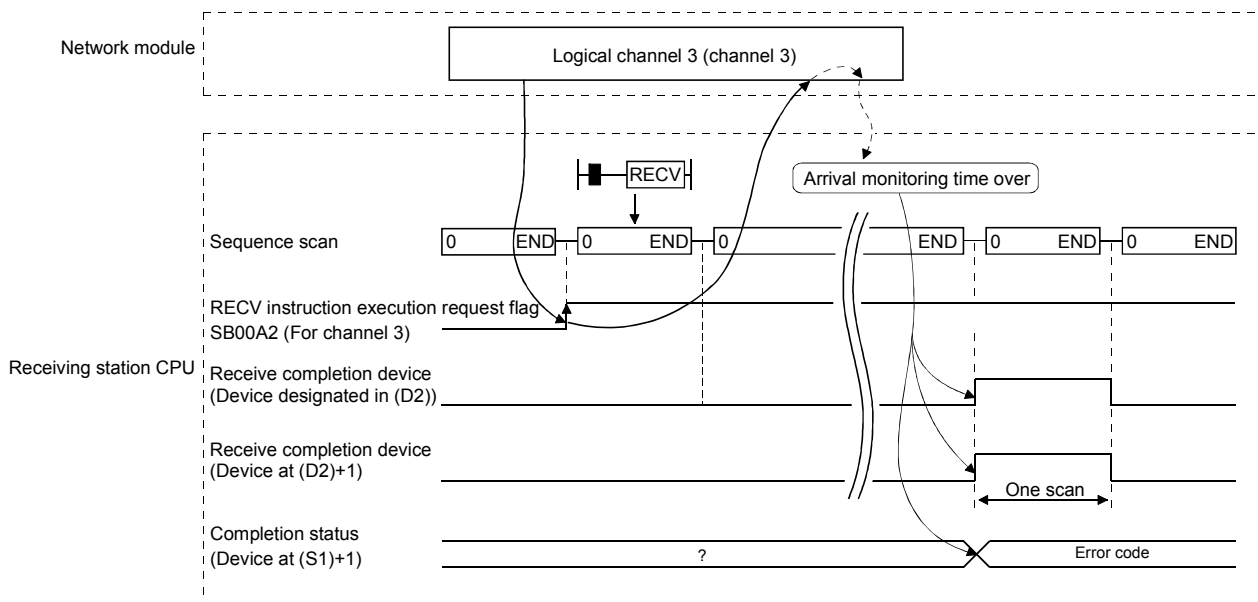
1) Normal completion



2) Abnormal completion [In case of the SEND instruction]



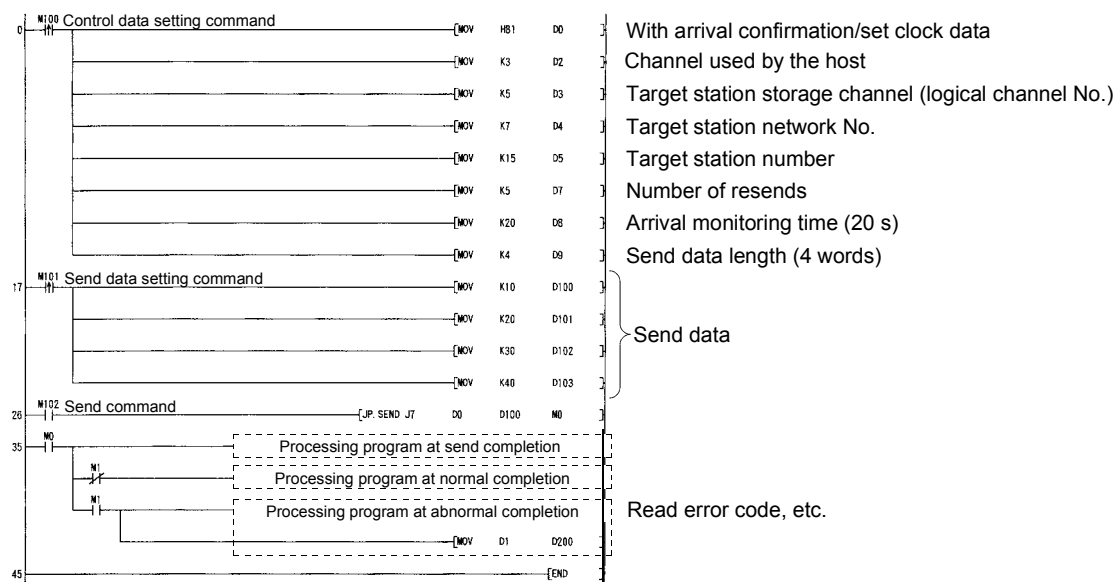
[In case of the RECV instruction]



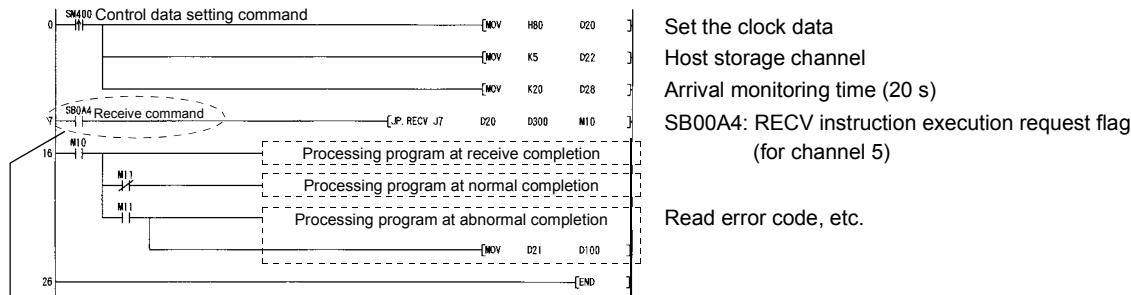
- Station number 3 uses channel 3 and sends data to the target station of station number 15's storage channel 5 (logical channel 5) using the SEND instruction.

The diagram illustrates a network topology for Network No. 7. It consists of four main components: a CPU on the left, a Network module (station No. 3), a Network module (station No. 15), and a CPU on the right. The Network module (station No. 3) contains eight channels, with Channel 3 highlighted. The Network module (station No. 15) contains eight logical channels, with Logical channel 5 (channel 5) highlighted. A connection is shown between Channel 3 of station No. 3 and Logical channel 5 of station No. 15. The CPU on the left is connected to station No. 3 via a SEND signal, and the CPU on the right is connected to station No. 15 via a RECV signal. The entire network is labeled Network No. 7.

- When actually using the following program, interlock the program by referring to Section 6.1.



- 2) Program for station number 15 (RECV instruction)
When actually using the following program, interlock the program by seeing to Section 6.1.



When data is stored in the receiving station's channel, the link special relay (SB00A0 to 00A7) corresponding to each channel turns on.
By using this signal for the receive command, data can be read automatically.
The signal turns off when the RECV instruction completes.

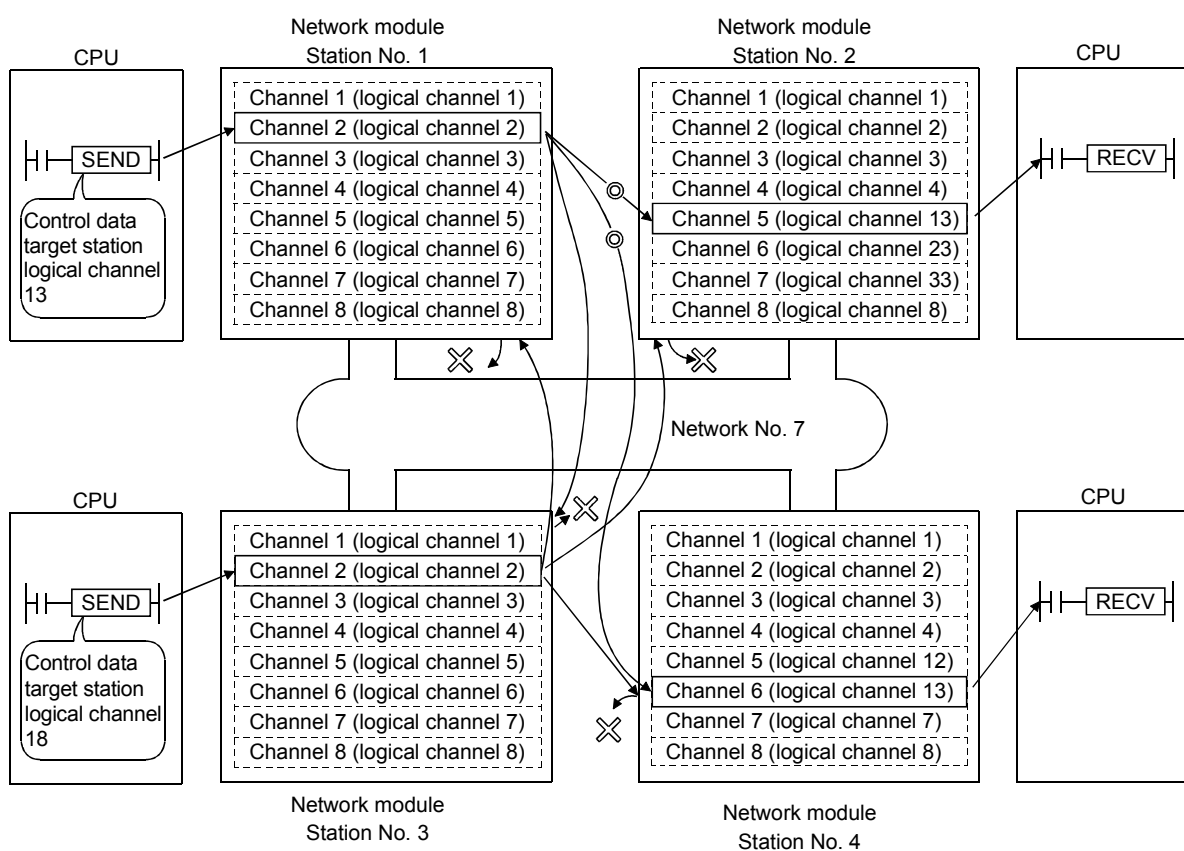
| Network module | | |
|----------------|-------------------------------|----------------------------------|
| | RECV receive instruction flag | Logical channel setting register |
| Channel 1 | SB00A0 | SW0008 |
| Channel 2 | SB00A1 | SW0009 |
| Channel 3 | SB00A2 | SW000A |
| Channel 4 | SB00A3 | SW000B |
| Channel 5 | SB00A4 | SW000C |
| Channel 6 | SB00A5 | SW000D |
| Channel 7 | SB00A6 | SW000E |
| Channel 8 | SB00A7 | SW000F |

(d) Program example 2 (logical channel numbers are used)

Station number 1 uses channel 2 and sends message data to the target station storage channel number 13 (logical channel 13) using the SEND instruction.

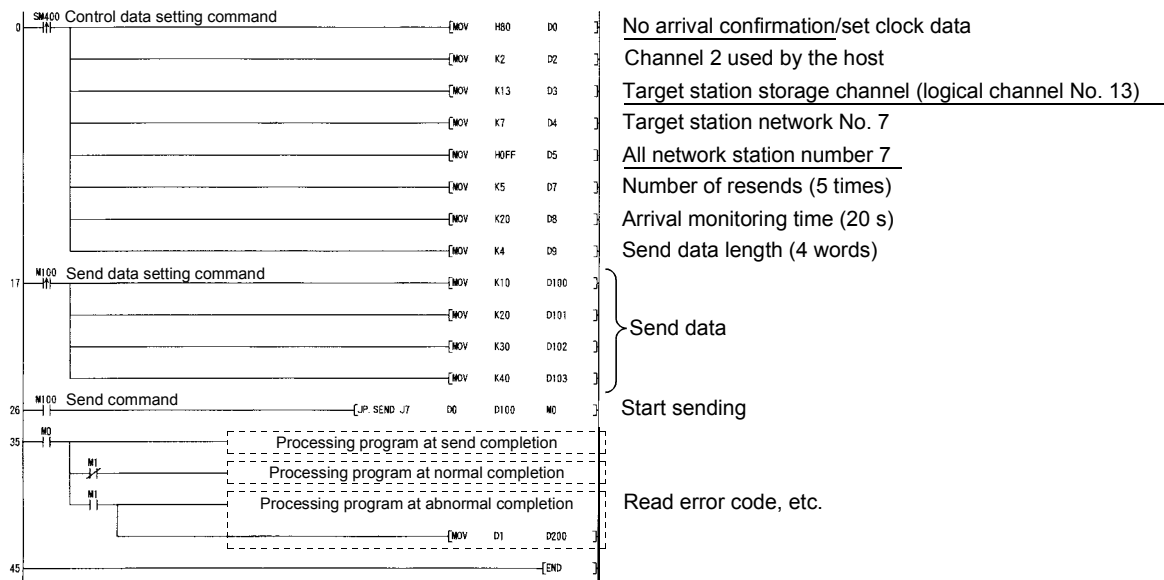
Station number 2 executes the RECV instruction and reads the received data from channel 5 (logical channel 13). At the same time, station number 4 executes the RECV instruction and reads the received data from channel 6 (logical channel 13).

Station number 3 uses channel 2 and sends the message data to the target station storage channel 18 (logical channel 18) using the SEND instruction, but it is not received because there is no matching logical channel number.

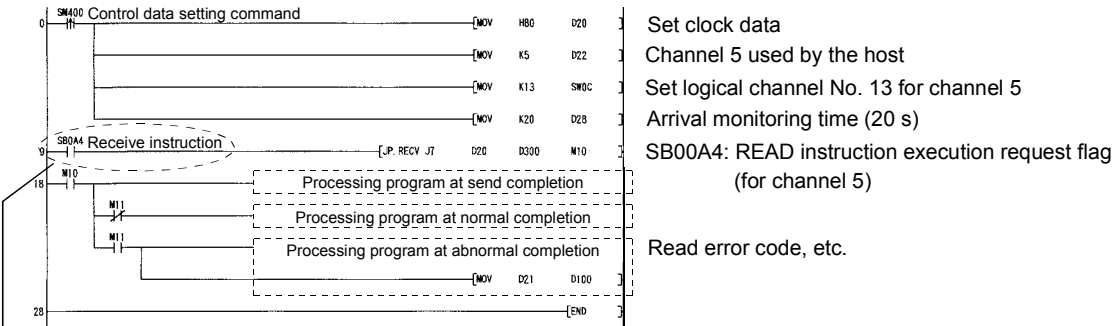


1) Program for station number 1 (SEND instruction)

When using the following program, interlock the program by seeing Section 6.1.



- 2) Program for receiving station (station number 2) (RECV instruction)
When using the following program, interlock the program by seeing Section 6.1.



When the data is stored in the receiving station's channel, the link special relay (SB00A0 to 00A7) corresponding to each channel turns on.
By using this signal for the receive command, data can be read automatically.
The signal turns off when the RECV instruction is completed.

Network module

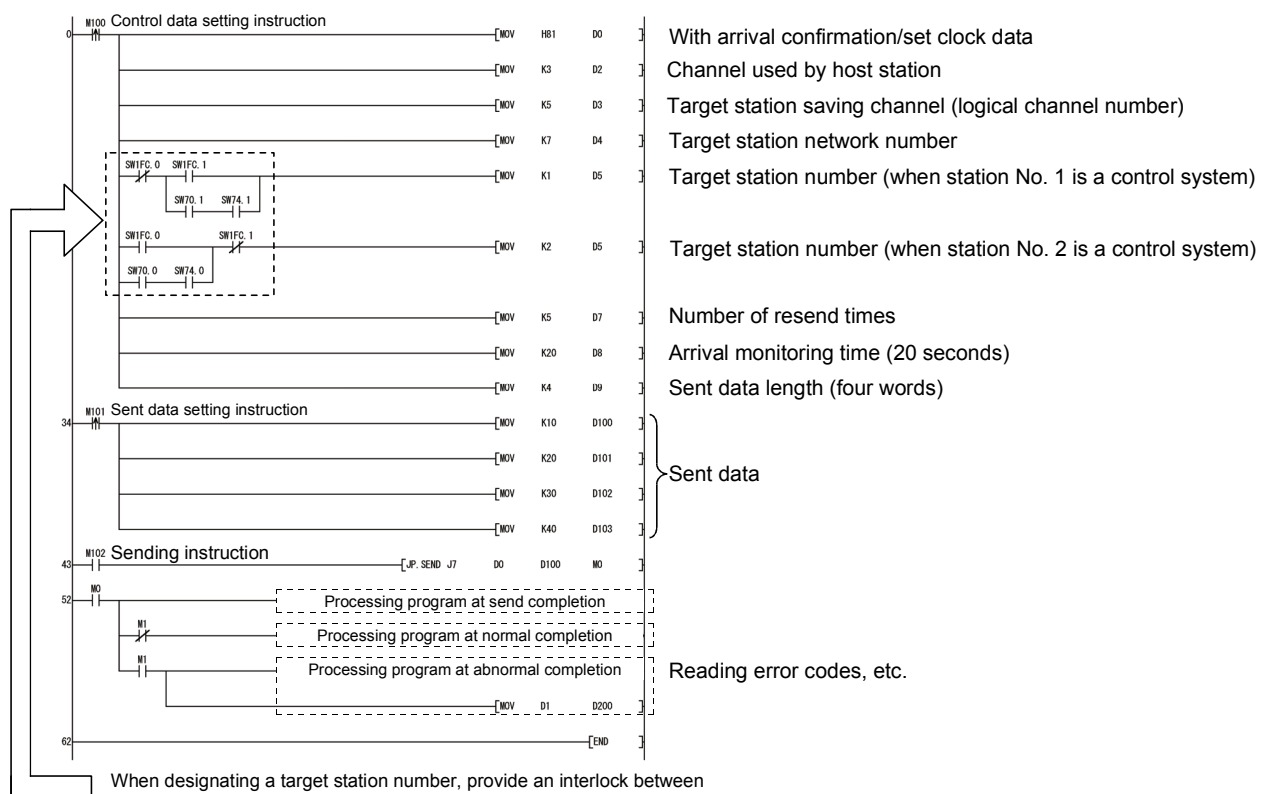
| | RECV receive instruction flag | Logical channel setting register |
|-----------|-------------------------------|----------------------------------|
| Channel 1 | SB00A0 | SW0008 |
| Channel 2 | SB00A1 | SW0009 |
| Channel 3 | SB00A2 | SW000A |
| Channel 4 | SB00A3 | SW000B |
| Channel 5 | SB00A4 | SW000C |
| Channel 6 | SB00A5 | SW000D |
| Channel 7 | SB00A6 | SW000E |
| Channel 8 | SB00A7 | SW000F |

- (e) Program example 3 (when designating a target station to execute an instruction to the redundant system)

When the target station is in a redundant system, the SEND instruction must be executed after judging whether it is a control system.

If the target station is on the standby system, the RECV instruction is not executed and the target station saving channel is not available.

The program example shown below is an interlock example for sending data from station number 3 of network number 7 to the control system of the redundant system made up of station numbers 1 and 2 of the same network.



| POINT | |
|-------|---|
| | <p>When the SEND instruction is executed to the redundant system, the processing of the RECV instruction and interrupt program (RECVS instruction) depends on the following conditions:</p> <p>(1) When the SEND instruction is executed to the control system and the system is switched before execution of the RECV instruction and the interrupt program</p> <p>If the control system is switched to the standby system before execution of the RECV instruction and the interrupt program, the control system retains the instruction execution request flags (SB00A0 to SB00A7) for the RECV instruction and the interrupt factor (interrupt pointer) of the interrupt program. If the standby system is returned to the control system due to system switching, the RECV instruction and the interrupt program will be executed according to the retained instruction execution request flags and interrupt factor.</p> <p>(2) When the SEND instruction is executed to the standby system</p> <p>When standby system receives data from the sending station, it retains the instruction execution request flags (SB00A0 to SB00A7) for the RECV instruction and the interrupt factor (interrupt pointer) of the interrupt program. If the standby system is switched to the control system, the RECV instruction and the interrupt program will be executed according to the retained instruction execution request flags and interrupt factor.</p> |

7.4.5 (2) Reading from/writing to word devices of other stations (JP/GP.READ, JP/GP.SREAD, JP/GP.WRITE, JP/GP.SWRITE)

| Target station | | |
|----------------|--------|--------|
| QCPU | QnACPU | AnUCPU |
| ○* | ○ | × |

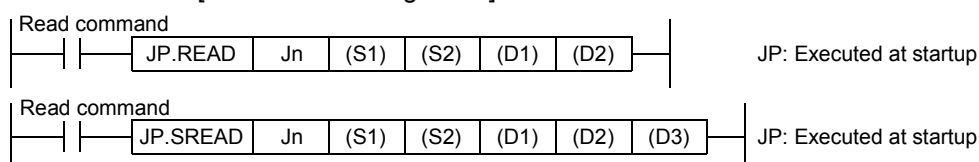
* : For link dedicated instruction for the safety CPU, refer to Section 6.3

The following explains the READ/WRITE instruction format and some program examples.

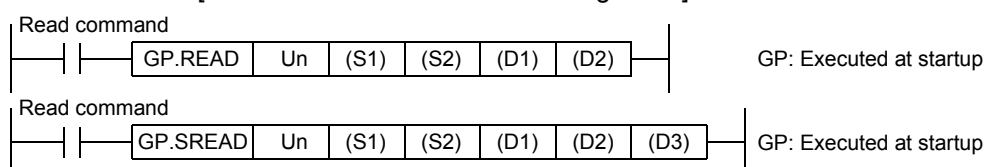
(a) Instruction format

1) JP/GP.READ and JP/GP.SREAD

[Network No. designation]

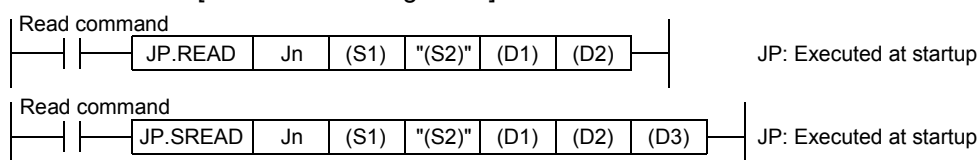


[Network module start I/O No. designation]

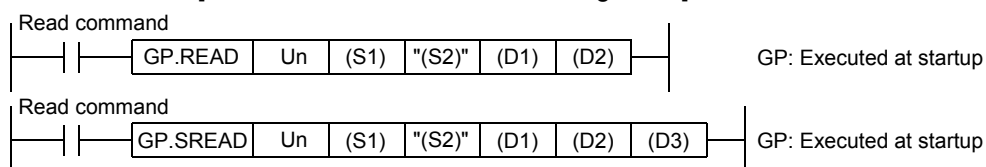


The following formats can be used only when the host is the Universal model QCPU.

[Network No. designation]



[Network module start I/O No. designation]



| | Description of setting | Setting range |
|------|--|---|
| Jn | Host's network No. | 1 to 239 254: Network designated by valid module during other station access |
| Un | Start I/O number of the host's network module Designate the higher two digits of the 3-digit I/O number. | 0 to FE _H |
| (S1) | Control data storage head device Designate the head device of the host that stores the control data. | Word device * 2 |
| (S2) | Read data storage head device (target station) Designate the head device of the target station that stores the data to be read. | Word device * 3 |
| (D1) | Read data storage head device (host) Designate the head device of the host that stores the data to be read. | Word device * 2 |
| (D2) | Read completion device (host) Designate the host's device to be turned on for one scan upon read completion. (D2) Off : Not completed On : Complete (D2)+1 Off : Normal On : Error | Bit device * 1 Bit designation of word device * 4 |
| (D3) | Read notification device (target station) Designate the target station's device to be turned on for one scan upon completion of the reading. (It can verify that the data in the target station has been read from other station.) (D3) Off : Not completed On : Complete | Bit device * 1 Bit designation of word device * 4 |

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

*2: Word device : T, C, D, W, ST, R, and ZR
(The Q00JCPU and QS001CPU cannot use R and ZR.)

*3: Word device : T, C, D, W, ST, SD, SW, R, and ZR
(The Q00JCPU and QS001CPU cannot use R and ZR.)

*4: Bit designation of word device : Word device. bit number

Detailed description of the control data

| Device | Item | Description | Setting side * 1 | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|---|---|------------------|-------------|-------------------|---|-----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--|------|
| (S1) | Abnormal completion type | <div><div><div>b15</div><div>to</div><div>b7</div><div>to</div><div>b0</div></div><div><div>0</div><div>1)</div><div>0</div><div>1</div></div></div> <div>1) Abnormal completion type (bit 7) Sets the clock data set status at abnormal completion. 0: Does not set clock data : Does not store the clock data at error occurrence in (S1) + 11 to (S1) + 17. 1: Sets clock data : Stores the clock data at error occurrence in (S1) + 11 to (S1) + 17.</div> | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+1 | Completion status | Stores the status when an instruction is completed. 0 : Normal Other than 0 : Abnormal (Refer to Section 8.3 for error codes) | System | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+2 | Channel used by the host | Designates the channel to be used by the host. 1 to 8 (channels) | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+3 | Target station CPU type | Designate the CPU type of the target station. <table><tr><th>Set value</th><th>Description</th></tr><tr><td>0000_H</td><td>Target station CPU/control CPU/host system CPU (The designation is the same as "03FF_H."</td></tr><tr><td>03D0_H * 2</td><td>Control system CPU * 3</td></tr><tr><td>03D1_H * 2</td><td>Standby system CPU * 3</td></tr><tr><td>03D2_H * 2</td><td>System A CPU</td></tr><tr><td>03D3_H * 2</td><td>System B CPU</td></tr><tr><td>03E0_H * 4</td><td>Multiple CPU No. 1 or target station CPU (in single CPU system)</td></tr><tr><td>03E1_H * 4</td><td>Multiple CPU No. 2</td></tr><tr><td>03E2_H * 4</td><td>Multiple CPU No. 3</td></tr><tr><td>03E3_H * 4</td><td>Multiple CPU No. 4</td></tr><tr><td>03FF_H * 2</td><td>Target station CPU/control CPU/host system CPU</td></tr></table> | Set value | Description | 0000 _H | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H ." | 03D0 _H * 2 | Control system CPU * 3 | 03D1 _H * 2 | Standby system CPU * 3 | 03D2 _H * 2 | System A CPU | 03D3 _H * 2 | System B CPU | 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | 03E1 _H * 4 | Multiple CPU No. 2 | 03E2 _H * 4 | Multiple CPU No. 3 | 03E3 _H * 4 | Multiple CPU No. 4 | 03FF _H * 2 | Target station CPU/control CPU/host system CPU | User |
| Set value | Description | | | | | | | | | | | | | | | | | | | | | | | | |
| 0000 _H | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H ." | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D0 _H * 2 | Control system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D1 _H * 2 | Standby system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D2 _H * 2 | System A CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D3 _H * 2 | System B CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E1 _H * 4 | Multiple CPU No. 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E2 _H * 4 | Multiple CPU No. 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E3 _H * 4 | Multiple CPU No. 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03FF _H * 2 | Target station CPU/control CPU/host system CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+4 | Target network No. | Designates the network No. of the target station. 1 to 239 : Network No. 254 : Specify this when 254 has been set in Jn. | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+5 | Target station number | Designates the target station number. 1 to 64: Station number | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+6 | (Use prohibited) | — | — | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+7 | Number of resends | 1) At instruction execution Sets the number of resends when the instruction fails to complete within the monitoring time designated by (S1) + 8. 0 to 15 (times) 2) At instruction completion Stores the number of resends executed (result). 0 to 15 (times) | User System | | | | | | | | | | | | | | | | | | | | | | |

(Continued to the next page)

*1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

*2: The CPU type can be specified when the host station is a network module of function version D or later.

(The specification is not available when they are other than the above. Access is made to the target station CPU.)

*3: If system switching occurs at the target system when the READ or SREAD instruction is executed to the redundant system with the control or standby system CPU designated, the instruction may not be normally completed (error code: 4244_H, 4248_H).

If the above-mentioned error occurs and the READ or SREAD instruction is not normally completed, retry to execute the instruction.

*4: The CPU type can be specified when the QCPUs and network modules of the host station or target station are the following versions.

(The specification is not available when they are other than the following. Access is made to the target station CPU.)

• Network module: First 5 digits of serial No. is "06092" or later

• QCPU: First 5 digits of serial No. is "06092" or later

Detailed description of the control data

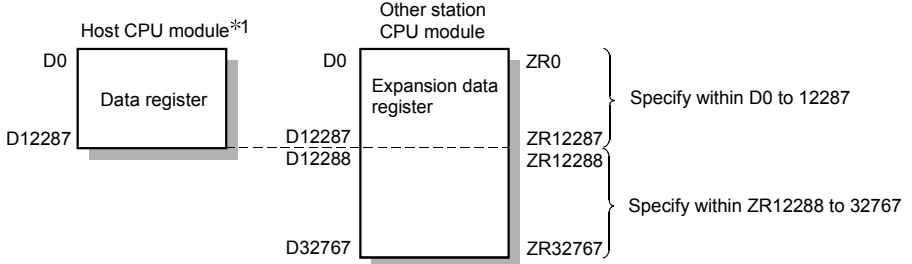
| Device | Item | Description | Setting side * 1 |
|---------|---|---|------------------|
| (S1)+8 | Arrival monitoring time | Set the monitoring time until completion of an instruction. When the instruction fails to complete within the monitoring time, it is resent for the number of resends designated in (S1) + 7. 0 : 10 s 1 to 32767 : 1 to 32767 s | User |
| (S1)+9 | Read data length | Designates the length of data to be read. (Refer to Section 2.2.1) 1 to 960 (words) | User |
| (S1)+10 | (Use prohibited) | — | — |
| (S1)+11 | Clock set flag | Stores the valid/invalid status of the clock data in (S1) + 12 to (S1) + 17. 0: Invalid 1: Valid | System |
| (S1)+12 | Month/year (lower two digits) of abnormal completion | Month and year (the lower two digits of the 4-digit year) are stored as BCD codes. b15 to b8 b7 to b0 Month (01 _H to 12 _H) Year (00 _H to 99 _H) | System |
| (S1)+13 | Hour/date of abnormal completion | Hour and date are stored as BCD codes. b15 to b8 b7 to b0 Hour (00 _H to 23 _H) Date (01 _H to 31 _H) | System |
| (S1)+14 | Second/minute of abnormal completion | Second and minute are stored as BCD codes. b15 to b8 b7 to b0 Second (00 _H to 59 _H) Minute (00 _H to 59 _H) | System |
| (S1)+15 | Year (higher two digits)/day of the week of abnormal completion | Year (the higher two digits of the 4-digit year) and day of the week are stored as BCD codes. b15 to b8 b7 to b0 Year (00 _H to 99 _H) *5 Day of the week (00 _H to 06 _H) 00 _H (Sunday) to 06 _H (Saturday) | System |
| (S1)+16 | Abnormal detection network No. | Stores the network No. of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 239 (network No.) | System |
| (S1)+17 | Abnormal detection station number | Stores the station number of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 64 (station No.) | System |

* 1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

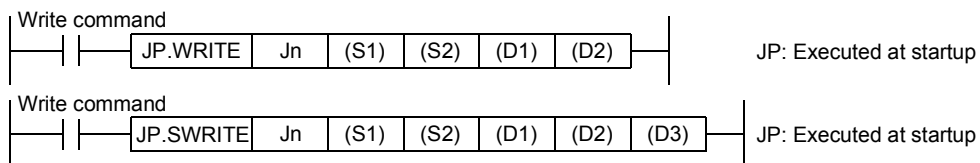
System: The programmable controller CPU stores the execution result of the link dedicated instruction.

*5: [00_H] will be stored in the [Year] field (higher two digits) when the CPU targeted by link dedicated instructions is a QnACPU. (Clock data will not be stored when errors have been completed in the case of the ACPU.)

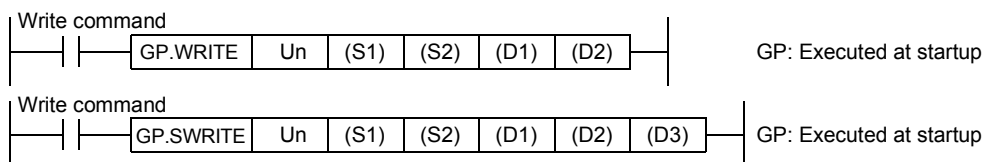
| POINT | |
|-------|--|
| (1) | When the target station of the SREAD instruction is the Basic model QCPU or safety CPU, the read notification device for the target station set in the argument (D3) is ignored. The operation of the SREAD instruction is the same as that of the READ instruction. |
| (2) | The SREAD instruction can be programmed without the argument (D3). However, its operation is the same as that of the READ instruction. You can either use the SREAD instruction with or without (D3). |
| (3) | Specify the device of the other station CPU module to be read with the READ/SREAD instruction within the range available for the host CPU module. (Head device No. (S2) of read target of other station CPU module) + (Number of read points - 1) ≤ (Last device No. of host CPU module *) *: Last device number at the host CPU module having the same device name as (S2) |
| (4) | Use the file register (ZR) when specifying the expansion data register (D) or the expansion link register (W) that are out of area of the data register (D) or the link register (W) on the host CPU module respectively. (excluding the Universal model QCPU) For calculating a area for the file regisger (ZR), refer to QCPU User's Manual (Function Explanation, Program Fundamentals). (Example) When not assigning the data register (D) of the other station CPU module, or assigning all of the 32K points of the file register (ZR) to the expansion data register (D). |
| |  <p style="text-align: center;">*1 File register with 32K points or more is required for the host CPU.</p> |

2) JP/GP.WRITE, JP/GP.SWRITE

[Network No. designation]

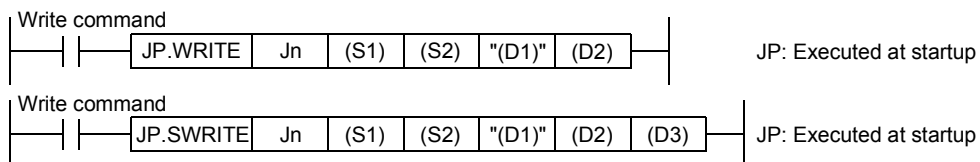


[Network module start I/O No. designation]

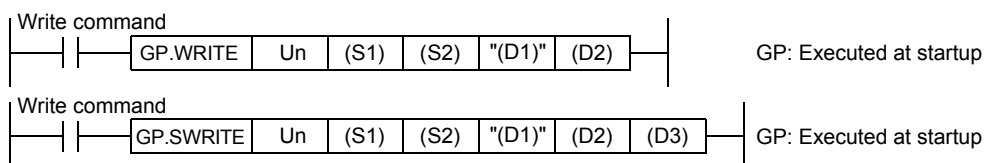


The following formats can be used only when the host is the Universal model QCPU.

[Network No. designation]



[Network module start I/O No. designation]



| | Description of setting | Setting range |
|------|--|---|
| Jn | Host's network No. | 1 to 239 254: Network designated by valid module during other station access |
| Un | Start I/O number of the host's network module Designate the higher two digits of the 3-digit I/O number. | 0 to FE _H |
| (S1) | Control data storage head device Designate the head device of the host that stores the control data. | Word device * 2 |
| (S2) | Write data storage head device (host) Designate the head device of the host that stores the data to be written. | Word device * 2 |
| (D1) | Write data storage head device (target station) Designate the head device of the target station that stores the data to be written. | Word device * 3 |
| (D2) | Write complete device (host) Designate the host's device to be turned on for one scan upon write completion. (D2) Off : Not completed On : Complete (D2)+1 Off : Normal On : Error | Bit device * 1 Bit designation of word device * 4 |
| (D3) | Write notification device (target station) Designate the target station's device to be turned on for one scan upon completion of the writing. (The target station can identify that the data has been written from other station.) (D3) Off : Not completed On : Complete | Bit device * 1 Bit designation of word device * 4 |

*1: Bit device

: X, Y, M, L, F, V, and B

*2: Word device

: T, C, D, W, ST, R, and ZR

(The Q00JCPU and QS001CPU cannot use R and ZR.)

*3: Word device

: T, C, D, W, ST, SD, SW, R, and ZR

(The Q00JCPU and QS001CPU cannot use R and ZR.)

For SD/SW, data can be written within the setting range allowed for the user.

For details on SD/SW, refer to the manual for the CPU module and network module on the target station.

*4: Bit designation of word device : Word device. bit number

Detailed description of the control data

| Device | Item | Description | Setting side * 1 |
|--------|------------------------------------|---|------------------|
| (S1) | Execution/abnormal completion type | <div style="text-align: center;"> </div> <p>1) Execution type (bit 0) 0: No arrival confirmation When the target station is on the local network: Completed when data is sent from the host.</p> <div style="text-align: center;"> </div> <p>When the target station is on other network: Completed when the data arrives at the relay station on the network of the host.</p> <div style="text-align: center;"> </div> <p>1: With arrival confirmation Completed when the data is written to the target station.</p> <div style="text-align: center;"> </div> <p>2) Abnormal completion type (bit 7) Sets the clock data set status at abnormal completion. 0: Does not set clock : Does not store the clock data at error occurrence in (S1) + 11 to (S1) + 17. data 1: Sets clock data : Stores the clock data at error occurrence in (S1) + 11 to (S1) + 17.</p> | User |
| (S1)+1 | Completion status | Stores the status when an instruction is completed. 0 : Normal Other than 0 : Abnormal (Refer to Section 8.3 for error codes) | System |
| (S1)+2 | Channel used by the host | Designates the channel used by the host. 1 to 8 (channels) | User |

(Continued to the next page)

*1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

Detailed description of the control data

| Device | Item | Description | Setting side * 1 | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|--|---|------------------|-------------|-------------------|--|-----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--|------|
| (S1)+3 | Target station CPU type | <div>Designate the CPU type of the target station.</div> <table><thead><tr><th>Set value</th><th>Description</th></tr></thead><tbody><tr><td>0000_H</td><td>Target station CPU/control CPU/host system CPU (The designation is the same as "03FF_H.")</td></tr><tr><td>03D0_H * 2</td><td>Control system CPU * 3</td></tr><tr><td>03D1_H * 2</td><td>Standby system CPU * 3</td></tr><tr><td>03D2_H * 2</td><td>System A CPU</td></tr><tr><td>03D3_H * 2</td><td>System B CPU</td></tr><tr><td>03E0_H * 4</td><td>Multiple CPU No. 1 or target station CPU (in single CPU system)</td></tr><tr><td>03E1_H * 4</td><td>Multiple CPU No. 2</td></tr><tr><td>03E2_H * 4</td><td>Multiple CPU No. 3</td></tr><tr><td>03E3_H * 4</td><td>Multiple CPU No. 4</td></tr><tr><td>03FF_H * 2</td><td>Target station CPU/control CPU/host system CPU</td></tr></tbody></table> | Set value | Description | 0000 _H | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | 03D0 _H * 2 | Control system CPU * 3 | 03D1 _H * 2 | Standby system CPU * 3 | 03D2 _H * 2 | System A CPU | 03D3 _H * 2 | System B CPU | 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | 03E1 _H * 4 | Multiple CPU No. 2 | 03E2 _H * 4 | Multiple CPU No. 3 | 03E3 _H * 4 | Multiple CPU No. 4 | 03FF _H * 2 | Target station CPU/control CPU/host system CPU | User |
| Set value | Description | | | | | | | | | | | | | | | | | | | | | | | | |
| 0000 _H | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D0 _H * 2 | Control system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D1 _H * 2 | Standby system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D2 _H * 2 | System A CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D3 _H * 2 | System B CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E1 _H * 4 | Multiple CPU No. 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E2 _H * 4 | Multiple CPU No. 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E3 _H * 4 | Multiple CPU No. 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03FF _H * 2 | Target station CPU/control CPU/host system CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+4 | Target station network No. | <div>Designates the network No. of the target station.</div> <div>1 to 239 : Network No.</div> <div>254 : Specify this when 254 has been set in Jn.</div> | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+5 | Target station number * 5 | <div>Designates the station number of the target station.</div> <div>1 to 64 : The station with the corresponding station No.</div> <div>81_H to A0_H : Group designation (Can be set when the execution type designated in (S1) is "0: No arrival confirmation.")</div> <div>FF_H : All stations of the target network No. (Can be set when the execution type designated in (S1) is "0: No arrival confirmation.") : excluding the host</div> <div>When a group is designated, set the group No. of the target station with the network parameters from GX Developer.</div> | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+6 | (Use prohibited) | — | — | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+7 | Number of resends | <div>1) At instruction execution</div> <div>Becomes valid when the execution type designated in (S1) is "1: With arrival confirmation." Set the number of resends when the instruction fails to complete within the monitoring time designated by (S1) + 8.</div> <div>0 to 15 (times)</div> <div>2) At instruction completion</div> <div>Stores the number of resends executed (result).</div> <div>0 to 15 (times)</div> | User System | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+8 | Arrival monitoring time | <div>Becomes valid when the execution type designated in (S1) is "1: With arrival confirmation." Set the monitoring time until the instruction completion.</div> <div>When the instruction fails to complete within the monitoring time, it is resent for the number of resends designated in (S1) + 7.</div> <div>0 : 10 s</div> <div>1 to 32767 : 1 to 32767 s</div> | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+9 | Write data length | <div>Designates the number of write data in (S2) to (S2) + n. (Refer to Section 2.2.1)</div> <div>1 to 960 (words)</div> | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+10 | (Use prohibited) | — | — | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+11 | Clock set flag | <div>Stores the valid/invalid status of the clock data in (S1) + 12 to (S1) + 17.</div> <div>0: Invalid</div> <div>1: Valid</div> | System | | | | | | | | | | | | | | | | | | | | | | |

(Continued to the next page)

*1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

*2: The CPU type can be specified when the host station is a network module of function version D or later. (The specification is not available when they are other than the above. Access is made to the target station CPU.)

*3: If system switching occurs at the target system when the WRITE or SWRITE instruction is executed to the redundant system with the control or standby system CPU designated, the instruction may not be normally completed (error code: 4244_H, 4248_H).
If the above-mentioned error occurs and the WRITE or SWRITE instruction is not normally completed, retry to execute the instruction.*4: The CPU type can be specified when the QCPUs and network modules of the host station or target station or the following versions.
(The specification is not available when they are other than the following. Access is made to the target station CPU.)

▪ Network module: First 5 digits of serial No. is "06092" or later

▪ QCPU: First 5 digits of serial No. is "06092" or later

*5: When a multiple CPU No. is specified for the target station CPU type ((S1)+3) and group designation (81_H to A0_H) or all stations (FF_H) is specified for the target station number ((S1)+5), the instruction is executed for only the system where the CPU specified for the target station CPU type is the control CPU of the target station.

Refer to Section 2.2.2 (5) for details.

Detailed description of the control data

| Device | Item | Description | Setting side * 1 |
|---------|---|--|------------------|
| (S1)+12 | Month/year (lower two digits) of abnormal completion | Month and year (the lower two digits of the 4-digit year) are stored as BCD codes. <div> <div>b15 to b8</div> <div>b7 to b0</div> <div>Month (01_H to 12_H)</div> <div>Year (00_H to 99_H)</div> </div> | System |
| (S1)+13 | Hour/date of abnormal completion | Hour and date are stored as BCD codes. <div> <div>b15 to b8</div> <div>b7 to b0</div> <div>Hour (00_H to 23_H)</div> <div>Date (01_H to 31_H)</div> </div> | System |
| (S1)+14 | Second/minute of abnormal completion | Second and minute are stored as BCD codes. <div> <div>b15 to b8</div> <div>b7 to b0</div> <div>Second (00_H to 59_H)</div> <div>Minute (00_H to 59_H)</div> </div> | System |
| (S1)+15 | Year (higher two digits)/day of the week of abnormal completion | Year (the higher two digits of the 4-digit year) and day of the week are stored as BCD codes. <div> <div>b15 to b8</div> <div>b7 to b0</div> <div>Year (00_H to 99_H) *6</div> <div>Day of the week (00_H to 06_H)</div> <div>00_H (Sunday) to 06_H (Saturday)</div> </div> | System |
| (S1)+16 | Abnormal detection network No. | Stores the network No. of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 239 (network No.) | System |
| (S1)+17 | Abnormal detection station number | Stores the station number of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 64 (station No.) | System |

*1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

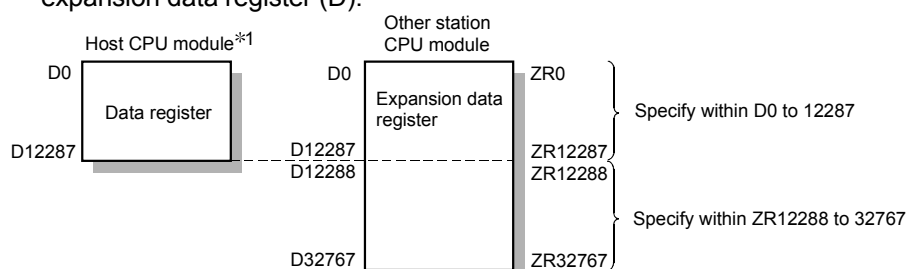
*6: [00_H] will be stored in the [Year] field (higher two digits) when the CPU targeted by link dedicated instructions is a QnACPU. (Clock data will not be stored when errors have been completed in the case of the ACPU.)

POINT

- (1) When the target station of the SWRITE instruction is the Basic model QCPU or safety CPU, the write notification device for the target station set in the argument (D3) is ignored. The operation of the SWRITE instruction is the same as that of the WRITE instruction.
- (2) The SWRITE instruction can be programmed without the argument (D3). However, its operation is the same as that of the WRITE instruction. You can either use the SWRITE instruction with or without (D3).
- (3) Specify the device of the other station CPU module to be written with the WRITE/SWRITE instruction within the range available for the host CPU module.
 (Head device No. (D1) of write target of other station CPU module) + (Number of write points - 1) ≤ (Last device No. of host CPU module *)
 *: Last device number at the host CPU module having the same device name as (D1)
- (4) In order to improve the reliability of data, it is recommended to execute instructions by setting the execution type to "With arrival confirmation".
- (5) If the execution type is set to "No arrival confirmation," all of the normally completed transmission is considered as normal even if the contents of the send data are abnormal.
 In addition, even if the contents of the send data are normal, when an instruction is executed to the same station from multiple stations, a "No free area in the receive buffer (F222H)" may occur in the target station but the sending completes normally in the sending station.
- (6) Use the file register (ZR) when specifying the expansion data register (D) or the expansion link register (W) that are out of area of the data register (D) or the link register (W) on the host CPU module respectively. (excluding the Universal model QCPU)

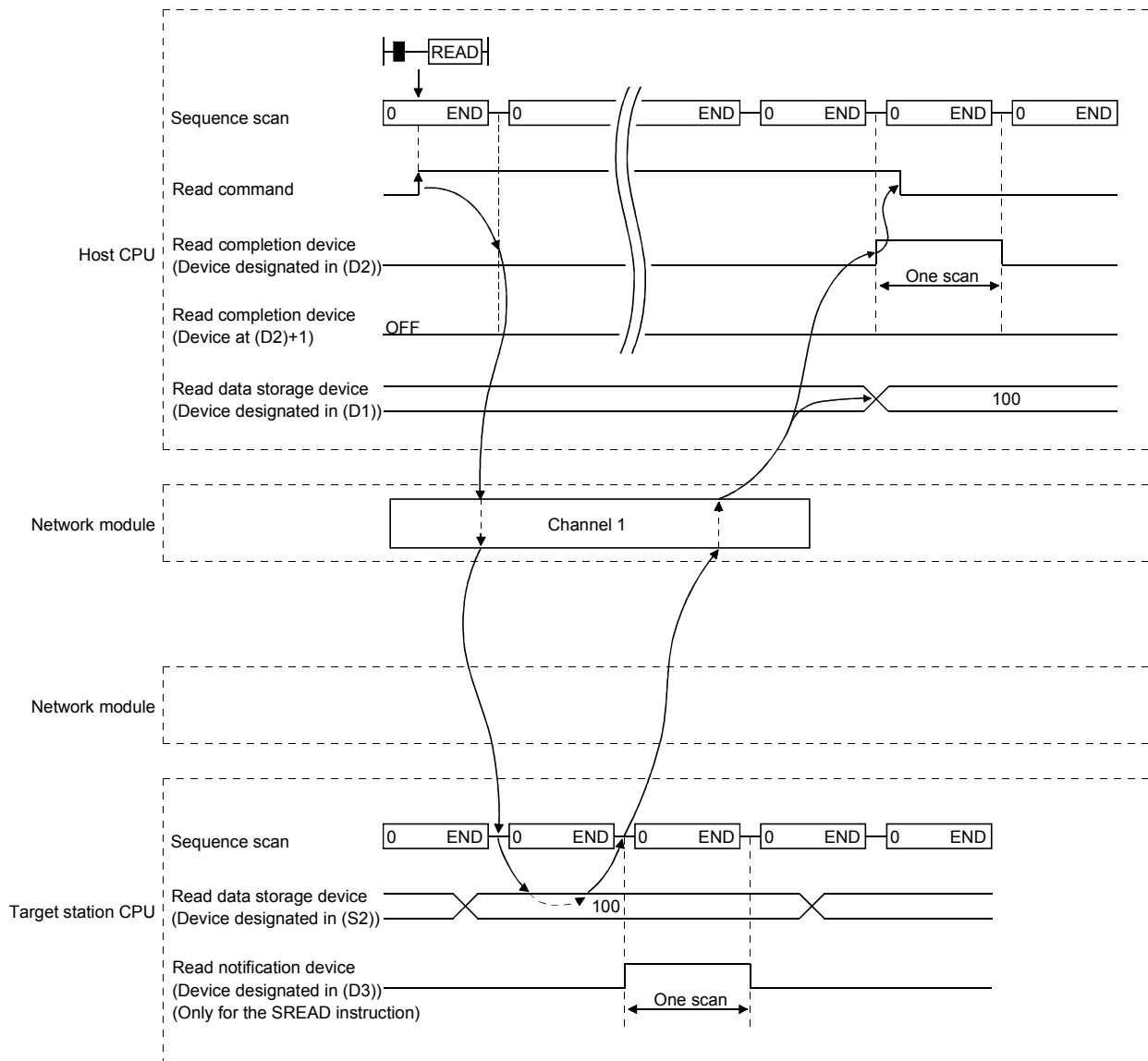
For calculating a area for the file regisger (ZR), refer to QCPU User's Manual (Function Explanation, Program Fundamentals).

(Example) When not assigning the data register (D) of the other station CPU module, or assigning all of the 32K points of the file register (ZR) to the expansion data register (D).

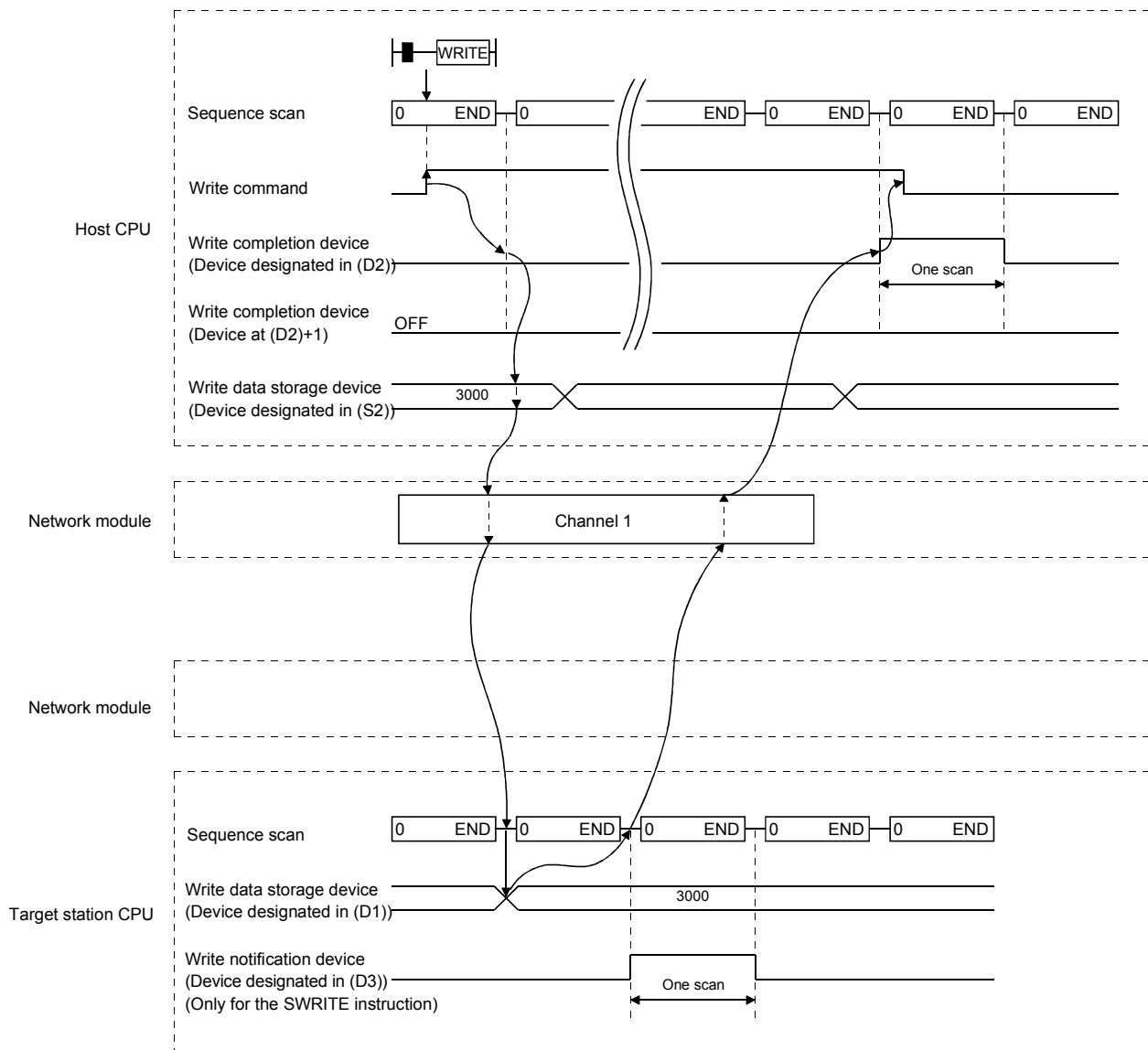


*1 File register with 32K points or more is required for the host CPU.

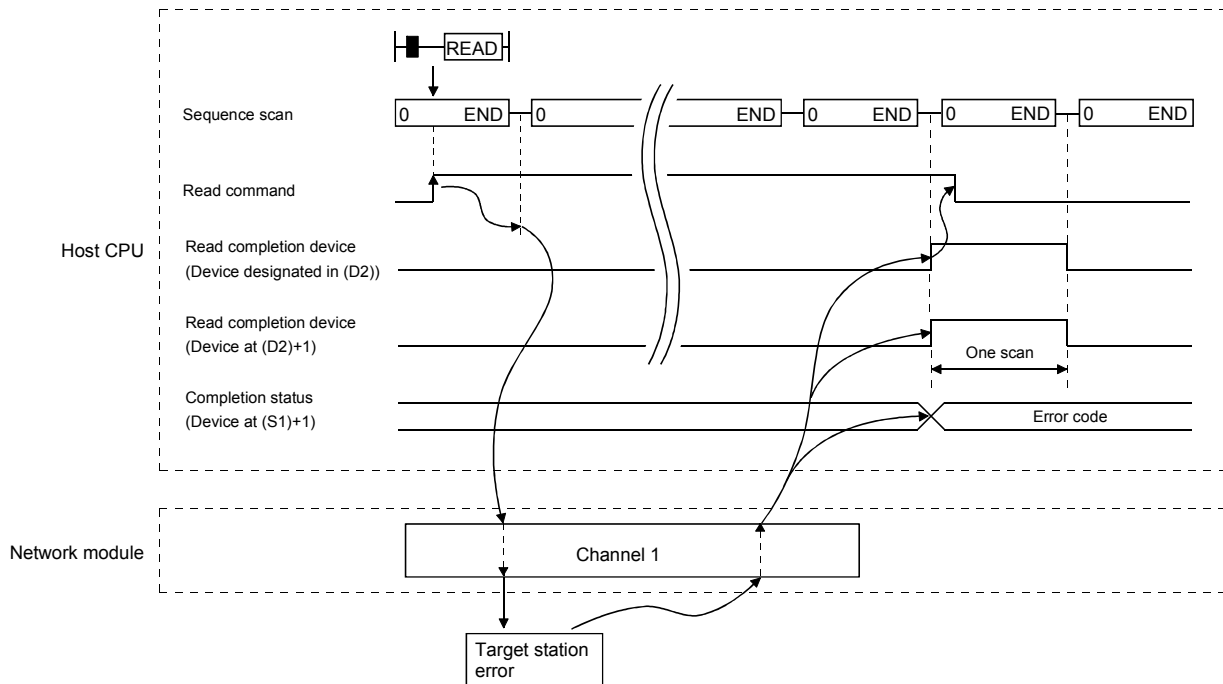
(b) Instruction execution timing

1) Normal completion
[READ and SREAD instructions]

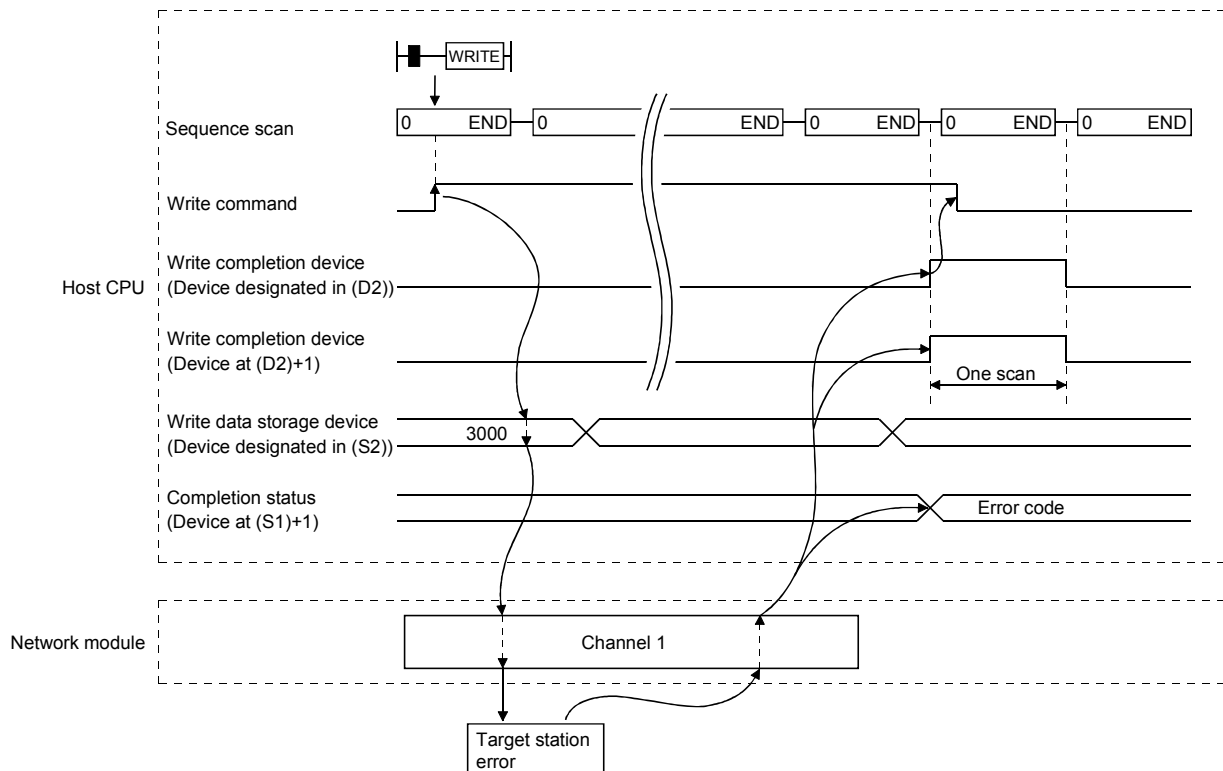
[WRITE and SWRITE instructions]



2) Abnormal completion [READ and SREAD instructions]



[WRITE and SWRITE instructions]

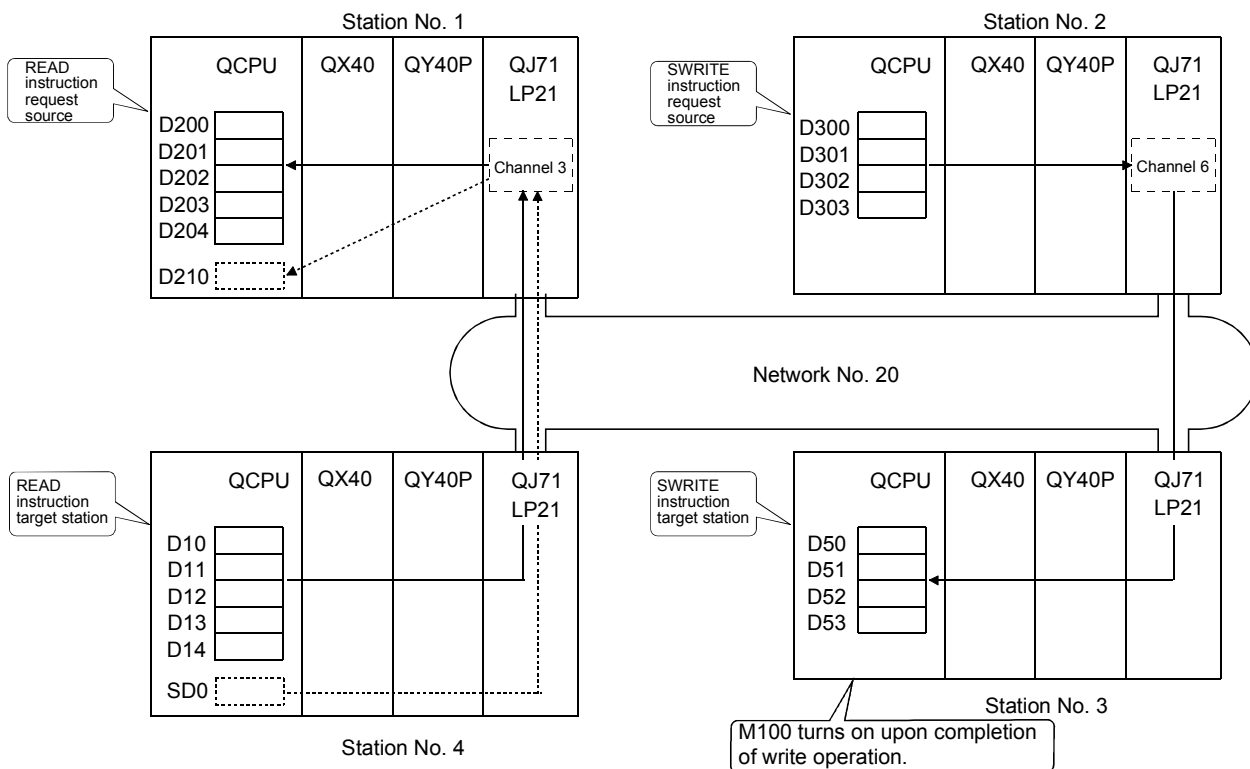


(c) Program example

Read the data in D10 to D14 of station number 4 to D200 to D204 of station number 1.

Read the data in SD0 (diagnostic error) of station number 4 to D210 of station number 1.

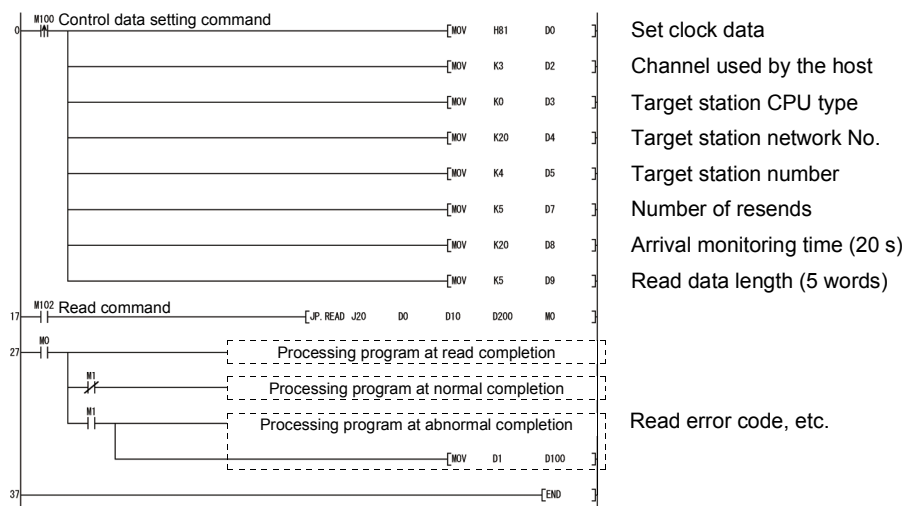
Write the data stored in D300 to D303 of station number 2 to D50 to D53 of station number 3.



1) Program for station number 1 (READ instruction)

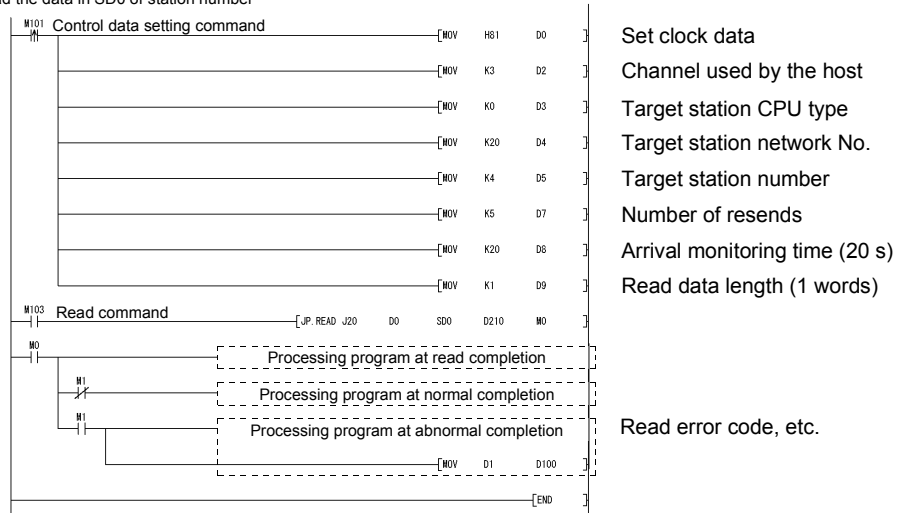
When actually using the following program, interlock the program by seeing Section 6.1.

(When reading the data in D10 to D14 of station number 4 to D200 to D204 of station number 1)



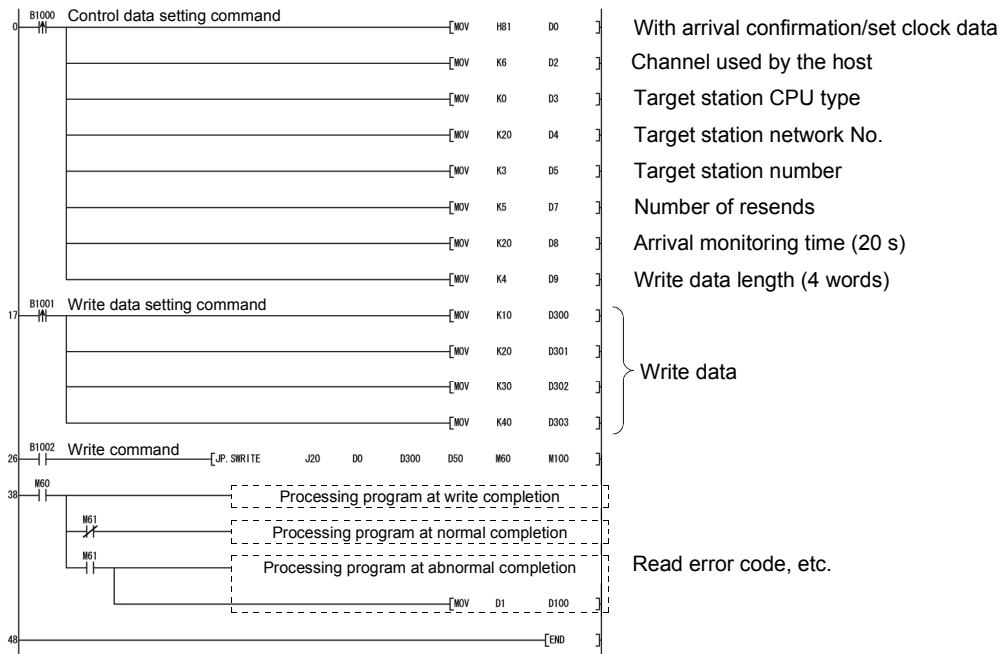
(When reading the data in SD0 (diagnostic error) of station number 4 to D210 of station number 1)

Read the data in SD0 of station number



2) Program for station number 2 (SWRITE instruction)

When actually using the following program, interlock the program by seeing Section 6.1.



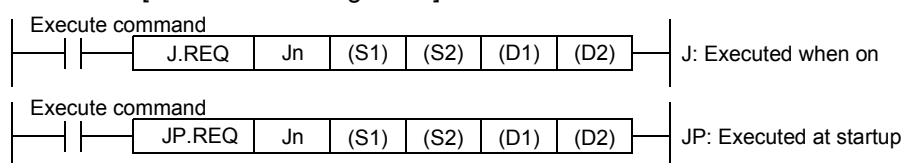
7.4.5 (3) Requesting transient transmission to other stations (J(P)/G(P).REQ)

| Target station | | |
|----------------|--------|--------|
| QCPU | QnACPU | AnUCPU |
| ○* | ○ | × |

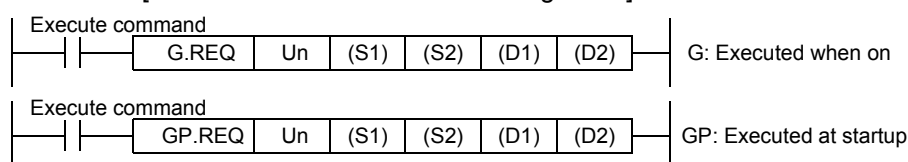
* : For link dedicated instruction for the safety CPU,
refer to Section 6.3

(a) Instruction format

[Network No. designation]



[Network module start I/O No. designation]



| | Description of setting | Setting range |
|------|---|--|
| Jn | Host's network No. | 1 to 239 254: Network designated by valid module during other station access. |
| Un | Start I/O number of the host's network module Designate the higher two digits of the 3-digit I/O number. | 0 to FE _H |
| (S1) | Control data storage head device Designate the head device of the host that stores the control data. | Word device * 2 |
| (S2) | Request data storage head device (host) Designate the head device of the host that stores the request data. | Word device * 2 |
| (D1) | Response data storage head device (host) Designate the head device of the host that stores the response data. However, response data is stored only when reading clock data. | Word device * 2 |
| (D2) | Execution completion device (host) Designate the host's device to be turned on for one scan upon execution completion. (D2) Off : Not completed On : Complete (D2)+1 Off : Normal On : Error | Bit device * 1 Bit designation of word device * 3 |

*1: Bit device

: X, Y, M, L, F, V, and B

*2: Word device

: T, C, D, W, ST, R, and ZR

(The Q00JCPU and QS001CPU cannot use R and ZR.)

*3: Bit designation of word device : Word device. bit number

Detailed description of the control data

| Device | Item | Description | Setting side * 1 | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|--|---|------------------|-------------|-------------------|--|-----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--|------|
| (S1) | Abnormal completion type | <div><div><div>b15</div><div>to</div><div>b7</div><div>to</div><div>b4</div><div>to</div><div>b0</div></div><div><div>0</div><div>1)</div><div>0</div><div>1</div><div>0</div><div>1</div></div></div> <div>1) Abnormal completion type (bit 7) Sets the clock data set status at abnormal completion. 0: Does not set clock data : Does not store the clock data at error occurrence in (S1) + 11 to (S1) + 17. 1: Sets clock data : Stores the clock data at error occurrence in (S1) + 11 to (S1) + 17.</div> | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+1 | Completion status | Stores the status when an instruction is completed. 0 : Normal Other than 0 : Error (Refer to Section 8.3 for error codes) | System | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+2 | Channel used by the host | Designates the channel used by the host. 1 to 8 (channels) | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+3 | Target station CPU type | <div>Designate the CPU type of the target station.</div> <table><tr><th>Set value</th><th>Description</th></tr><tr><td>0000_H</td><td>Target station CPU/control CPU/host system CPU (The designation is the same as "03FF_H.")</td></tr><tr><td>03D0_H * 2</td><td>Control system CPU * 3</td></tr><tr><td>03D1_H * 2</td><td>Standby system CPU * 3</td></tr><tr><td>03D2_H * 2</td><td>System A CPU</td></tr><tr><td>03D3_H * 2</td><td>System B CPU</td></tr><tr><td>03E0_H * 4</td><td>Multiple CPU No. 1 or target station CPU (in single CPU system)</td></tr><tr><td>03E1_H * 4</td><td>Multiple CPU No. 2</td></tr><tr><td>03E2_H * 4</td><td>Multiple CPU No. 3</td></tr><tr><td>03E3_H * 4</td><td>Multiple CPU No. 4</td></tr><tr><td>03FF_H * 2</td><td>Target station CPU/control CPU/host system CPU</td></tr></table> | Set value | Description | 0000 _H | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | 03D0 _H * 2 | Control system CPU * 3 | 03D1 _H * 2 | Standby system CPU * 3 | 03D2 _H * 2 | System A CPU | 03D3 _H * 2 | System B CPU | 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | 03E1 _H * 4 | Multiple CPU No. 2 | 03E2 _H * 4 | Multiple CPU No. 3 | 03E3 _H * 4 | Multiple CPU No. 4 | 03FF _H * 2 | Target station CPU/control CPU/host system CPU | User |
| Set value | Description | | | | | | | | | | | | | | | | | | | | | | | | |
| 0000 _H | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D0 _H * 2 | Control system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D1 _H * 2 | Standby system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D2 _H * 2 | System A CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| 03D3 _H * 2 | System B CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E1 _H * 4 | Multiple CPU No. 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E2 _H * 4 | Multiple CPU No. 3 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03E3 _H * 4 | Multiple CPU No. 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| 03FF _H * 2 | Target station CPU/control CPU/host system CPU | | | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+4 | Target station network No. | Designates the target station's network No. 1 to 239 : Network number 254 : Specify this when 254 has been set in Jn. | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+5 | Target station number * 5 | Designates the station number of the target station. 1 to 64 : Station number 81 _H to A0 _H : Group designation (Possible only for clock data write and remote RUN/STOP) FF _H : All stations of the target network No. (Possible only for clock write read and remote RUN/STOP): excluding the host When a group is designated, set the group No. of the target station with the network parameters from GX Developer. | User | | | | | | | | | | | | | | | | | | | | | | |
| (S1)+6 | (Use prohibited) | — | — | | | | | | | | | | | | | | | | | | | | | | |

(Continued to the next page)

*1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

*2: The CPU type can be specified when the host station is a network module of function version D or later. (The specification is not available when they are other than the above. Access is made to the target station CPU.)

*3: If system switching occurs at the target system when the REQ instruction is executed to the redundant system with the control or standby system CPU designated, the instruction may not be normally completed (error code: 4244_H, 4248_H).

If the above-mentioned error occurs and the REQ instruction is not normally completed, retry to execute the instruction.

*4: The CPU type can be specified when the QCPUs and network modules of the host station or target station are the following versions.

(The specification is not available when they are other than the following. Access is made to the target station CPU.)

▪ Network module: First 5 digits of serial No. is "06092" or later

▪ QCPU: First 5 digits of serial No. is "06092" or later

*5: When a multiple CPU No. is specified for the target station CPU type ((S1)+3) and group designation (81_H to A0_H) or all stations (FF_H) is specified for the target station number ((S1)+5), the instruction is executed for only the system where the CPU specified for the target station CPU type is the control CPU of the target station.

Refer to Section 2.2.2 (5) for details.

Detailed description of the control data

| Device | Item | Description | Setting side * 1 |
|---------|---|--|------------------|
| (S1)+7 | Number of resends | 1) At instruction execution Sets the number of resends when the instruction fails to complete within the monitoring time designated by (S1) + 8. 0 to 15 (times) 2) At instruction completion Stores the number of resends executed (result). 0 to 15 (times) | User System |
| (S1)+8 | Arrival monitoring time | Sets the monitoring time until the instruction completion. When the instruction fails to complete within the monitoring time, it is resent for the number of resends designated in (S1) + 7. 0 : 10 s 1 to 32767 : 1 to 32767 s | User |
| (S1)+9 | Request data length | Designates the request data count (words). 2: Clock data read 6: Clock data write 3: Remote STOP 4: Remote RUN | User |
| (S1)+10 | Response data length | Stores the response data count (words). 6: Clock data read 2: Clock data write 2: Remote RUN/STOP | System |
| (S1)+11 | Clock set flag | Stores the valid/invalid status of the clock data in ((S1) + 12 to (S1) + 17). 0: Invalid 1: Valid | System |
| (S1)+12 | Month/year (lower two digits) of abnormal completion | Month and year (the lower two digits of the 4-digit year) are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 Month (01_H to 12_H) </div> <div style="text-align: center;"> b7 to b0 Year (00_H to 99_H) </div> </div> | System |
| (S1)+13 | Hour/date of abnormal completion | Hour and date are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 Hour (00_H to 23_H) </div> <div style="text-align: center;"> b7 to b0 Date (01_H to 31_H) </div> </div> | System |
| (S1)+14 | Second/minute of abnormal completion | Second and minute are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 Second (00_H to 59_H) </div> <div style="text-align: center;"> b7 to b0 Minute (00_H to 59_H) </div> </div> | System |
| (S1)+15 | Year (higher two digits)/day of the week of abnormal completion | Year (the higher two digits of the 4-digit year) and day of the week are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 Year (00_H to 99_H) *6 </div> <div style="text-align: center;"> b7 to b0 Day of the Week (00_H to 06_H) </div> </div> 00 _H (Sunday) to 06 _H (Saturday) | System |
| (S1)+16 | Abnormal detection network No. | Stores the network No. of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 239 (network No.) | System |
| (S1)+17 | Abnormal detection station number | Stores the station number of the station that detected an abnormality. However, it is not stored when the completion status of (S1) + 1 is "Host station channel in use (F7C1 _H)." 1 to 64 (station number) | System |

* 1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

*6: [00_H] will be stored in the [Year] field (higher two digits) when the CPU targeted by link dedicated instructions is a QnACPU. (Clock data will not be stored when errors have been completed in the case of the ACPU.)

[Request data (S2)/response data(D1) (for reading/writing the clock data)]

1) Request data (all set by the user (○))

| Device | Item | Description | Clock data read | Clock data write |
|----------|---|--|-----------------|------------------|
| (S2) | Request type | 0001 _H : Clock data read 0011 _H : Clock data write (when the station number is designated at (S1) + 5) 0031 _H : Clock data write (when all stations or a group is designated at (S1) + 5) | ○ | ○ |
| (S2)+1 | Sub-request type | 0002 _H : Clock data read 0001 _H : Clock data write | ○ | ○ |
| (S2)+2 | Pattern to be changed Year to be changed | <p>1) Pattern to be changed (bit 0 to 7) Specify which items are to be written to the fields of (high byte of (S2)+2) to ((S2)+5). 0: No change 1: Change</p> <p>2) Year to be changed (bit 8 to 15) Year (the lower two digits of the 4-digit year) is stored as BCD codes.</p> | — | ○ |
| (S2) + 3 | Date and month to be changed | <p>Designate date and month with BCD codes.</p> | — | ○ |
| (S2) + 4 | Minute and hour to be changed | <p>Designate minute and hour with BCD codes.</p> | — | ○ |
| (S2) + 5 | Day and second of the week to be changed | <p>Designate day and second of the week with BCD codes.</p> | — | ○ |

2) Response data (all set by the system (○))

When "all stations or a group (FF_H or 81_H to A0_H)" is specified in Target station number ((S1)+5), no response data will be stored.

| Device | Item | Description | Clock data read | Clock data write |
|--------|------------------------|---|-----------------|------------------|
| (D1) | Request type | 0081 _H : Clock data read 0091 _H : Clock data write (when the station number is designated at (S1) +5) | ○ | ○ |
| (D1)+1 | Sub-request type | 0002 _H : Clock data read 0001 _H : Clock data write | ○ | ○ |
| (D1)+2 | Month and year read | Month and year (the lower two digits of the 4-digit year) are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 Month (01_H to 12_H) </div> <div style="text-align: center;"> b7 to b0 Year (00_H to 99_H) </div> </div> | ○ | — |
| (D1)+3 | Hour and date read | Hour and date are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 Hour (00_H to 23_H) </div> <div style="text-align: center;"> b7 to b0 Date (01_H to 31_H) </div> </div> | ○ | — |
| (D1)+4 | Second and minute read | Second and minute are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 Second (00_H to 59_H) </div> <div style="text-align: center;"> b7 to b0 Minute (00_H to 59_H) </div> </div> | ○ | — |
| (D1)+5 | Day of the week read | Day of the week are stored as BCD codes. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> b15 to b8 00_H </div> <div style="text-align: center;"> b7 to b0 Day of the week (00_H to 06_H) </div> </div> <div style="margin-left: 100px;"> ↓ 00_H (Sunday) to 06_H (Saturday) </div> | ○ | — |

POINT

When there is a system protection on the CPU module of the target station, the clock data cannot be written.

[Request data (S2)/response data (D1) at remote RUN/STOP]

1) Request data (all set by the user (○))

| Device | Item | Description | Remote RUN | Remote STOP |
|--------|------------------|---|------------|-------------|
| (S2) | Request type | 0010 _H : When the station number is designated at (S1) + 5 0030 _H : When all stations or a group is designated at (S1) + 5 | ○ | ○ |
| (S2)+1 | Sub-request type | 0001 _H : Remote RUN 0002 _H : Remote STOP | ○ | ○ |
| (S2)+2 | Mode | Designates whether or not to forcefully execute remote RUN/STOP. The forced execution is a function for forcefully executing remote RUN from other station when the station that executed the remote STOP is no longer able to execute remote RUN. • For remote RUN 0001 _H : No forced execution 0003 _H : Forced execution • For remote STOP 0003 _H (Fixed) | ○ | ○ |
| (S2)+3 | Clear mode | Designates the device memory status of the CPU module when remote RUN is executed. 0000 _H : Does not clear (setting at remote STOP) 0001 _H : Clears (excluding the latch range) 0002 _H : Clears (including the latch range) Clear mode ((S2)+3) allows specification of the CPU module device clear (initialization) process at the start of CPU module operation activated by remote RUN. The CPU module will perform the specified clear processing, and then it will run according to the setting that can be confirmed by [PLC parameters] - [PLC file] - [Initial Device value] in GX Developer. | ○ | — |

2) Response data (all set by the system (○))

When "all stations or a group (FF_H or 81_H to A0_H)" is specified in Target station No. ((S1)+5), no response data will be stored.

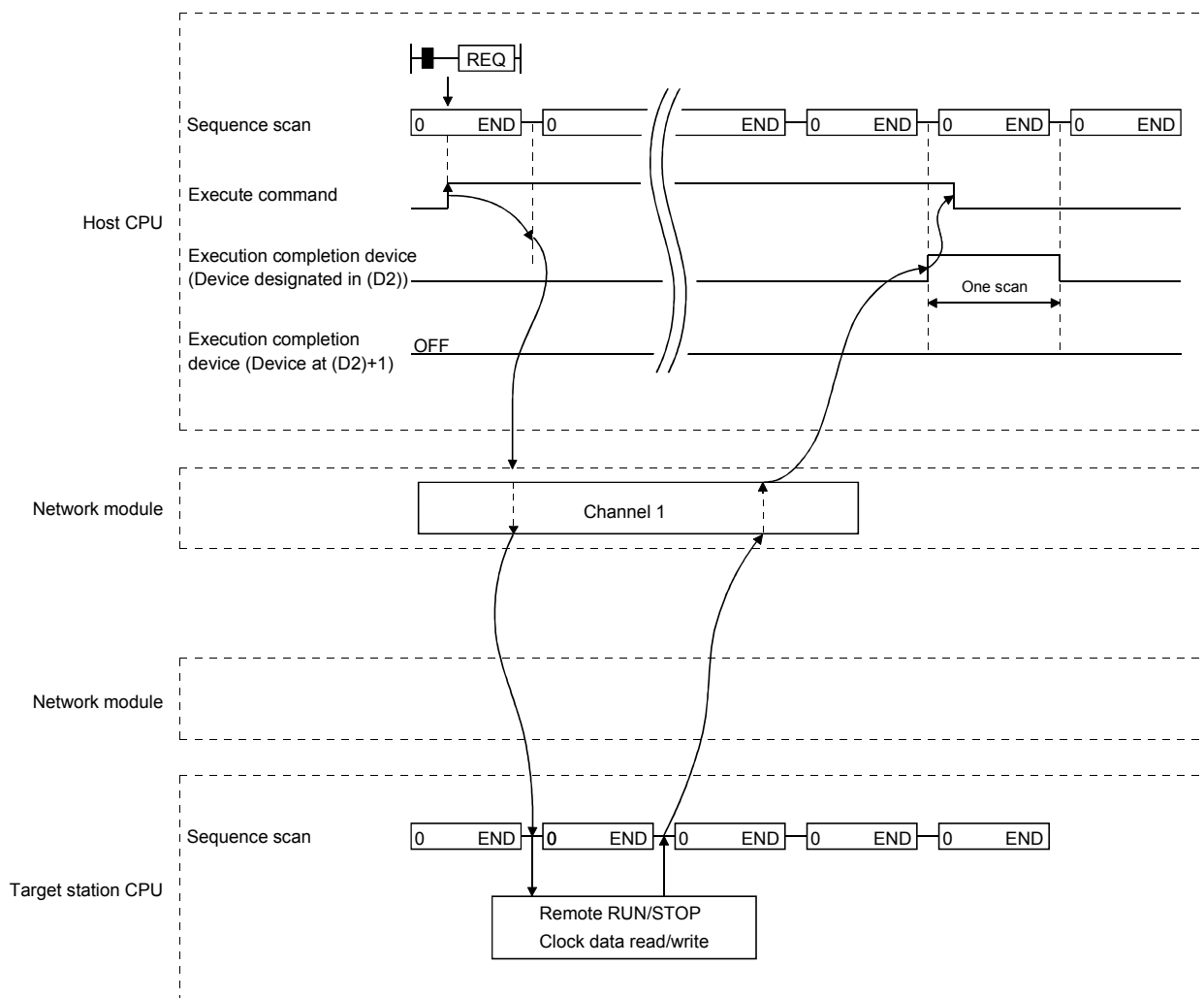
| Device | Item | Description | Remote RUN | Remote STOP |
|--------|------------------|---|------------|-------------|
| (D1) | Request type | 0090 _H : When the station number is designated at (S1) + 5 | ○ | ○ |
| (D1)+1 | Sub-request type | 0001 _H : Remote RUN 0002 _H : Remote STOP | ○ | ○ |

POINT

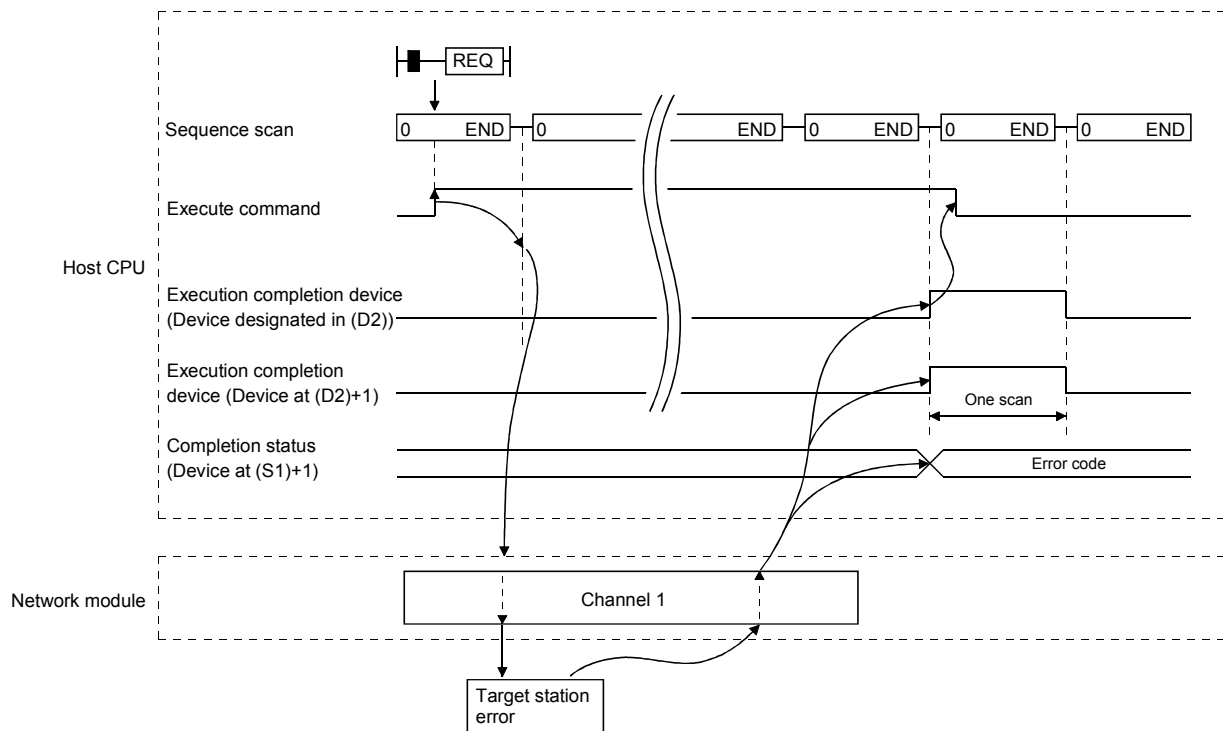
- (1) Remote RUN/STOP becomes valid when the RUN/STOP switch of the target station's CPU module is in the "RUN" position.
- (2) Remote RUN/STOP cannot be executed when there is a system protection on the target station's CPU module.
- (3) When other station has executed a remote STOP/PAUSE on the target station, the RUN request cannot be executed if the mode of (S2) + 2 is "Does not force execution (0001_H)."
- (4) If the CPU module of the target station on which a remote STOP has been executed is reset, the information of the remote STOP will be erased.

(b) Instruction execution timing

1) Normal completion

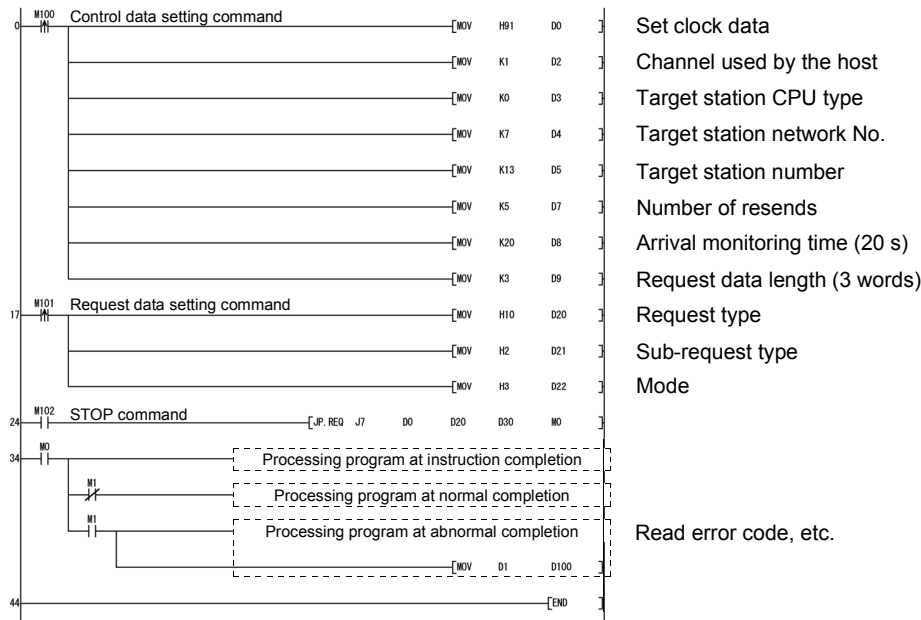


2) Abnormal completion



(c) Program example

The following example shows a program that stops the CPU module of station number 13 in network number 7.
When using the following program, interlock the program by seeing Section 6.1.



7.4.5 (4) Reading/writing word devices of other stations (J(P).ZNRD, J(P).ZNWR)

| Target station | | |
|----------------|--------|--------|
| QCPU | QnACPU | AnUCPU |
| ○* | ○ | ○ |

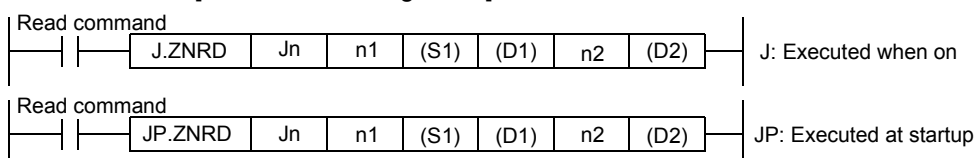
* : For link dedicated instruction for the safety CPU,
refer to Section 6.3

The following explains the ZNRD/ZNWR instruction format and some program examples.

(a) Instruction format

1) J(P).ZNRD

[Network No. designation]



| | Description of setting * 5 | Setting range |
|------|---|---|
| Jn | Target station's network No. | 1 to 239 |
| n1 | Target station number | 1 to 64 (Constant) Designation of the number of digits for bit device * 2 Word device * 3 |
| (S1) | Head device of the target station from which data is read | T, C, D and W |
| (D1) | Head device of the host that stores the data to read | Word device * 3 |
| n2 | Number of points to read (word) | 1 to 230 (constant): When the target station is a QCPU, QnACPU, or AnUCPU 1 to 32 (constant): When the target station is other than a QCPU, QnACPU, or AnUCPU Designation of the number of digits for bit device * 2 Word device * 3 |
| (D2) | Completion device Designate the host's device to be turned on for one scan upon read completion (D2) Off : Not completed On : Complete (D2)+1 Off : Normal On : Abnormal If the reading is not normally completed, the corresponding error code will be stored at SW0031. (For the error code, refer to Section 8.3.) | Bit device * 1 Bit designation of word device * 4 |

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

*2: Designation of the number of digits for bit device : Number of digits of K, bit device head No.

*3: Word device : T, C, D, W, ST, ST, R, and ZR
(The Q00JCPU cannot use R and ZR.)

*4: Bit designation of word device : Word device, bit number

*5: In addition to the setting data, the ZNRD instruction is executed using the following fixed values.

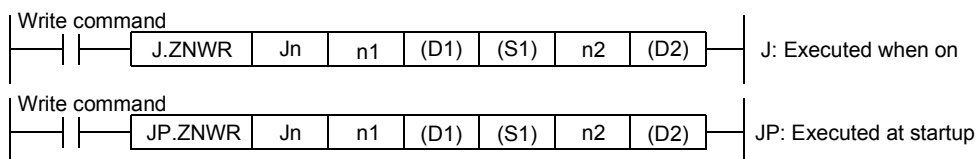
Channel used by host station: Channel 1

Arrival monitoring time (monitoring time until instruction completion): 10 seconds

Number of resends for arrival monitoring timeout: 0 times

| POINT |
|---|
| Specify the device of the other station CPU module to be read with the ZNRD instruction within the range available for the host CPU module. (Head device No. (S1) of read target of other station CPU module) + (Number of read points - 1) ≤ (Last device No. of host CPU module *) *: Last device number at the host CPU module having the same device name as (S1) |

2) J(P).ZNWR instruction
[Network No. designation]



| | Description of setting * 5 | Setting range |
|------|---|--|
| Jn | Target network No. | 1 to 239 |
| n1 | Target station number | 1 to 64 (Constant) 81 _H to A0 _H : Group designation FF _H : Target network No. for all stations: excluding the host Designation of the number of digits for bit device * 2 Word device * 3 When a group is designated, set the group No. of the target station with the network parameters from GX Developer. |
| (D1) | Head device of the target station from which data is written | T, C, D, and W |
| (S1) | Head device of the host that stores the data to write | Word device * 3 |
| n2 | Number of points to write (word) | 1 to 230 (constant): When the target station is a QCPU, QnACPU, or AnUCPU 1 to 32 (constant): When the target station is other than a QCPU, QnACPU, or AnUCPU Designation of the number of digits for bit device * 2 Word device * 3 |
| (D2) | Complete device Designate the host's device to be turned on for one scan upon write completion (D2) Off : Not completed On : Complete (D2)+1 Off : Normal On : Error If the writing is not normally completed, the corresponding error code will be stored at SW0033. (For the error code, refer to Section 8.3.) | Bit device * 1 Bit designation of word device * 4 |

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

*2: Designation of the number of digits for bit device : Number of digits of K, bit device head No.

*3: Word device : T, C, D, W, ST, ST, R, and ZR
(The Q00JCPU cannot use R and ZR.)

*4: Bit designation of word device : Word device. bit number

*5: In addition to the setting data, the ZNWR instruction is executed using the following fixed values.

Channel used by host station: Channel 2

Arrival monitoring time (monitoring time until instruction completion): 10 seconds

Number of resends for arrival monitoring timeout: 0 times

POINT

Specify the device of the other station CPU module to be written with the ZNRD instruction within the range available for the host CPU module.

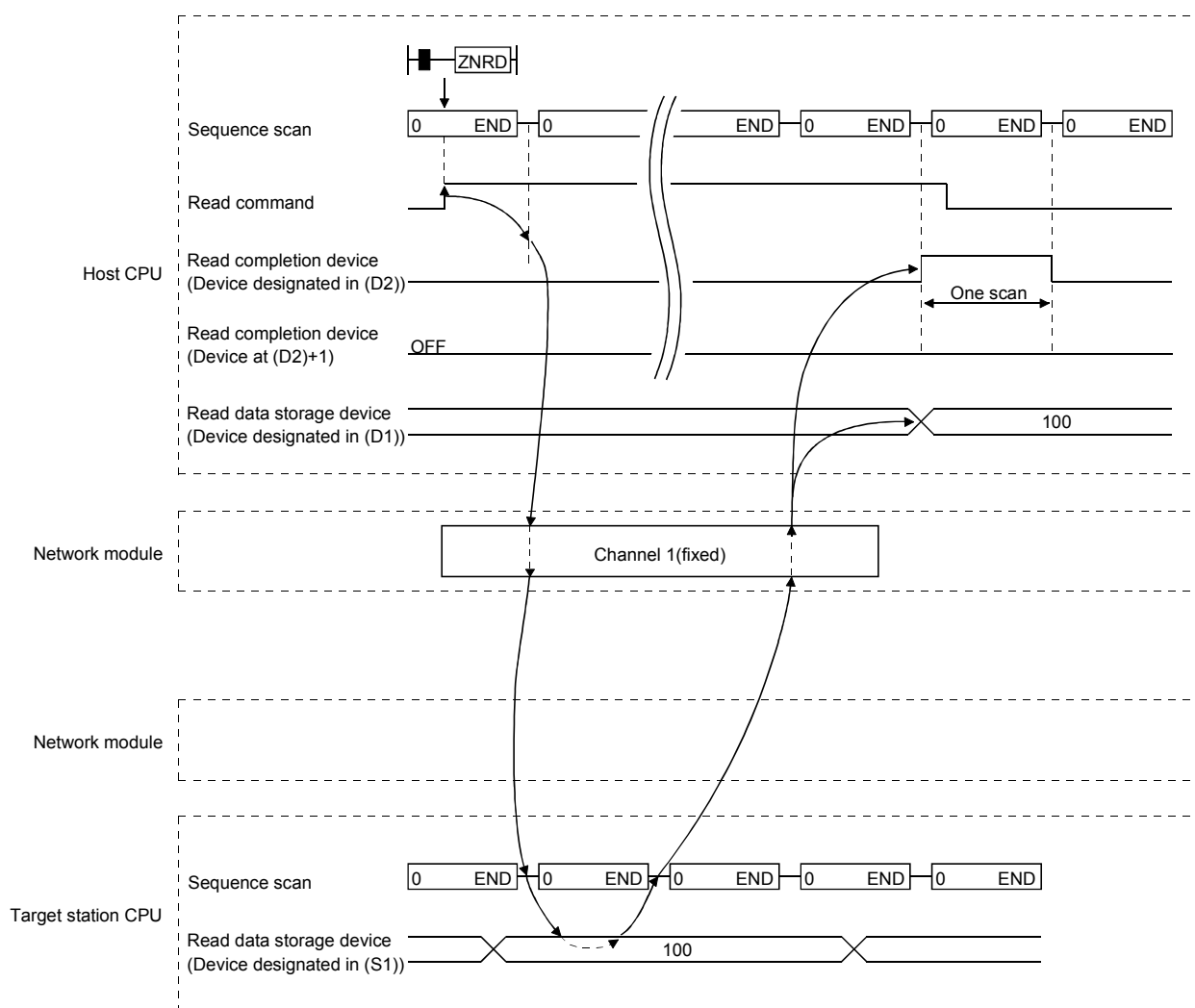
(Head device No. (D1) of write target of other station CPU module) + (Number of write points - 1) ≤ (Last device No. of host CPU module *)

※: Last device number at the host CPU module having the same device name as (D1)

(b) Instruction execution timing

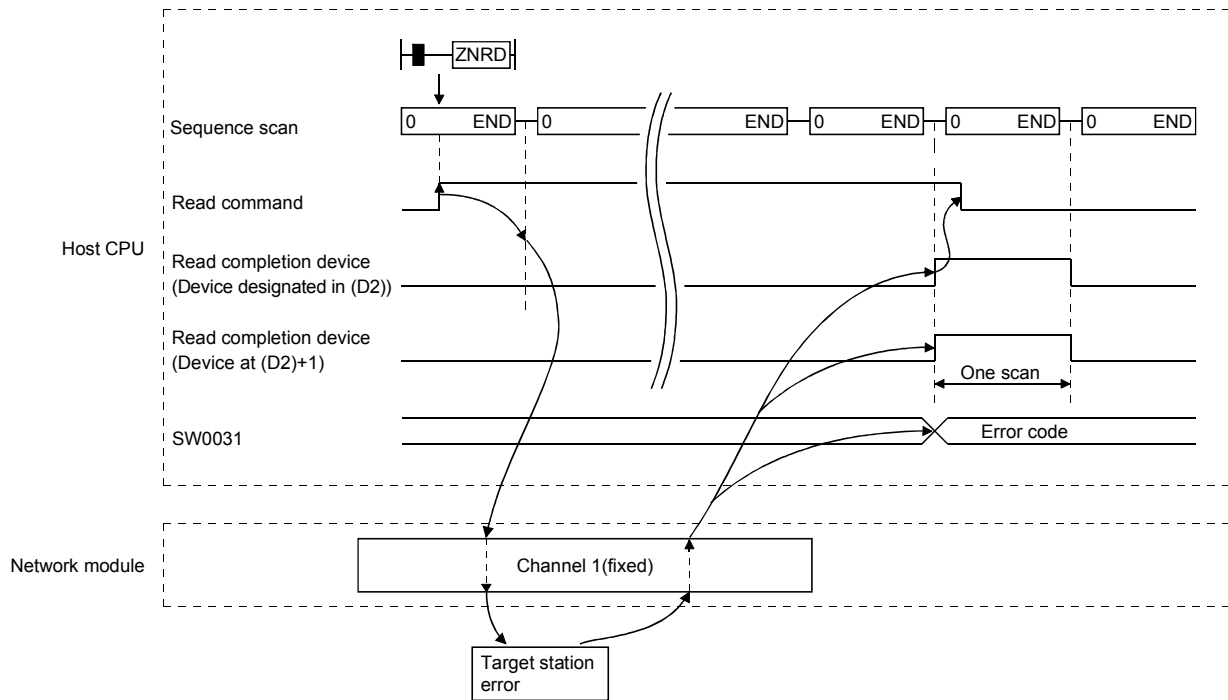
1) Normal completion

[ZNRD instruction]

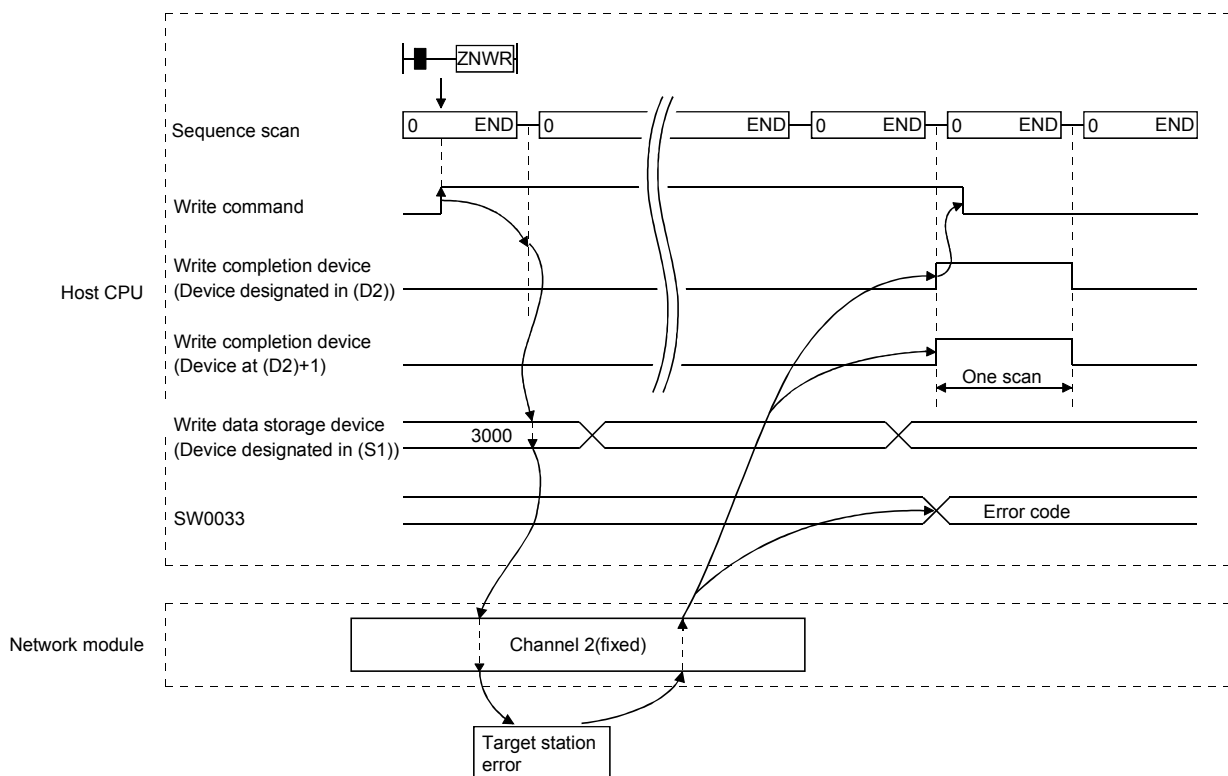




2) Abnormal completion [ZNRD instruction]



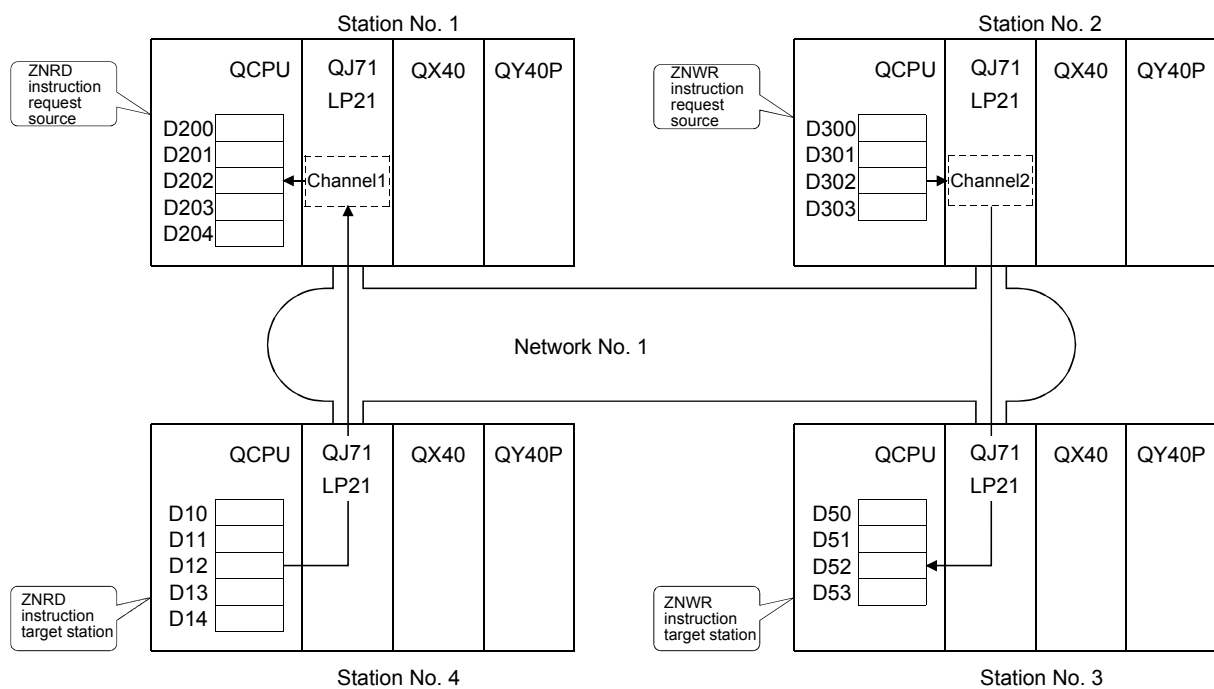
[ZNWR instruction]



- (c) Program example 1 (When a system other than the redundant system is the target system)

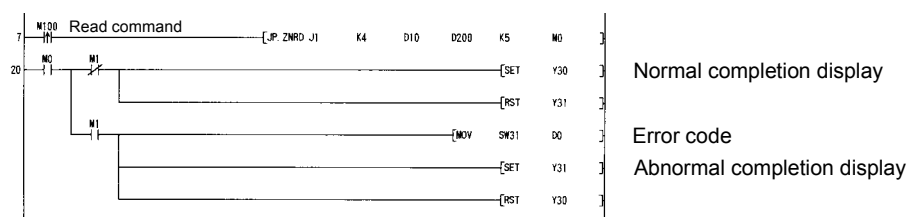
The program examples shown below are programmed for the following system configuration.

When actually using the programs below, interlock the programs by seeing Section 6.1.



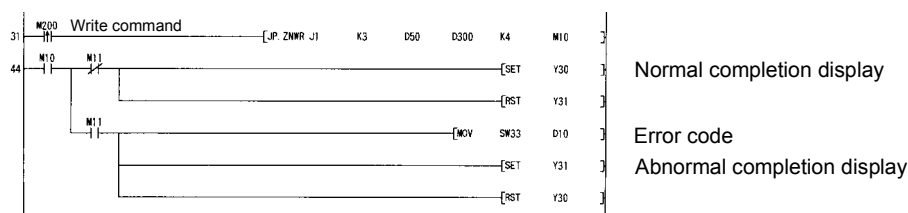
1) ZNRD instruction

The following program reads the contents of D10 to D14 of station number 4 to D200 to D204 of station number 1.



2) ZNWR instruction

The following program writes the contents of D300 to D303 of station number 2 to D50 to D53 of station number 3.

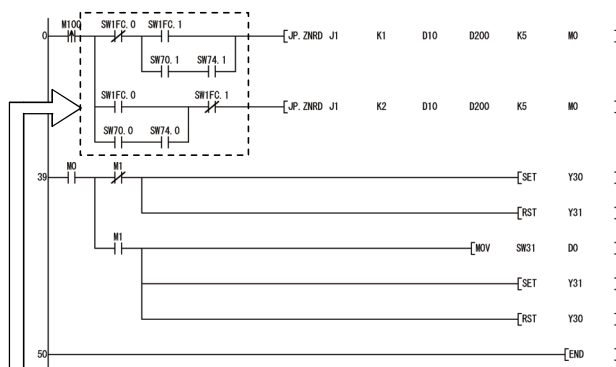


(d) Program example 2 (when a redundant system is the target system)

When the target station is in a redundant system, the ZNRD instruction must be executed after judging whether it is a control system.

The program example shown below is an interlock program for reading D10 to D14 of the control system CPU of the redundant system consisting of station Nos. 1 and 2 into D200 to D204 of the host station.

Provide the identical interlock for the ZNWR instruction.



The ZNRD instruction is executed to station No. 1 (when station No. 1 is a control system)

The ZNRD instruction is executed to station No. 2 (when station No. 2 is a control system)

When executing the instruction, provide an interlock between SW01FC to SW01FF (redundant system status) for judging whether the target station is a control system.

7.4.5 (5) Remote RUN/Remote STOP (Z(P).RRUN, Z(P).RSTOP)

| Target station | | |
|----------------|--------|--------|
| QCPU | QnACPU | AnUCPU |
| ○* | × | × |

* : For link dedicated instruction for the safety CPU,
refer to Section 6.3

This section explains the RRUN and RSTOP instruction formats, and provides program samples.

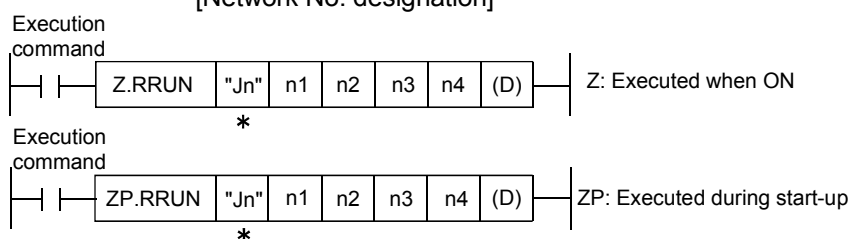
The RRUN instruction runs other station CPU module operations remotely.

The RSTOP instruction stops other station CPU module operations remotely.

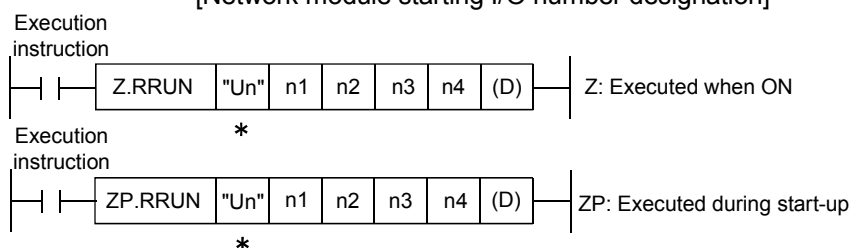
(a) Instruction format

1) Z(P).RRUN

[Network No. designation]



[Network module starting I/O number designation]



* : If the originating station is a Basic model QCPU (function version B or later) or Universal model QCPU, " "(double quotation) for the first argument can be omitted.

| | Description of setting | Setting range |
|----|---|--|
| Jn | Target network No. | 1 to 239 254: The network designated at the valid module during access to another station |
| Un | Starting I/O number of the host station network module Designate the three-digit I/O number with the first two digits. | 0 to FE _H |
| n1 | Channel used by the host * 1 | 1 to 8 (Constant) Word device * 8 |
| n2 | Target station number * 2 | 1 to 64 (Constant) 81 _H to A0 _H : Group designation FF _H : Target network No. for all stations: excluding the host Word device * 8 When a group is designated, set the group No. of the target station with the network parameters from GX Developer. |

(Continued to the next page)

* 1: To execute the RRUN instruction, set the channel used by the host station, which was used to execute the RSTOP instruction.

* 2: When the multiple CPU No. is specified for the target station CPU type (n3) and group designation (81_H to A0_H) or all stations (FF_H) is specified for the target station number (n2), the instruction is executed for only the system where the CPU specified for the target station CPU type is the control CPU of the target station. Refer to Section 2.2.2 (5) for details.

* 8: Word device: T, C, D, W, ST, R, and ZR (The Q00JCPU cannot use R and ZR.)

| | Description of setting | Setting range | | | | | | | | | | | | | | | | | | | | | | |
|-------------------|--|--|---|-------------|-----------------------|---|-----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|-------------------|--|
| n3 | Target station CPU type | Designate the CPU type of the target station. | | | | | | | | | | | | | | | | | | | | | | |
| | | <table><tr><th>Set value</th><th>Description</th></tr><tr><td>0000_H * 3</td><td>Target station CPU/control CPU/host system CPU (The designation is the same as "03FF_H.")</td></tr><tr><td>03D0_H * 3</td><td>Control system CPU * 4</td></tr><tr><td>03D1_H * 3</td><td>Standby system CPU * 4</td></tr><tr><td>03D2_H * 3</td><td>System A CPU</td></tr><tr><td>03D3_H * 3</td><td>System B CPU</td></tr><tr><td>03E0_H * 5</td><td>Multiple CPU No. 1 or target station CPU (in single CPU system)</td></tr><tr><td>03E1_H * 5</td><td>Multiple CPU No. 2</td></tr><tr><td>03E2_H * 5</td><td>Multiple CPU No. 3</td></tr><tr><td>03E3_H * 5</td><td>Multiple CPU No. 4</td></tr><tr><td>03FF_H</td><td>Target station CPU/control CPU/host system CPU</td></tr></table> | Set value | Description | 0000 _H * 3 | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | 03D0 _H * 3 | Control system CPU * 4 | 03D1 _H * 3 | Standby system CPU * 4 | 03D2 _H * 3 | System A CPU | 03D3 _H * 3 | System B CPU | 03E0 _H * 5 | Multiple CPU No. 1 or target station CPU (in single CPU system) | 03E1 _H * 5 | Multiple CPU No. 2 | 03E2 _H * 5 | Multiple CPU No. 3 | 03E3 _H * 5 | Multiple CPU No. 4 | 03FF _H | Target station CPU/control CPU/host system CPU |
| | | Set value | Description | | | | | | | | | | | | | | | | | | | | | |
| | | 0000 _H * 3 | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | | | | | | | | | | | | | | | | | | | | | |
| | | 03D0 _H * 3 | Control system CPU * 4 | | | | | | | | | | | | | | | | | | | | | |
| | | 03D1 _H * 3 | Standby system CPU * 4 | | | | | | | | | | | | | | | | | | | | | |
| | | 03D2 _H * 3 | System A CPU | | | | | | | | | | | | | | | | | | | | | |
| | | 03D3 _H * 3 | System B CPU | | | | | | | | | | | | | | | | | | | | | |
| | | 03E0 _H * 5 | Multiple CPU No. 1 or target station CPU (in single CPU system) | | | | | | | | | | | | | | | | | | | | | |
| | | 03E1 _H * 5 | Multiple CPU No. 2 | | | | | | | | | | | | | | | | | | | | | |
| | | 03E2 _H * 5 | Multiple CPU No. 3 | | | | | | | | | | | | | | | | | | | | | |
| | | 03E3 _H * 5 | Multiple CPU No. 4 | | | | | | | | | | | | | | | | | | | | | |
| 03FF _H | Target station CPU/control CPU/host system CPU | | | | | | | | | | | | | | | | | | | | | | | |
| Word device * 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| Word device * 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| * 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| n4 | Mode | Word device * 8 | | | | | | | | | | | | | | | | | | | | | | |
| | | * 6 | | | | | | | | | | | | | | | | | | | | | | |
| (D) | Completion device (host) Designate the host device to set scan 1 at ON when execution has been completed. (D) Off : Not completed On : Complete (D)+1 Off : Normal On : Abnormal If the execution is not normally completed, the corresponding error code will be saved at SW0031 to SW003F. (For the error code, refer to Section 8.3.) | Bit device * 7 Bit designation of word device * 9 | | | | | | | | | | | | | | | | | | | | | | |

* 3: The CPU type can be specified when the host station is a network module of function version D or later. (The specification is not available when they are other than the above. Access is made to the target station CPU.)

* 4: If system switching occurs at the target station when the RRUN instruction is executed to the redundant system with the control or standby system CPU designated, the instruction may not be normally completed (error code: 4244_H, 4248_H).
If the above-mentioned error occurs and the RRUN instruction is not normally completed, retry to execute the instruction.

* 5: The CPU type can be specified when the QCPUs of the host station and target station are the following versions. (The specification is not available when they are other than the following. Access is made to the target station CPU.)

• QCPU: First 5 digits of the serial No. are "06092" or later

* 6: Settings each of the following modes.

| | | |
|-----------|----------|----------|
| b15 to b8 | b7 to b4 | b3 to b0 |
| 0 | 2) | 1) |

1) Operation mode:

→ Designates the enforced execution of the RRUN instruction.

1_H: Not forcibly executed

3_H: Forcibly executed. (The enforced execution mode enables the remote RUN instruction to be forcibly executed from another station when the station for which the remote STOP instruction was executed no longer operates under the remote RUN instruction.)

2) Clear mode:

→ Clear mode allows specification of the CPU module device clear (initialization) process at the start of CPU module operation activated by remote RUN. The CPU module will perform the specified clear processing, and then it will run according to the setting that can be confirmed by [PLC parameters] - [PLC file] - [Initial Device value] in GX Developer.

0_H: Not cleared. However, the local device is cleared.

1_H: Cleared with the exception of the latch range.

2_H: Clears all device memories, including the latch range.

* 7: Bit device : X, Y, M, L, F, V, and B

* 8: Word device : T, C, D, W, ST, R, and ZR (The Q00JCPU cannot use R and ZR.)

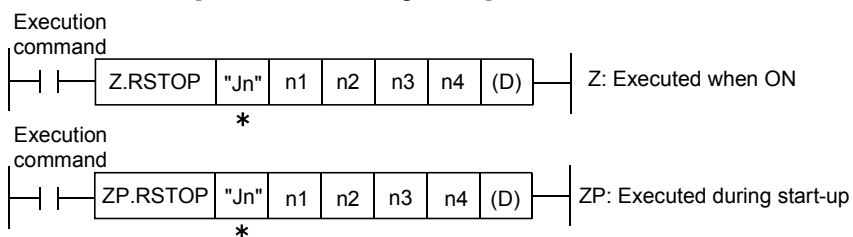
* 9: Bit designation of word device : Word device. bit No.

POINT

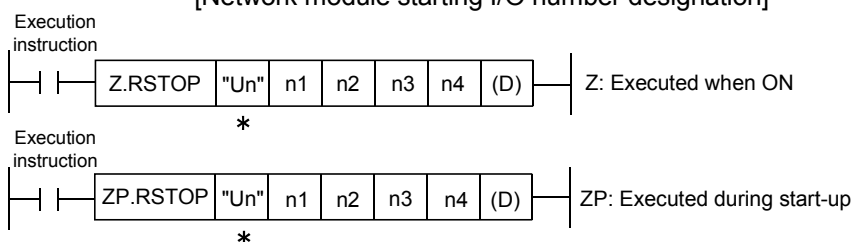
- (1) The remote RUN instruction is enabled when the RUN/STOP switch on the targeted station's CPU module is set to "RUN".
- (2) Remote RUN is not possible when the system protection function has been activated for the targeted station's CPU module.
- (3) If remote STOP or PAUSE are already in effect for the targeted station from other stations, it is not possible to perform RUN if the (n4) mode is set at "Not forcibly executed (0001_H)".

2) Z(P).RSTOP

[Network No. designation]



[Network module starting I/O number designation]



* : If the originating station is a Basic model QCPU (function version B or later) or Universal model QCPU, " "(double quotation) for the first argument can be omitted.

| | Description of setting | Setting range |
|----|---|--|
| Jn | Target network No. | 1 to 239 254: The network designated at the valid module during access to another station |
| Un | Starting I/O number of the host station network module Designate the three-digit I/O number with the first two digits. | 0 to FE _H |
| n1 | Channel used by the host | 1 to 8 (Constant) Word device * 7 |
| n2 | Target station number * 1 | 1 to 64 (Constant) 81 _H to A0 _H : Group designation FF _H : Target network No. for all stations: excluding the host Word device * 7 When a group is designated, set the group No. of the target station with the network parameters from GX Developer. |

(Continued to the next page)

* 1: When the multiple CPU No. is specified for the target station CPU type (n3) and group designation (81_H to A0_H) or all stations (FF_H) is specified for the target station number (n2), the instruction is executed for only the system where the CPU specified for the target station CPU type is the control CPU of the target station.

Refer to Section 2.2.2 (5) for details.

* 7: Word device: T, C, D, W, ST, R, and ZR (The Q00JCPU cannot use R and ZR.)

| | Description of setting | Setting range | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|--|--|-----------|-------------|-----------------------|--|-----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|-------------------|--|
| n3 | Target station CPU type | <div>Designate the CPU type of the target station.</div> <table><tr><th>Set value</th><th>Description</th></tr><tr><td>0000_H * 2</td><td>Target station CPU/control station CPU/host system CPU (The designation is the same as "03FF_H.")</td></tr><tr><td>03D0_H * 2</td><td>Control system CPU * 3</td></tr><tr><td>03D1_H * 2</td><td>Standby system CPU * 3</td></tr><tr><td>03D2_H * 2</td><td>System A CPU</td></tr><tr><td>03D3_H * 2</td><td>System B CPU</td></tr><tr><td>03E0_H * 4</td><td>Multiple CPU No. 1 or target station CPU (in single CPU system)</td></tr><tr><td>03E1_H * 4</td><td>Multiple CPU No. 2</td></tr><tr><td>03E2_H * 4</td><td>Multiple CPU No. 3</td></tr><tr><td>03E3_H * 4</td><td>Multiple CPU No. 4</td></tr><tr><td>03FF_H</td><td>Target station CPU/control CPU/host system CPU</td></tr></table> <div>Word device * 7</div> | Set value | Description | 0000 _H * 2 | Target station CPU/control station CPU/host system CPU (The designation is the same as "03FF _H .") | 03D0 _H * 2 | Control system CPU * 3 | 03D1 _H * 2 | Standby system CPU * 3 | 03D2 _H * 2 | System A CPU | 03D3 _H * 2 | System B CPU | 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | 03E1 _H * 4 | Multiple CPU No. 2 | 03E2 _H * 4 | Multiple CPU No. 3 | 03E3 _H * 4 | Multiple CPU No. 4 | 03FF _H | Target station CPU/control CPU/host system CPU |
| Set value | Description | | | | | | | | | | | | | | | | | | | | | | | |
| 0000 _H * 2 | Target station CPU/control station CPU/host system CPU (The designation is the same as "03FF _H .") | | | | | | | | | | | | | | | | | | | | | | | |
| 03D0 _H * 2 | Control system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 03D1 _H * 2 | Standby system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 03D2 _H * 2 | System A CPU | | | | | | | | | | | | | | | | | | | | | | | |
| 03D3 _H * 2 | System B CPU | | | | | | | | | | | | | | | | | | | | | | | |
| 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | | | | | | | | | | | | | | | | | | | | | | | |
| 03E1 _H * 4 | Multiple CPU No. 2 | | | | | | | | | | | | | | | | | | | | | | | |
| 03E2 _H * 4 | Multiple CPU No. 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 03E3 _H * 4 | Multiple CPU No. 4 | | | | | | | | | | | | | | | | | | | | | | | |
| 03FF _H | Target station CPU/control CPU/host system CPU | | | | | | | | | | | | | | | | | | | | | | | |
| n4 | Mode | <div>Word device * 7</div> <div>* 5</div> | | | | | | | | | | | | | | | | | | | | | | |
| (D) | <div>Complete device (host)</div> <div>Designate the host device to set scan 1 at ON when execution has been completed.</div> <div>(D) Off : Not completed On : Complete</div> <div>(D)+1 Off : Normal On : Error</div> <div>If the execution is not normally completed, the corresponding error code will be saved at SW0031 to SW003F. (For the error code, refer to Section 8.3.)</div> | <div>Bit device * 6</div> <div>Bit designation of word device * 8</div> | | | | | | | | | | | | | | | | | | | | | | |

* 2: The CPU type can be specified when the host station is a network module of function version D or later. (The specification is not available when they are other than the above. Access is made to the target station CPU.)

* 3: If system switching occurs at the target station when the RSTOP instruction is executed to the redundant system with the control or standby system CPU designated, the instruction may not be normally completed (error code: 4244_H, 4248_H).

If the above-mentioned error occurs and the RSTOP instruction is not normally completed, retry to execute the instruction.

* 4: The CPU type can be specified when the QCPUs of the host station and target station are the following versions. (The specification is not available when they are other than the following. Access is made to the target station CPU.)

• QCPU: First 5 digits of the serial No. are "06092" or later

* 5: Settings each of the following modes.

| | | |
|-----|----|-------------|
| b15 | to | b4 b3 to b0 |
| 0 | | 1) |

1) Operation mode → 1_H (fixed)

* 6: Bit device : X, Y, M, L, F, V, and B

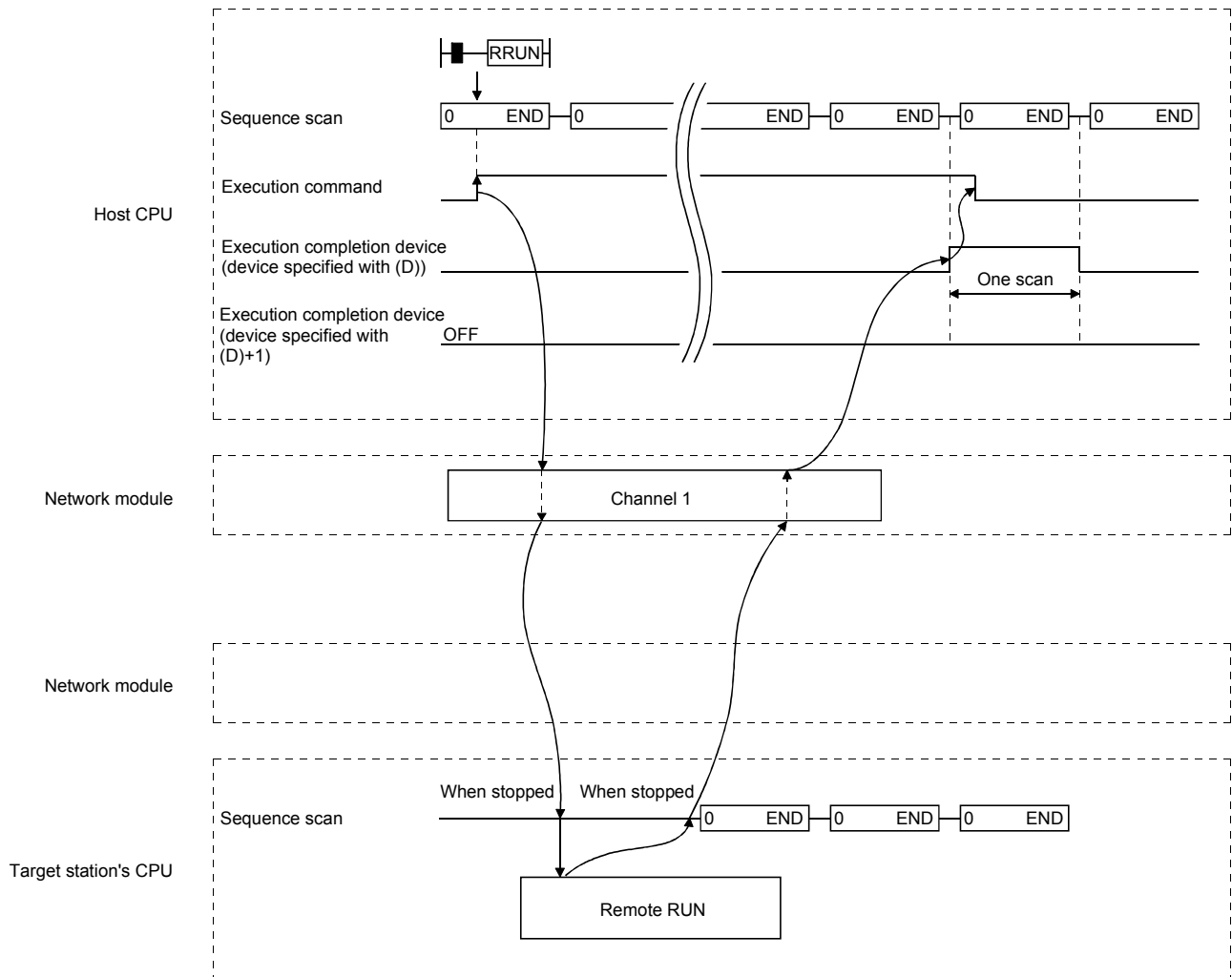
* 7: Word device : T, C, D, W, ST, R, and ZR (The Q00JCPU cannot use R and ZR.)

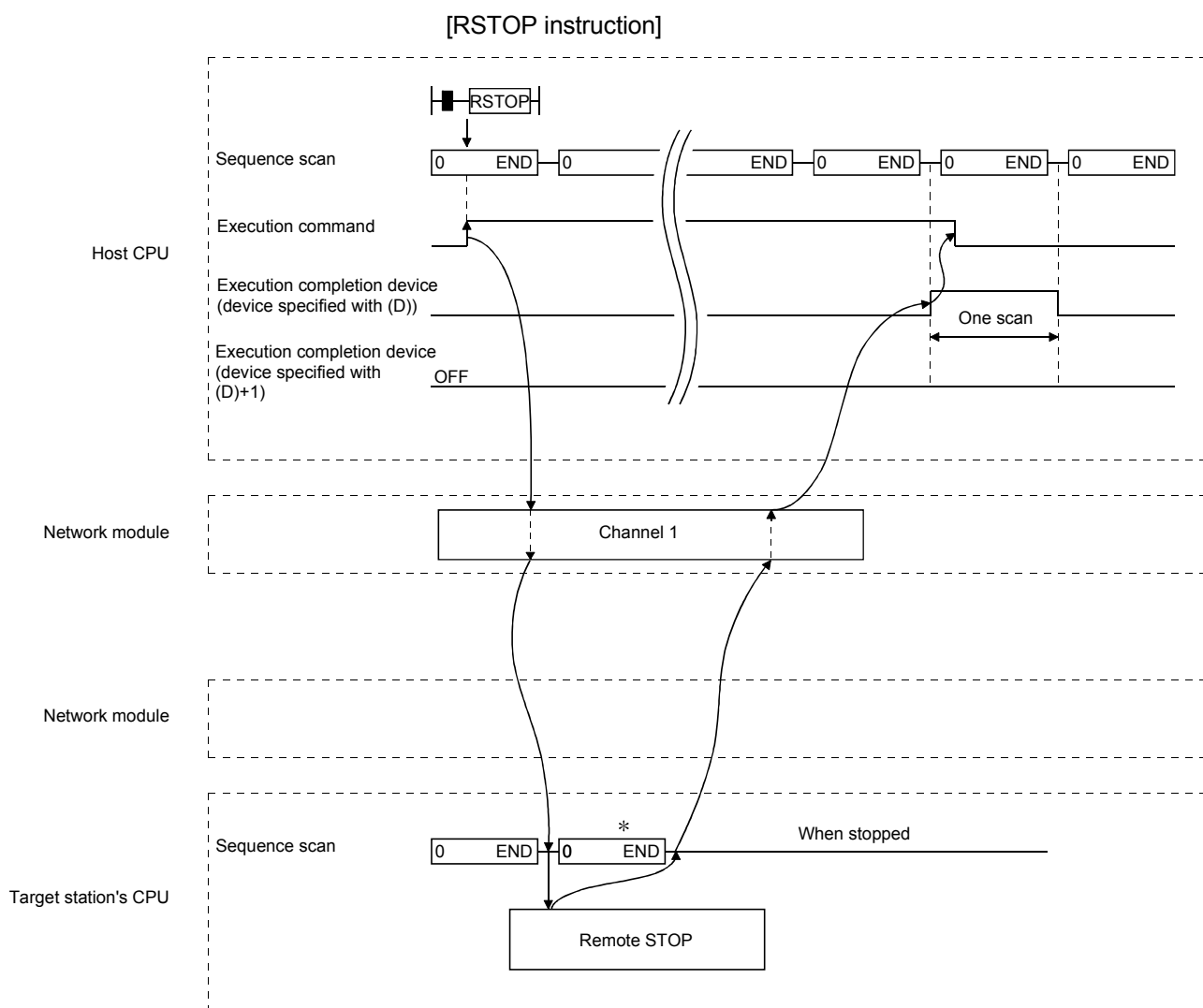
* 8: Bit designation of word device : Word device. bit No.

POINT

- (1) Remote STOP is available when the RUN/STOP switch of the target station CPU is set to "RUN".
- (2) Remote STOP is not possible when the system protection function has been activated for the targeted station's CPU module.
- (3) The remote STOP information will be deleted if the target station's CPU module for which remote STOP is being performed is reset.

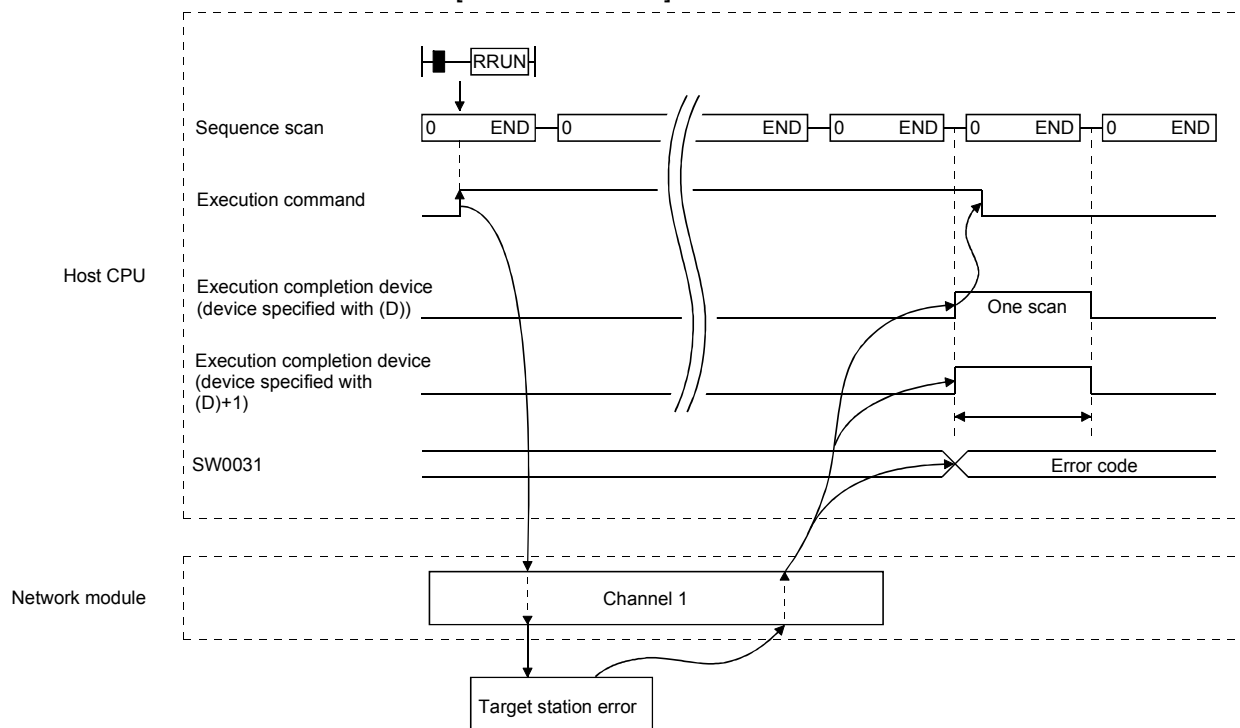
(b) Instruction execution timing

1) Normal completion
[RRUN instruction]

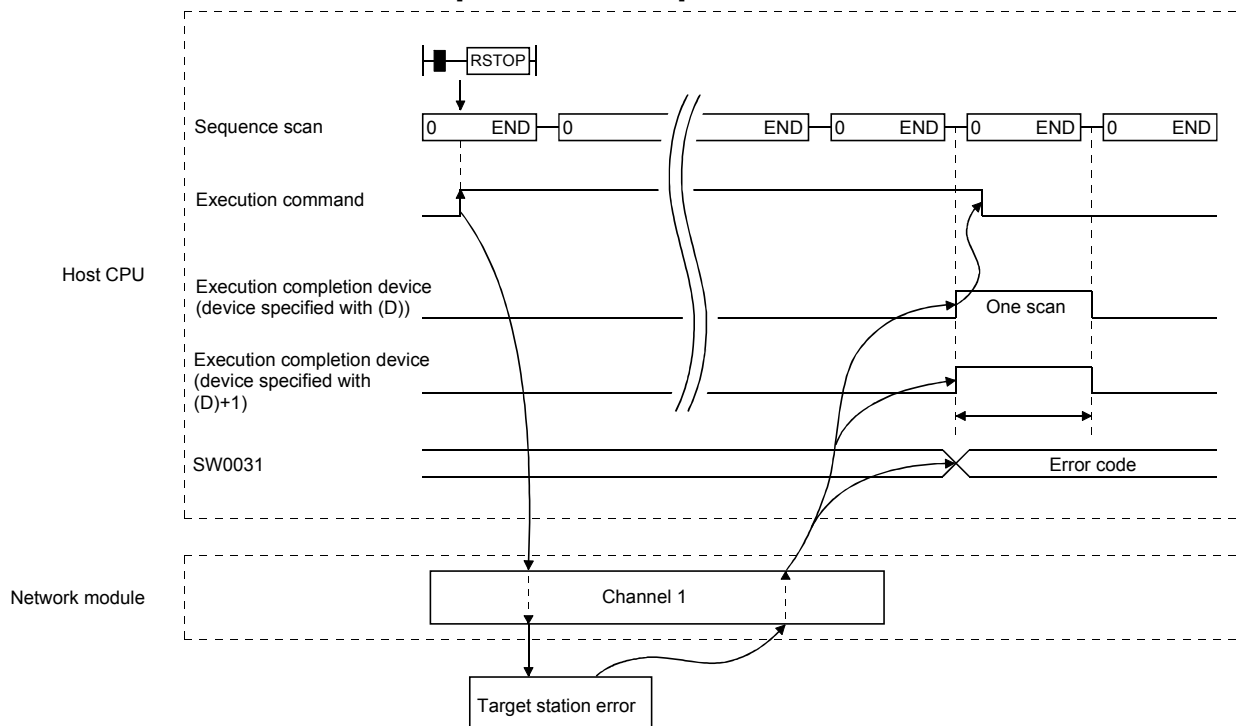


* According to the system organization, sequence scan time, etc., several scans will be run until the sequence scan STOP instruction is given.

2) Abnormal completion [RRUN instruction]



[RSTOP instruction]



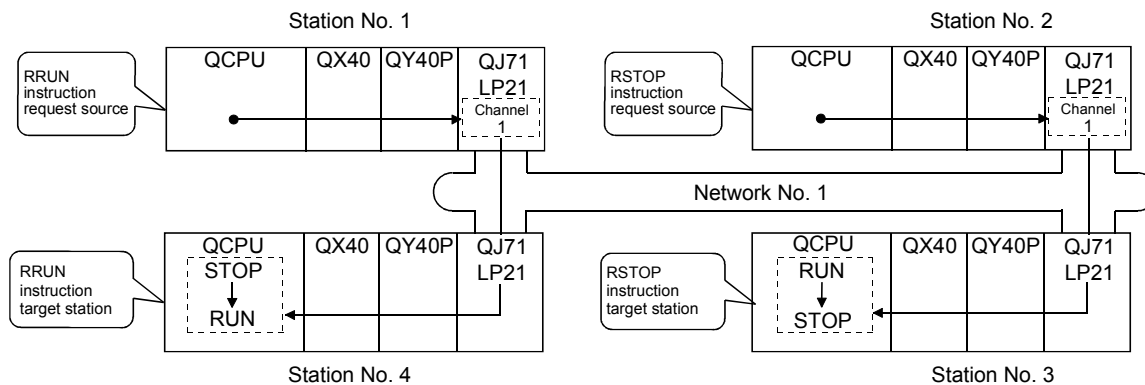
POINT

The error code will be stored in SW0031 to SW003F depending on the channel number in use. Refer to section 8.3 (3) for further details.

(c) Program examples

The program examples shown below are programmed for the following system configuration.

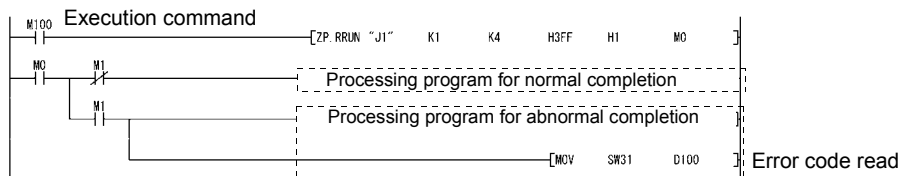
When actually using the programs below, interlock the programs by seeing Section 6.1.



1) RRUN instruction

A program to execute the remote RUN instruction using channel 1 for the station No.4 control CPU is shown below.

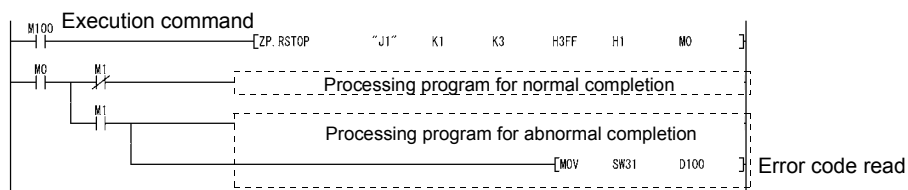
M0 is used as the completion device.



2) RSTOP instruction

A program to execute the remote STOP instruction using channel 1 for the station No.3 control CPU is shown below.

M0 is used as the completion device.



7.4.5 (6) Reading and writing clock data of other station CPU modules (Z(P).RTMRD, Z(P).RTMWR)

| Target station | | |
|----------------|--------|--------|
| QCPU | QnACPU | AnUCPU |
| ○* | × | × |

* : For link dedicated instruction for the safety CPU, refer to Section 6.3

This section explains the RTMRD and RTMWR instruction formats, and provides program samples.

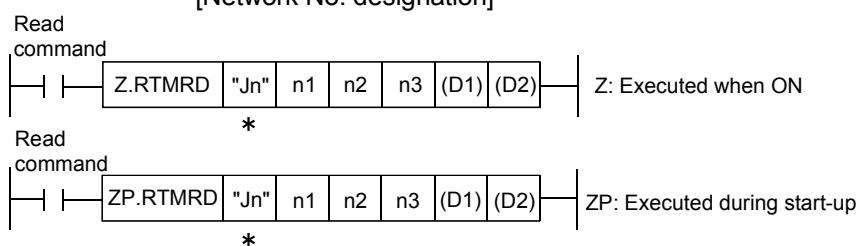
The RTMRD instruction reads other station CPU module clock data.

The RTMWR instruction writes other station CPU module clock data.

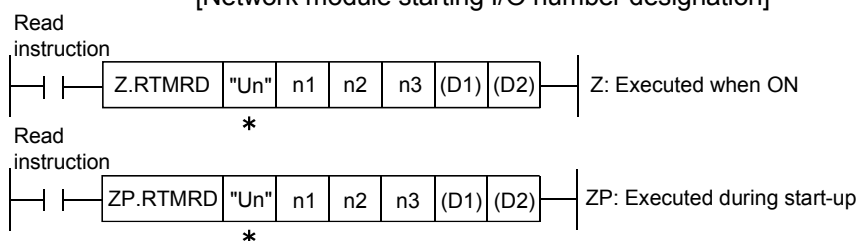
(a) Instruction format

1) Z(P).RTMRD

[Network No. designation]



[Network module starting I/O number designation]



* : If the originating station is a Basic model QCPU (function version B or later), Universal model QCPU, or safety CPU, " "(double quotation) for the first argument can be omitted.

| | Description of setting | Setting range |
|----|---|--|
| Jn | Target network No. | 1 to 239 254: The network designated at the valid module during access to another station |
| Un | Starting I/O number of the host station network module Designate the three-digit I/O number with the first two digits. | 0 to FE _H |
| n1 | Channel used by the host | 1 to 8 (Constant) Word device * 5 |
| n2 | Target station number | 1 to 64 (Constant) Word device * 5 |

(Continued to the next page)

* 5: Word device: T, C, D, W, ST, R, and ZR (The Q00JCPU and QS001CPU cannot use R and ZR.)

| Description of setting | | Setting range | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|--|---|--|-------------|-----------------------|--|-----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|-----------------------|--------------|-------------------|---|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--|
| n3 | Target station CPU type | Designate the CPU type of the target station. | | | | | | | | | | | | | | | | | | | | | | |
| | | <table><tr><th>Set value</th><th>Description</th></tr><tr><td>0000_H * 1</td><td>Target station CPU/control CPU/host system CPU (The designation is the same as "03FF_H."</td></tr><tr><td>03D0_H * 1</td><td>Control system CPU * 2</td></tr><tr><td>03D1_H * 1</td><td>Standby system CPU * 2</td></tr><tr><td>03D2_H * 1</td><td>System A CPU</td></tr><tr><td>03D3_H * 1</td><td>System B CPU</td></tr><tr><td>03E0_H</td><td>Multiple CPU No. 1 or target station CPU (in single CPU system)</td></tr><tr><td>03E1_H</td><td>Multiple CPU No. 2</td></tr><tr><td>03E2_H</td><td>Multiple CPU No. 3</td></tr><tr><td>03E3_H</td><td>Multiple CPU No. 4</td></tr><tr><td>03FF_H</td><td>Target station CPU/control CPU/host system CPU</td></tr></table> | Set value | Description | 0000 _H * 1 | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H ." | 03D0 _H * 1 | Control system CPU * 2 | 03D1 _H * 1 | Standby system CPU * 2 | 03D2 _H * 1 | System A CPU | 03D3 _H * 1 | System B CPU | 03E0 _H | Multiple CPU No. 1 or target station CPU (in single CPU system) | 03E1 _H | Multiple CPU No. 2 | 03E2 _H | Multiple CPU No. 3 | 03E3 _H | Multiple CPU No. 4 | 03FF _H | Target station CPU/control CPU/host system CPU |
| | | Set value | Description | | | | | | | | | | | | | | | | | | | | | |
| | | 0000 _H * 1 | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H ." | | | | | | | | | | | | | | | | | | | | | |
| | | 03D0 _H * 1 | Control system CPU * 2 | | | | | | | | | | | | | | | | | | | | | |
| | | 03D1 _H * 1 | Standby system CPU * 2 | | | | | | | | | | | | | | | | | | | | | |
| | | 03D2 _H * 1 | System A CPU | | | | | | | | | | | | | | | | | | | | | |
| | | 03D3 _H * 1 | System B CPU | | | | | | | | | | | | | | | | | | | | | |
| | | 03E0 _H | Multiple CPU No. 1 or target station CPU (in single CPU system) | | | | | | | | | | | | | | | | | | | | | |
| | | 03E1 _H | Multiple CPU No. 2 | | | | | | | | | | | | | | | | | | | | | |
| | | 03E2 _H | Multiple CPU No. 3 | | | | | | | | | | | | | | | | | | | | | |
| | | 03E3 _H | Multiple CPU No. 4 | | | | | | | | | | | | | | | | | | | | | |
| 03FF _H | Target station CPU/control CPU/host system CPU | | | | | | | | | | | | | | | | | | | | | | | |
| Word device * 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| * 4 | | | | | | | | | | | | | | | | | | | | | | | | |
| (D1) | First device storing the read clock data * 3 | Word device * 5 | | | | | | | | | | | | | | | | | | | | | | |
| (D2) | Completion device (host) Designate the host device to set scan 1 at ON when execution has been completed. (D2)..... Off : Not completed On : Complete (D2)+1..... Off : Normal On : Abnormal If the execution is not normally completed, the corresponding error code will be saved at SW0031 to SW003F. (For the error code, refer to Section 8.3.) | Bit device * 4 Bit designation of word device * 6 | | | | | | | | | | | | | | | | | | | | | | |

* 1: The CPU type can be specified when the host station is a network module of function version D or later. (The specification is not available for other versions. The target station CPU will be accessed.)

* 2: If system switching occurs at the target station when the RTMRD instruction is executed to the redundant system with the control or standby system CPU designated, the instruction may not be normally completed (error code: 4244_H, 4248_H).

If the above-mentioned error occurs and the RTMRD instruction is not normally completed, retry to execute the instruction.

* 3: The following details of the read clock data are stored with the BCD code.

| Device | Item | Description | | | | | | | | | | | | |
|---|---|--|---|----|----|----|----|----|---|--|--|---|--|--|
| (D1) | Year (lower two digits)/month the data was read | <table><tr><td>b15</td><td>to</td><td>b8</td><td>b7</td><td>to</td><td>b0</td></tr><tr><td colspan="3">Year (lower two digits) (00_H to 99_H)</td><td colspan="3">Month (01_H to 12_H)</td></tr></table> | b15 | to | b8 | b7 | to | b0 | Year (lower two digits) (00 _H to 99 _H) | | | Month (01 _H to 12 _H) | | |
| b15 | to | b8 | b7 | to | b0 | | | | | | | | | |
| Year (lower two digits) (00 _H to 99 _H) | | | Month (01 _H to 12 _H) | | | | | | | | | | | |
| (D1)+1 | Date/hour the data was read | <table><tr><td>b15</td><td>to</td><td>b8</td><td>b7</td><td>to</td><td>b0</td></tr><tr><td colspan="3">Date (01_H to 31_H)</td><td colspan="3">Hour (00_H to 23_H)</td></tr></table> | b15 | to | b8 | b7 | to | b0 | Date (01 _H to 31 _H) | | | Hour (00 _H to 23 _H) | | |
| b15 | to | b8 | b7 | to | b0 | | | | | | | | | |
| Date (01 _H to 31 _H) | | | Hour (00 _H to 23 _H) | | | | | | | | | | | |
| (D1)+2 | Minute/second the data was read | <table><tr><td>b15</td><td>to</td><td>b8</td><td>b7</td><td>to</td><td>b0</td></tr><tr><td colspan="3">Minutes (00_H to 59_H)</td><td colspan="3">Seconds (00_H to 59_H)</td></tr></table> | b15 | to | b8 | b7 | to | b0 | Minutes (00 _H to 59 _H) | | | Seconds (00 _H to 59 _H) | | |
| b15 | to | b8 | b7 | to | b0 | | | | | | | | | |
| Minutes (00 _H to 59 _H) | | | Seconds (00 _H to 59 _H) | | | | | | | | | | | |
| (D1)+3 | Year (higher two digits)/day the data was read | <table><tr><td>b15</td><td>to</td><td>b8</td><td>b7</td><td>to</td><td>b0</td></tr><tr><td colspan="3">Year (higher two digits) (19_H/20_H)</td><td colspan="3">Day (00_H to 06_H)</td></tr></table> <div>→ 00_H (Sunday) to 06_H (Saturday)</div> | b15 | to | b8 | b7 | to | b0 | Year (higher two digits) (19 _H /20 _H) | | | Day (00 _H to 06 _H) | | |
| b15 | to | b8 | b7 | to | b0 | | | | | | | | | |
| Year (higher two digits) (19 _H /20 _H) | | | Day (00 _H to 06 _H) | | | | | | | | | | | |

* 4: Bit device : X, Y, M, L, F, V, and B

* 5: Word device : T, C, D, W, ST, R, and ZR (The Q00JCPU and QS001CPU cannot use R and ZR.)

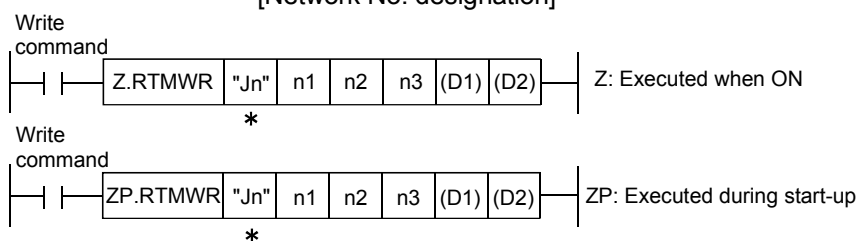
* 6: Bit designation of word device : Word device. bit No.

POINT

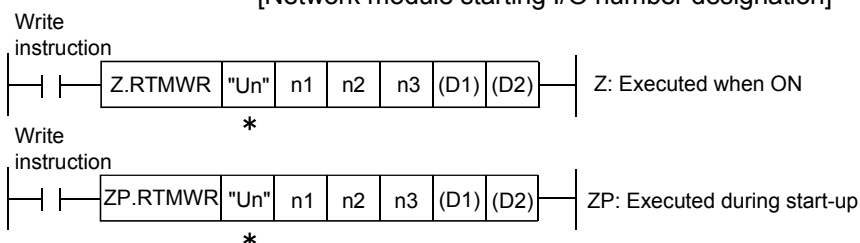
The readable range for the year (4 digits) is from 1980 to 2079.

2) Z(P).RTMWR

[Network No. designation]



[Network module starting I/O number designation]



*: If the originating station is a Basic model QCPU (function version B or later), Universal model QCPU, or safety CPU, " "(double quotation) for the first argument can be omitted.

| | Description of setting | Setting range | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|---|--|-----------|-------------|-----------------------|---|-----------------------|------------------------|-----------------------|------------------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---|-----------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|-------------------|--|
| Jn | Target network No. | 1 to 239 254: The network designated at the valid module during access to another station | | | | | | | | | | | | | | | | | | | | | | |
| Un | Starting I/O number of the host station network module Designate the three-digit I/O number with the first two digits. | 0 to FE _H | | | | | | | | | | | | | | | | | | | | | | |
| n1 | Channel used by the host | 1 to 8 (Constant) Word device * 7 | | | | | | | | | | | | | | | | | | | | | | |
| n2 | Target station number * 1 | 1 to 64 (Constant) 81 _H to A0 _H : Group designation FF _H : Target network No. for all stations: excluding the host Word device * 7 When a group is designated, set the group No. of the target station with the network parameters from GX Developer. | | | | | | | | | | | | | | | | | | | | | | |
| n3 | Target station CPU type | <div>Designate the CPU type of the target station.</div> <table><tr><th>Set value</th><th>Description</th></tr><tr><td>0000_H * 2</td><td>Target station CPU/control CPU/host system CPU (The designation is the same as "03FF_H.")</td></tr><tr><td>03D0_H * 2</td><td>Control system CPU * 3</td></tr><tr><td>03D1_H * 2</td><td>Standby system CPU * 3</td></tr><tr><td>03D2_H * 2</td><td>System A CPU</td></tr><tr><td>03D3_H * 2</td><td>System B CPU</td></tr><tr><td>03E0_H * 4</td><td>Multiple CPU No. 1 or target station CPU (in single CPU system)</td></tr><tr><td>03E1_H * 4</td><td>Multiple CPU No. 2</td></tr><tr><td>03E2_H * 4</td><td>Multiple CPU No. 3</td></tr><tr><td>03E3_H * 4</td><td>Multiple CPU No. 4</td></tr><tr><td>03FF_H</td><td>Target station CPU/control CPU/host system CPU</td></tr></table> <div>Word device * 7</div> | Set value | Description | 0000 _H * 2 | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | 03D0 _H * 2 | Control system CPU * 3 | 03D1 _H * 2 | Standby system CPU * 3 | 03D2 _H * 2 | System A CPU | 03D3 _H * 2 | System B CPU | 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | 03E1 _H * 4 | Multiple CPU No. 2 | 03E2 _H * 4 | Multiple CPU No. 3 | 03E3 _H * 4 | Multiple CPU No. 4 | 03FF _H | Target station CPU/control CPU/host system CPU |
| Set value | Description | | | | | | | | | | | | | | | | | | | | | | | |
| 0000 _H * 2 | Target station CPU/control CPU/host system CPU (The designation is the same as "03FF _H .") | | | | | | | | | | | | | | | | | | | | | | | |
| 03D0 _H * 2 | Control system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 03D1 _H * 2 | Standby system CPU * 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 03D2 _H * 2 | System A CPU | | | | | | | | | | | | | | | | | | | | | | | |
| 03D3 _H * 2 | System B CPU | | | | | | | | | | | | | | | | | | | | | | | |
| 03E0 _H * 4 | Multiple CPU No. 1 or target station CPU (in single CPU system) | | | | | | | | | | | | | | | | | | | | | | | |
| 03E1 _H * 4 | Multiple CPU No. 2 | | | | | | | | | | | | | | | | | | | | | | | |
| 03E2 _H * 4 | Multiple CPU No. 3 | | | | | | | | | | | | | | | | | | | | | | | |
| 03E3 _H * 4 | Multiple CPU No. 4 | | | | | | | | | | | | | | | | | | | | | | | |
| 03FF _H | Target station CPU/control CPU/host system CPU | | | | | | | | | | | | | | | | | | | | | | | |

(Continued to the next page)

* 1: When the multiple CPU No. is specified for the target station CPU type (n3) and group designation (81_H to A0_H) or all stations (FF_H) is specified for the target station number (n2), the instruction is executed for only the system where the CPU specified for the target station CPU type is the control CPU of the target station.

Refer to Section 2.2.2 (5) for details.

* 7: Word device: T, C, D, W, ST, R, and ZR (The Q00JCPU and QS001CPU cannot use R and ZR.)

| | Description of setting | Setting range |
|------|---|--|
| (D1) | First device storing the write clock data * 5 | Word device * 7 |
| (D2) | Completion device (host) Designate the host device to set scan 1 at ON when execution has been completed. (D2)..... Off : Not completed On : Complete (D2)+1.... Off : Normal On : Abnormal If the execution is not normally completed, the corresponding error code will be saved at SW0031 to SW003F. (For the error code, refer to Section 8.3.) | Bit device * 6 Bit designation of word device * 8 |

* 2: The CPU type can be specified when the host station is a network module of function version D or later. (The specification is not available when the are other than the above. Access is made to the target station CPU)

* 3: If system switching occurs at the target system when the RTMWR instruction is executed to the redundant system with the control or standby system CPU designated, the instruction may not be normally completed (error code: 4244_H, 4248_H).

If the above-mentioned error occurs and the RTMWR instruction is not normally completed, retry to execute the instruction.

* 4: The CPU type can be specified when the QCPUs of the host station and target station are the following versions. (The specification is not available when they are other than the following. Access is made to the target station CPU.)

• QCPU: First 5 digits of the serial No. are "06092" or later

* 5: The following details of the written clock data are stored with The BCD code.

| Device | Item | Description |
|--------|--|--|
| (D1) | Amendment pattern | <p>Specifies the item into which the (D1)+1 to (D1)+4 clock data is to be written.</p> <p>0: Not amended 1: Amended</p> <div><div><div>b15to b8b7b6b5b4b3b2b1b0</div><div>0to0</div></div><div><div>→ Year (lower two digits)</div><div>→ Month</div><div>→ Date</div><div>→ Hour</div><div>→ Minutes</div><div>→ Seconds</div><div>→ Day</div><div>→ Year (higher two digits)</div></div></div> |
| (D1)+1 | Year (lower two digits)/month the data write | <div><div>b15to b8b7to b0</div><div><div>Year (lower two digits) (00_H to 99_H)</div><div>Month (01_H to 12_H)</div></div></div> |
| (D1)+2 | Date/hour the data write | <div><div>b15to b8b7to b0</div><div><div>Date (01_H to 31_H)</div><div>Hour (00_H to 23_H)</div></div></div> |
| (D1)+3 | Minute/second the data write | <div><div>b15to b8b7to b0</div><div><div>Minutes (00_H to 59_H)</div><div>Seconds (00_H to 59_H)</div></div></div> |
| (D1)+4 | Year (higher two digits)/day the data write | <div><div>b15to b8b7to b0</div><div><div>Year (higher two digits) (19_H/20_H)</div><div>Day (00_H to 06_H)</div></div><div>→ 00_H (Sunday) to 06_H (Saturday)</div></div> |

* 6: Bit device : X, Y, M, L, F, V, and B

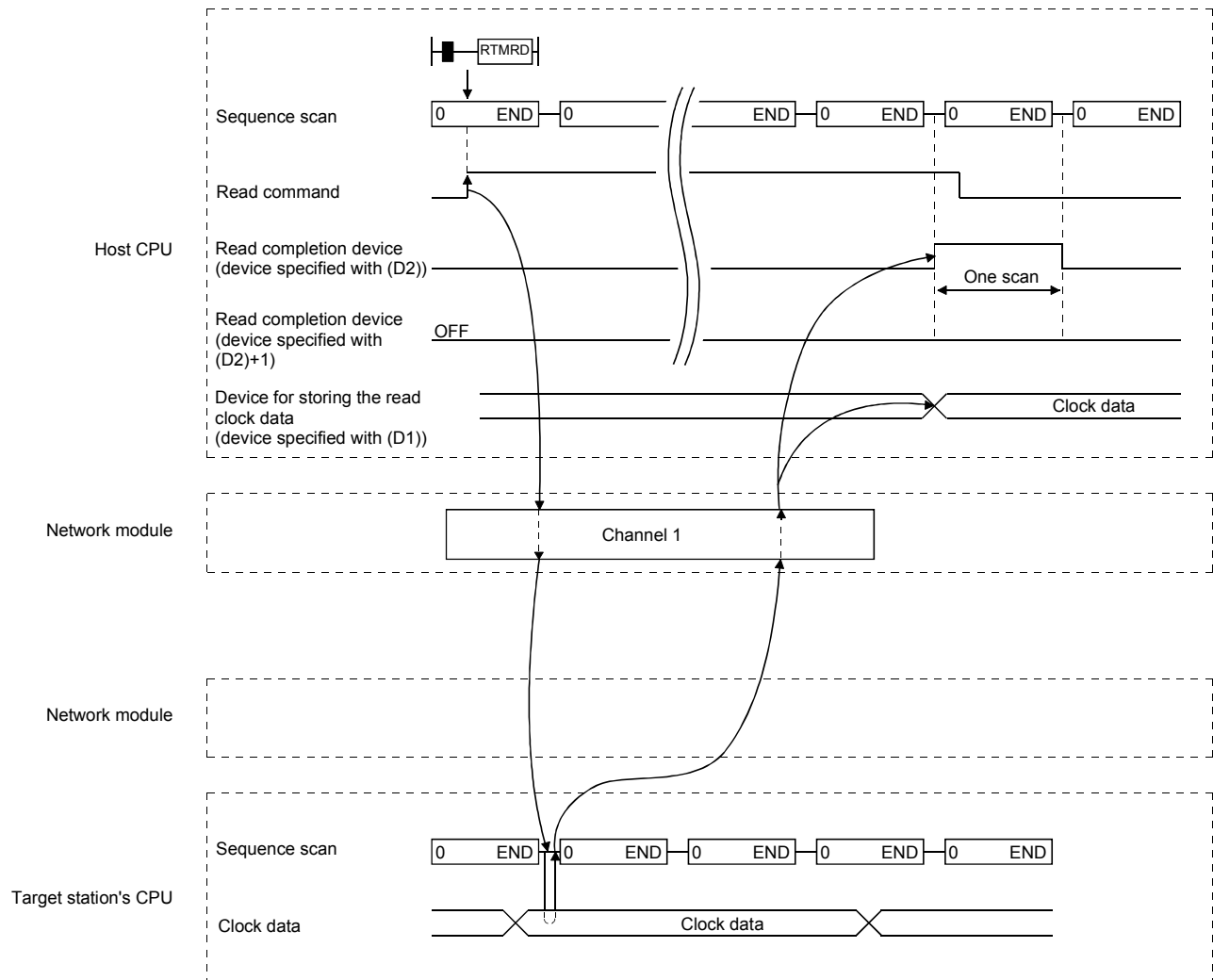
* 7: Word device : T, C, D, W, ST, R, and ZR (The Q00JCPU and QS001CPU cannot use R and ZR.)

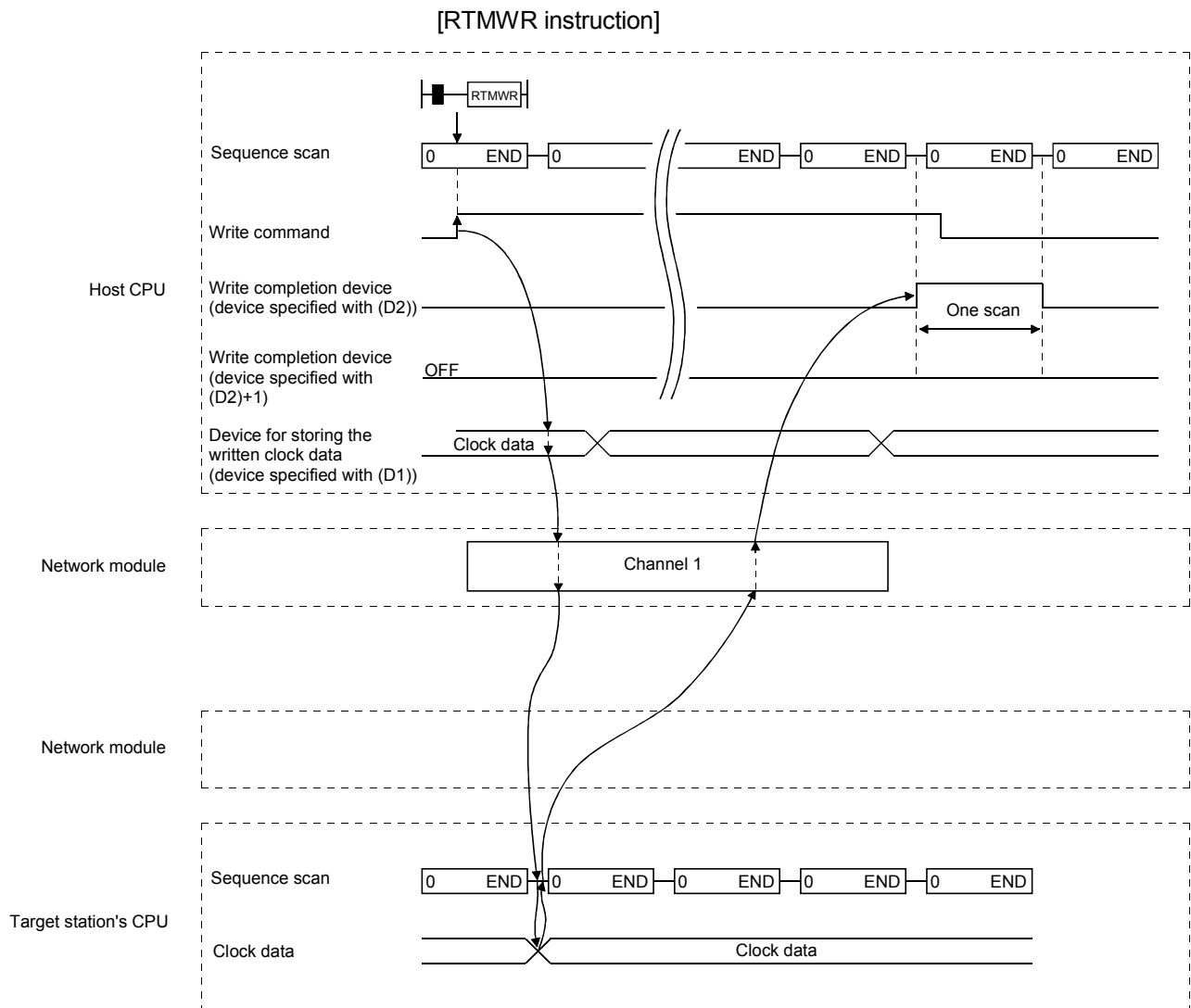
* 8: Bit designation of word device : Word device. bit No.

POINT

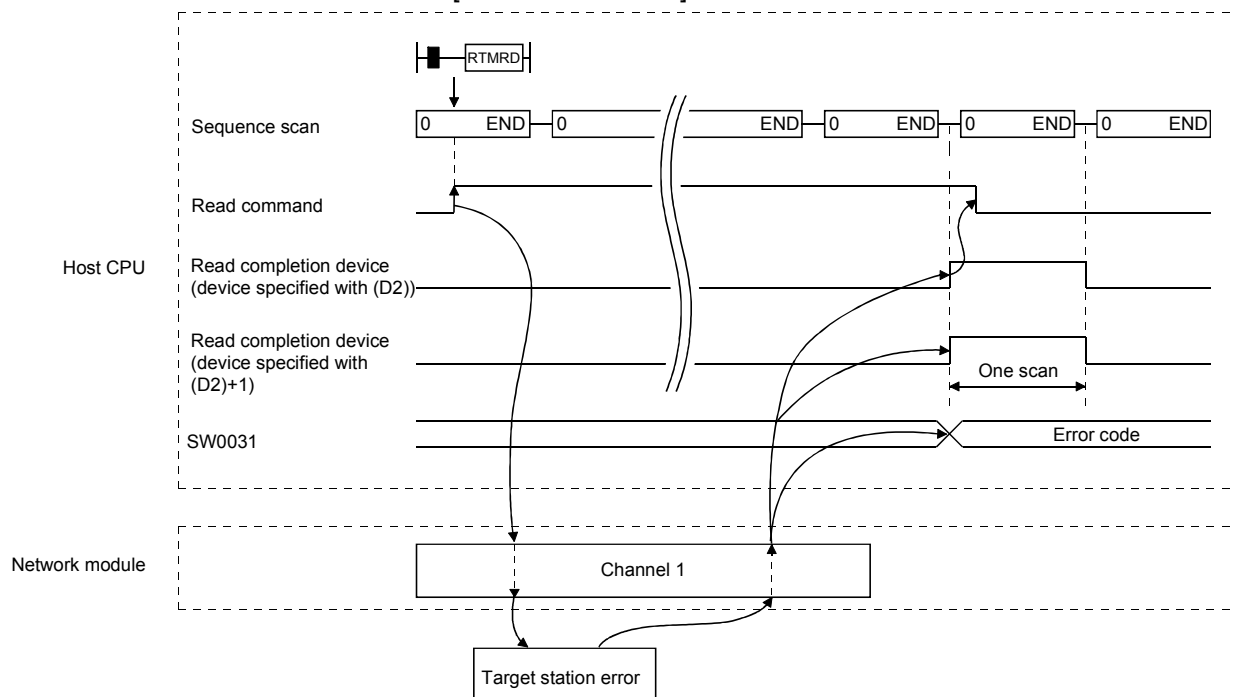
- (1) Clock data cannot be written when the system protection function has been activated for the targeted station's CPU module.
- (2) The writable range for the year (4 digits) is from 1980 to 2079.

(b) Instruction execution timing

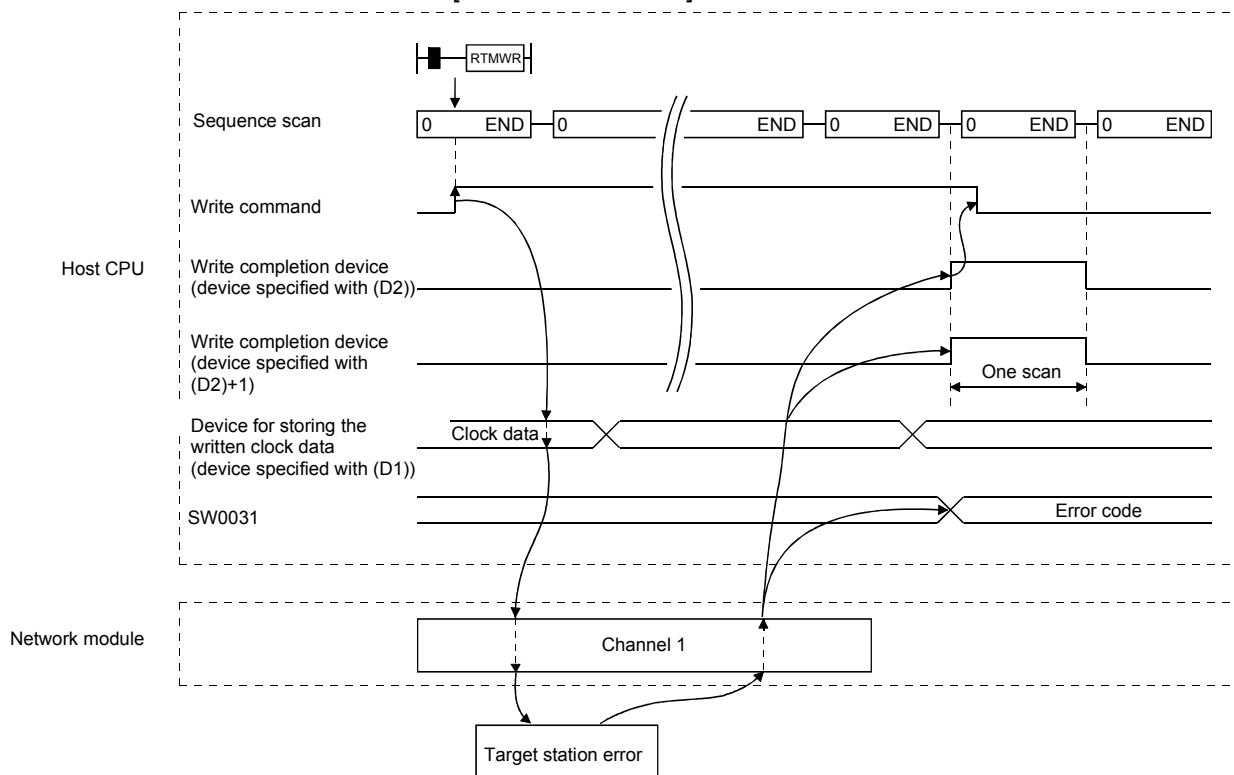
1) Normal completion
[RTMRD instruction]



2) Abnormal completion [RTMRD instruction]



[RTMWR instruction]



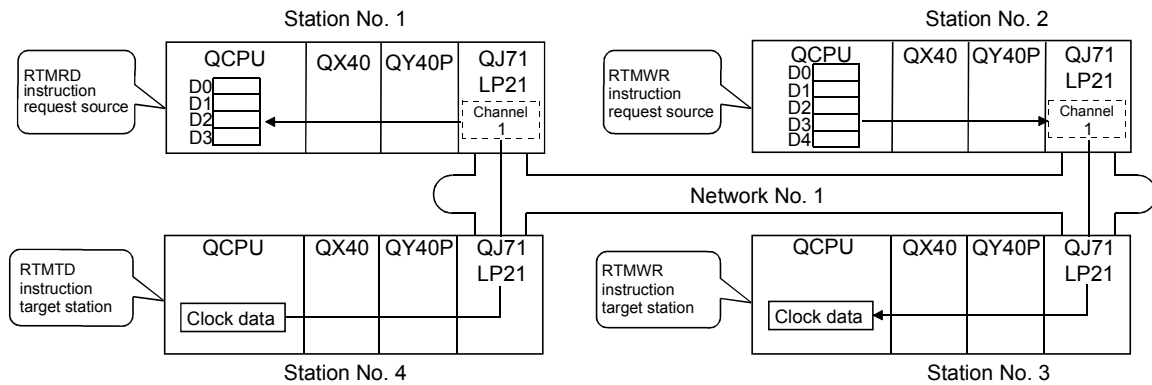
POINT

The error code will be stored in SW0031 to SW003F depending on the channel number in use. Refer to section 8.3 (3) for further details.

(c) Program examples

The program examples shown below are programmed for the following system configuration.

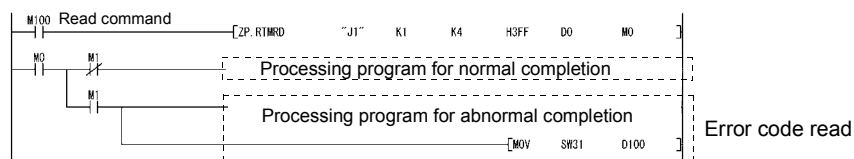
When actually using the programs below, interlock the programs by seeing Section 6.1.



1) RTMRD instruction

A program to execute the clock data read instruction with the use of channel 1 for the station No.4 control CPU and storing the result in D0 is shown below.

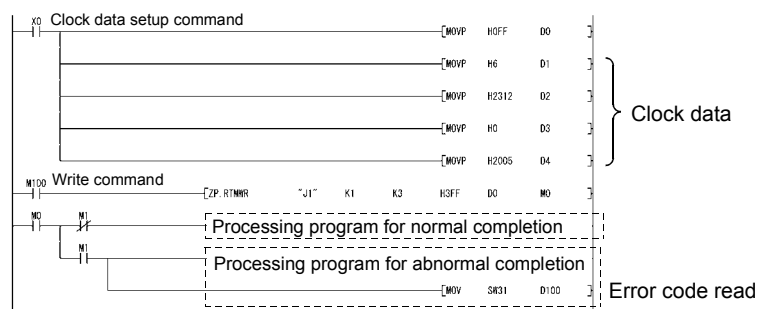
M0 is used as the completion device.



2) RTMWR instruction

A program for writing the clock data stored in the host's D0 with the use of channel 1 into the station No.3 control CPU is shown below.

M0 is used as the completion device.

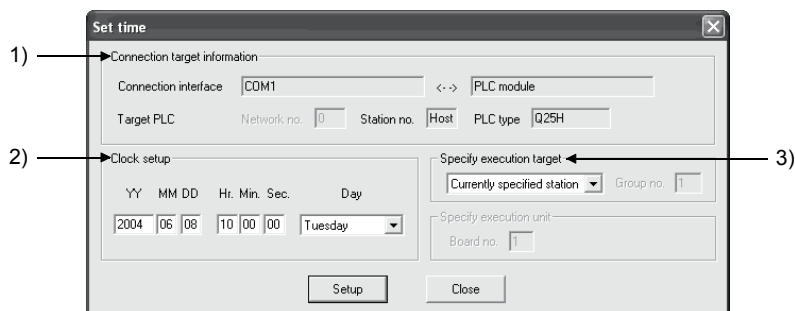


7.4.6 Setting the clock on the stations on a network with GX Developer

The clock can be set on the CPU modules that are connected on a network using GX Developer.

By designating the execution destination to all stations or a group, the clock can be set on multiple stations at the same time.

Select [Online] → [Set time] on the GX Developer screen to display the following screen. First, check the connection destination and set the clock. Then, after selecting the execution destination, click the [Setup] button to execute.



- 1) Connection target information
The current connection destination information is displayed.
- 2) Clock setup
Enter the date, time and day of the week.
- 3) Specify execution target
Select the target for the clock setup.
Currently specified station:
Sets the clock only on the station currently designated as the connection destination.
Designate all stations:
Sets the clock on all stations on the network of the currently designated station.
Select a module from Modules 1 to 4 in the execution module designation.
Designate group:
Sets the clock on all stations in a specific group on the network of the currently designated station.
Designate the execution module (Modules 1 to 4) and the Group No.

POINT

- (1) The clock can be set regardless of the on/off status of the device "SM210" that is used for the clock setting.
The on/off status of the "SM210" does not change after the execution.
- (2) The time set is not reflected on SD210 to SD213 (clock data) of the CPU module. The time is written to the time element of the CPU module.
To store the set time to SD210 to SD213 of the CPU module, turn SM213 (clock data read request) on.
- (3) After the clock setting, errors that are equal to the transfer time will occur.

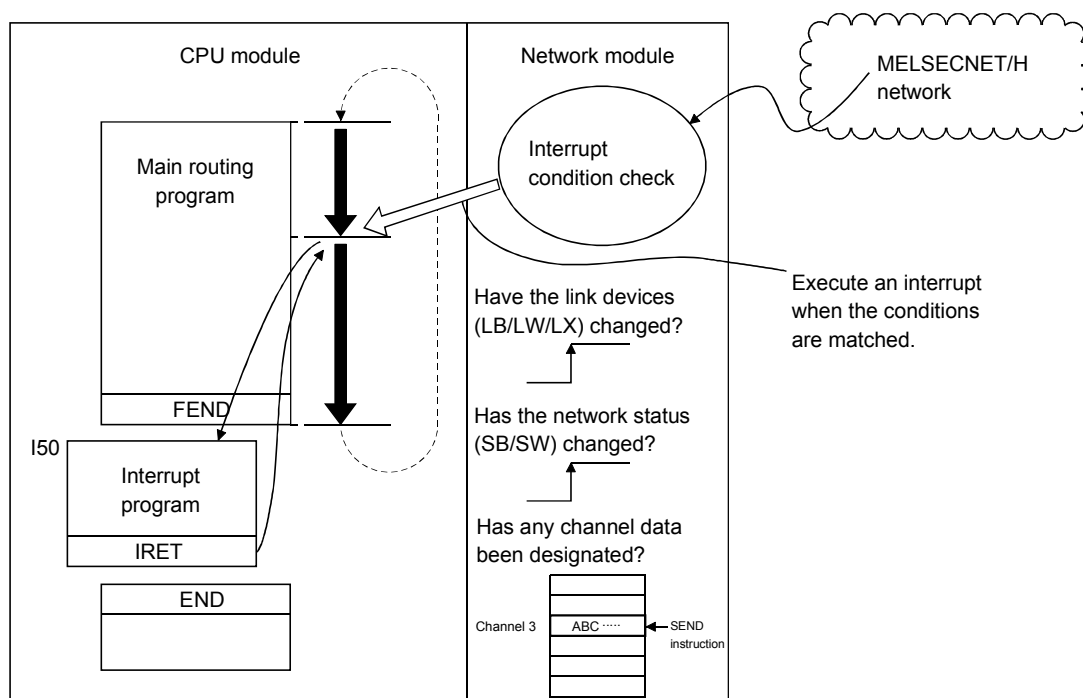
7.5 Starting the Interrupt Sequence Program

This function checks the interrupt conditions at data receiving from other stations using the interrupt setting parameters of the host. When the interrupt conditions are matched, it issues an interrupt request to the CPU module from the network module and starts the interrupt sequence program of the host's CPU.

[Advantages]

- 1) The startup of the interrupt sequence program of the applicable station can be instructed from other stations.
- 2) The number of programming steps is reduced and the scan time is shortened because the programming for the startup conditions is not required in the sequence program.

[Visual representation of the function]



POINT

- (1) The Basic model QCPU of function version B or later allows the setting of the interrupt setting parameters.
- (2) When multiple interrupt conditions are set, the operation may be delayed if an interrupt request is issued from other stations at the same time because other interrupts have to wait to be processed.
- (3) When executing the interrupt sequence program, it is necessary to execute "EI" (Enable Interrupt) with the main routine program.

7.5.1 Interrupt setting parameters

A maximum of 16 interrupt conditions can be set for each device code of the interrupt setting conditions on the following setting screen.

Click the **Interrupt settings** button to display the setting screen.

| | Device code | Device No. | Detection method | Interrupt condition | Word device: Setting value | Board No. | Interrupt (SI) No. |
|----|-------------------|------------|------------------|---------------------|----------------------------|-----------|--------------------|
| 1 | LB | 0000 | Edge detect | ON | | | 0 |
| 2 | LX | 0100 | Edge detect | OFF | | | 1 |
| 3 | SB | 0047 | Edge detect | ON | | | 2 |
| 4 | LW | 0200 | Edge detect | Equal | 500 | | 3 |
| 5 | SW | 0074 | Edge detect | Unequal | 0 | | 4 |
| 6 | RECVS instruction | | Edge detect | Scan completed | | 5 | 5 |
| 7 | Scan completed | | | | | | 6 |
| 8 | | | | | | | |
| 9 | LB | | | | | | |
| 10 | LX | | | | | | |
| 11 | SB | | | | | | |
| 12 | LW | | | | | | |
| 13 | SW | | | | | | |
| 14 | RECVS instruction | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |

Input format: DEC.

Buttons: Clear, Check, End, Cancel

[Selections of interrupt conditions for interrupt device codes and valid setting ranges]

| Setting condition Device code | Device No. | Detection method | Interrupt condition | Word device setting value | Board No. | Interrupt (SI) No. |
|----------------------------------|------------------------|---|---|------------------------------|-----------|-----------------------|
| RECVS instruction | — | Edge detection fixed | Scan completion fixed An interrupt occurs when the designated channel receives data. | — | 1 to 8 | 0 to 15 |
| LB | 0 to 3FFF _H | Edge detection/level detection + on/off An interrupt occurs under the following conditions: At on : (on + level * 1) At off : (off + level * 1) At rise : (on + edge) At fall : (off + edge) | | — | — | 0 to 15 |
| LX | 0 to 1FFF _H | | | — | — | 0 to 15 |
| SB | 0 to 1FF _H | | | — | — | 0 to 15 |
| LW | 0 to 3FFF _H | Edge detection/level detection + equal to/not equal to An interrupt occurs under the following conditions: Values match : (equal to + level * 1) Values mismatch : (not equal to + level * 1) Values match (only for the first time) : (equal to + edge) Values mismatch (only for the first time) : (not equal to + edge) | | 0 to 65535 | — | 0 to 15 |
| SW | 0 to 1FF _H | | | 0 to 65535 | — | 0 to 15 |
| Scan completion * 2 | — | — | — | — | — | 0 to 15 |

*1: When the level detection is selected as the detection method, an interrupt occurs after the designated device's level condition is checked for each link scan of the set network module.

*2: When the scan completion is selected, an interrupt occurs for each link scan of the set network module.

REMARKS

The correspondence between the interrupt (SI) No. of the network module and the interrupt pointer (I□□)*¹ on the CPU side are set on the PLC system setting screen on the PLC parameters as shown below.

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

The following shows how to set these parameters on the PC system setting screen using the interrupt setting parameters shown on the previous page.

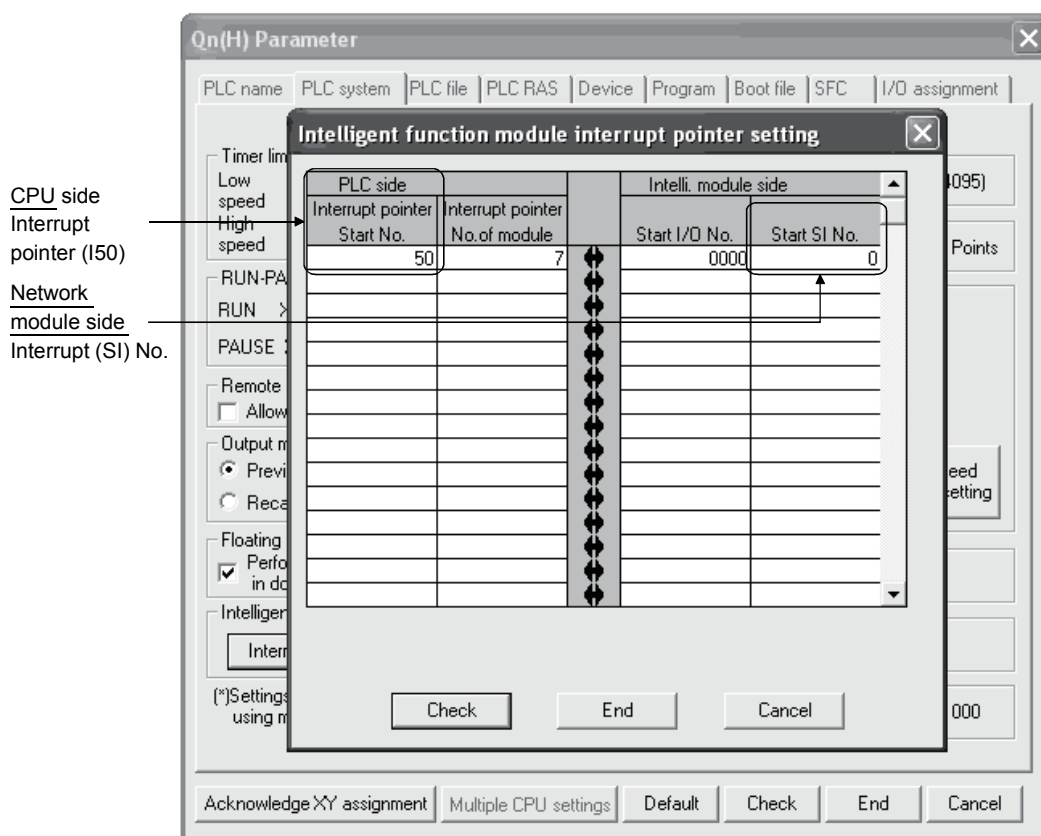
The interrupt (SI) No. (0 to 6) of the network module side are assigned to the interrupt pointers (I50 to I56) of the CPU side:

Intelligent module side

- (1) Start I/O No. : 0000 Network module installation position
- (2) Start SI No. : 0 Start number (0 to 6) of interrupt (SI) number

CPU side

- (1) Interrupt pointer start No.: 50 Start No. (I50 to I56) of the interrupt program
- (2) Interrupt pointer count: 7 Number of interrupt setting conditions



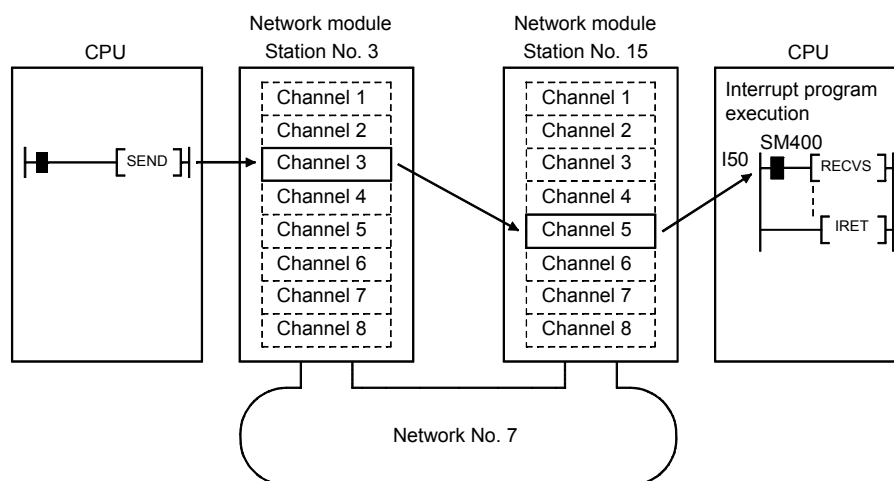
7.5.2 Interrupts using the RECVS instruction

An interrupt program can be started when the SEND instruction is received at the channel whose parameters are designated with the RECVS instruction.

When "RECV instruction" is selected as the device code, the settings of "Channel No." and "Interrupt (SI) No." are enabled.

In the example below, data is sent from station number 3 to channel 5 of station number 15 using the SEND instruction.

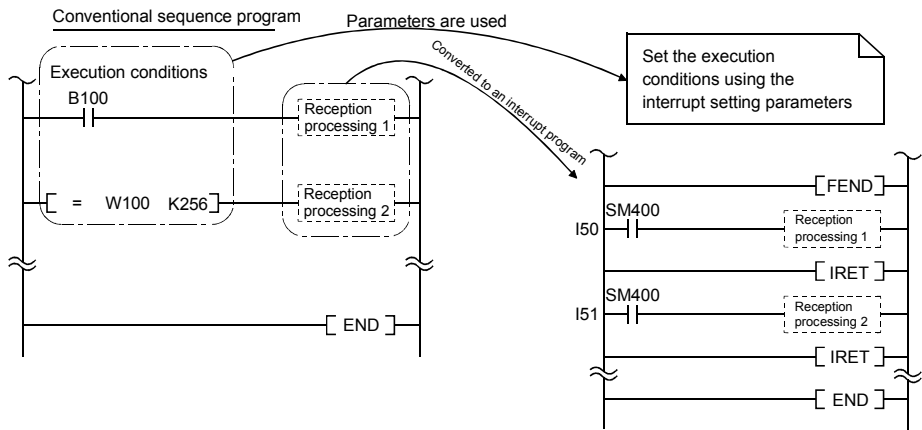
The interrupt program setting parameters of station number 15 are set so that the interrupt program is started by the SEND instruction to channel 5.



7.5.3 Interrupts by the link devices (LB/LW/LX) for cyclic transmission

The designated interrupt sequence program can be executed from other stations when the conditions of "rise/fall" of the link devices (LB/LW) and "equal to/not equal to" of the link register (LW) are matched.

The following figure shows the comparison between the conventional and new interrupt sequence programs.



Interrupts generated by the link devices (LB/LW/LX) can be used for normal cyclic transmission and direct access destinations.

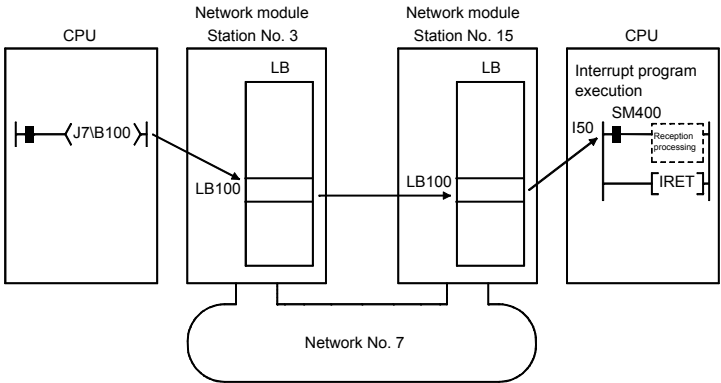
In the example below, the link device LB100 of station number 15 is turned on (1) using direct access (designate outside the set refresh range but within the host's send range) to the link device of station number 3. Also, the interrupt setting parameters are set for station number 15 so that the interrupt program is started when LB100 of station number 15 turns on.

[Interrupt setting parameters]

| Device code | Device No. | Detection method | Interrupt condition | Word device setting value | Channel No./ connection No. | Interrupt (SI) No. |
|-------------|------------|------------------|---------------------|---------------------------|-----------------------------|--------------------|
| LB | 100 | Edge detection | On | — | — | 0 |

[Interrupt pointer settings]

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



| |
|---------|
| REMARKS |
|---------|

- (1) When the sequence program executes at high speed, the scan time may take longer because the execution time of the interrupt program affects the performance of the interrupt program.
- (2) When multiple interrupts occur at the same time, the operation delay may occur.
- (3) This function cannot be used during offline or online testing.
- (4) Do not start the interrupt sequence program by the designated device's rise (PLS instruction, etc.) and fall (PLF instruction, etc.); the change in the device may not be read.

7.5.4 Interrupts by the link special device (SB/SW)

The designated interrupt sequence program can be executed when the conditions of the control information (SB/SW) during data linking match.

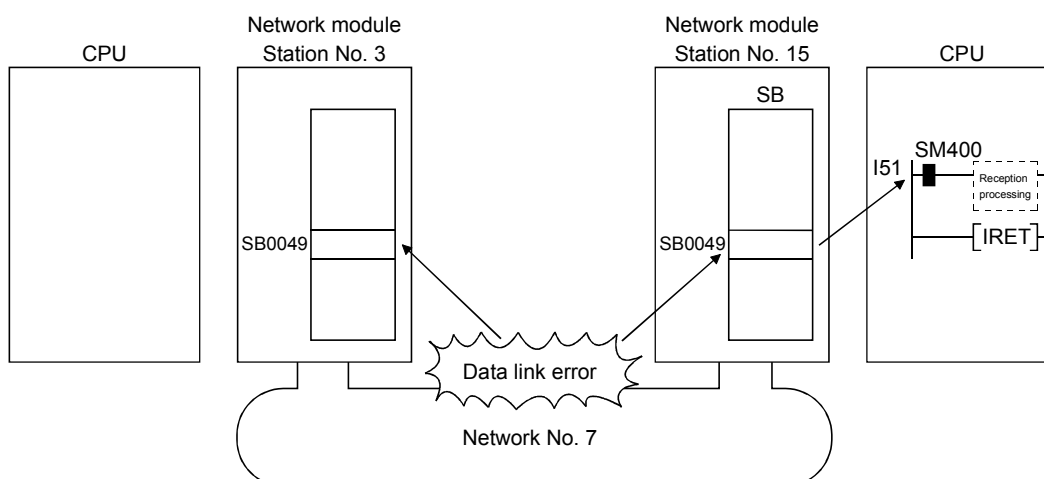
In the example below, designate the interrupt setting parameters for station number 15 so that the interrupt program is started when SB0049 turns on (data link error occurred).

[Interrupt setting parameters]

| Device code | Device No. | Detection method | Interrupt condition | Word device setting value | Channel No./connection No. | Interrupt (SI) No. |
|-------------|------------|------------------|---------------------|---------------------------|----------------------------|--------------------|
| SB | 49 | Edge detection | On | — | — | 0 |

[Interrupt pointer settings]

| CPU side | | | Intelligent module side | |
|-----------------------------|-------------------------|---|-------------------------|--------------|
| Interrupt pointer start No. | Interrupt pointer count | | Start I/O No. | Start SI No. |
| 51 | 1 | ↔ | 0000 | 0 |



REMARKS

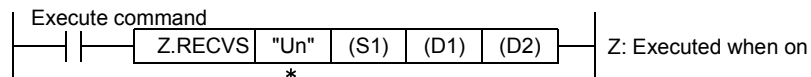
- (1) When the sequence program executes at high speed, the scan time may take longer because the execution time of the interrupt program affects the performance of the interrupt program.
- (2) When multiple interrupts occur at the same time, the operation delay may occur.
- (3) This function cannot be used during offline or online testing.

7.5.5 Message reception "one scan completion" instruction (Z.RECVS)

This instruction reads the channel data that is sent to the host with the SEND instruction.

The processing completes at the execution of this instruction; thus, the processing speed of this instruction is faster than that of the RECV instruction.

(1) The instruction format of RECVS



* : If the originating station is a Basic model QCPU (function version B or later) or Universal model QCPU, " "(double quotation) for the first argument can be omitted.

| | Description of setting | Setting range | Device that can be used |
|------|---|--|--|
| Un | The start I/O number of the host's network module Designate the higher two digits of the 3-digit I/O number. | 0 to FE _H | — |
| (S1) | Control data storage head device Designate the head device of the host that stores the control data. | Within the range of the designated devices | Word device * 2 |
| (D1) | Receive data storage head device Designate the head device of the host, from which receive data are stored. | Within the range of the designated devices | Word device * 2 |
| (D2) | Dummy | — | Bit device * 1 Bit designation of word device * 3 |

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

* 2: Word device T, C, D, W, ST, R, and ZR (The Q00JCPU cannot use R and ZR.)

* 3: Bit designation of word device Word device. bit No.

Detailed description of the control data

| Device | Item | Description | Setting side * 1 |
|--------------------|-------------------------------------|---|------------------|
| (S1) | Abnormal completion type | <div><div><div>b15to b8 b7 b6to b0</div><div>0to010to0</div></div><div>1) Abnormal completion type (bit 7) Sets the clock data set status at abnormal completion. 0: Does not set clock data : Do not store the clock data at error occurrence in (S1) + 11 to (S1) + 17. 1: Sets clock data : Stores the clock data at error occurrence in (S1) + 11 to (S1) + 17.</div></div> | User |
| (S1)+1 | Completion status | Stores the status at the instruction completion. 0 : Normal Other than 0: Abnormal (refer to Section 8.3 for error codes) | System |
| (S1)+2 | Host storage channel | Designates the channel that stores the data to be read. 1 to 8 (channels) | User |
| (S1)+3 | Channel used by the sending station | Stores the channel used by the sending station. 1 to 8 (channels) | System |
| (S1)+4 | Sending station network No. | Stores the station No. of the sending station. 1 to 239: Network No. | System |
| (S1)+5 | Sending station number | Designates the station number of the target station. 1 to 64: Station number | System |
| (S1)+6 | (Use prohibited) | — | — |
| (S1)+7 | (Use prohibited) | — | — |
| (S1)+8 | (Use prohibited) | — | — |
| (S1)+9 | Receive data length | Stores the receive data count stored in (D1) to (D1) + n. 1 to 960 (words) | System |
| (S1)+10 to (S1)+17 | (Use prohibited) | — | — |

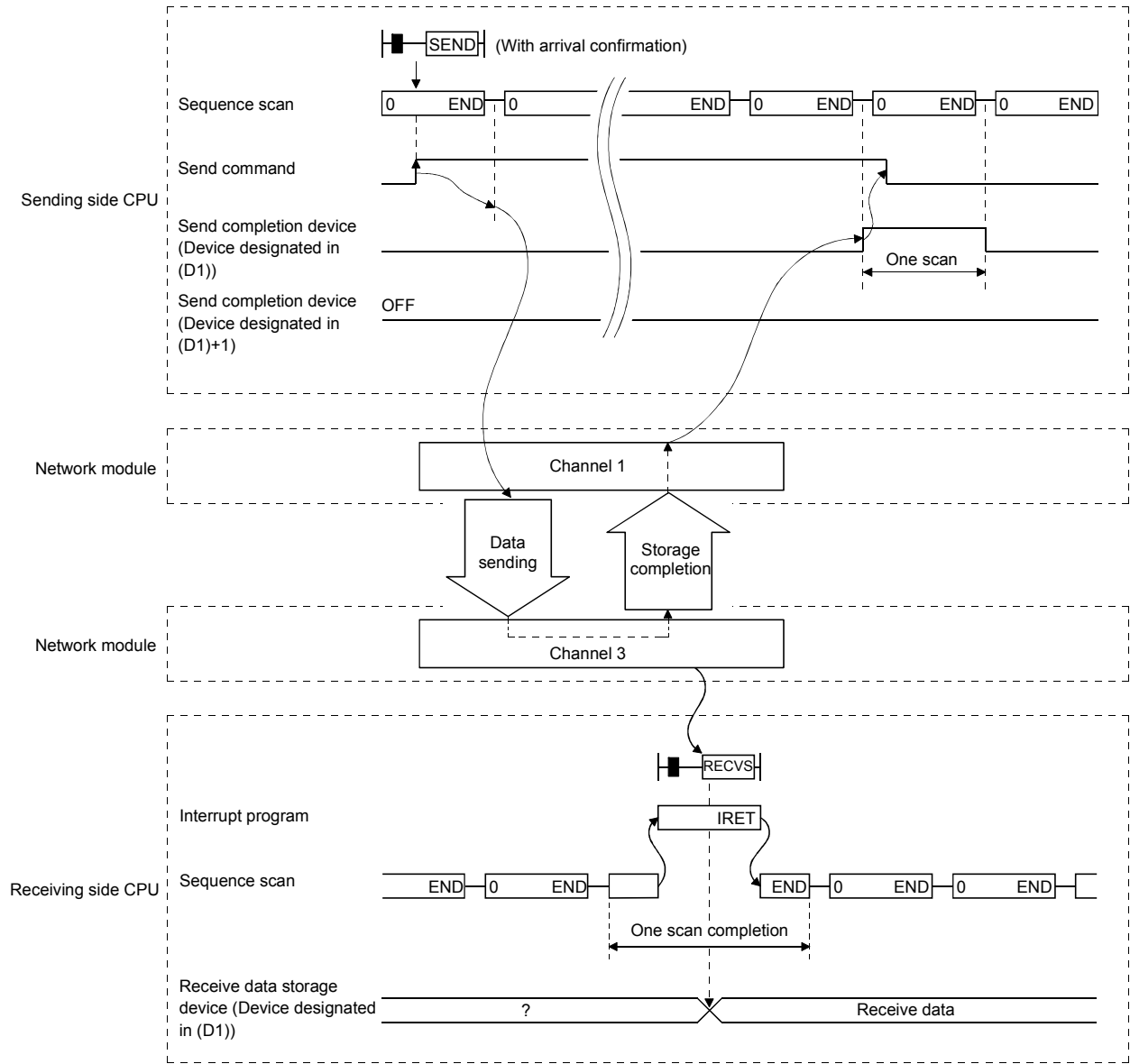
* 1: The setting side is as shown below.

User: It is data the user sets in the sequence program before execution of a link dedicated instruction.

System: The programmable controller CPU stores the execution result of the link dedicated instruction.

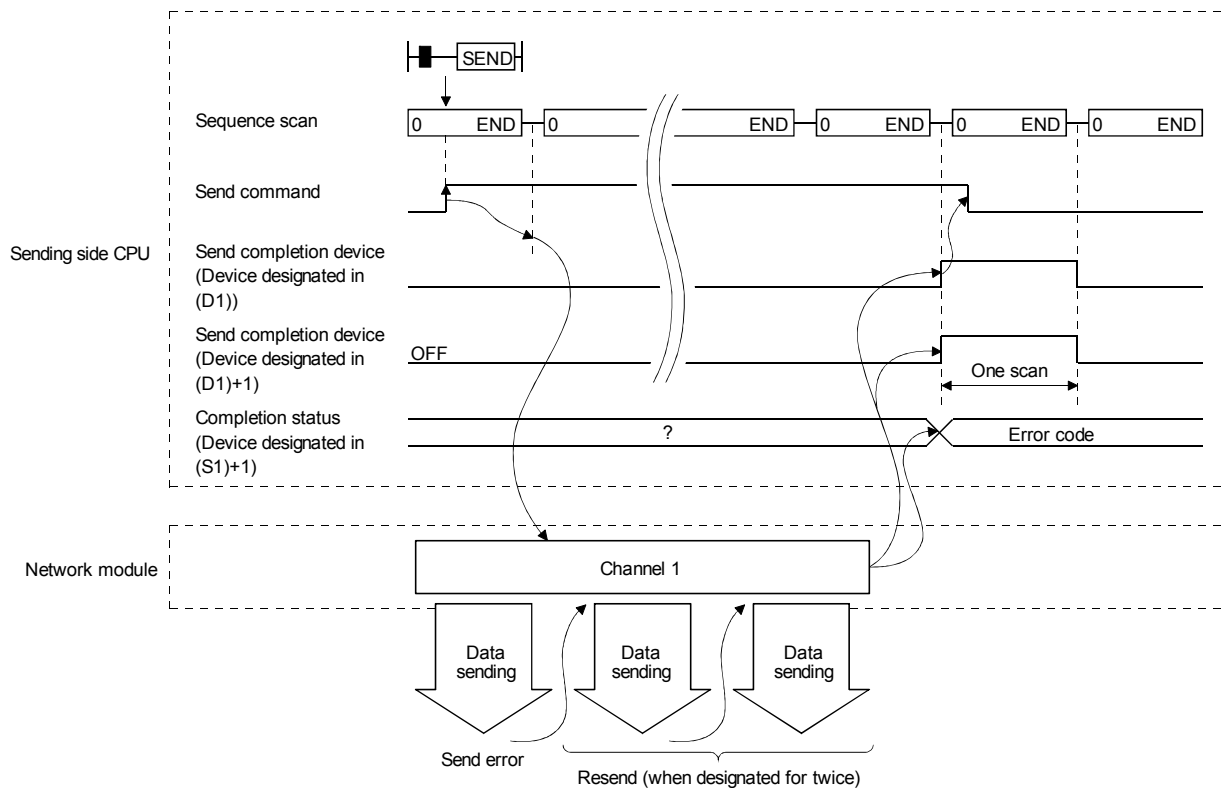
(2) Instruction execution timing

(a) Normal completion

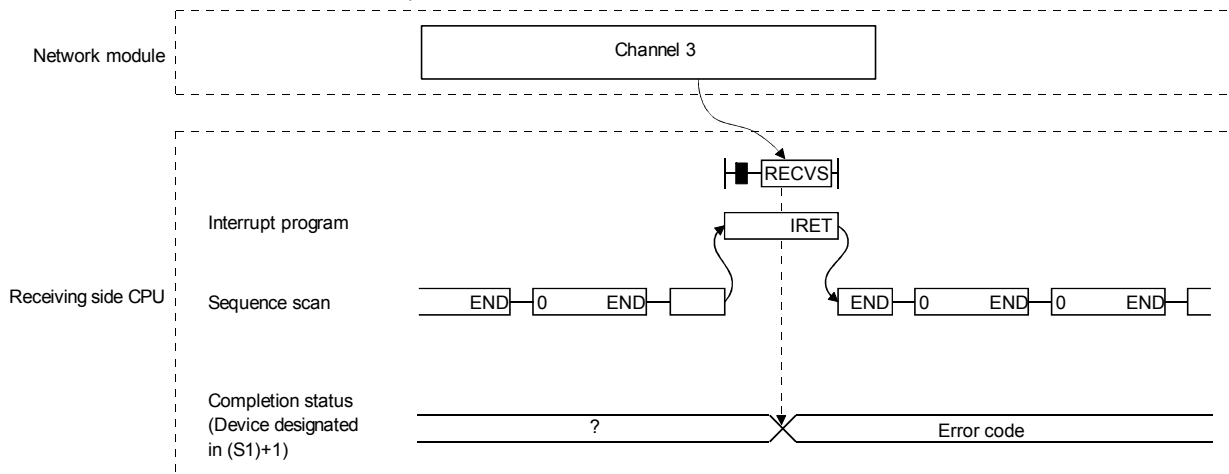


(b) Abnormal completion

1) In case of the SEND instruction

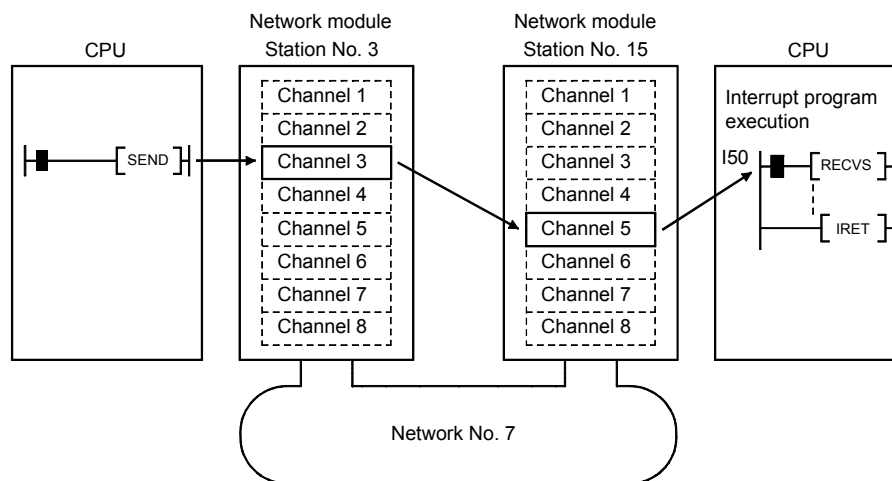


2) In case of the RECVS instruction



7.5.6 Application example

The following explains the parameter settings and program examples.



(1) How to set the parameters on the interrupt setting screen (network parameters)

Set the device code, channel No. and interrupt (SI) No. in such a way that an event is issued to the CPU side when data is received at channel 5 of station number 15's network module.

| Device code | Device No. | Detection method | Interrupt condition | Word device Setting value | Board No. | Interrupt (SI) No. |
|-------------------|------------|------------------|---------------------|---------------------------|-----------|--------------------|
| RECVS instruction | — | (Edge detection) | (Scan completed) | — | 5 | 0 |

(2) How to set the parameters on the interrupt pointer setting screen (PC parameters)

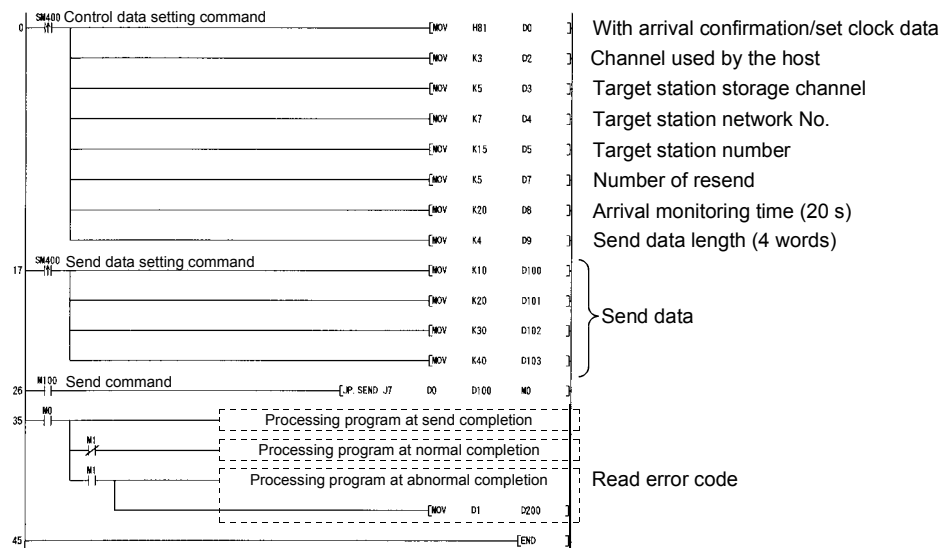
Set the start I/O No. (0000) of the I/O where the network module is loaded and the interrupt SI No. (0) on the intelligent module side, and the interrupt pointer (I50) that is used for even issue on the CPU side. It is also possible to start multiple interrupt programs by setting the interrupt pointer No. of units (setting count of interrupt conditions).

| PLC side | | | Intelli. module side | |
|-----------------------------|---------------------------------|---|----------------------|--------------|
| Interrupt pointer Start No. | Interrupt pointer No. of module | | Start I/O No. | Start SI No. |
| 50 | 1 | ↔ | 0000 | 0 |

(3) Program examples

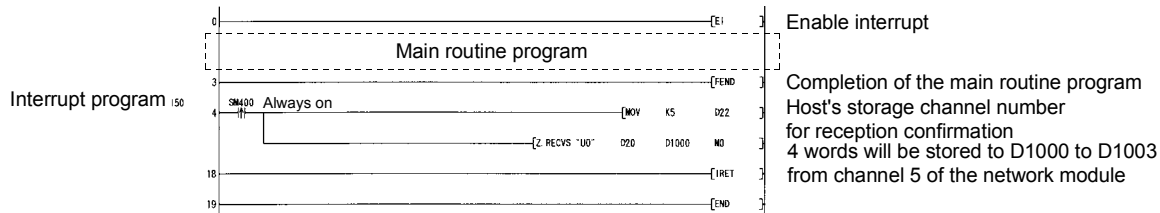
(a) Program for station number 3

When actually using the following program, interlock the program by referring to Section 6.1.



(b) Program for station number 15

When actually using the program below, interlock the program by seeing Section 6.1.



REMARKS

- (1) The RECV instruction execution request flag corresponding to the channel number used in data reception (SB00A0 to SB00A7) is not set.
- (2) When the sequence program executes at high speed, the scan time may take longer because the execution time of the interrupt program affects the performance of the interrupt program.
- (3) When multiple interrupts occur at the same time, the operation delay may occur.
- (4) This function cannot be used during offline or online testing.

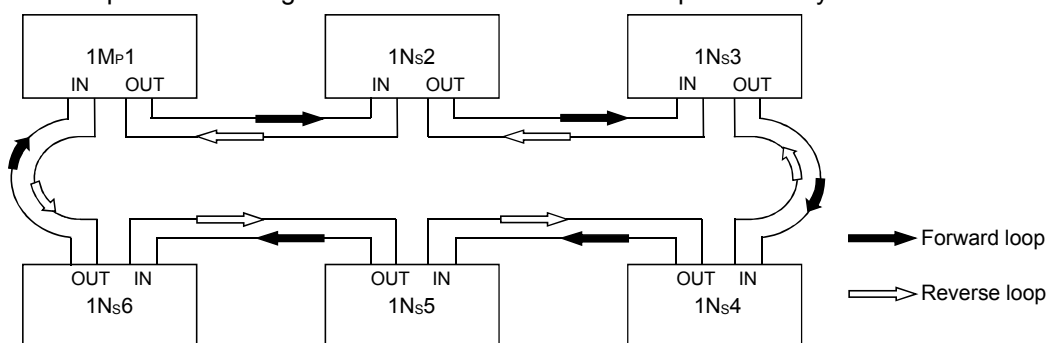
POINT

Since the RECVS instruction starts the interrupt program according to the parameter settings, it is necessary to execute "EI" (Enable Interrupt) with the main routine program. If the enable interrupt has not been executed at the data receiving, the status of "channel being used" is maintained.

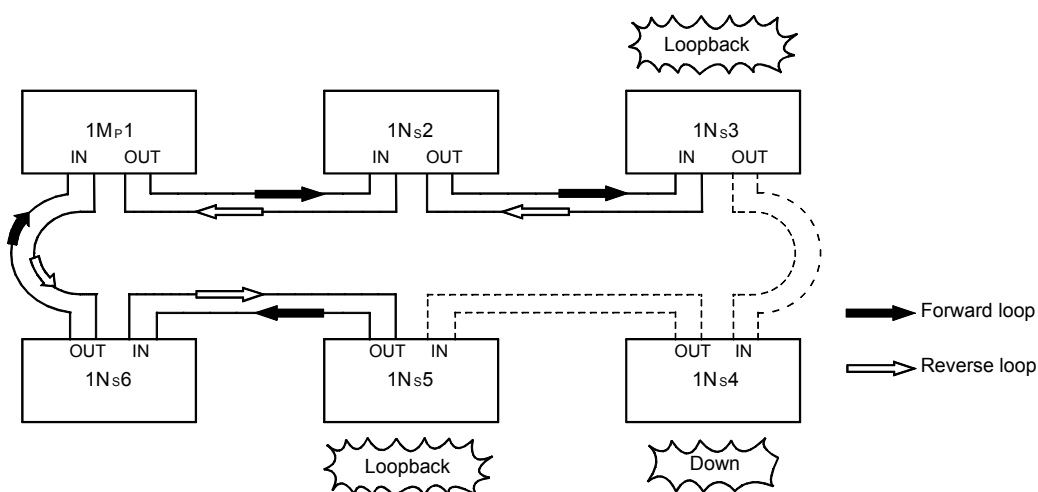
7.6 Multiplex Transmission Function (Optical Loop System)

The multiplex transmission function allows high-speed communications using duplex transmission paths (both the forward and reverse loops) in the optical loop system. In order to execute the multiplex transmission function, setting for the "Supplementary settings" of the common parameters is required. Note that this setting is not allowed unless the total number of link stations is four stations or more.

- (1) Using the multiplex transmission function, the high-speed communication is performed using both the forward and reverse loops effectively.



- (2) If an error occurs in the transmission path while the multiplex transmission function is used, data linking continues by communicating only using the transmission path on one side of either the forward or reverse loop, or by switching to the communication using loopback. The transmission speed in this case is 10 Mbps/25 Mdps.

**REMARKS**

The multiplex transmission function is effective only in reducing the link scan time when the number of connected stations is 16 or more and the link devices assigned with common parameters is 2,048 bytes or more. The link scan time will be 1.1 to 1.3 times faster compared to when the multiplex transmission function is not used. If the multiplex transmission function is used in the configuration where the number of connected stations or the assigned link devices is less than the above, the link scan time may be increased compared to the case where the function is not used.

7.7 Simple Dual-Structured Network (High Performance model QCPU and Process CPU)

By installing two network modules, a regular network module and a standby network module, to each CPU module, data linking can be continued by switching to link data refreshing with the standby network when a faulty area is detected on the regular network due to wire breakage, etc. When there is no error, both the regular and standby network modules will be executing data linking at the same time.

| |
|--|
| POINT |
| A simple dual-structured system cannot be constructed with the Simple dual-structured system cannot be configured with the Basic model QCPU, Redundant CPU, and Universal model QCPU. These CPUs are applicable for a single network system. |

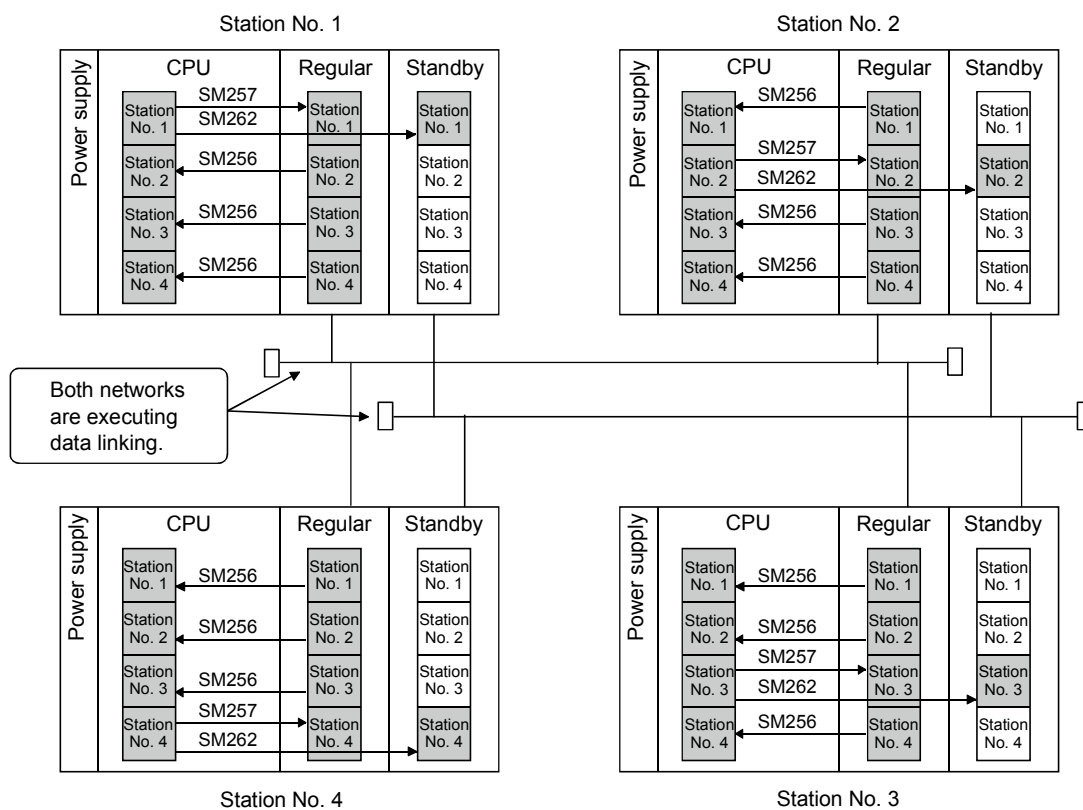
- (1) The switching between the regular and standby networks (i.e., which network the CPU module refreshes) is performed by the sequence program.
By checking the data link status (SB0074, SW0074 to 0077) of each station, the sequence program refreshes with the standby network modules when an error is detected in the regular network.

(2) Set different network Nos. for the regular and standby network modules.

[When the regular network is normal]

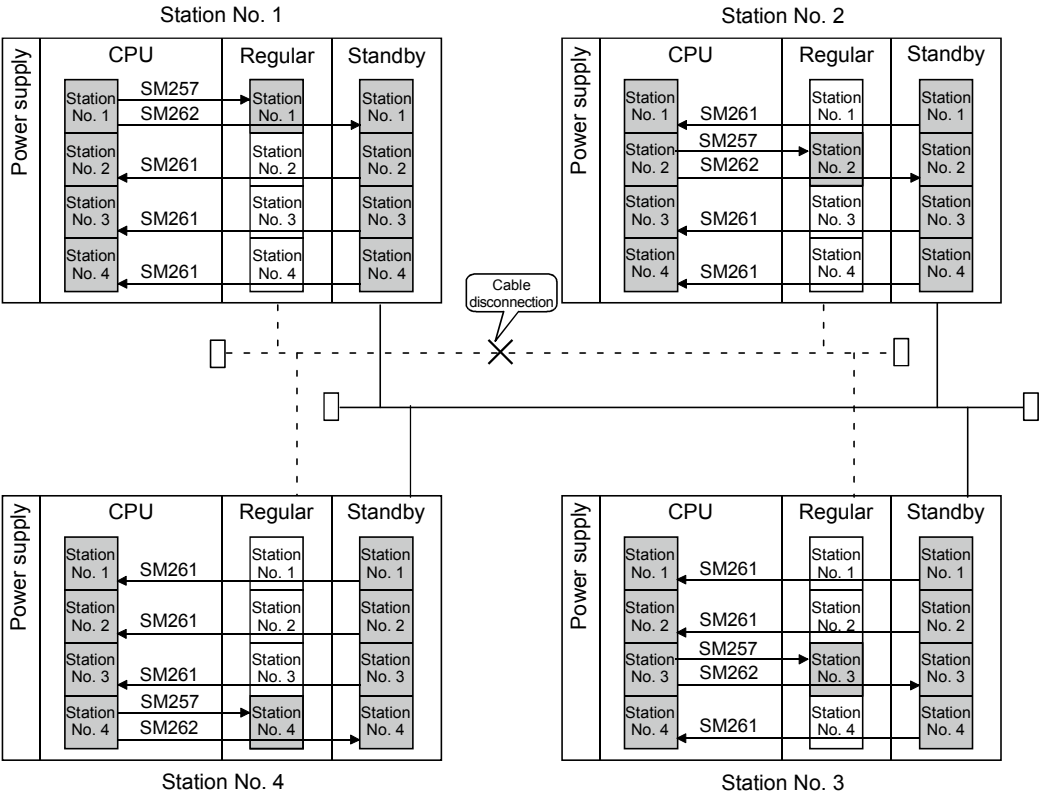
At the initial startup, the CPU module controls the on/off status of the special relay (SM).

| | Signal | Status | Remarks |
|----------|--|-----------------------|-----------------------------------|
| Module 1 | SM255 (Distinction between regular/standby network) | Off (Regular) | Controlled by the CPU. |
| | SM 256 (Refresh from the network modules to the CPU) | Off (Refreshes) | Controlled by the user. |
| | SM 257 (Refresh from the CPU to the network modules) | Off (Refreshes) | (Initially controlled by the CPU) |
| Module 2 | SM260 (Distinction between regular/standby network) | On (Standby) | Controlled by the CPU. |
| | SM261 (Refresh from the network modules to the CPU) | On (Does not refresh) | Controlled by the user. |
| | SM262 (Refresh from the CPU to the network modules) | Off (Refreshes) | (Initially controlled by the CPU) |



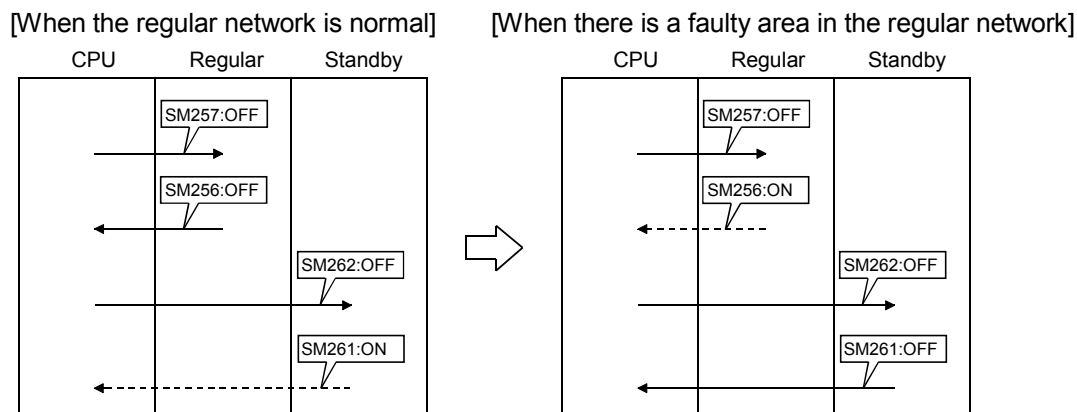
[When the regular network is faulty]
The CPU module does not control the special relay (SM) automatically; thus, must be controlled by the sequence program.

| Signal | | Status | Remarks |
|----------|--|-----------------------|-----------------------------------|
| Module 1 | SM255 (distinction between regular/standby network) | Off (Regular) | Controlled by the CPU. |
| | SM 256 (Refresh from the network modules to the CPU) | On (Does not refresh) | Controlled by the user. |
| | SM 257 (Refresh from the CPU to the network modules) | Off (Refreshes) | (Initially controlled by the CPU) |
| Module 2 | SM260 (distinction between regular/standby network) | On (Standby) | Controlled by the CPU. |
| | SM261 (Refresh from the network modules to the CPU) | Off (Refreshes) | Controlled by the user. |
| | SM262 (Refresh from the CPU to the network modules) | Off (Refreshes) | (Initially controlled by the CPU) |

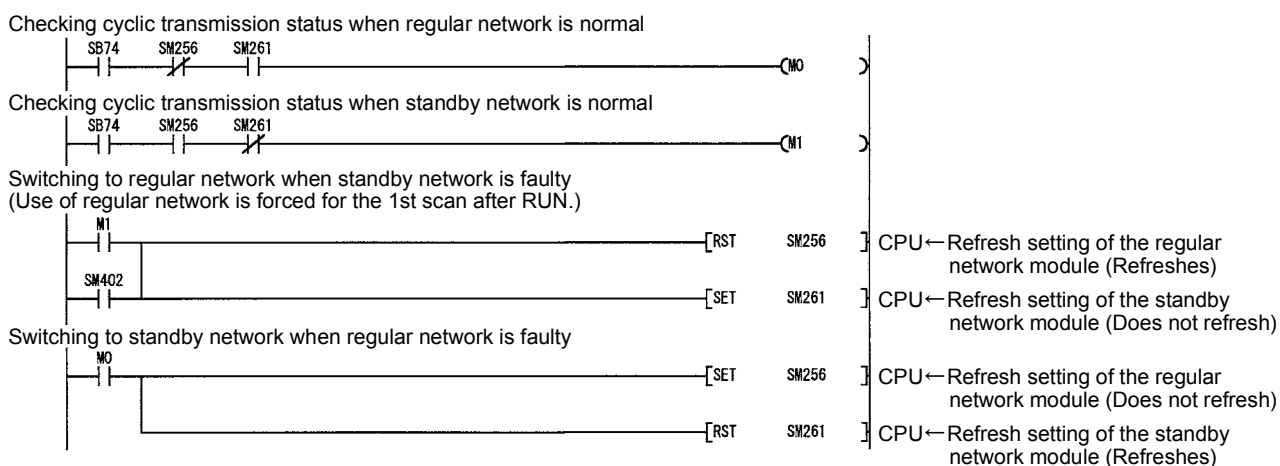


(3) Program for the simple dual-structured system

The following explains the program that performs refresh switching between the regular and standby networks.



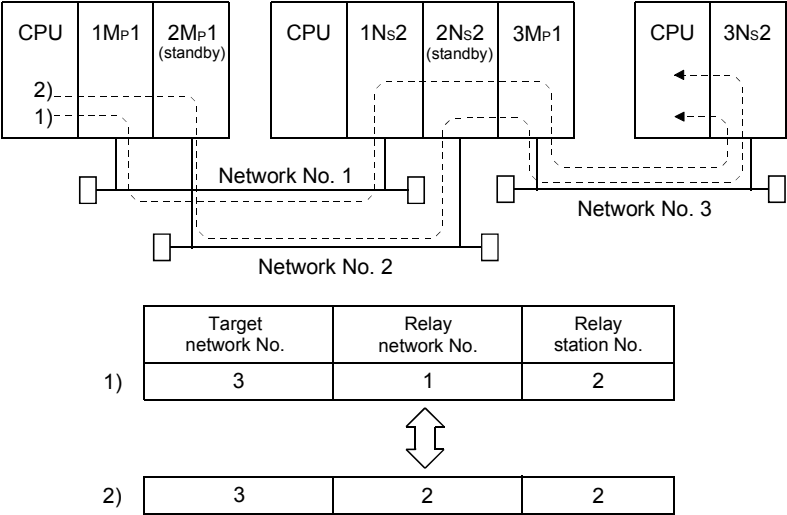
- (a) The following shows the program that switches to refresh the standby side when a faulty station is detected in the regular network. It is necessary to write the same program to all of the stations in the network.



- (b) The following table lists the refresh setting devices (SM) for each network.

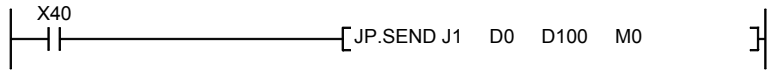
| | Module 1 | Module 2 | Module 3 | Module 4 |
|---|----------|----------|----------|----------|
| Regular/standby network setting status (Off: Regular On: Standby) | SM255 | SM260 | SM265 | SM270 |
| Refreshing from the network modules to the CPU (Off: Refreshes On: Does not refresh) | SM256 | SM261 | SM266 | SM271 |
| Refreshing from the CPU to the network modules (Off: Refreshes On: Does not refresh) | SM257 | SM262 | SM267 | SM272 |

- (c) The target network No. in the routing parameters must be rewritten with the RTWRITE instruction because the same number cannot be set twice.
- 1) When the regular network is normal
 - 2) When the regular network is faulty

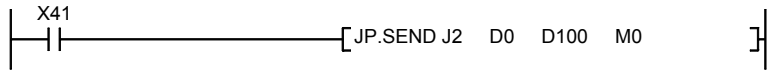


- (d) The network No. (Jn) of the dedicated link instruction must be changed as follows.

- 1) When the regular network is normal



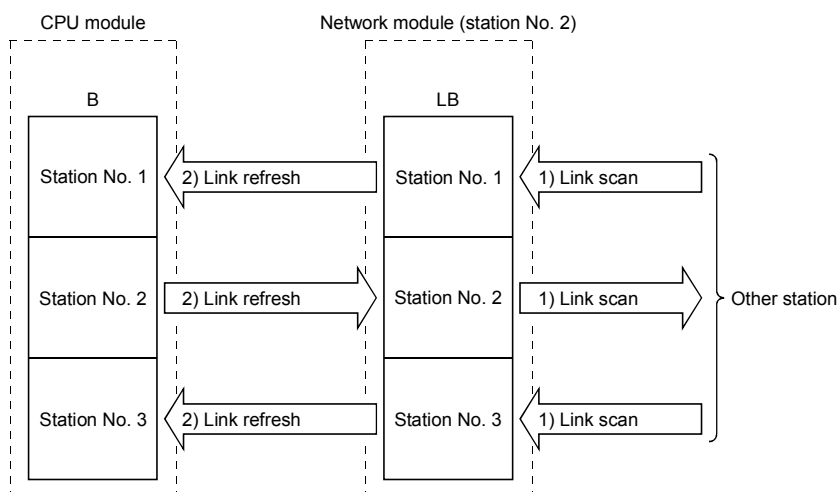
- 2) When the regular network is faulty



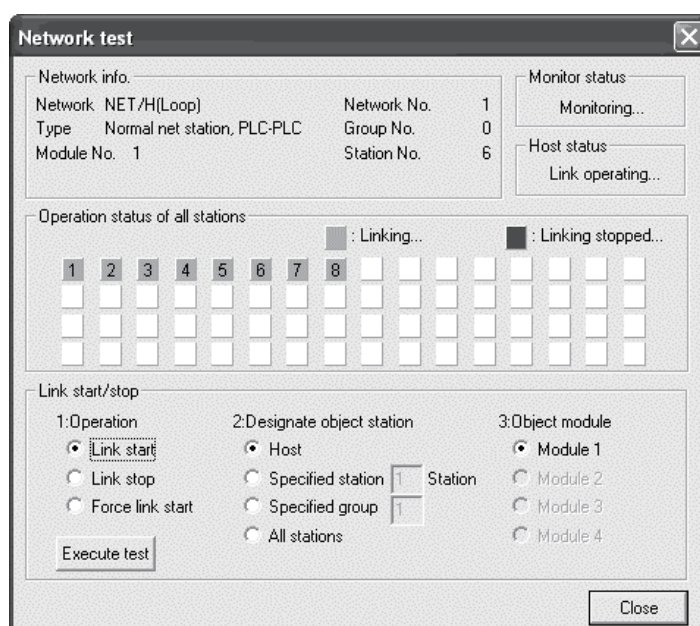
7.8 Stopping/Restarting the Cyclic Transmission and Stopping Link Refreshing (Network Test)

The cyclic transmission can be stopped or restarted using the "Network test" function of GX Developer.

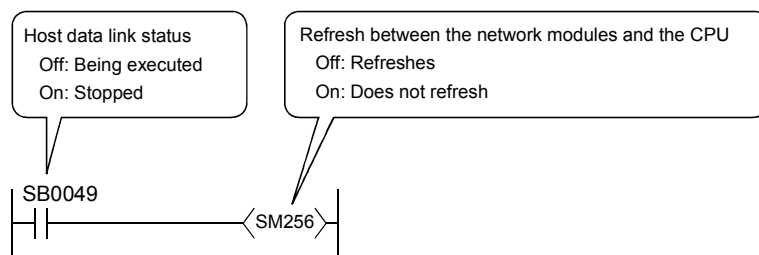
This function is useful when other station's data should not be received or when the host's data should not be sent at system startup (when debugging), etc.



- 1) Stopping/restarting the cyclic transmission stops or restarts the data receiving (link scan) between the network modules of the applicable station. However, the data receiving (link refresh) between the CPU module and network modules cannot be stopped or restarted by this processing.
- 2) Execution using GX Developer
Through the network test, link startup, link stop and forced link startup can be performed using GX Developer. For details on the network testing methods, see the GX Developer Operating Manual.



- 3) Execution using the sequence program (Not allowed for the Basic model QCPU and safety CPU)
 The data receiving between the CPU module and network modules (link refreshing) is not stopped or restarted by stopping/restarting the cyclic transmission.
 Thus, it is necessary to stop/restart link refreshing by the sequence program using the CPU module's special relay (SM).
 Link refreshing is stopped or restarted by Host data link status (SB0049) as shown in the following program.



- 4) Whether or not the restart operation is possible as determined by the stop operation method
 The priority order of startup and stop is as follows:
 Link startup < Link stop < Forced link startup.

| Type of restart operation Target station | Link startup | | | Forced link startup | | |
|---|--------------|--------------------|--------------|---------------------|--------------------|--------------|
| | Host | Designated station | All stations | Host | Designated station | All stations |
| Status of target station | | | | | | |
| Stop link by designating host | ○ | × | × | ○ | ○ | ○ |
| Stop link by designating specified station | × | ○ | × | ○ | ○ | ○ |
| Stop link by designating all the stations | × | × | ○ | × | × | ○ |

○: Startup possible ×: Startup not possible

POINT

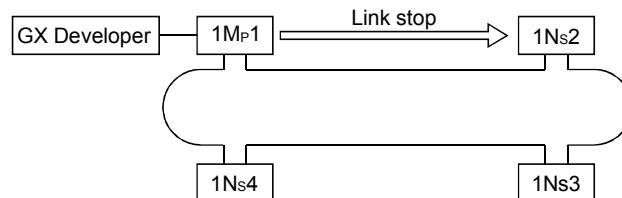
Link start cannot be done even if the link start operation is performed to an offline-mode station (disconnected from the network).
 No error will be detected, in this case, because no response is returned from the target station.

(1) Stop/startup operation within a network

The following shows an example in which 1M_P1 issues a stop request to 1N_s2 and then restarts the data link.

(a) Stop

Stop the cyclic transmission of 1N_s2 with GX Developer.



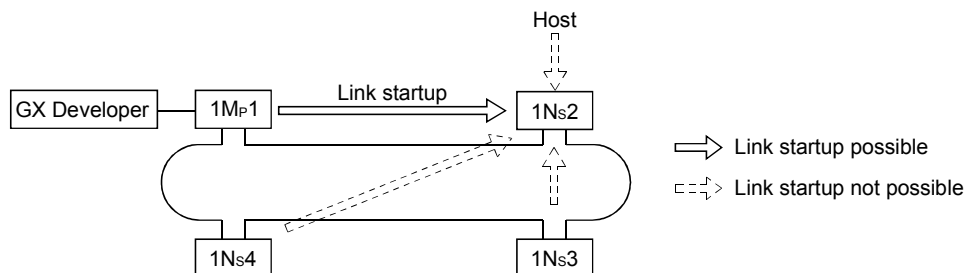
(b) Restart

There are two methods to restart the cyclic transmission of the stopped station: "Link startup" and "Forced link startup."

1) In case of "Link startup"

The stopped station (1N_s2) can be restarted only from the station (1M_P1) that stopped the link.

The link cannot be started from stations (such as the host, 1N_s3 and 1N_s4) other than the stop requesting station.

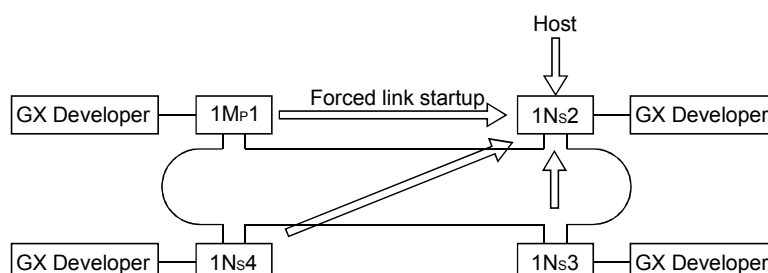


2) In case of "Forced link startup"

The cyclic transmission of the stopped station (1N_s2) can also be started from stations (including the host) other than the stop requesting station.

This startup method is used when the stop requesting station is down. The startup can be executed from the host as well as other stations regardless of the stopped station.

However, the forced startup cannot be executed per station while the link is stopped by designating all stations at the same time (designating the host or one station).

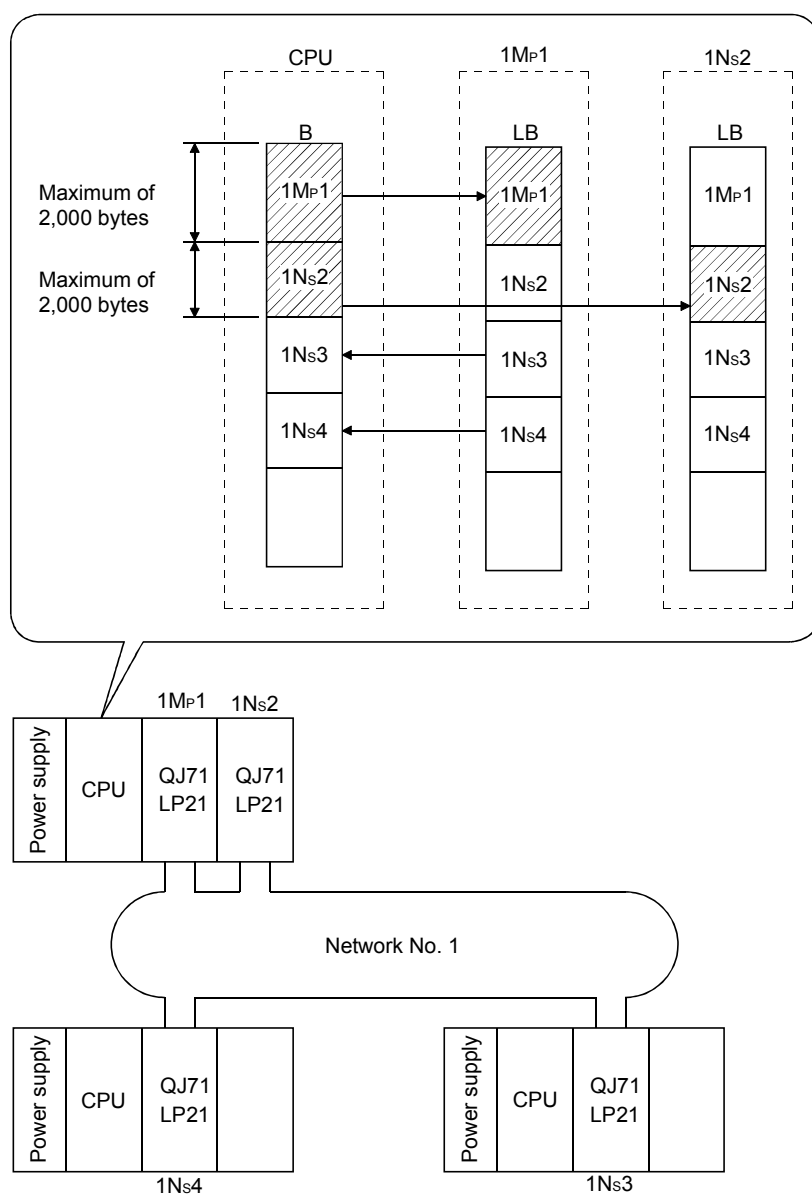


7.9 Increasing the Number of Send Points by Installing Multiple Modules with the Same Network (High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU)

The number of send points (maximum of 2,000 bytes per station) can be increased up to a maximum of 8,000 bytes (when four cards are installed) by installing multiple network modules with the same network number to one CPU module.

[Example]

In the system configuration shown below, a maximum of 4,000 bytes can be send by installing station 1Mp1 and station 1Ns2 on one CPU module.



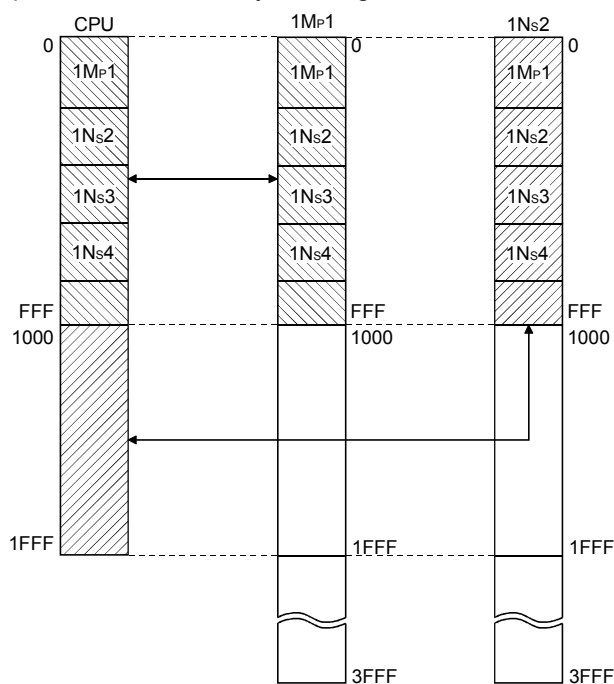
POINT

The Basic model QCPU and safety CPU accept only one network module. Hence, the number of send points cannot be increased by installing multiple modules on the same network.

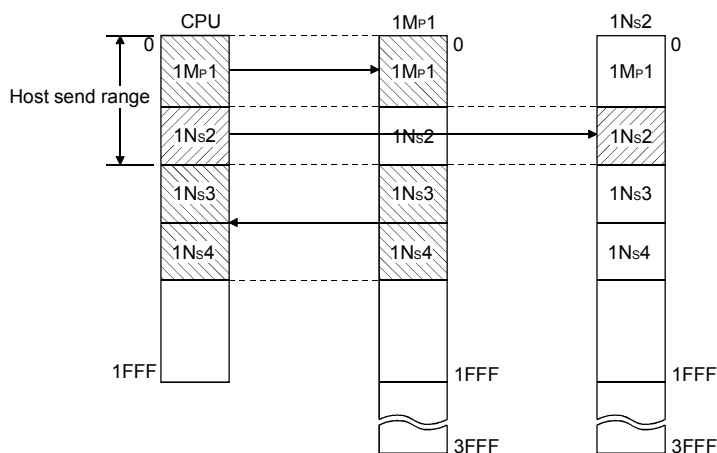
POINT

The following precautions should be observed when installing multiple network modules with the same network number to one CPU module:

- (1) They cannot be set to the same station number.
- (2) Multiple stations cannot be set as control stations.
- (3) The "youngest number" of the I/O numbers is used for the transient transmission.
- (4) It is necessary to change the settings of the refresh parameters.
 - 1) By default, the refresh range is equally divided for each module. (In this example shown below, only the range of 1M_P1 can be transmitted.)



- 2) It is necessary to change the setting so that the entire host send range (both 1M_P1 and 1N_S2) can be refreshed.



7.10 Constructing a network with a redundant system

This section outlines the operation of a redundant system and describes the network parameters to be set to construct a redundant system with the MELSECNET/H.

7.10.1 Outline of the redundant system operation

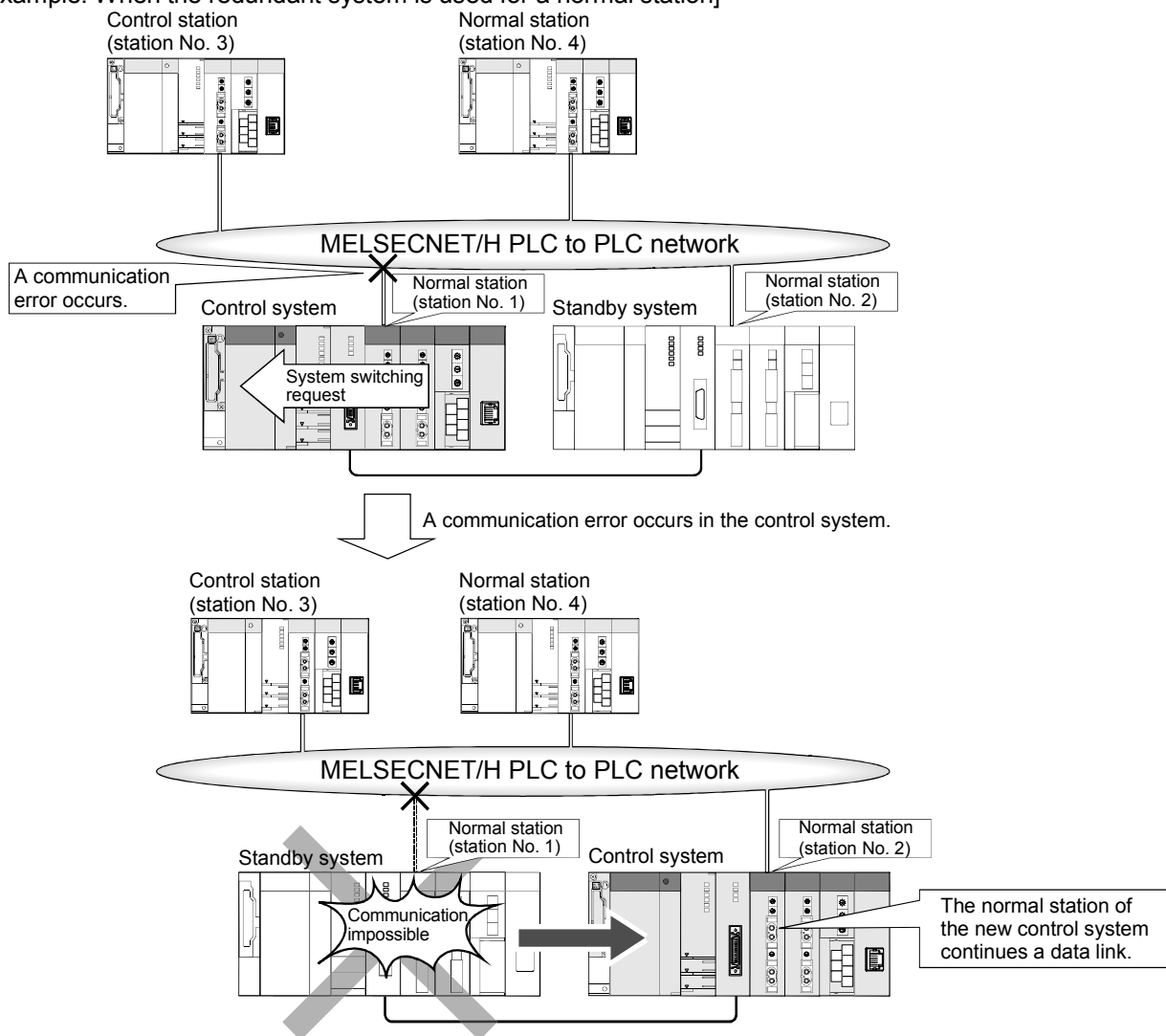
Described below is an outline of the redundant system operation.

(1) Operation of a redundant system

(a) Continuing a data link

If an error has occurred in the control system CPU or a network module, the system will be switched to the standby system on which system control and a data link can be continued.

[Example: When the redundant system is used for a normal station]



(b) Sending and receiving cyclic data

Cyclic data are sent and received by the following processing:

- 1) Processing by the network module connected to the control system
The redundant system consists of a control system and a standby system, and only the control system executes programs. Thus, the network module connected to the control system sends and receives cyclic data.

- 2) Processing by the network module connected to the standby system
The network module connected to the standby system only receives cyclic data from other stations to continue control when system switching results from either of the following events.

For further information about system switching, refer to the QnPRHCPU User's Manual (Redundant System).

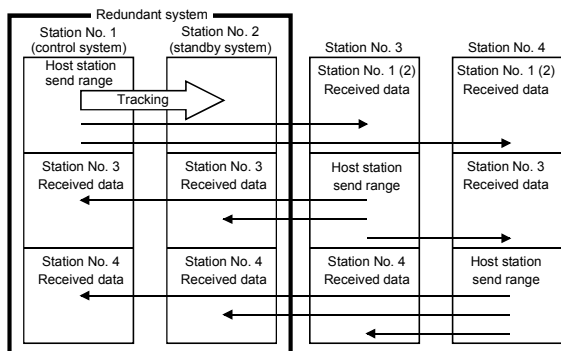
- System switching (control system's CPU module, network module, or power supply module malfunction or error, etc.)
- Manual system switching (GX Developer, system switching dedicated instructions, etc.)

Perform tracking from the control system CPU to the standby system CPU using the host station send range as a tracking device.

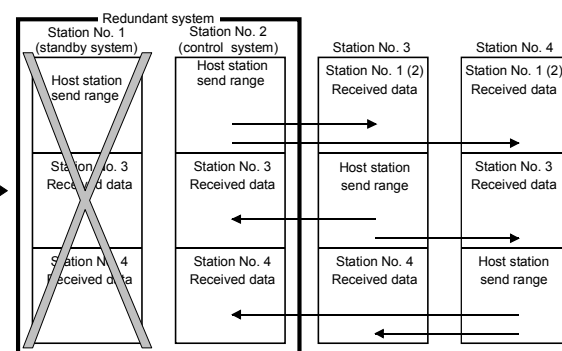
To realize cyclic transmission in the redundant system, pairing must be set in the network parameters.

For further information about pairing setting, refer to Section 7.10.3.

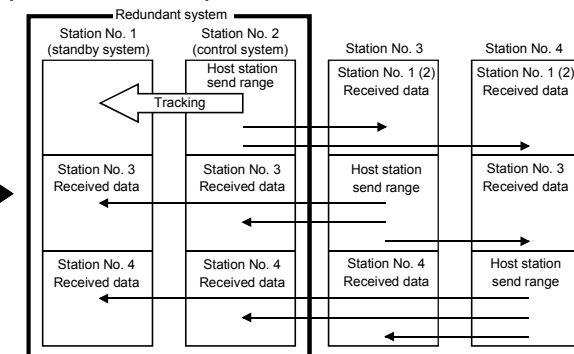
[When the redundant system is in normal communication]



[When station No. 1 is cut off due to a communication error (system switching occurs)]



[When station No. 1 is returned*1]



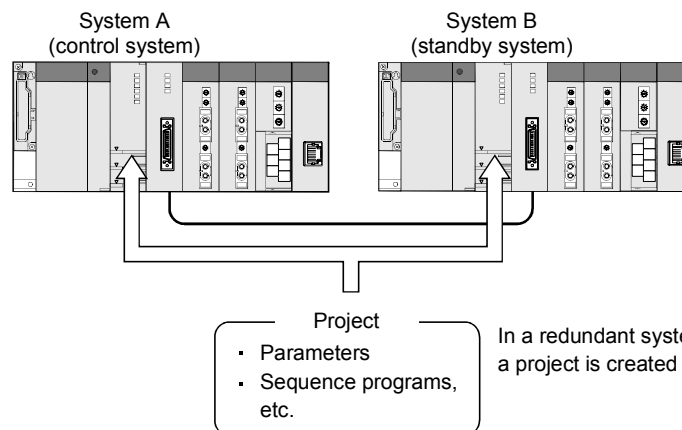
*1: Even if the station is recovered from a communication error, system switching does not occur in the redundant system.

(2) Redundant system project

In a redundant system using redundant CPUs, one project is required to create parameters and sequence programs and there is no need to create 2 projects for each of the control and standby systems.

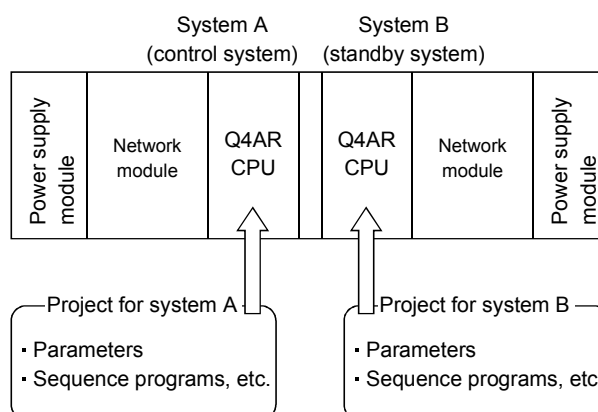
The network modules mounted to the control and standby systems can communicate with each other with a single network parameter.

<Redundant system using redundant CPUs>



In a redundant system using redundant CPUs, a project is created and written to both systems.

<Redundant system using Q4ARCPUs>



In a redundant system using Q4ARCPUs, 2 projects must be created for each of systems A and B and written to them.

(3) Station type at startup of the redundant system (when the redundant system is a control station)

At the time of startup of the redundant system, the network module installed with the control system CPU is identified as a "control station," and the network module installed with the standby system CPU is identified as a "normal station".

7.10.2 Precautions for network construction containing a redundant system

This section describes precautions when constructing a MELSECNET/H or MELSECNET/10 network containing a redundant system.

When constructing such a network, pay careful attentions to the following points.

For further information, refer to (1) and (2) of this section.

- 1) Use a network module of function version D or later for the following:
 - Network module to be mounted on the same base with the redundant CPU
 - Network module to be mounted on the same base with a QCPU other than the redundant CPU and used as a control station^{*1}
- 2) Use GX Developer of version 8.18U or later for the following stations, and set network parameters:
 - Network module to be mounted on the same base with the redundant CPU
 - Network module to be mounted on the same base with a QCPU other than the redundant CPU and used as a control station^{*2}
- 3) The network module mounted with an AnUCPU or QnACPU cannot be set as a control station if a redundant system using Q4ARCPUs or if redundant CPUs exist in the network^{*3}.
- 4) When the redundant system is in the debug mode, do not connect the network modules on both systems to the network at the same time. In the debug mode, system B CPU also operates with the same parameters as system A. Therefore, duplication of the control station is detected at the time of concurrent connection to the network
- 5) The following operations must be performed prior to system operation.
 - Power ON/OFF of other stations (including stations on the standby system)
 - Startup and shutdown of the personal computer where a MELSECNET/H interface board is installed

If the above operation is performed during system operation, a MELSECNET/H module on the control system may detect a communication error and a system-switching request may be issued.

When the system-switching request is issued before startup of the standby system, a continue error, "CAN'T SWITCH" may be detected in the control system CPU.

Generally, normal system control is continued even if "CAN'T SWITCH" is detected. However, in the case of the system where error detection will stop the control, program the system to prevent such a control stop.

For the method for automatically clearing the "CAN'T SWITCH" error, refer to the QnPRHCPU User's Manual (Redundant System).

*1: When the redundant CPU is in debug mode, a network module of function version A or B can be used.

*2: When the redundant CPU is in debug mode, GX Developer compatible with each QCPU can be used.

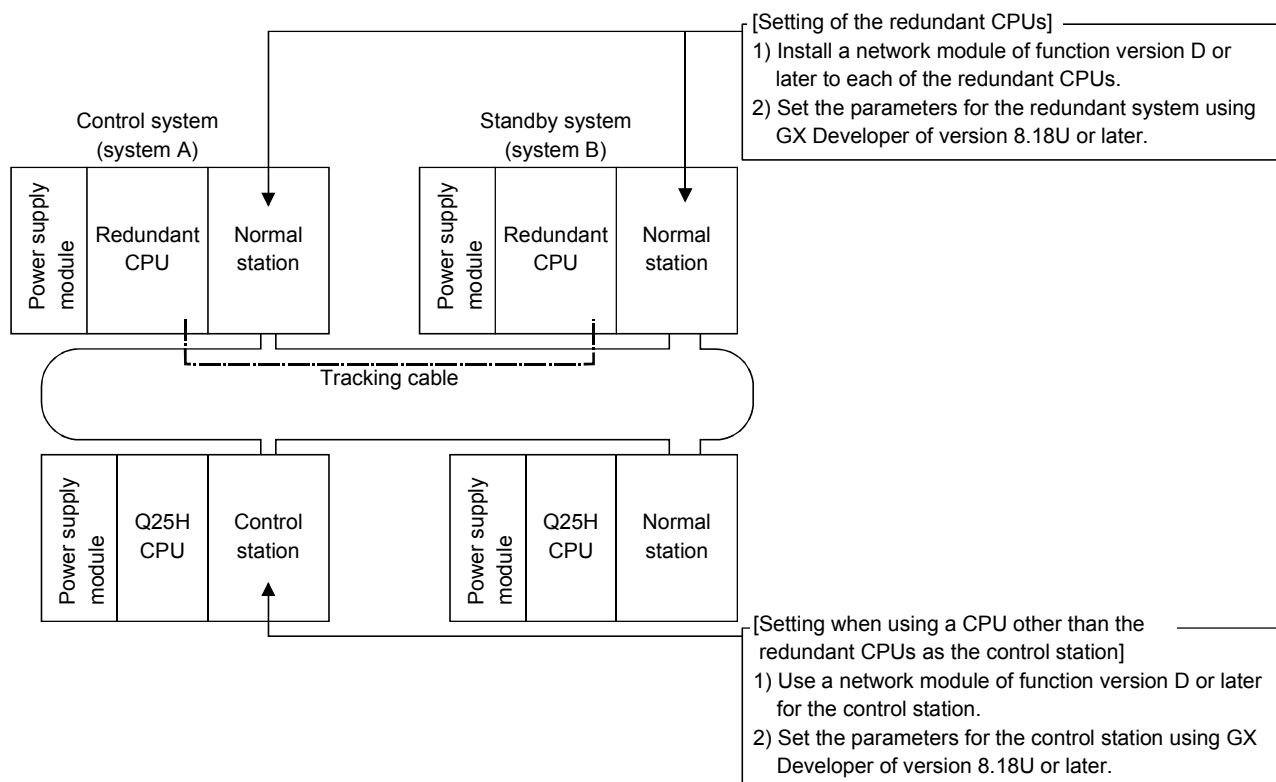
*3: When the Q4ARCPU is used in a single CPU system or when the redundant CPU is in debug mode, the network module mounted with an AnUCPU or QnACPU can be set as a control station.

(1) Constructing a MELSECNET/H network containing a redundant system

When constructing a MELSECNET/H network containing a redundant system or when connecting a redundant system to an existing MELSECNET/H, follow the restrictions shown below.

(a) When constructing a new MELSECNET/H network containing a redundant system

To construct a new MELSECNET/H network containing a redundant system, use the following network modules and GX Developer.



1) Function versions of network modules

| Station type | CPU type | Function version of network module |
|-----------------|--|--|
| Control station | Q12PRH/Q25PRHCPU | Function version D or later |
| | Q00J/Q00/Q01CPU | |
| | Q02/Q02H/Q06H/Q12H/Q25HCPU | |
| | Q02PH/Q06PH/Q12PH/ Q25PHCPU | |
| | Q02U/Q03UD/Q04UDH/ Q06UDH/Q13UDH/Q26UDH/ Q03UDE/Q04UDEH/Q06UDEH/ Q13UDEH/Q26UDEHCPU | |
| | QS001CPU | |
| | QS001CPU | Setting not available |
| Normal station | Q12PRH/Q25PRHCPU | Function version D or later |
| | Q00J/Q00/Q01CPU | No restrictions (However, use a model of function version B or later when constructing a multiple CPU system using a normal station.) |
| | Q02/Q02H/Q06H/Q12H/Q25HCPU | |
| | Q02PH/Q06PH/Q12PH/ Q25PHCPU | |
| | Q02U/Q03UD/Q04UDH/Q06UDH/ Q13UDH/Q26UDH/Q03UDE/ Q04UDEH/Q06UDEH/Q13UDEH/ Q26UDEHCPU | |
| | QS001CPU | |
| | QS001CPU | |

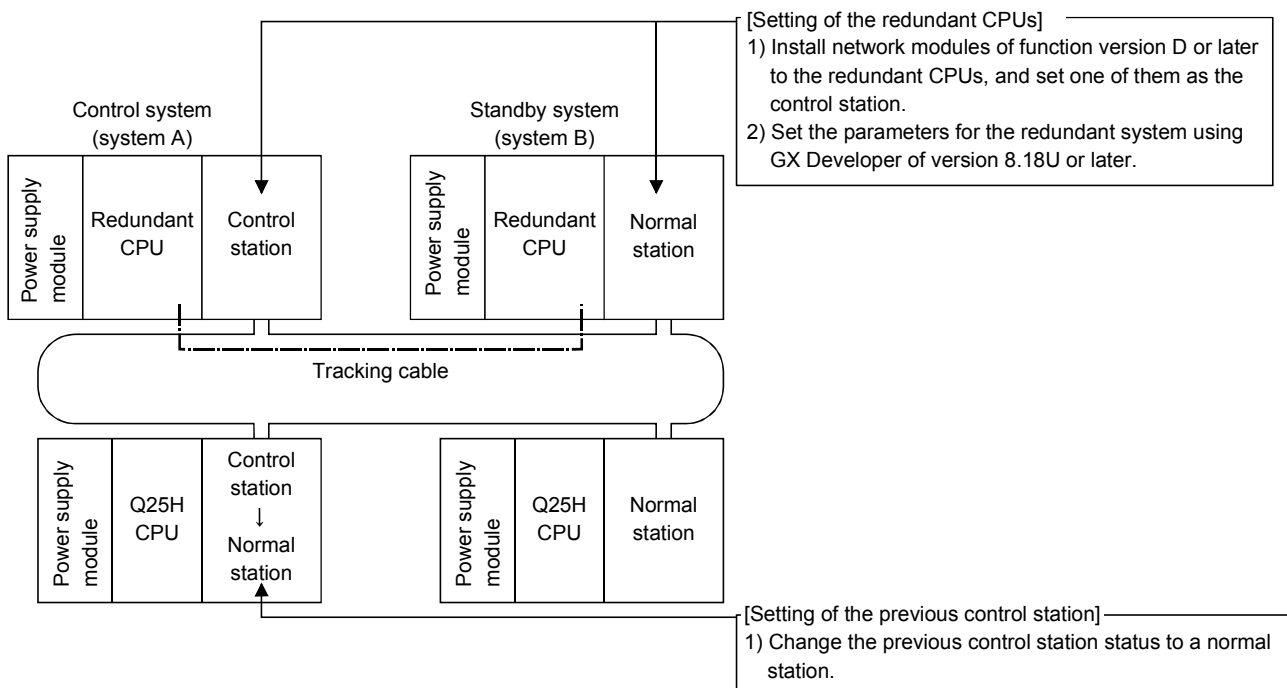
2) Versions of GX Developer for setting parameters

| Station type | CPU type | | Version of GX Developer |
|-----------------|---|---------------------|-------------------------|
| Control station | Q12PRH/Q25PRHCPU | Redundant system | Version 8.18U or later |
| | Q00J/Q00/Q01CPU | Single CPU system | |
| | | Multiple CPU system | |
| | Q02/Q02H/Q06H/Q12/Q25HCPU | Single CPU system | |
| | | Multiple CPU system | Version 8.68W or later |
| | Q02PH/Q06PHCPU | Single CPU system | |
| | | Multiple CPU system | Version 8.18U or later |
| | Q12PH/Q25PHCPU | Single CPU system | |
| | | Multiple CPU system | Version 8.48A or later |
| | Q02U/Q03UD/Q04UDH/ Q06UDHCPU | Single CPU system | |
| | | Multiple CPU system | Version 8.62Q or later |
| | Q13UDH/Q26UDHCPU | Single CPU system | |
| | | Multiple CPU system | Version 8.68W or later |
| | Q03UDE/Q04UDEH/Q06UDEH/ Q13UDEH/Q26UDEHCPU | Single CPU system | |
| | | Multiple CPU system | Setting not available |
| | QS001CPU | Single CPU system | |
| Normal station | Q12PRH/Q25PRHCPU | Redundant system | Version 8.18U or later |
| | Q00J/Q00/Q01CPU | Single CPU system | Version 7 or later |
| | | Multiple CPU system | Version 8 or later |
| | Q02/Q02H/Q06H/Q12H/Q25HCPU | Single CPU system | Version 4 or later |
| | | Multiple CPU system | Version 6 or later |
| | Q02PH/Q06PHCPU | Single CPU system | Version 8.68W or later |
| | | Multiple CPU system | |
| | Q12PH/Q25PHCPU | Single CPU system | Version 7.10 or later |
| | | Multiple CPU system | |
| | Q02U/Q03UD/Q04UDH/ Q06UDHCPU | Single CPU system | Version 8.48A or later |
| | | Multiple CPU system | |
| | Q13UDH/Q26UDHCPU | Single CPU system | Version 8.62Q or later |
| | | Multiple CPU system | |
| | Q03UDE/Q04UDEH/Q06UDEH/ Q13UDEH/Q26UDEHCPU | Multiple CPU system | Version 8.68W or later |
| | | Single CPU system | |
| | QS001CPU | Single CPU system | Version 8.40S or later |

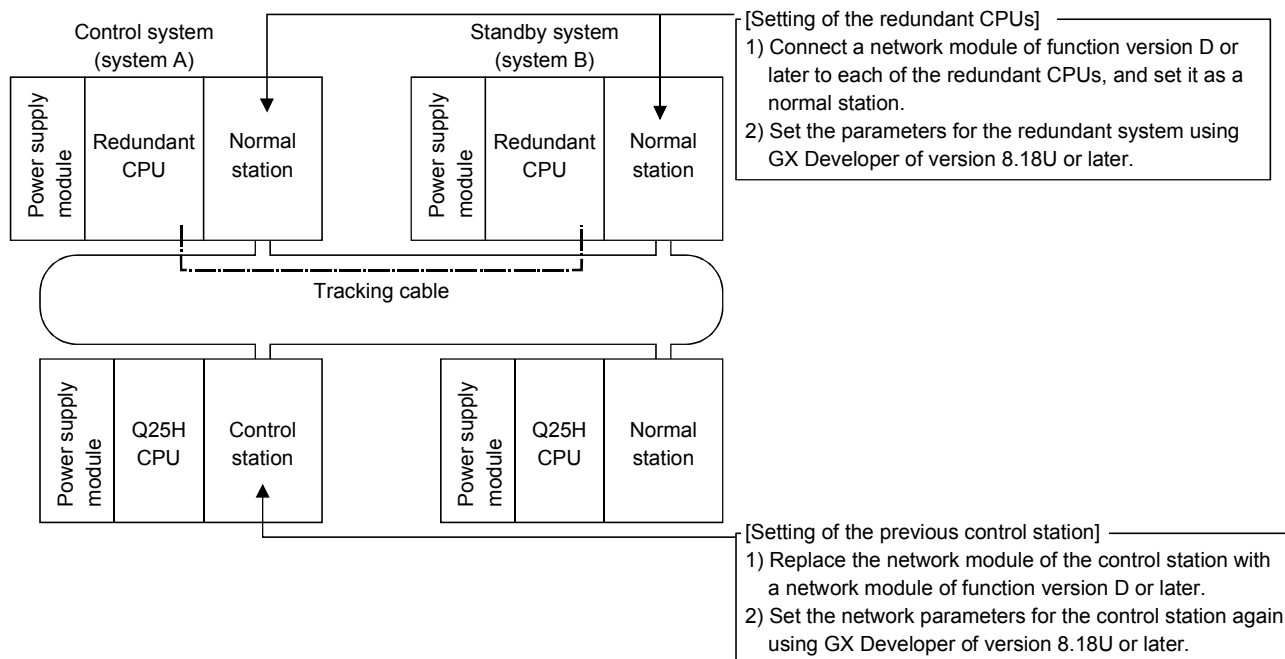
- (b) When connecting a redundant system to an existing MELSECNET/H network

The method for constructing a network depends on conditions 1) and 2) shown below.

- 1) When connecting a redundant system as the control station
Change the previous control station to a normal station, and connect a redundant system.
Set new network parameters at the redundant system using GX Developer of version 8.18U or later.



- 2) When connecting a redundant system as normal stations
- Replace the network module of the control station with a network module of function version D or later (it is not necessary to change the CPU module).
- After changing the network module of the control station, use GX Developer of version 8.18U or later to make the network parameter setting again.



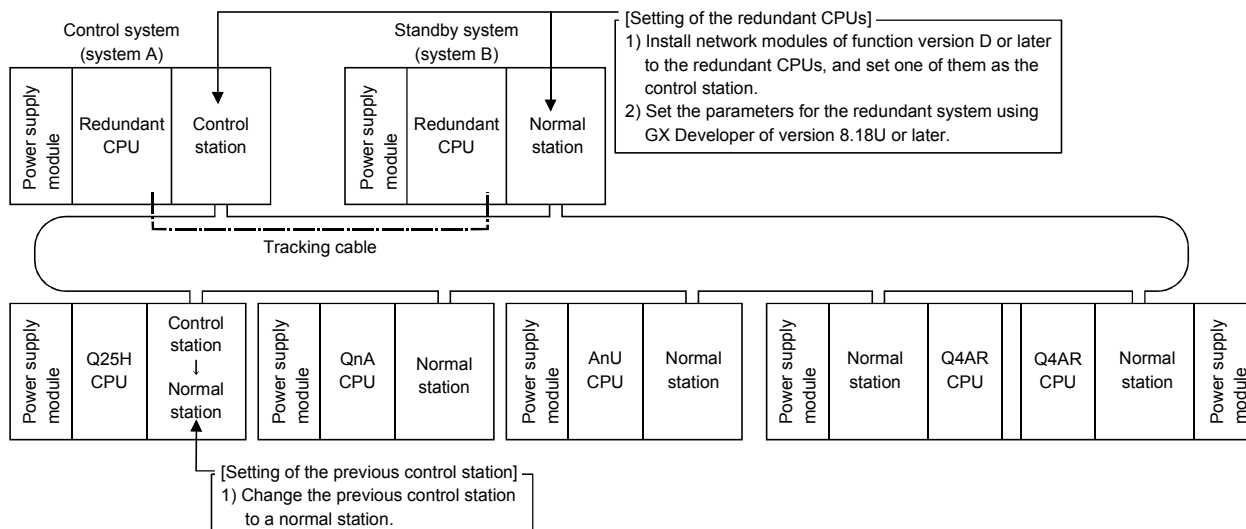
(2) Connecting a redundant system to an existing MELSECNET/10

When connecting a redundant system to an existing MELSECNET/10, the method for constructing a network depends on conditions (a) to (d) shown below.

(a) When connecting a redundant system as the control station

Change the previous control station to a normal station, and connect the redundant system.

Set new network parameters at the redundant system using GX Developer of version 8.18U or later.

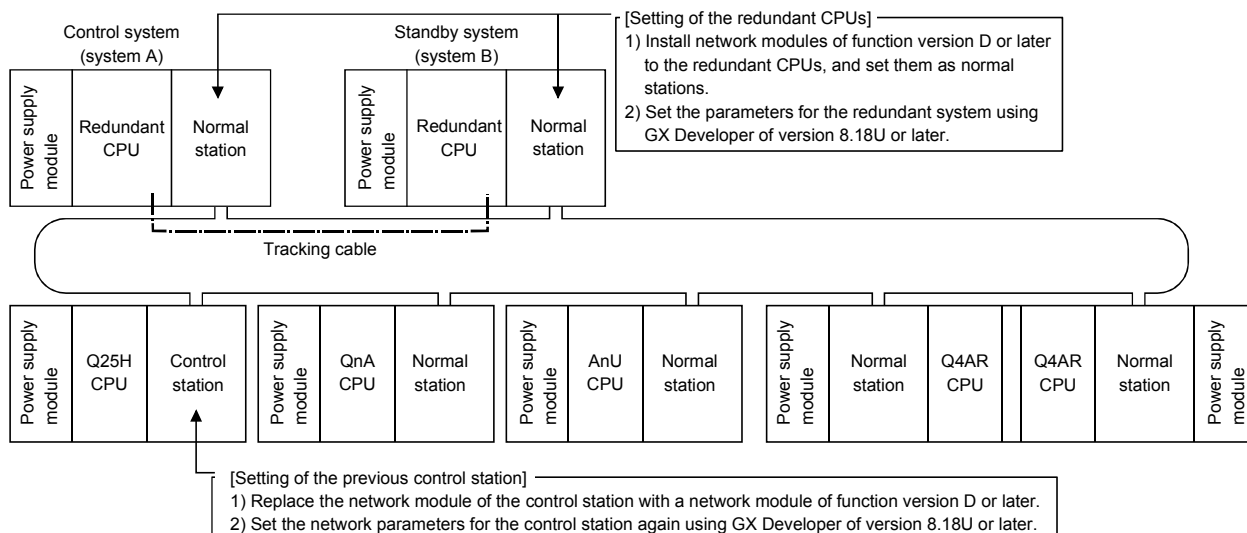


(b) When connecting a redundant system as normal stations

- 1) Connecting a redundant system as normal stations to a MELSECNET/10 including a QCPU (other than the redundant CPU) station acting as a control station

Replace the network module of the control station with a network module of function version D or later (it is not necessary to change the CPU module).

After changing the network module of the control station, use GX Developer of version 8.18U or later to reset network parameters.



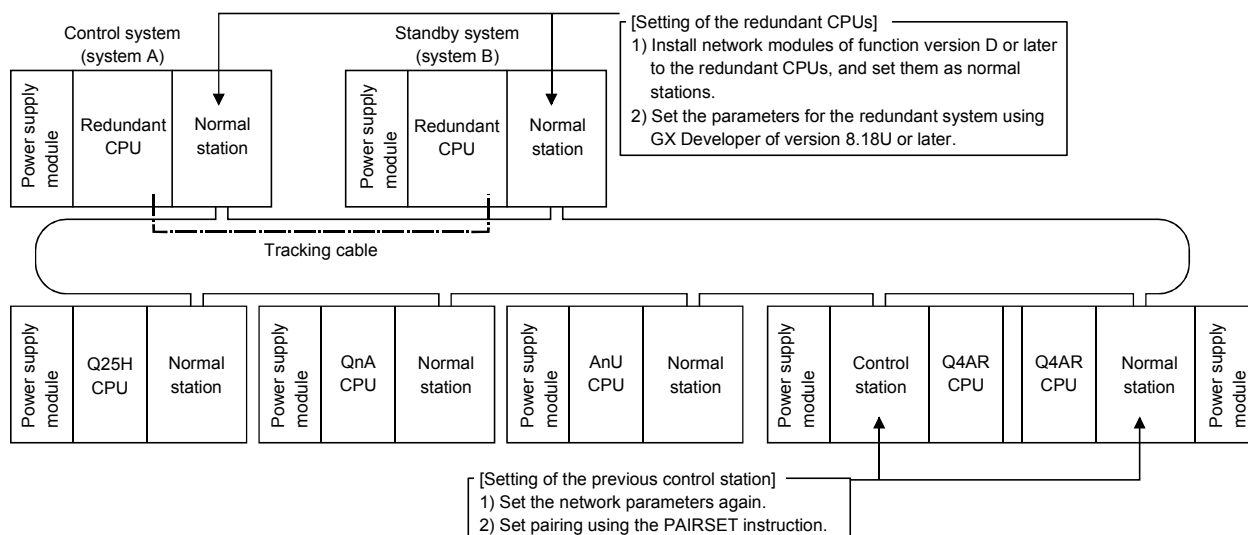
- 2) When connecting a redundant system as normal stations to a MELSECNET/10 including a Q4ARCPU^{*1} station acting as a control station

Set the network parameters for the control station (Q4ARCPU^{*1}) again. Make the pairing setting of the redundant system using the PAIRSET instruction at the control station (Q4ARCPU).

For further information on the PAIRSET instruction, refer to the QnA/Q4AR MELSECNET/10 Network System Reference Manual.

^{*1}: It represents both a single and a redundant system Q4ARCPU.

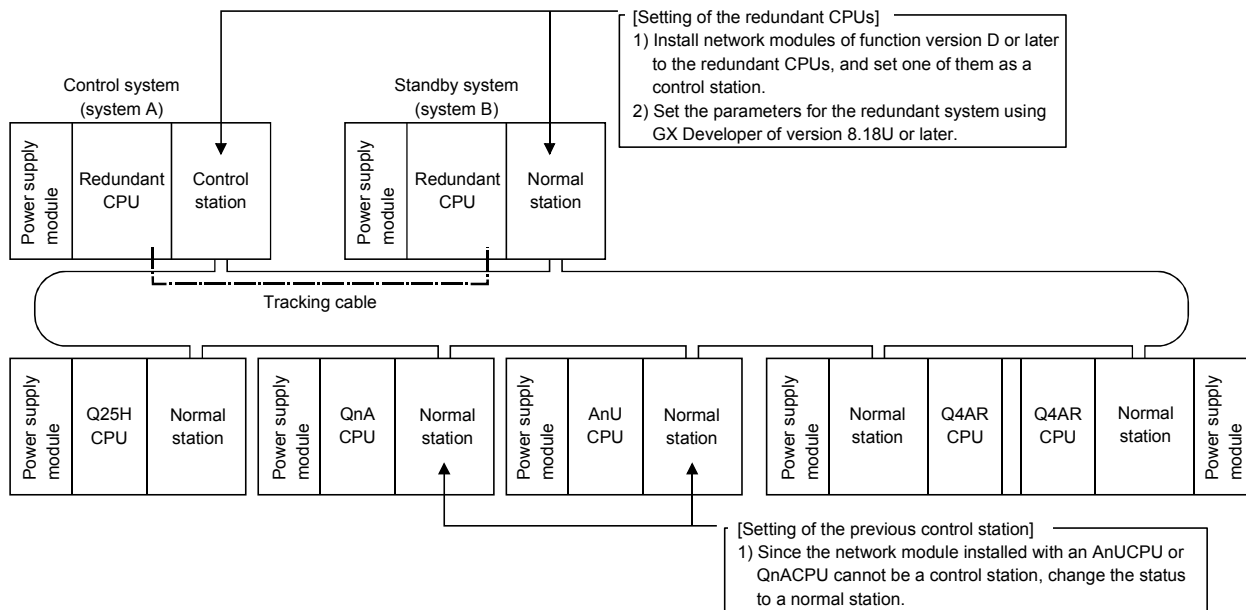
[When the redundant system using a Q4ARCP is the control station]



- 3) When connecting a redundant system as normal stations to a MELSECNET/10 including an AnUCPU or QnACPU station acting as a control station

The network module installed with an AnUCPU or QnACPU cannot be set as a control station if a redundant system using Q4ARCPUs or redundant CPUs exists in the network.

Change the network module status of the AnCPU or QnACPU to a normal station, and connect the redundant system as the control station. (refer to (2) (a) in this section.)



7.10.3 Pairing setting at a redundant system

A redundant system consists of a control system and a standby system.

In pairing setting, set a combination of the station numbers of the network modules making up the redundant system.

When there is a redundant system in the network, the pairing setting must be done with the common parameters of the control station^{*1}.^{*2}

*1: For the control station, use a network module of function version D or later.

*2: Make the pairing setting using GX Developer of version 8.18U or later.

(1) Setting items

Make settings in "Pairing" on the "Network Range Assignment" screen with careful consideration for the following points:

- 1) Set numbers of two adjoining stations as a pair. The station with the smaller station number can be set to either redundant CPU of system A or B.
- 2) The last station number and station No. 1 (example: station Nos. 64 and 1) cannot be paired.
- 3) Confirm that the stations to be paired are installed with redundant CPUs.
If either of the paired stations has a QCPU other than the redundant CPU, an error will occur in the CPU module.

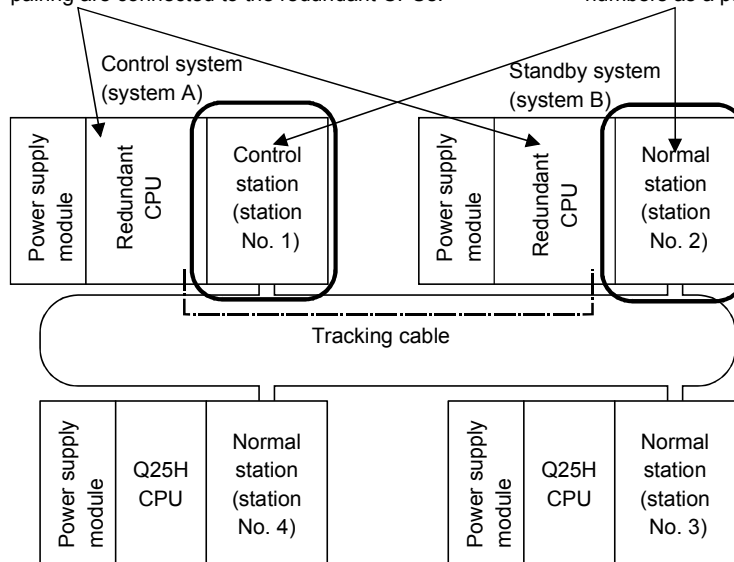
| POINT |
|--|
| Before pairing setting, confirm the station numbers of the network modules. If the contents of pairing setting do not match the actual combination of the station numbers of the network modules, a receive data error will occur when the power is turned on or at the time of system switching. |

(2) Setting example and cyclic transmission

The following system configuration example is used to describe a setting example and cyclic transmission.

Confirm that the network modules set for pairing are connected to the redundant CPUs.

Set two adjoining station numbers as a pair.



(a) Setting example

This example shows the send range for each station (LB/LW setting) when 256 points are assigned to each of station Nos. 1 to 4.

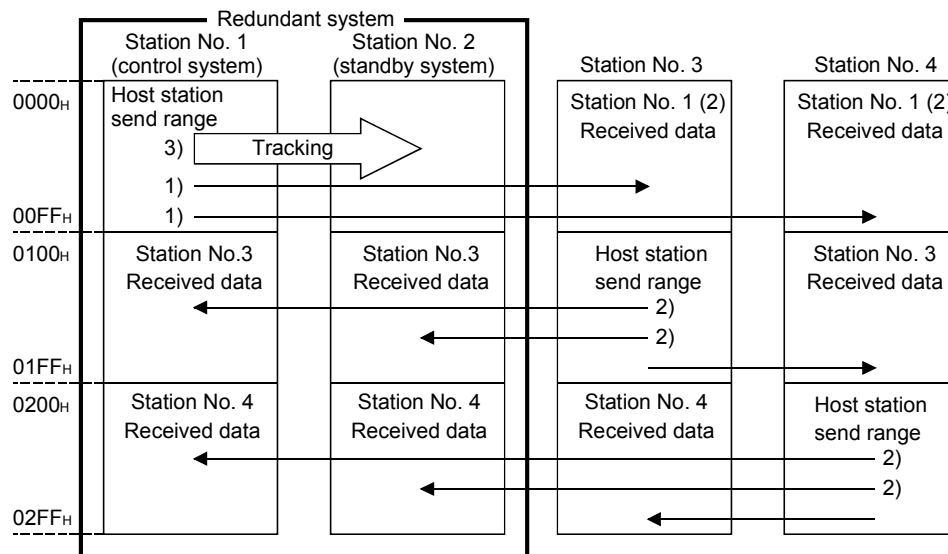
| Station No. | Send range for each station | | | Send range for each station | | | Send range for each station | | | Send range for each station | | | Pairing |
|-------------|-----------------------------|-------|------|-----------------------------|-------|------|-----------------------------|-------|-----|-----------------------------|-------|-----|---------|
| | LB | | | LW | | | Low speed LB | | | Low speed LW | | | |
| | Points | Start | End | Points | Start | End | Points | Start | End | Points | Start | End | |
| 1 | 256 | 0000 | 00FF | 256 | 0000 | 00FF | | | | | | | Enable |
| 2 | 256 | 0000 | 00FF | 256 | 0000 | 00FF | | | | | | | Enable |
| 3 | 256 | 0100 | 01FF | 256 | 0100 | 01FF | | | | | | | Disable |
| 4 | 256 | 0200 | 02FF | 256 | 0200 | 02FF | | | | | | | Disable |

1) To pair station Nos. 1 and 2, set the smaller station number to "Enable" (station No. 1 in this case).

2) By setting station No. 1 to "Enable", the send range for station No. 1 will be copied as that for station No. 2.

(b) Cyclic transmission

[When the redundant system is in normal communication]



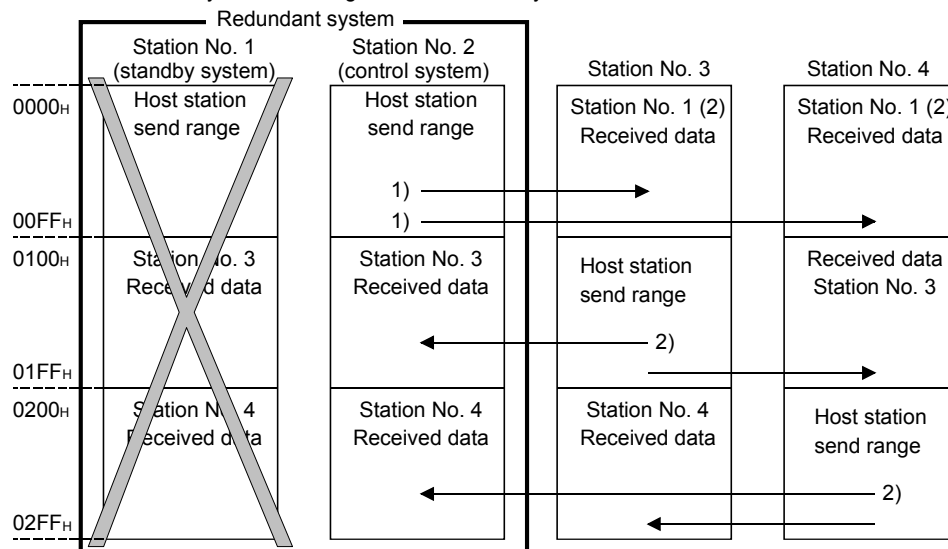
- 1) The send range for the redundant system is sent from the control system CPU of station No. 1 or 2.
- 2) Station Nos. 1 and 2 receive data from another station.
- 3) The data sent from station No. 1 of the control system CPU to another station are transferred to the standby system CPU as tracking device data.

[When station No. 1 is cut off due to a communication error (system switching occurs)]

If a communication error occurs in station No. 1 and it is consequently cut off from the network, the network module automatically issues a system switching request to the control system CPU, and system switching occurs in the redundant system.

After system switching, station No. 2, a new control system, continues a data link.

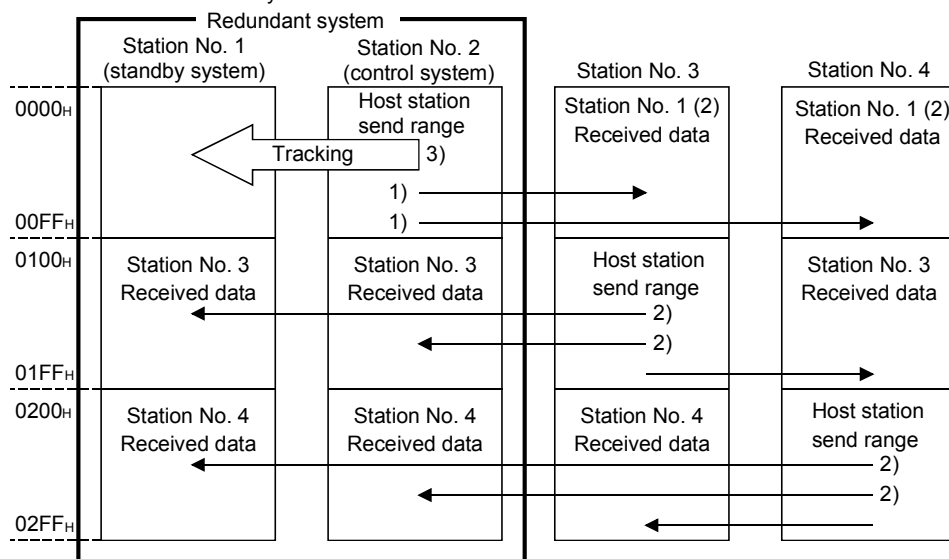
Cyclic transmission after system switching in the redundant system is shown below.



- 1) Station No. 2 takes over the host station send range data handled by station No. 1 (data tracked) and sends them to other stations without discontinuing a data link.
- 2) Station No. 2 receives data from other stations.

[When station No. 1 is returned to the system]

When station No. 1 separated due to a communication error is returned to the system, the redundant CPU installed with the station No. 1 network module becomes the standby system CPU (system switching will not occur in the redundant system).
Cyclic transmission after recovery from a communication error is shown below.



- 1) Station No. 2 of the control system CPU sends the send range data of the redundant system.
- 2) Station Nos. 1 and 2 receive data from other stations.
- 3) The data sent from station No. 2 of the control system CPU to other stations are transferred to the standby system CPU as tracking device data.

POINT

- (1) Communication by LX/LY is not supported by the pairing setting.
- (2) Set the refresh target devices of LB/LW set in the host station send range of the redundant system as tracking devices. For details, refer to the QnPRHCPU User's Manual (Redundant System).
- (3) When tracking a link special relay and a link special register, exercise care not to transfer the link special relay (SB0020 to SB01FF) and the link special register (SW0020 to SW01FF) in use by the system.

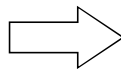
7.10.4 Redundant settings in the redundant system

In the redundant settings, set the operation mode of the network module mounted to system B.

When the mode setting switch of the network module mounted to system B is set to online (0 or 4), the mode selection of this parameter is valid.

(Redundant settings screen)

| Module 1 | |
|---------------------------|-------------------------------|
| Network type | MNET/H mode (Control station) |
| Starting I/O No. | 0000 |
| Network No. | 1 |
| Total stations | 4 |
| Group No. | 0 |
| Station No. | |
| Mode | On line |
| Network range assignment | |
| Refresh parameters | |
| Interrupt settings | |
| Return as control station | |
| Redundant settings | |



Redundant settings

Network type: MNET/H mode (Control station)

Start I/O No.: 0000

Mode(System A): On line

Mode(System B): On line

On line
 Debug mode
 Off line
 Forward loop test
 Reverse loop test
 Test between master station
 Test between slave station

End Cancel

For details on the setting items, refer to Section 5.2.5.

Click on the Redundant settings button.

(1) Using the redundant system in backup mode

To use the redundant system in backup mode, set the same operation mode as that of system A for system B.

If the mode of the network module is different between systems A and B, an error will occur in the redundant CPUs.

(2) Performing station-to-station or forward/reverse loop test

To perform station-to-station or forward/reverse loop test, set the mode of system B according to the relevant test setting.

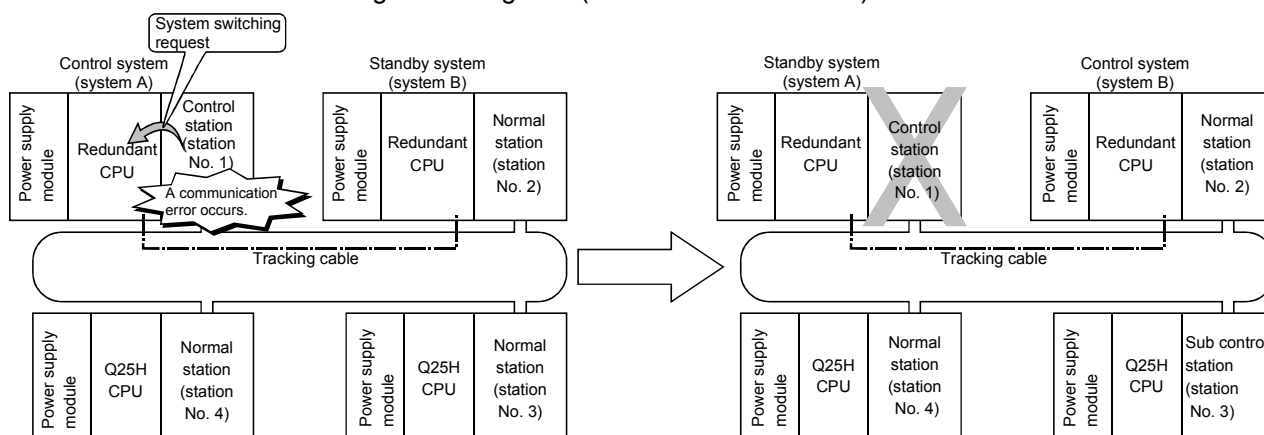
For further information, refer to Sections 4.7.1 and 4.7.2.

POINT

- (1) Except the operation mode, use the same network parameters between systems A and B.
- (2) Set the mode of the network module mounted to system A in "Mode" on the Network Setting screen.

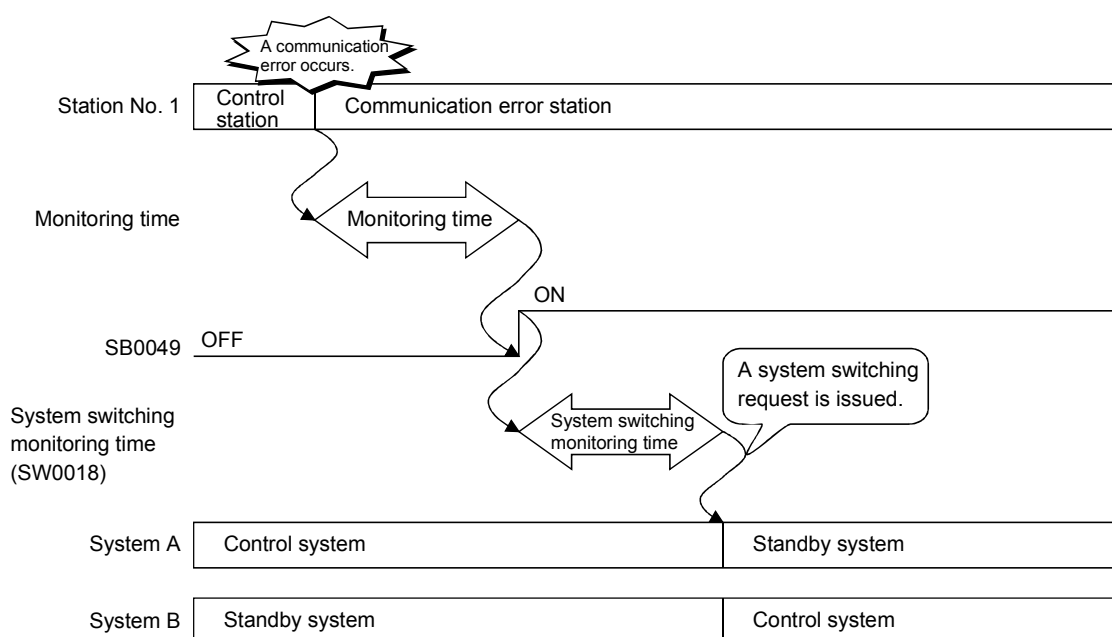
7.10.5 System switching request to the control system CPU

The network module in the control system of the redundant system automatically issues a system switching request to the control system CPU when the data link status of the network module remains faulty (the D. LINK LED goes off) over the system switching monitoring time (the time set at SW0018).



(1) Process for issuing a system switching request

- 1) An error occurs in the network module mounted to the control system CPU.
- 2) After the monitoring time has elapsed, the D. LINK LED goes off (the host station data link status (SB0049) is ON).
- 3) After the time set for the switching monitoring time setting (SW0018) has elapsed, a system switching request is issued to the control system CPU.
- 4) Upon receipt of the system switching request from the network module, the control system CPU switches the systems.
- 5) After system switching has been completed, the network module mounted to the new control system CPU continues a data link.



(2) System switching monitoring time

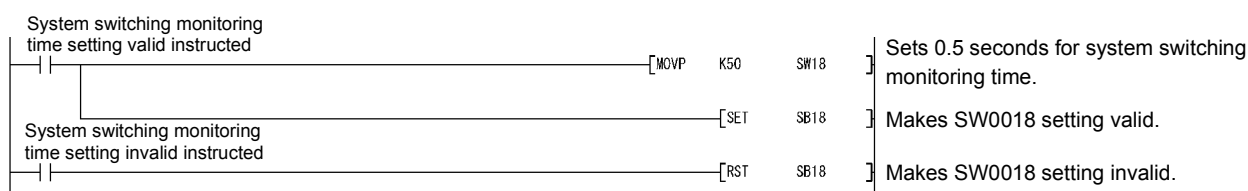
Use SW0018 (system switching monitoring time) to set the time from the occurrence of the host station data link error (the D. LINK LED goes off) to the issue of a system switching request.

For further information about SB and SW, refer to Appendices 3 and 4.

| Set value | Monitoring time before issuing a system switching request |
|------------------------|---|
| 0 (default) | A system switching request is issued 2 seconds after SB0049 turns on. |
| 1 to 500 ^{*1} | A system switching request is issued (set value x 10 ms) after SB0049 turns on. |

^{*1}: This set value is valid when the system switching monitoring time setting valid flag (SB0018) is on.

To reduce the system switching monitoring time from 2 seconds (default) to 0.5 seconds, set SB0018 and SW0018 in the sequence program as shown below.

**POINT**

The network module issues a system switching request through the process described in (1) of this section and automatically switches the systems of the redundant system.

However, if the standby station has been already in an error status (power supply off, redundant CPU resetting, stop error, etc.), the system will not be switched even if the network module issues a system switching request to the control system CPU.

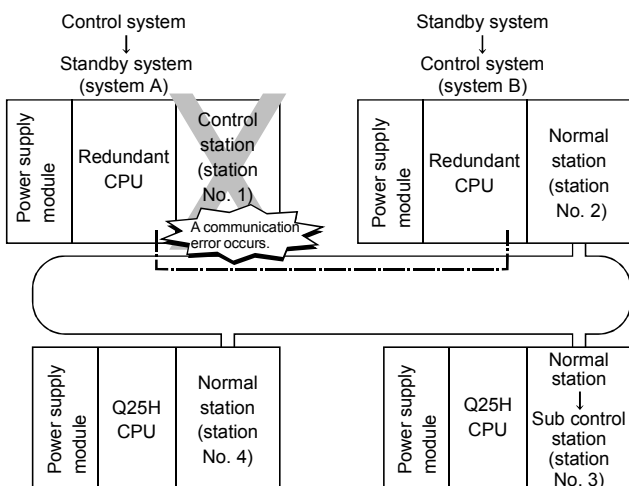
For further information, refer to the QnPRHCPU User's Manual (Redundant System).

7.10.6 Function for returning to control station in a redundant system

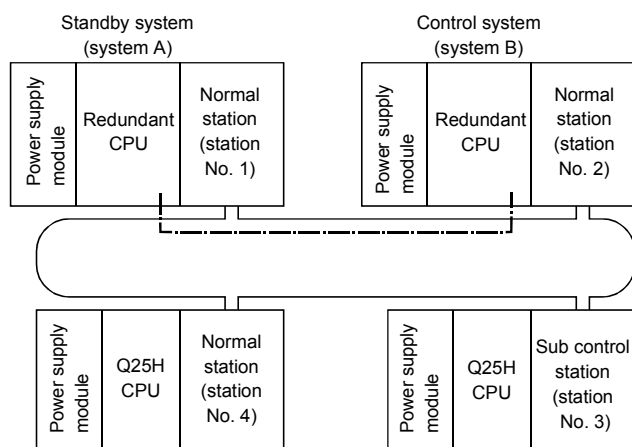
This section describes unavailability of the function for returning to control station status when a redundant system has been acting as a control station.

In the redundant system, when the redundant CPU is in the standby system at the time of return to the system, the previous control station is returned as a normal station even if "Return as control station" is set for the return setting for the station.

- 1) When the control station falls into a communication error, another normal station will become a sub control station.



- 2) System switching does not occur even if station No. 1 returns to the system, and system A remains as the standby system and returns as a normal station (it does not return as a control station).



7.10.7 Data retention time for system switching

This section describes the cyclic data retention time at another station when system switching occurs in the redundant system.

Calculate the cyclic data retention time at another station based on:

- Monitoring time (Refer to Section 5.4);
- System switching monitoring time (Refer to Section 7.10.5);
- Control station shift time (Refer to Section 3.3.5);
- Redundant CPU system switching time (refer to the QnPRHCPU User's Manual (Redundant System); and
- Redundant CPU scan time (refer to the QnPRHCPU User's Manual (Redundant System).

The expression of the cyclic data retention time at another station depends on the reason(s) for system switching.

| Reason | Expression |
|--|-------------------------------|
| Control system power supply module malfunction, power supply off | Refer to (1) of this section. |
| Control system CPU malfunction, resetting | |
| Control system CPU stop error | Refer to (2) of this section. |
| Execution of system switching instruction | |
| System switching operation from GX Developer | |
| System switching request from other network module | |
| System switching request from network module (host station) | Refer to (3) of this section. |

(1) Cyclic data retention time for control system power supply module malfunction, power supply off, control system CPU malfunction, or resetting

Use the following expression to calculate the cyclic data retention time in the case of control system power supply module malfunction, power supply off, control system CPU malfunction, or resetting.

(a) When the redundant system has a control station

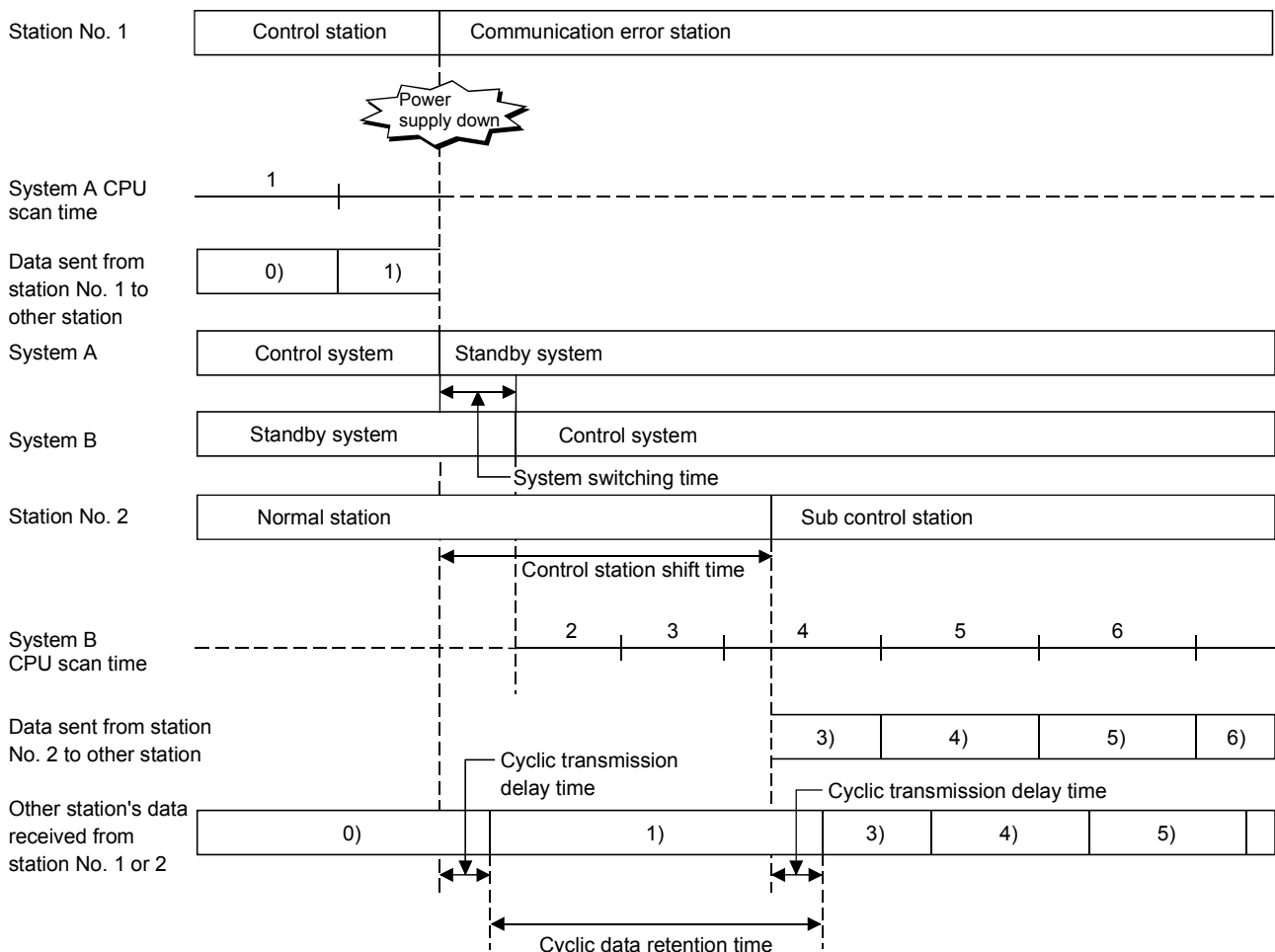
1) Redundant CPU system switching time (T_{sw}) < Control station shift time (C_{sw})

[Cyclic data retention time (T_H)]

$$T_H = C_{sw} + SS \quad [\text{ms}]$$

C_{sw} : Control station shift time [ms]

SS : Redundant CPU scan time [ms]



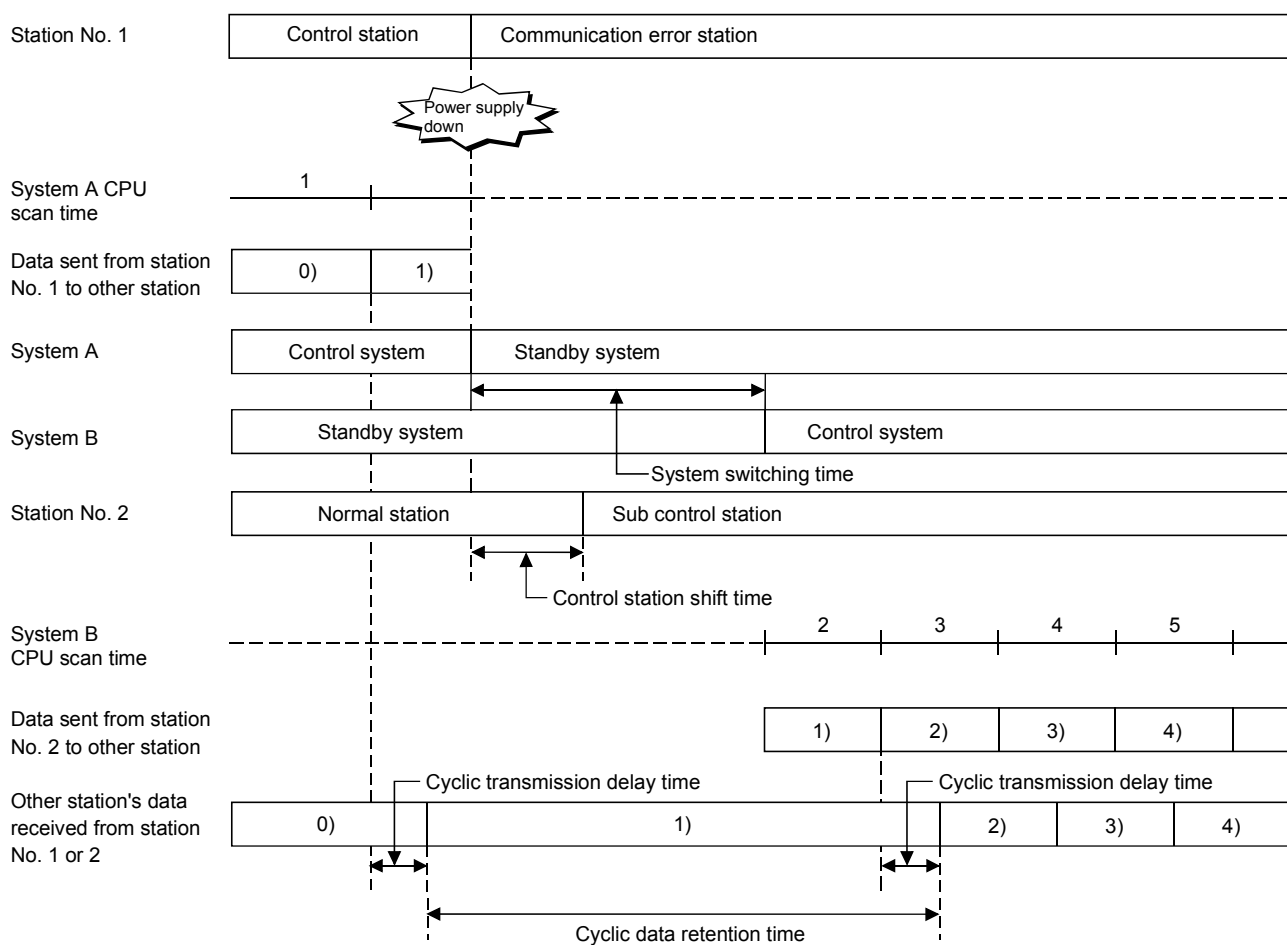
2) Redundant CPU system switching time (T_{sw}) > Control station shift time (C_{sw})

[Cyclic data retention time (T_H)]

$$T_H = T_{sw} + SS \quad [\text{ms}]$$

T_{sw} : Redundant CPU system switching time [ms]

SS : Redundant CPU scan time [ms]

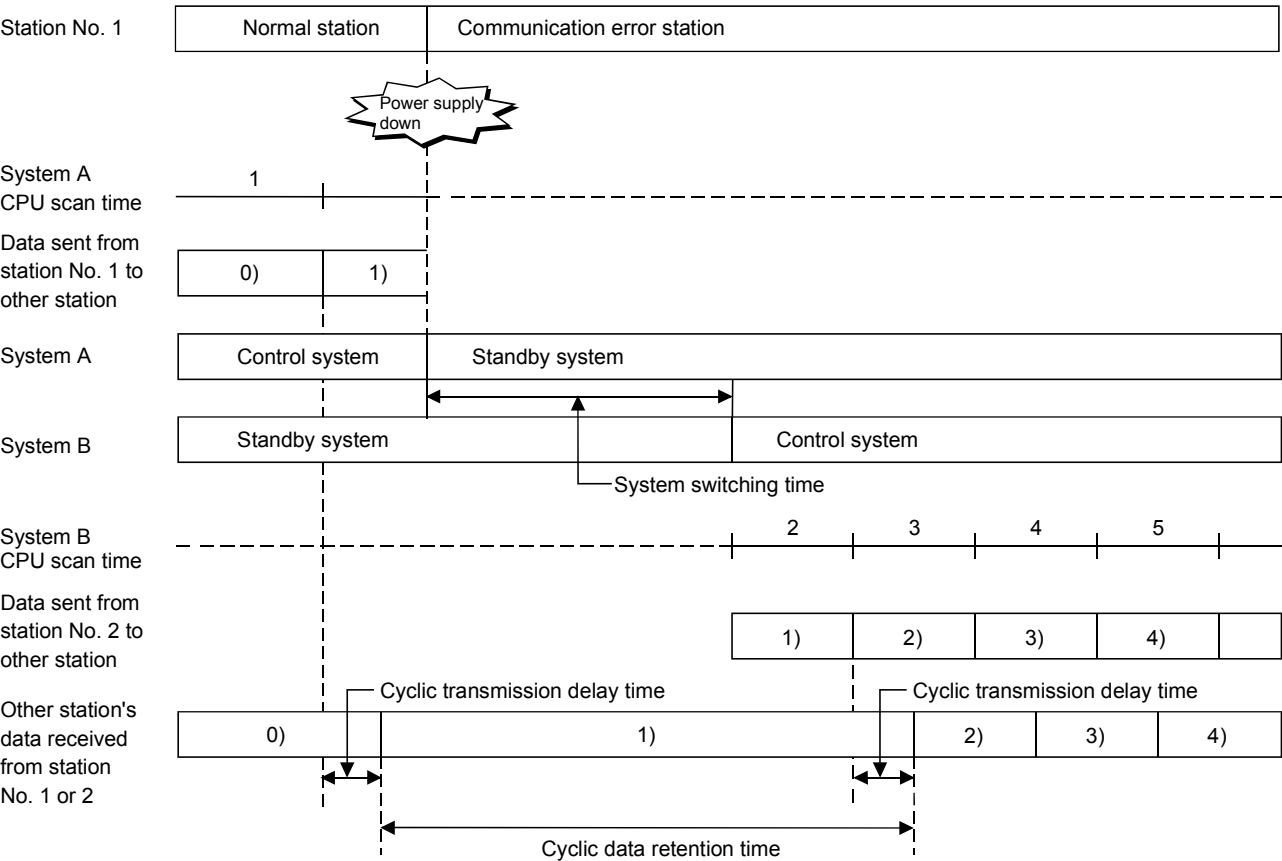


(b) When the redundant system has normal stations

[Cyclic data retention time (T_H)]

$T_H = T_{sw} + SS \text{ [ms]}$

T_{sw} : Redundant CPU system switching time [ms]
 SS : Redundant CPU scan time [ms]



- (2) Cyclic data retention time for a control system CPU stop error, execution of a system switching instruction, system switching operation from GX Developer, or system switching requesting from other network module

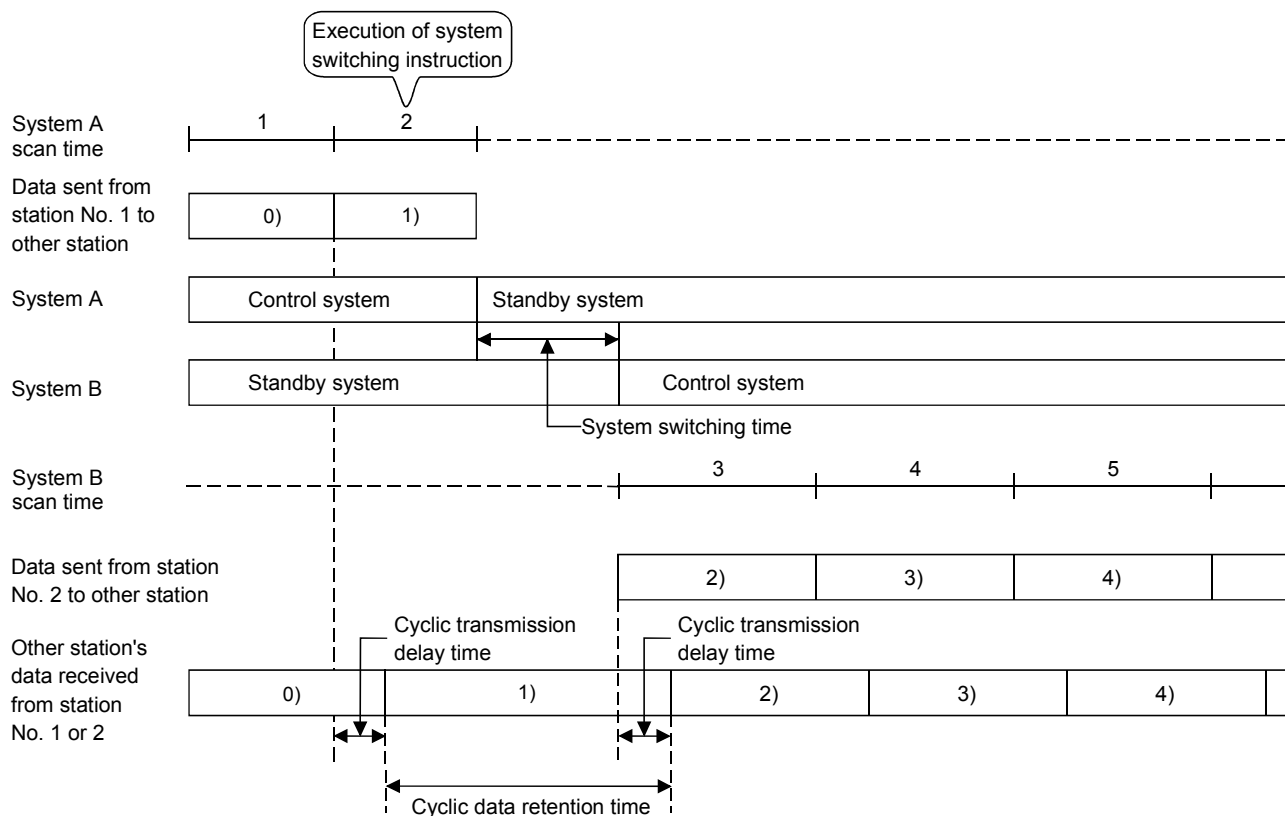
Use the following expression to calculate the cyclic data retention time in the case of a control system CPU stop error, execution of a system switching instruction, system switching operation from GX Developer, and system switching requesting from other network module.

[Cyclic data retention time (T_H)]

$$T_H = T_{sw} + SS \quad [\text{ms}]$$

T_{sw} : Redundant CPU system switching time [ms]

SS : Redundant CPU scan time [ms]



(3) Cyclic data retention time for system switching requesting from a network module (host station)

Use the following expression to calculate the cyclic data retention time in the case of system switching requesting from a network module (host station).

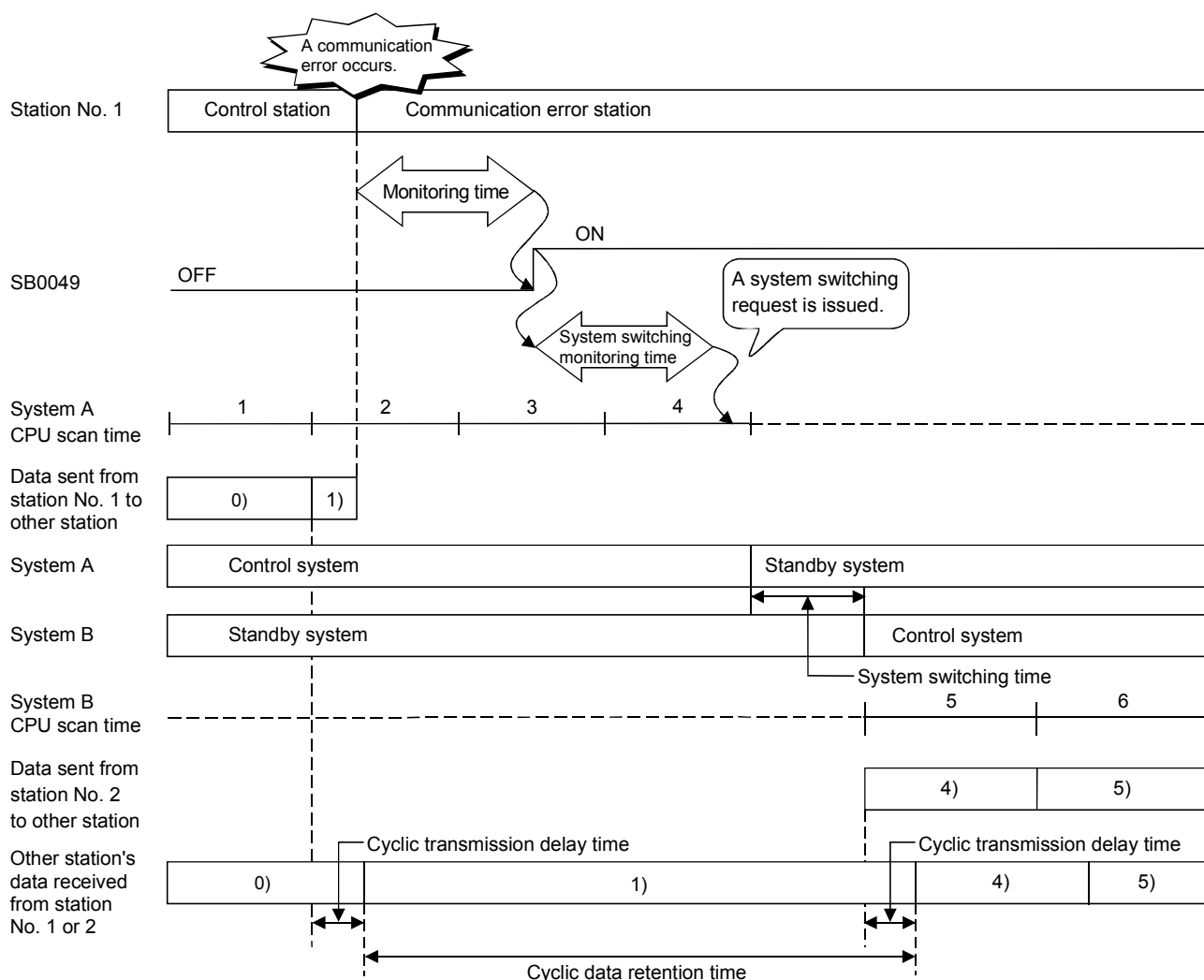
$$T_H = 500 + K + T_c + T_{sw} + (SS \times 2) \text{ [ms]}$$

K : Monitoring time [ms]

T_c : System switching monitoring time [ms]

T_{sw} : Redundant CPU system switching time [ms]

SS : Redundant CPU scan time [ms]

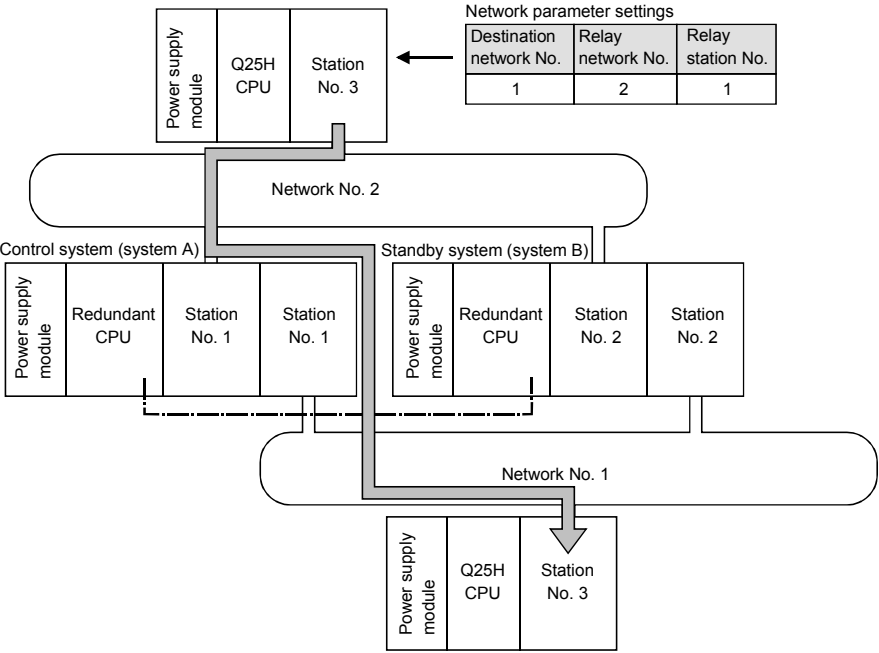


7.10.8 Routing via a redundant system

This section describes the function of routing via a redundant system.

(1) Routing via a redundant system

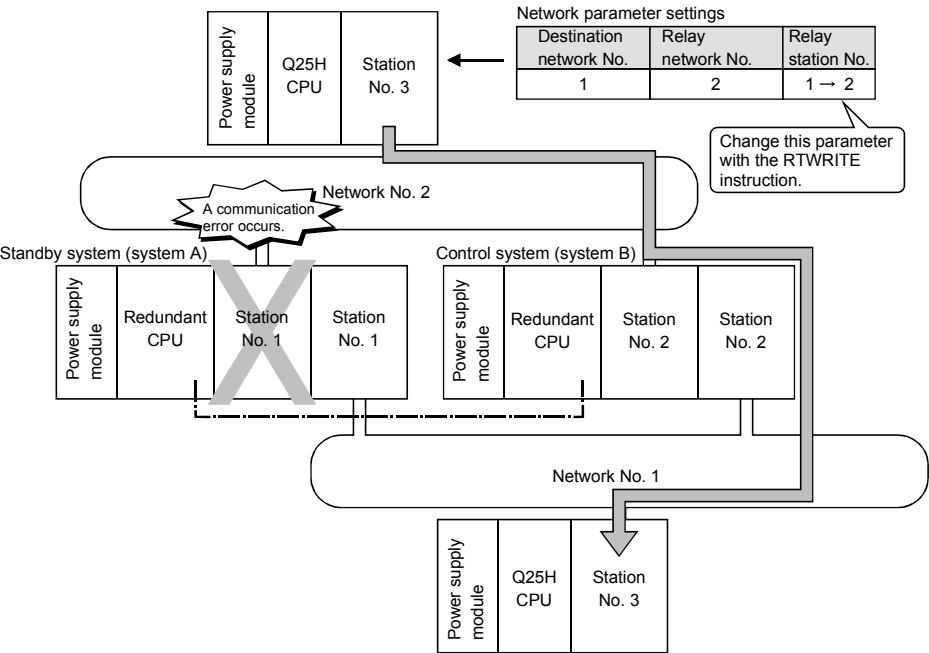
To use the routing via a redundant system, set the network module mounted to the control system CPU as a station to be routed.



When the control system is switched, the routing parameter must be changed to go through the station of the new control system.

Change the routing parameter with the RTWRITE instruction.

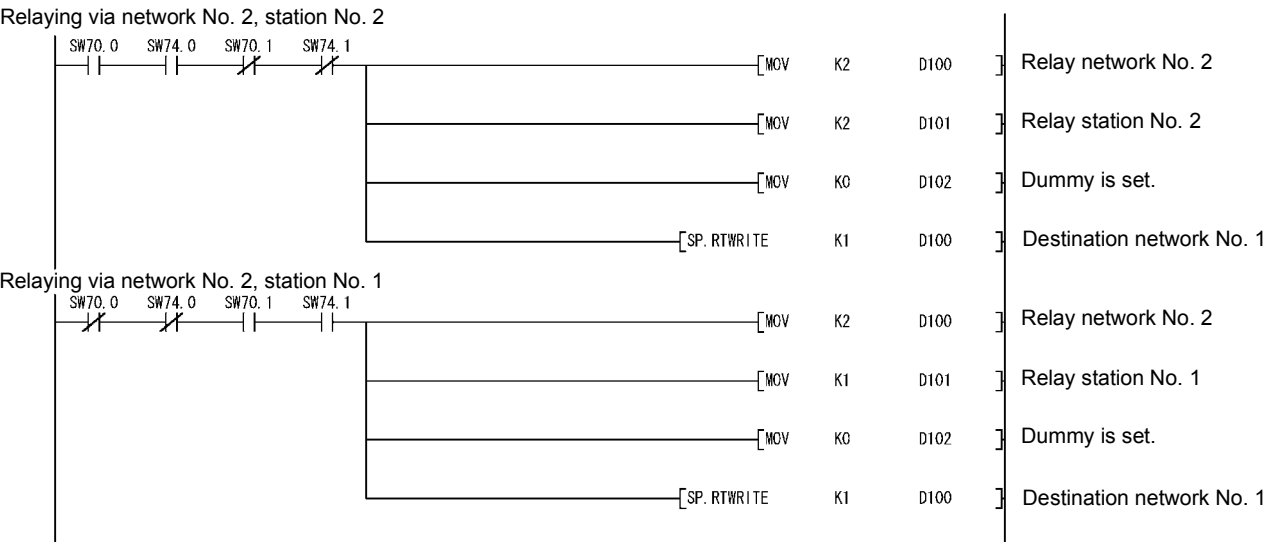
For a sample program in the following system configuration example, refer to (2) of this section.



(2) RTWRITE instruction

The following is a sample program for changing the routing parameters for the requesting station (network No. 2, station No. 3) shown in (1) of this section using the RTWRITE instruction.

For further information on the RTWRITE instruction, refer to the QCPU (Q Mode) /QnACPU Programming Manual (Common Instructions).



8 TROUBLESHOOTING

In order to improve the reliability of the system, it is important to fix errors immediately and in the correct way.

For that purpose, it is necessary to grasp the contents of any errors quickly and accurately. Errors can be checked in three ways as explained below:

(1) Network diagnostics with GX Developer

(a) Line monitor (Refer to Section 8.1)

The status of the following four types of networks can be checked by monitoring the line:

- 1) Status of the entire network: Host information
- 2) Data link status and parameter status, etc. of each station:
Other station information
- 3) Control station information, detailed data link information, etc.:
Network monitor details
- 4) Loop switch count, line error, communication error, etc.:
Error history monitor

(b) Diagnostic tests (Refer to Sections 4.8 and 7.8)

The following five items can be checked or executed through the diagnostic tests:

- 1) Wiring status (IN/OUT, etc.) of the data link cable:
Loop test (required for optical loop)
- 2) Setting status of numbers: control station/remote master station duplication, network numbers and group numbers: Setup confirmation test
- 3) The order of stations connected in the direction of the forward loop and the reverse loop: Station order check test
- 4) Setting status of the routing parameters: Communication test
- 5) Link startup/stop for the host, designated stations and all stations:
Network test

(2) Confirmation by error code: Refer to Section 8.3

When either cyclic transmission or transient transmission using dedicated link instructions or GX Developer (communication with other stations) was not normally performed, an error code is stored in the link special register and the system monitor. The contents of the error can be checked by this error code.

(3) Confirmation by the LED displays on the front of the network module (Refer to Section 4.2)

With the LED displays, the following errors can be checked: whether the host is operating or stopped, whether the station acts as a control station or a normal station, whether the baton pass is being executed, whether data linking is being executed, whether data is being transmitted/received, and whether any error has occurred.

REMARKS

In order to fix the errors that may have occurred during data linking quickly and efficiently, it is important to perform offline tests of the network module and check the data link cable when starting up the system.

Make sure to perform the following checks, which are explained in Chapter 4, "Setup and Procedures Before Starting the Operation."

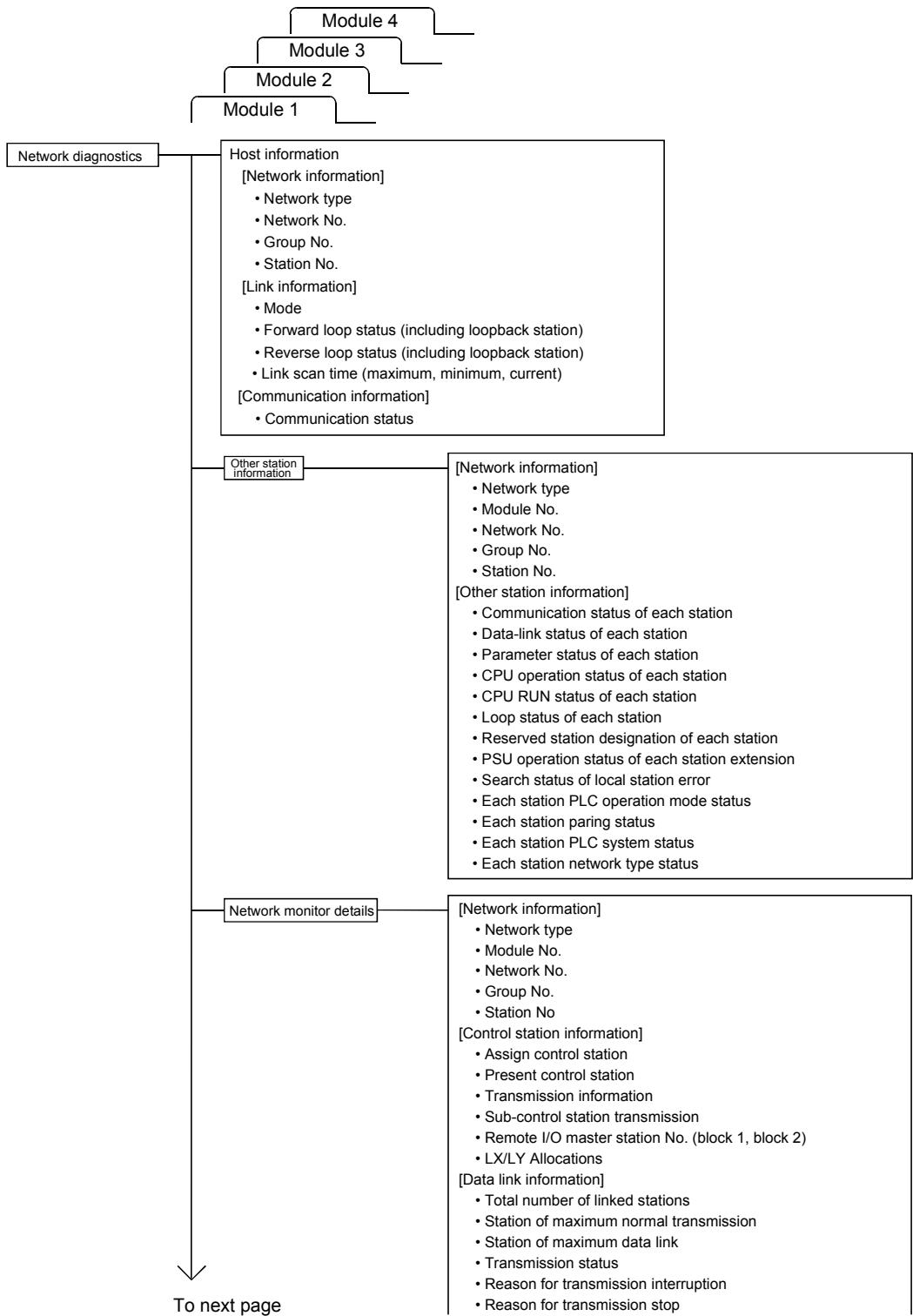
- 1) Standalone operation check and operational setting of the network module
- 2) Offline tests:
Hardware test, Internal self-loopback test, self-loopback test, station-to-station test, and forward loop/reverse loop test (required for optical loop)
- 3) Check the connection of the data link cable.

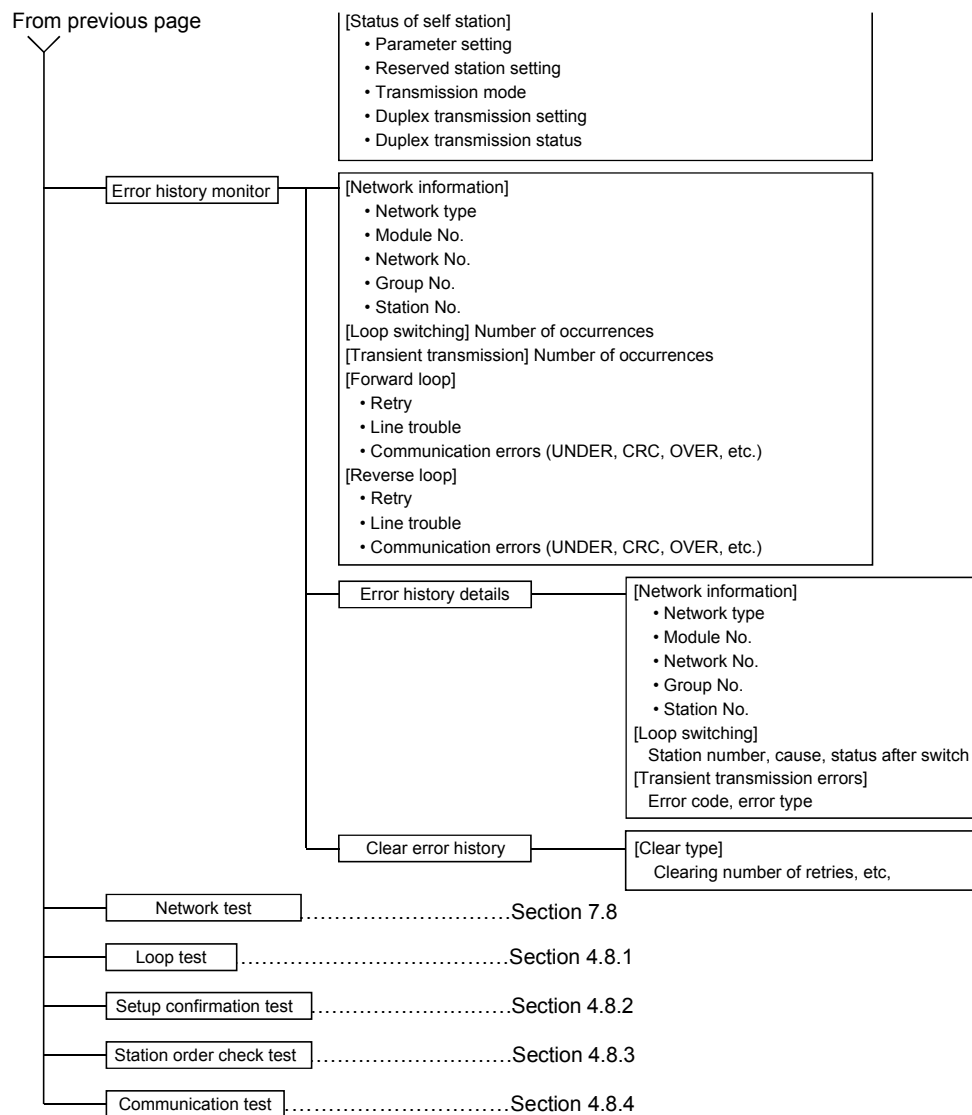
8.1 Network Diagnostics (Network Monitor)

The status of the MELSECNET/H can be checked using the network diagnostic function of GX Developer.

When an error occurs, the faulty station can be identified using the host information, other station information, and error history monitor functions of the network.

The following lists the items that can be checked with the network diagnostic function.





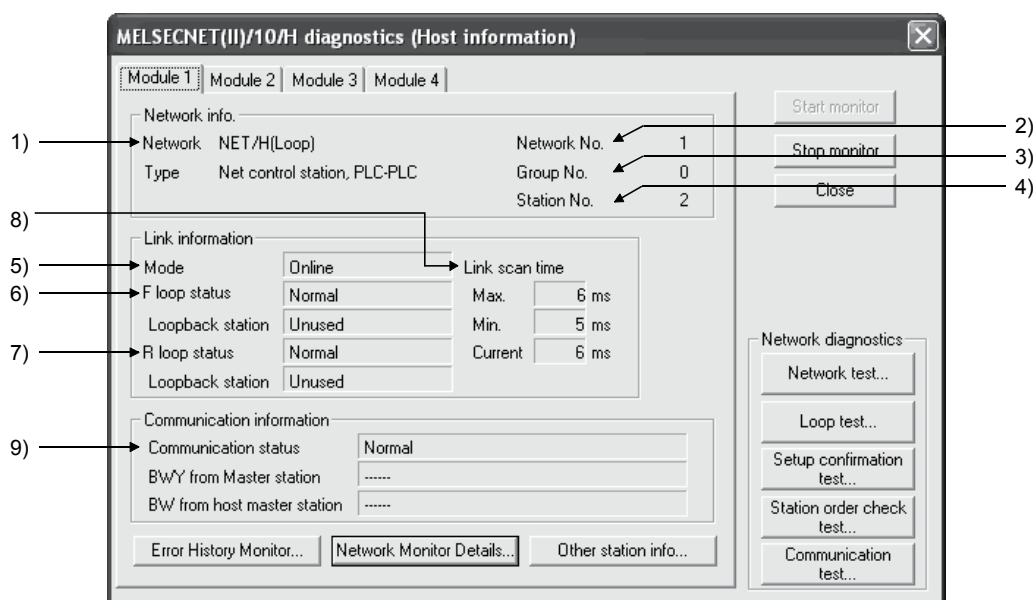
| POINT | |
|-------|--|
| (1) | The target of the network diagnostics is the host's network designated as the connection destination. |
| (2) | When another station is specified in the transfer setup, only the host information and other stations' information are available in the network diagnostics. |
| (3) | The network diagnostics cannot be displayed correctly while the network module is executing the offline test. |
| (4) | <p>When the link dedicated instruction is used to access the other station programmable controller during network diagnosis, the execution of the link dedicated instruction may be delayed.</p> <p>After taking the following measures, perform network diagnosis processing and execute the link dedicated instruction.</p> <ul style="list-style-type: none"> • Execute the COM instruction. • Secure the communication processing security time for 2 to 3ms. For the High Performance model QCPU, Process CPU, and Redundant CPU, set it by the special register SD315. For the Universal model QCPU, set it by the service processing setting of the PLC parameter (PLC system) of GX Developer. |

REMARKS

SB□□□□ and SW□□□□ found in the explanations of each item indicate the link special relay (SB) or the link special register (SW) used for monitoring.

8.1.1 Host information

On the host information screen, the information of the entire network of the connection destination and the status of the host can be checked.



[Network info.]

- 1) Network type (SB0040, SB0044, SB0057, SB005A, SW0044, SW0046)
Displays the network type of the host
 - MELSECNET/H (loop) PLC to PLC network control station
 - MELSECNET/H (loop) PLC to PLC network normal station
 - MELSECNET/H Extended Mode (loop) PLC to PLC network control station
 - MELSECNET/H Extended Mode (loop) PLC to PLC network normal station
 - MELSECNET/H (bus) PLC to PLC network control station
 - MELSECNET/H (bus) PLC to PLC network normal station
 - MELSECNET/H Extended Mode (bus) PLC to PLC network control station
 - MELSECNET/H Extended Mode (bus) PLC to PLC network normal station
 - MELSECNET/10 (loop) PLC to PLC network control station
 - MELSECNET/10 (loop) PLC to PLC network normal station
 - MELSECNET/10 (bus) PLC to PLC network control station
 - MELSECNET/10 (bus) PLC to PLC network normal station
- 2) Network No. (SW0040)
Displays the network No. of the host
- 3) Group No. (SW0041)
Displays the group No. of the host
- 4) Station No. (SW0042)
Displays the station No. of the host

[Link information]

5) Mode (SW0043)

Displays the operation mode of the host.

- Online
- Offline (debug mode)
- Offline
- Forward loop test
- Reverse loop test
- Station-to-station test (Station that executes tests)
- Station-to-station test (Station to be tested)

6) F loop status (SB0091), Loopback station (SB0099)

Displays the status of the forward loop side.

- Loop status : Normal/abnormal
 - Loopback : Unused/"executed station number"
- "---" is displayed in case of bus type.

7) R loop status (SB0095), Loopback station (SB009A)

Displays the status of the reverse loop side.

- Loop status : Normal/abnormal
 - Loopback : Unused/"executed station number"
- "---" is displayed in case of bus type.

8) Link scan time (SW006B/SW006C/SW006D)

Displays the maximum/minimum/current value of the link scan time of the host.

| Station type Constant link scan | Control station | Normal station |
|------------------------------------|--|-------------------------------|
| | | |
| No | Measured value (Displays the maximum/minimum/current value the link scan actually took.) | |
| Yes | Measured value (Displays the maximum, minimum, and current values of the times that were actually taken. If the set value is small, the formula in Appendix 4 (SW006B to 6D) is applied.) | Constant link scan ± 2 ms |

[Communication information]

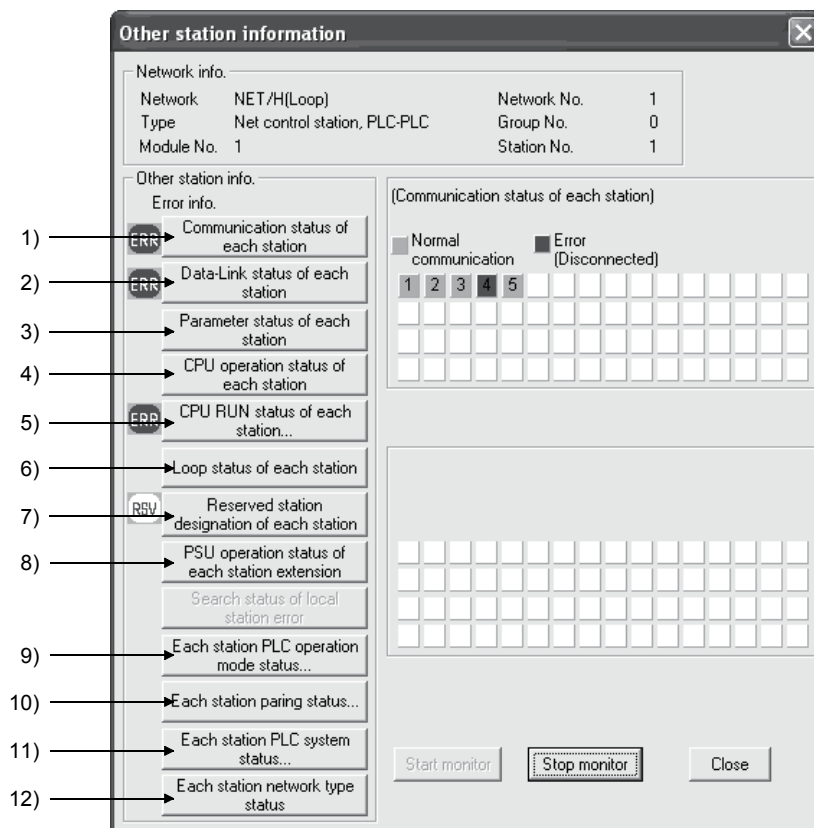
9) Communication status (SB0047)

Displays the communication status of the host.

- Data link being executed (SB0047: Off)
- Data link stopped (SB0047: On)

8.1.2 Other station information

On the other station information screen, information such as the communication, data link, parameter, CPU, loop and reserved station statuses of each station can be checked.



[Network info.]

This area displays the same information as the host information in Section 8.1.1.

[Other station info.]

When any STOP-status station, reserved station and/or externally-powered station is detected for 1) to 8) and 12), the following mark(s) is displayed in the error information area. (For 9) to 11), "ERR" is not displayed.)

| Status | Display |
|---|---------|
| When a faulty or STOP-status station is detected | ERR |
| When a reserved station exists | RSV |
| When power is supplied to a module with external power supply | PWR |

By clicking each item button, the corresponding status of each station is displayed.

This information is displayed for the number of stations that equals to the "total number of link stations" set with the network parameters.

1) Communication status of each station (SW0070 to 73)

Displays the status of the baton pass (whether or not the transient transmission is possible).

- Normal display : Communication normal station or reserved station
- Highlighted display : Communication error station (disconnected status)

- 2) Data-Link status of each station (SW0074 to 77)
Displays the status of the cyclic transmission.
 - Normal display : Normal station or reserved station
 - Highlighted display : Error station (data link not executed)
- 3) Parameter status of each station
Displays the parameter communication status of each station (SW0078 to 7B).
 - Normal display : Other than during parameter communication, reserved station or unconnected station
 - Highlighted display : During parameter communication
 Displays the abnormal parameter status of each station (SW007C to 7F).
 - Normal display : Normal parameter, reserved station or unconnected station
 - Highlighted display : Abnormal parameter
- 4) CPU operation status of each station (SW0080 to 83, SW0088 to 8B)
Displays the operation status of the CPU.
When the communication status of each station is normal, the display is effective.
 - Normal display : CPU normal, reserved station or unconnected station
 - Highlighted display : CPU error, Minor: Minor error

Serious: Serious
(watchdog timer error, etc.)
fatal (hardware error, etc.)
- 5) CPU RUN status of each station (SW0084 to 87)
Displays the RUN/STOP status of the CPU.
When the communication status of each station is normal, the display is effective.
 - RUN : RUN or STEP RUN
 - STOP : STOP, PAUSE, ERROR or unconnected station

"---" is displayed for a reserved station.
- 6) Loop status of each station (SW0091 to 94, SW0095 to 98)
Displays the status of the forward/reverse loops in case of the optical loop system.
 - Normal display : Normal, reserved station or unconnected station
 - Highlighted display : Error
- 7) Reserved station designation of each station (SW0064 to 67)
Displays the setting status of a reserved station.
 - Normal display : Unreserved station
 - Highlighted display : Reserved station
- 8) PSU operation status of each station extension (SW008C to 8F)
Displays the supply status of the external power 24 V DC of the network module.
When the communication status of each station is normal, the display is effective.
 - Normal display : Not powered by 24 V DC or network module without supply terminal
 - Highlighted display : 24 V DC powered

- 9) Each station PLC operation mode status (SW01F4 to 1F7)
 Displays the operation mode of the Redundant CPU.
 "----" indicates that the CPU is other than the Redundant CPU.
- Backup mode : Operating in the backup mode
 - Separate mode : Operating in the separate mode

Each station PLC operation mode status

Network info.

| | | | |
|------------|------------------------------|-------------|---|
| Network | NET/H(Loop) | Network No. | 1 |
| Type | Net control station, PLC-PLC | Group No. | 0 |
| Module No. | 1 | Station No. | 1 |

PLC status

| | | | | | | | |
|----|-------------|----|--|----|--|----|--|
| 1 | Backup mode | 17 | | 33 | | 49 | |
| 2 | Backup mode | 18 | | 34 | | 50 | |
| 3 | ---- | 19 | | 35 | | 51 | |
| 4 | ---- | 20 | | 36 | | 52 | |
| 5 | | 21 | | 37 | | 53 | |
| 6 | | 22 | | 38 | | 54 | |
| 7 | | 23 | | 39 | | 55 | |
| 8 | | 24 | | 40 | | 56 | |
| 9 | | 25 | | 41 | | 57 | |
| 10 | | 26 | | 42 | | 58 | |
| 11 | | 27 | | 43 | | 59 | |
| 12 | | 28 | | 44 | | 60 | |
| 13 | | 29 | | 45 | | 61 | |
| 14 | | 30 | | 46 | | 62 | |
| 15 | | 31 | | 47 | | 63 | |
| 16 | | 32 | | 48 | | 64 | |

Start monitor Stop monitor Close

- 10) Each station pairing status (SW01F8 to 1FB)
 Displays the status of the pairing setting.
- No pair : Station not specified for pairing
 - Pair : Station specified for pairing

Each station pairing status

Network info.

| | | | |
|------------|------------------------------|-------------|---|
| Network | NET/H(Loop) | Network No. | 1 |
| Type | Net control station, PLC-PLC | Group No. | 0 |
| Module No. | 1 | Station No. | 1 |

PLC status

| | | | | | | | |
|----|---------|----|--|----|--|----|--|
| 1 | Pair | 17 | | 33 | | 49 | |
| 2 | Pair | 18 | | 34 | | 50 | |
| 3 | No pair | 19 | | 35 | | 51 | |
| 4 | No pair | 20 | | 36 | | 52 | |
| 5 | | 21 | | 37 | | 53 | |
| 6 | | 22 | | 38 | | 54 | |
| 7 | | 23 | | 39 | | 55 | |
| 8 | | 24 | | 40 | | 56 | |
| 9 | | 25 | | 41 | | 57 | |
| 10 | | 26 | | 42 | | 58 | |
| 11 | | 27 | | 43 | | 59 | |
| 12 | | 28 | | 44 | | 60 | |
| 13 | | 29 | | 45 | | 61 | |
| 14 | | 30 | | 46 | | 62 | |
| 15 | | 31 | | 47 | | 63 | |
| 16 | | 32 | | 48 | | 64 | |

Start monitor Stop monitor Close

11) Each station PLC system status (SW01FC to 1FF)

Displays the system status of the Redundant CPU.

"---" indicates that the CPU is other than the Redundant CPU.

- Control system : Operating as the control system
- Standby system : Operating as the standby system

Each station PLC system status

Network info.

| | | | |
|------------|------------------------------|-------------|---|
| Network | NET/H(Loop) | Network No. | 1 |
| Type | Net control station, PLC-PLC | Group No. | 0 |
| Module No. | 1 | Station No. | 1 |

PLC status

| Station No. | System | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
|-------------|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | Control system | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Standby system | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | --- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | --- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Start monitor Stop monitor Close

12) Each station network type status (SW01E0 to 1E3F)

Displays whether the network type set to the control station is consistent with those set to the normal stations.

Reserved stations and faulty stations are displayed normally.

- When the control station is in MELSECNET/H Extended mode
Normal stations in MELSECNET/H or MELSECNET/10 mode are displayed highlighted.
- When the control station is in MELSECNET/H or MELSECNET/10 mode
Normal stations in MELSECNET/H Extended mode are displayed highlighted.

8.1.3 Network monitor details

On the Network Monitor Details screen, the control station information, data link information and the parameter status of the host can be checked.

The screenshot shows the 'Network Monitor Details' window. It is divided into several sections:

- Network info:** Contains fields for Network (NET/H(Loop)), Type (Net control station, PLC-PLC), Module No. (1), Network No. (1), Group No. (0), and Station No. (1).
- Control Station Information:** Contains fields for Assign Control Station (1), Present Control Station (1), Transmission Information (Control Station), Sub Control Station Transmission (Yes), Remote I/O Master Station Number (Block 1: None, Block 2: None), and LX/LY Allocations.
- Data Link Information:** Contains fields for Total Number of Linked Stations (8), Station of Maximum Normal Transmission (8), Station of Maximum Data Link (8), Transmission Status (Baton Pass(No area)), Reason for Transmission Interruption (Normal), and Reason for Transmission Stop (Normal).
- Status of Self Station:** Contains fields for Parameter Setting (Common Parameter), Reserved Station Setting (Exists), Transmission Mode (Normal), Duplex Transmission Setting (None), and Duplex Transmission Status (Normal).

Numbered callouts point to the following elements:

- Assign Control Station
- Present Control Station
- Transmission Information
- Sub Control Station Transmission
- Remote I/O Master Station Number
- LX/LY Allocations
- Total Number of Linked Stations
- Station of Maximum Normal Transmission
- Station of Maximum Data Link
- Transmission Status
- Reason for Transmission Interruption
- Reason for Transmission Stop
- Parameter Setting
- Reserved Station Setting
- Transmission Mode
- Duplex Transmission Setting
- Duplex Transmission Status

[Network info.]

This area displays the same information as the host information in Section 8.1.1.

[Control Station Information]

- 1) Assign Control Station (SW0057)
Displays the number of the control station designated with the parameter.
- 2) Present Control Station (SW0056)
Displays the number of the station that actually controls the network.
- 3) Transmission Information (SB0056)
Displays the type of the station that controls the network.
When the control station goes down, the display automatically changes to the sub-control station.
 - Control station communication/sub-control station communication
- 4) Sub Control Station Transmission (SB0058)
Displays whether or not to execute data linking by the sub-control station when the control station is down.
 - Yes/No
- 5) Remote I/O Master Station Number
Displays the number of the I/O master station of X/Y communication blocks 1 and 2.
 - Block 1
 - Block 2

"None" is displayed for blocks that are not set.
- 6) LX/LY Allocations
Nothing is displayed

[Data Link Information]

- 7) Total Number of Linked Stations (SW0059)
Displays the total number of link stations set with the parameter.
- 8) Station of Maximum Normal Transmission (SW005A)
Displays the highest station number that is executing the baton pass normally (the status where the transient transmission is possible).
The T.PASS LED of the network module turns on for stations executing the baton pass normally.
- 9) Station of Maximum Data Link (SW005B)
Displays the highest station number that is executing data linking normally (cyclic transmission and transient transmission).
The D.LINK LED of the network module turns on for stations executing data linking normally.
- 10) Transmission Status (SW0047)
Displays the communication status of the host.

| Indication | Description |
|-----------------------------|---|
| In Data Link | Data link is being executed. |
| Suspend Data link (Other) | Other station stopped the cyclic transmission. |
| Suspend Data link (Host) | The host station stopped the cyclic transmission. |
| Baton Pass (No area) | No area is assigned for the host's B/W transmission. |
| Baton Pass (Parameter Halt) | An error is identified in the host's parameters. |
| Baton Pass (No Receive) | The common parameters have not been received. |
| Disconnecting (No Baton) | Station numbers are duplicated or the cable is not connected. |
| Disconnecting (Link Error) | The cable is not connected. |
| In Test | The online/offline test is being executed. |
| Resetting | Hardware fault |

11) Reason for Transmission Interruption (SW0048)

Displays the causes why the host cannot communicate (transient transmission).

For details on actions to take, refer to Section 8.3, "Error Codes."

| Indication | Description/Action |
|----------------------------|---|
| Normal | Communications being executed normally |
| Offline | In offline status |
| Offline Test | The offline test being executed |
| Initial state | Error occurred (Error code: F101, F102, F105) |
| Shift Control Station | Error occurred (Error code: F104, F106) |
| Online testing | Error occurred (Error code: F103, F109, F10A) |
| Baton disappearance | Error occurred (Error code: F107) |
| Baton repetition | Error occurred (Error code: F108) |
| Same Station Present | Error occurred (Error code: F10B) |
| Control Station repetition | Error occurred (Error code: F10C) |
| Reception retry error | Error occurred (Error code: F10E) |
| Transmission retry error | Error occurred (Error code: F10F) |
| Timeout error | Error occurred (Error code: F110) |
| Network Disorder | Error occurred (Error code: F112) |
| Disconnecting... | Error occurred (Error code: F11B) |
| No baton to local station | Error occurred (Error code: F11F) |
| Error code: **** | Error occurred (Refer to the displayed error code.) |

12) Reason for Transmission Stop (SW0049)

Displays the causes why the host's data linking (cyclic transmission) was disabled.

| Indication | Description |
|-----------------------------------|--|
| Normal | Communications being executed normally |
| There is a stop instruction (All) | Cyclic transmission to all stations is stopped from the host or other station. |
| There is a stop instruction (Own) | Cyclic transmission of the host station is stopped. |
| Stop instruction present (□) | Cyclic transmission of the host station is stopped from other station (station No. □). |
| No Parameter | No parameter can be received. |
| Illegal Parameter | Set parameters are not correct. |
| Host PLC Error | A moderate or major error occurred in the CPU module of the host station. |
| Suspend Communication | Data link error occurred on the host station. |

[Status of Self Station]

13) Parameter Setting (SB0054, SW0054)

Displays the parameter setting status of the host.

- Common parameters
- Common + specific
- Default parameters
- Default + specific

14) Reserved Station Setting (SB0064)

Displays the designation status of reserved stations.

- Yes/No

15) Transmission Mode (SB0068)

Displays the link scan status.

- Normal mode
- Constant link scan

16) Duplex Transmission Setting (SB0069)

Displays the designation status of the multiplex transmission.

- Normal transmission
- Multiplex transmission

"----" is displayed for the bus type system.

17) Duplex Transmission Status (SB006A)

Displays the status of the multiplex transmission.

- Normal transmission
- Multiplex transmission

"----" is displayed for the bus type system.

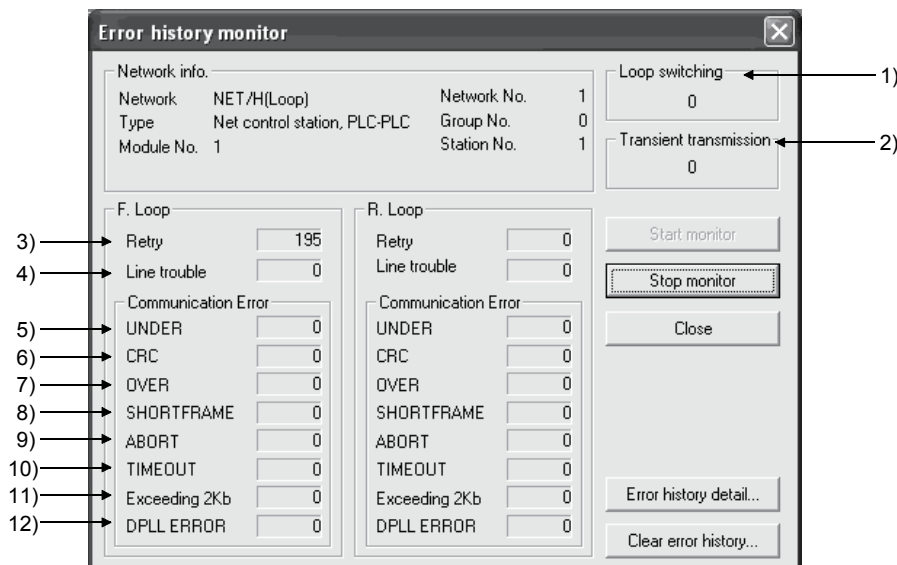
| |
|---------|
| REMARKS |
|---------|

- (1) A station that detected a forward loop error executes the reverse loopback.
- (2) A station that detected a reverse loop error executes the forward loopback.

8.1.4 Error history monitor

With the error history monitor information, the status of the forward/reverse loop errors, communication errors, and transient transmission errors that have occurred can be checked. In addition, the detailed error history display and the error history can be cleared on this screen.

(1) Error history monitor



[Network info.]

This area displays the same information as the host information in Section 8.1.1.

1) Loop switching (SW00CE)

Displays how many times loops were switched.

<Error Cause> Station's power-ON/OFF, faulty cable, noise, etc.

<Corrective Action> Refer to POINT on the next page.

2) Transient transmission (SW00EE)

Displays how many transient transmission errors have occurred.

<Error Cause> Power-OFF of the destination station, failure of the destination station's CPU module, faulty cable, noise, etc.

<Corrective Action> Check the error code of the transient transmission error from "Error history detail..." and correct the error referring to Section 8.3.

3) Retry (SW00C8, SW00C9)

Displays the number of retries (communication retries when a communication error occurs.)

<Error Cause> Station's power-ON/OFF, faulty cable, noise, etc.

<Corrective Action> Refer to POINT on the next page.

4) Line trouble (SW00CC, SW00CD)

Display how many line errors have occurred.

<Error Cause> Power-OFF of the adjacent station, faulty cable, noise, etc.

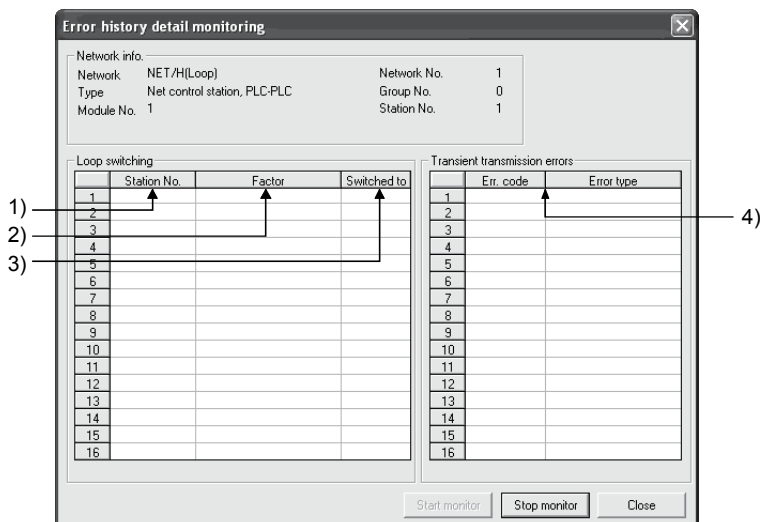
<Corrective Action> Refer to POINT on the next page.

- 5) UNDER (SW00B8, SW00C0)
Displays how many UNDER errors have occurred.
<Error Cause> Power-ON/OFF of the adjacent station, faulty cable, etc.
<Corrective Action> Refer to the following POINT.
- 6) CRC (SW00B9, SW00C1)
Displays how many CRC errors have occurred.
<Error Cause> Isolation of the sending station, faulty cable, hardware failure, noise, etc.
<Corrective Action> Refer to the following POINT.
- 7) OVER (SW00BA, SW00C2)
Displays how many OVER errors have occurred.
<Error Cause> Faulty cable, hardware failure, noise, etc.
<Corrective Action> Refer to the following POINT.
- 8) SHORTFRAME (SW00BB, SW00C3)
Displays how many short frame errors (messages too short) have occurred.
<Error Cause> Faulty cable, hardware failure, noise, etc.
<Corrective Action> Refer to the following POINT.
- 9) ABORT (SW00BC, SW00C4)
Displays how many AB and IF errors have occurred.
<Error Cause> Isolation of the sending station, faulty cable, hardware failure, noise, etc.
<Corrective Action> Refer to the following POINT.
- 10) TIMEOUT (SW00BD, SW00C5)
Displays how many timeout errors have occurred.
<Error Cause> Data link monitoring time too short, faulty cable, noise, etc.
<Corrective Action> Refer to the following POINT.
- 11) Exceeding 2Kb (SW00BE, SW00C6)
Display how many times messages exceeding 2k bytes were received.
<Error Cause> Faulty cable, hardware failure, noise, etc.
<Corrective Action> Refer to the following POINT.
- 12) DPLL ERROR (SW00BF, SW00C7)
Displays how many times the DPLL errors occurred.
<Error Cause> Faulty cable, hardware failure, noise, etc.
<Corrective Action> Refer to the following POINT.

| | |
|--------------|--|
| POINT | <p>The number of each error occurrence does not necessarily mean a problem unless the count value rises frequently during operation. If it rises frequently, observe the following.</p> <ol style="list-style-type: none"> 1) Check the power-ON/OFF status of the host and other stations. 2) Check the condition of the cables and connectors. (Disconnection or looseness of the connectors, cable breakage, cable length, etc.) 3) Perform the self-loopback test, internal self-loopback test and hardware test. 4) Perform the station-to-station test, forward/reverse loop test. 5) Referring to the user's manual (for hardware) of the network module, perform the wiring again. Also, set the system again referring to the user's manual of the CPU module. |
|--------------|--|

(2) Error history detail monitoring

Displays the causes of loop switches and the history of the transient transmission errors.



[Loop switching]

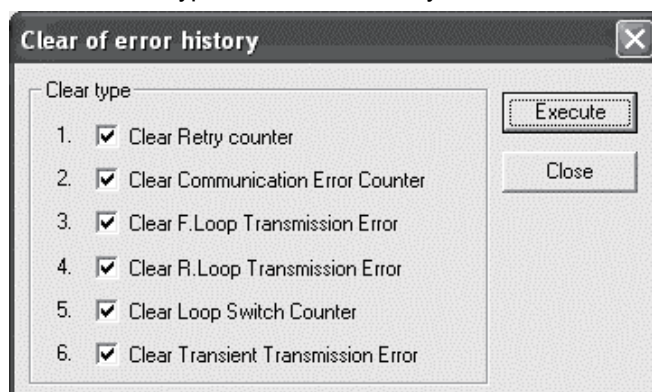
- 1) Station No. (SW00E0 to 00E7)
Displays the number of the station (not necessarily an adjacent station) that requested the loop switch and loopback.
- 2) Factor (SW00D0 to 00DF)
Displays the reason why the loop switch and loop back are executed.
 - Normal return
 - Forward loop hardware error : Cable or optical module error
 - Reverse loop hardware error : Cable or optical module error
- 3) Switched to (SW00D0 to 00DF)
Displays the data link status after the loop switch.
 - Multiplex transmission: Forward loop/reverse loop normal
 - Forward loop transmission
 - Reverse loop transmission
 - Loopback transmission

[Transient transmission errors]

- 4) Error code, error type (SW00F0 to 00FF)
Displays the error code.
Refer to Section 8.3

(3) Clear of error history

Select the check box of the items whose error history should be cleared from the list of clear types. The error history can be cleared for each clear type.



8.2 Troubleshooting

Check the programmable controller CPU for an error before starting the troubleshooting of the network module and network.

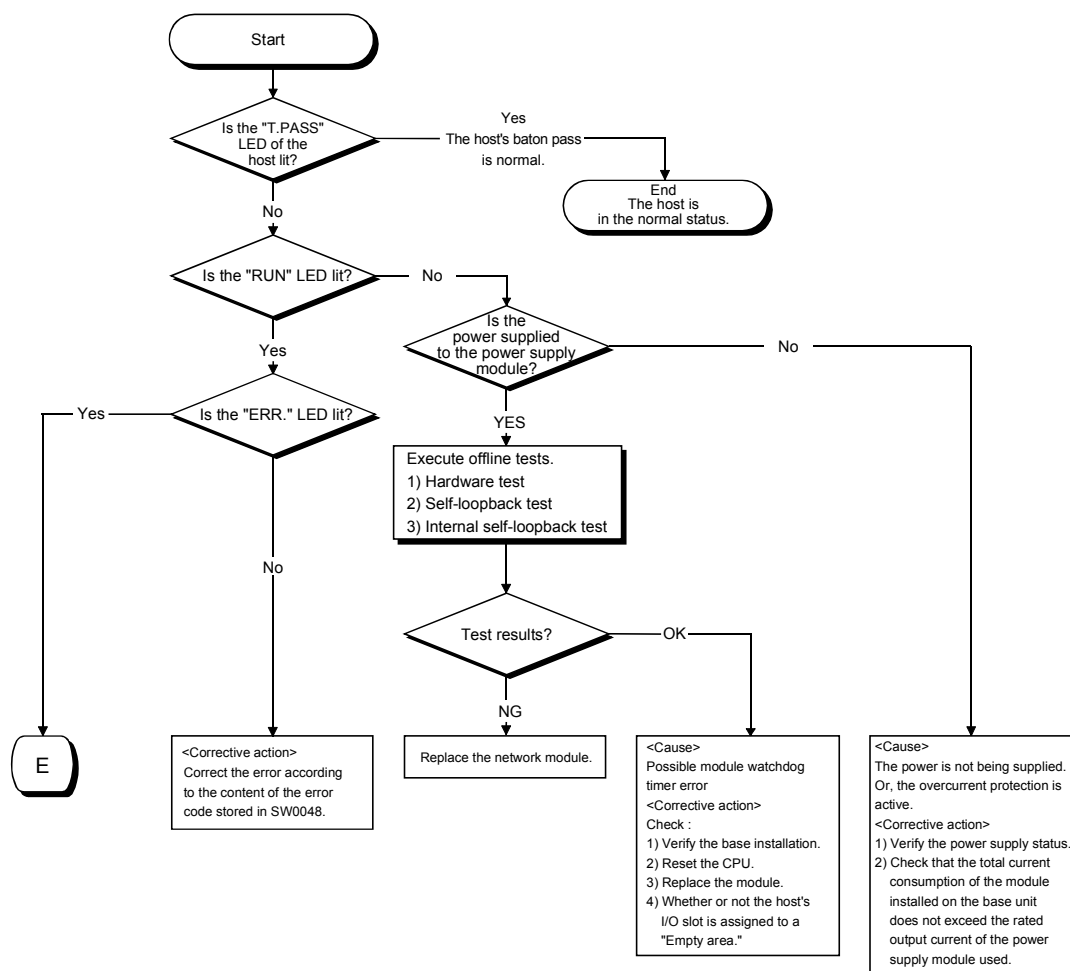
If the RUN LED of the programmable controller CPU is off/flickering or the ERR. LED is on, identify the error that occurred in the programmable controller CPU, and take corrective action.

(1) Check that the host has joined the network.

Start the troubleshooting of the host by monitoring the status of the host. First, check whether or not the host has joined the network.

This is important because it is not possible to monitor the status of other stations and to perform troubleshooting on other stations unless the host has joined the network.

The troubleshooting flowchart shown below explains the sequence from checking an error to enabling a baton pass (in order to join the network).

**POINT**

If the "T. PASS" LED turns on and off and looks instable, refer to the following.

<Cause>

The line status is assumed to be instable.

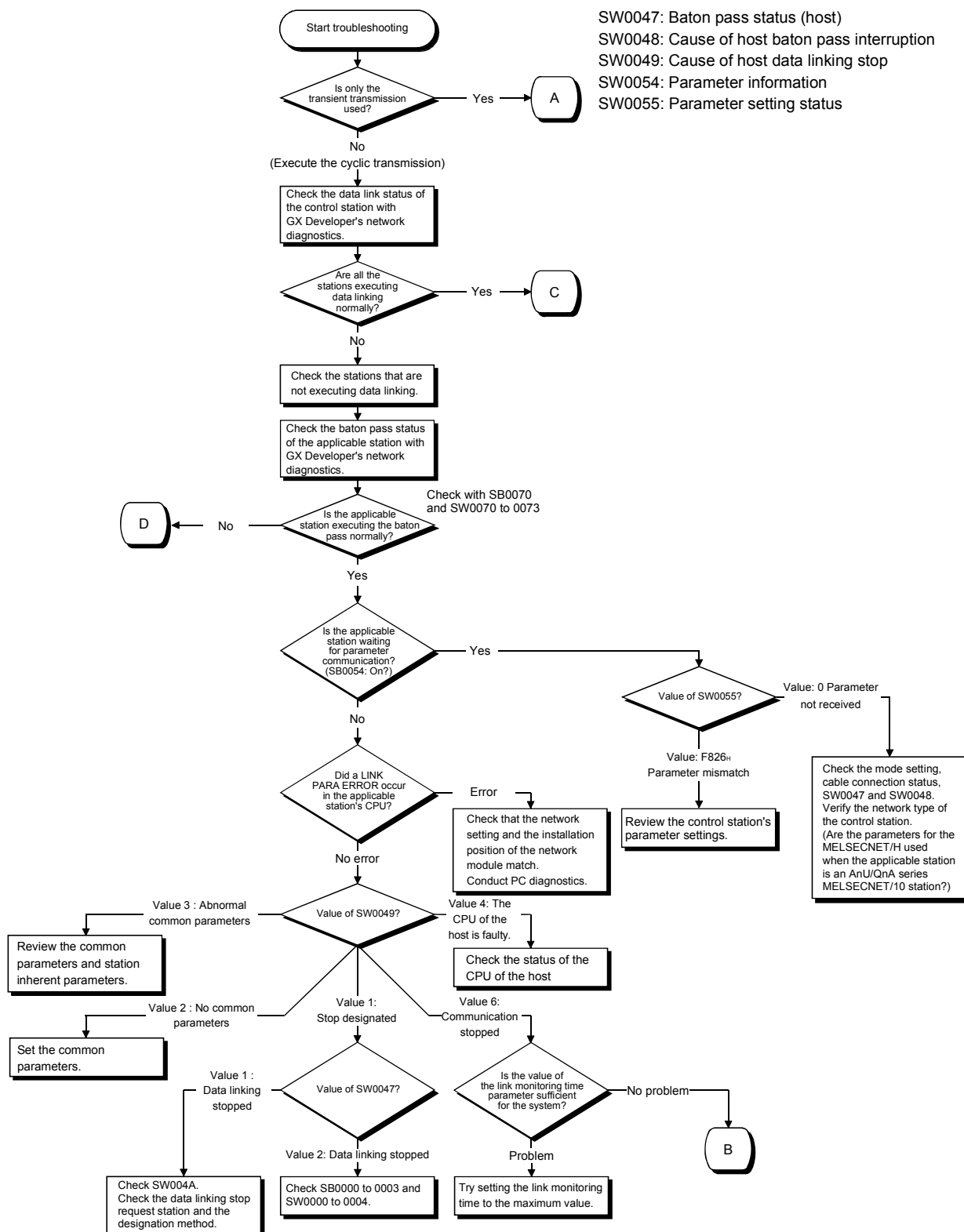
<Troubleshooting>

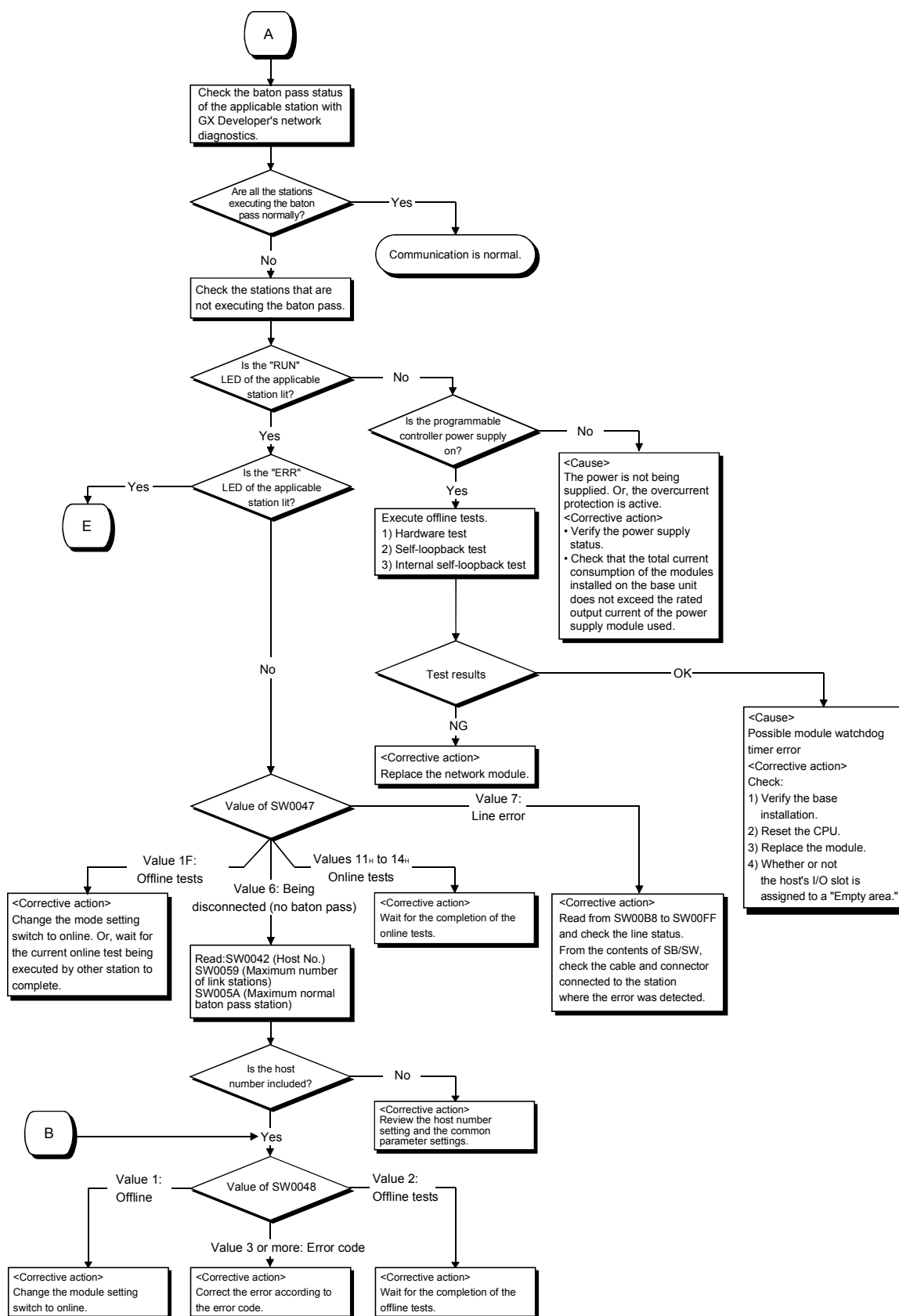
- 1) Check the connector for loose connection and the cable for a break.
- 2) Check that the cable used conforms to the specifications.
- 3) Check that the overall length and interstation distance conform to the specifications. (Refer to Section 4.6 Cable Connection.).

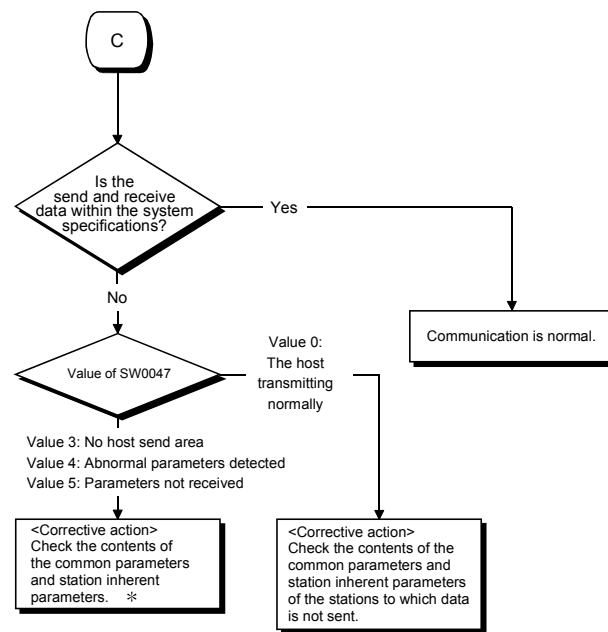
(2) From monitoring the network status to troubleshooting of a faulty station

The following flowchart illustrates the procedure for monitoring the status of the entire network, detecting a faulty station, and then performing troubleshooting for the applicable station.

The status of the entire network is monitored with GX Developer.

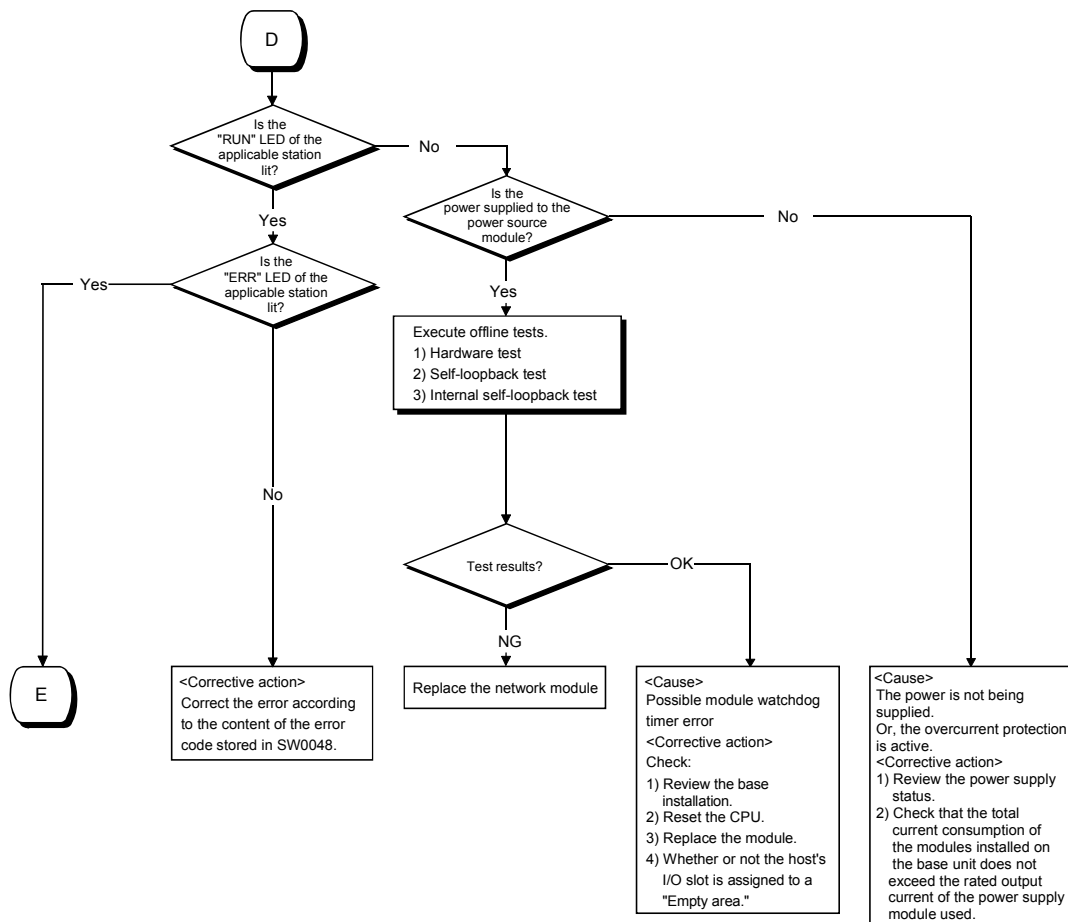






* : In case of SW0047 = 3, the following two causes may be considered:

- 1) The link device has not been assigned; only the station number was set with the common parameters.
- 2) The link device was assigned, but "Send/receive link points = 0" was specified in the station inherent parameters setting.





| |
|---|
| <p><Cause 1> M/S error or SW error is assumed.</p> <p><Corrective action 1></p> <ol style="list-style-type: none">1) Check for duplicate station number, duplicate control station designations or switch setting error.2) Take corrective action according to the contents of SW0047 and the error code stored in SW0048. |
|---|

| |
|---|
| <p><Cause 2> Programmable controller error is assumed.</p> <p><Corrective action 2> Check the programmable controller CPU error in the PLC diagnostics and restore the CPU to normal. (Refer to Section 8.2.1.)</p> |
|---|

8.2.1 Items to be checked first

| Check item | Checking procedure |
|---|---|
| Monitor the communication status of each station with GX Developer's network diagnostics. | Check the CPU module status of the faulty station, the status of the network modules, the loop status of each station to search for the location where the error occurred. |
| Is the "ERR." LED of the CPU module still lit or flickering? | <p>Read the error code using GX Developer, and take proper measures against the error. (For details, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).)</p> <p>Check the following when LINK PARA. ERROR occurs.</p> <ol style="list-style-type: none"> 1) Check whether the starting I/O in the network setting matches the slot where the network module is installed. (Refer to Section 5.2.1.) 2) Check for consistency in the network type and the station number of the network module. (Refer to Section 5.1.) 3) Check if the PLC side device ranges in Refresh parameters are within the ranges set in [PLC parameter] – [Device]. (Refer to Section 5.7.2 (2).) If refresh parameters have not been set, set them according to the changes made in [Device] under [PLC parameter]. (Refer to Section 5.7.2 (3).) 4) When the Redundant CPU is installed, check whether the host station is set to be paired. (Refer to Section 7.10.3.) 5) Check whether the network type of the control station matches that of the normal stations. (Refer to Section 5.1.) 6) When the MELSECNET/H Extended mode has been set, check whether a compatible network module is used. (Refer to Section 2.2.) |
| Is the on/off status of the LEDs on the network module normal? | <p>Check the on/off status of the "RUN," "ERR," "L ERR." and other LEDs and correct the error accordingly. (Refer to Section 4.2.)</p> <p>If the "T. PASS" LED turns on and off and looks instable, the line status is assumed to be instable. Therefore, check the following.</p> <ol style="list-style-type: none"> 1) Check the connector for loose connection and the cable for a break. 2) Check that the cable used conforms to the specifications. 3) Check that the overall length and interstation distance conform to the specifications. (Refer to Section 4.6 Cable Connection.) |

8.2.2 Data link failure on the entire system

| Check item | Checking procedure |
|---|--|
| Monitor the communication status of each station with GX Developer's network diagnostics. | Check the line condition with GX Developer's network diagnostic loop test (only in case of optical loop test). Check the faulty station's CPU module and network module. Check the network module and data link cable with the self-loopback test and station-to-station test of the offline tests. Check whether data linking is stopped for all stations. |
| Are the network parameters set for the control station? | Check whether the network parameters from the control station's CPU module are set. |
| Are the switch settings of the control station's network module correct? | Check the station number setting switch and mode setting switch. |
| Are the switches of the network modules on all stations set in the correct position? | Make sure that the mode setting switches of the network modules on all stations are in the same position. |
| Is the link monitoring time set to a sufficient value? | Set the link monitoring time to the maximum value and check whether or not data linking can be performed. |
| Did the control station and remote master station go down? | Check the on/off status of the LEDs of the network modules of the control station and the remote master station. |
| Did the control switch to the sub-control station? | Check that the "continue data linking by a sub-station when the control station goes down" setting is set to "Yes" in the communication error settings of the control station's common parameters. |

8.2.3 Data link failure caused by reset or power-off of each station

| Check item | Checking procedure |
|--|--|
| Is the cable wired properly? | Check the wiring status with GX Developer's network diagnostic loop test. (Refer to Section 4.8.1.) |
| Is the network cable disconnected? | Check the status of each station to see whether the entire system is faulty or a specific-station is faulty, and locate the faulty area. |
| Are the switches of the network modules on all stations set in the correct position? | Make sure that the mode setting switches of the network modules on all stations are in the same position. |
| Is the setting of the link monitoring time sufficient? | Set the link monitoring time to the maximum value and check whether or not data linking is possible. If the "L ERR." LED of a normal station is lit, check the TIME error with the GX Developer's network diagnostics. |

POINT

In the optical loop system, do not reset the CPU modules of adjoining stations (adjoining stations on the wiring) at the same time.

Data link may be disabled.

In the case of initializing adjoining stations at the same time, turn off the power and turn it on again.

8.2.4 Data link failure of a specific station

| Check item | Checking procedure |
|---|---|
| Monitor the communication status of each station. | Perform line monitoring of the network diagnostics of GX Developer, check for any abnormally communicating station and check the loop status. Also, check whether or not data linking is stopped. In case of an optical loop system, check the line condition and communication status of each station as well, using the loop test of GX Developer's network diagnostics. |
| Is the network module of the faulty station normal? | Check whether or not an error or problem occurred in the CPU module and network module of the faulty station. |
| Was the loop error caused by the network module or the data link cable? | Check whether or not the network module works normally with the self-loopback test of the offline tests. Check whether or not the data link cable is normal with the station-to-station test of the offline tests. |
| Are the control station's parameters correct? | Check that the total number of link stations is set to the largest number of the connected stations or more, and check that the stations that cannot communicate are designated as reserved stations. |
| Are the control station's parameters normal? | Read the network parameters from the faulty station's CPU module and check that the network settings such as the network type, start I/O number and network number are correct. |
| Are the switch settings of the network module correct? | Check the station number setting switch and the mode setting switch. |
| Is any data link cable disconnected? | Perform the line monitoring and loop tests in the network diagnostics of GX Developer and check the wiring conditions. |

8.2.5 Data link failure in MELSECNET/H Extended mode

| Checkpoint | Checking procedure |
|---|---|
| LINK PARA. ERROR occurs on the control station. | Replace the network module on the control station with a network module that supports the MELSECNET/H extended mode. (Error code F813 _H) For applicable network modules, refer to Section 2.2. |
| All stations do not start data link. | |
| LINK PARA. ERROR occurs on a normal station. | Make the network type of the normal station matched with the network type set to the control station. (Error code: F82A _H) |
| | Replace the network module on the normal station with a network module that supports the MELSECNET/H extended mode. (Error code F820 _H) For applicable network modules, refer to Section 2.2. |
| Specific normal station does not start data link. | Make the network type of the normal station matched with the network type set to the control station. (Error code: F82A _H) |
| | Replace the network module on the normal station with a network module that supports the MELSECNET/H extended mode. (Error code F820 _H) For applicable network modules, refer to Section 2.2. |
| Some station does not send the cyclic data of 2000 bytes or more. | Set the network type of the control station to the MELSECNET/H Extended mode. |
| | In the network parameter (network range assignment) of the control station, set more than 2000 bytes to send range for each station of the station. |

8.2.6 Data link in redundant system

(1) An error occurs in the redundant CPU

| Checkpoint | Checking procedure |
|--|---|
| Is the station set for pairing a programmable controller CPU other than the redundant CPU? | Check the CPU model name of the station set for pairing. |
| Is the station installed with the redundant CPU preset for pairing? | Using the device monitoring function of GX Developer, check SW01F8 to SW01FB for pairing setting. |
| Is the station set for pairing a network module of function version D or later? | Install a network module of function version D or later. |
| Is the station installed with the redundant CPU a network module of function version D or later? | |
| Is GX Developer used to set network parameters compatible with the redundant system? | Using GX Developer of version 8.18U or later, set network parameters. |

(2) The redundant CPU does not shift the system although the network module cable is disconnected

| Checkpoint | Checking procedure |
|--|---|
| Is the power supply module on the standby system faulty? | Check the external power supply for the standby system. |
| Is the rated voltage supplied to the power supply module on the standby system? | |
| Is there any stop error in the redundant CPU on the standby system? | Connect GX Developer to the redundant CPU on the standby system to check whether an error exists. |
| Is there any error in the network module mounted on the base unit of the standby system? | Confirm the status of the network module on the standby system. |
| Is the tracking cable disconnected? | Properly connect the tracking cable. |

(3) Cyclic data are cleared permanently or temporarily in system switching

| Checkpoint | Checking procedure |
|--|--|
| Has the host station No. +1 or -1 been set to the station to be paired by pairing setting? | Confirm the number of the station set for pairing. |
| Is the send range of the host station within the tracking range? | Confirm that the refresh target devices of the LB/LW within the host station's send range are set as tracking devices. |
| Is any parameter destroyed? | Rewrite each parameter using GX Developer. If the symptom remains unchanged after rewriting, create a new project, and rewrite parameters. |

8.2.7 Abnormal transmission/reception data

(1) The cyclic transmission data is abnormal

| Check item | Checking procedure |
|--|--|
| Is the sequence program correct? | Stop the CPU modules of both the sending and receiving stations and turn the link device of the sending station on and off by GX Developer's test operation to check whether or not data is sent to the receiving station. If it is normal, review the sequence program. If it is abnormal, review the control station's common parameters as well as the host's refresh parameters. |
| Are the parameter settings of the control station and remote master station correct? | Review the range of the link devices assigned to the sending station. |
| Are the parameter settings of the sending station correct? | Check the settings of the refresh parameters and the station specific parameters to see in what range of LB/LW/LX/LY of the network module the device range used by the sequence program is stored. |
| Are the parameter settings of the receiving station correct? | Check the settings of the refresh parameters and the station specific parameters to see in what device range used by the sequence program the range of LB/LW/LX/LY of the network module received from the transmitting station is stored. |
| Is the switch setting of the network module correct? | Confirm that the station numbers of the network modules on system A and B of the redundant system are n and n + 1 respectively. |
| Is any parameter destroyed? | Rewrite each parameter using DX Developer. If the symptom remains unchanged after rewriting, create a new project, and rewrite parameters. |

(2) The transient transmission is abnormal

| Check item | Checking procedure |
|---|--|
| Did an error occur while the transient transmission was being executed? | Check the error code at the transient transmission execution and correct the error according to the error code table in Section 8.3. |
| | Confirm whether a dedicated link instruction is executed to a programmable controller CPU other than the redundant CPU with the control or standby system specified. (Error code: 4B00 _H) |
| | Check if a dedicated link instruction is executed for a CPU other than the QCPU in the multiple CPU No. specification. (Error code: 4100 _H , 4B00 _H , FE20 _H) |
| | Confirm whether a dedicated link instruction is executed to a single CPU system with a multiple CPU number specified. (Error code: 4B00 _H) |
| Are the routing parameter settings correct? | Check if a non-existing multiple CPU No. is specified in the target station type. (Error code: 4B00 _H) |
| Are the routing parameter settings correct? | Check the routing parameters with the communication test of GX Developer's network diagnostics. |
| Is the network No. parameter correct? | Check the network No. parameter. If the parameter is not set, the network No. has been set to 1 (default); so check other station's network No.. |
| A dedicated link instruction is not responded within specified time. | Confirm whether a value out of the set range is set for the target station CPU type. |
| Does the transmission go through the network module on the standby system in the redundant system? | Using the RTWRITE instruction, change the routing parameter so that transmission will go through the network module on the control system. |
| The dedicated link instruction executed in the multiple CPU No. specification does not access the target CPU. | <p><When the dedicated link instruction is started from the QnACPU> Not executable for the QnACPU.</p> <p><When the dedicated link instruction is started from the QCPU> Check whether the QCPUs and network modules of the host station and target station are the following versions.</p> <ul style="list-style-type: none"> • QCPU: The first 5 digits of the serial No. are "06092" or later. • Network module: The first 5 digits of the serial No. are "06092" or later. |
| | Check if the group or all stations has been specified for the target station number. (Refer to Section 2.2.2 (5).) |

8.2.8 Link dedicated instruction execution not complete

| Check item | Checking procedure |
|---|--|
| Is the link dedicated instruction issuing station online? | <p>Place the link dedicated instruction issuing station online and execute the link dedicated instruction.</p> <p>Use SB0043 as an interlock to confirm the online status in the sequence program.</p> |

8.2.9 Checking online for reverse optical fiber cable connection

This section explains the checking procedure for incorrect optical fiber cable connection (IN-IN, OUT-OUT) during online and the link special registers (SW009C to SW009F) used for the check.

Unlike the loop test, the checking procedure given in this section allows a check without stopping a data link.

If incorrect cable connection is found, correct the wiring after shutting off all phases of the system.

POINT

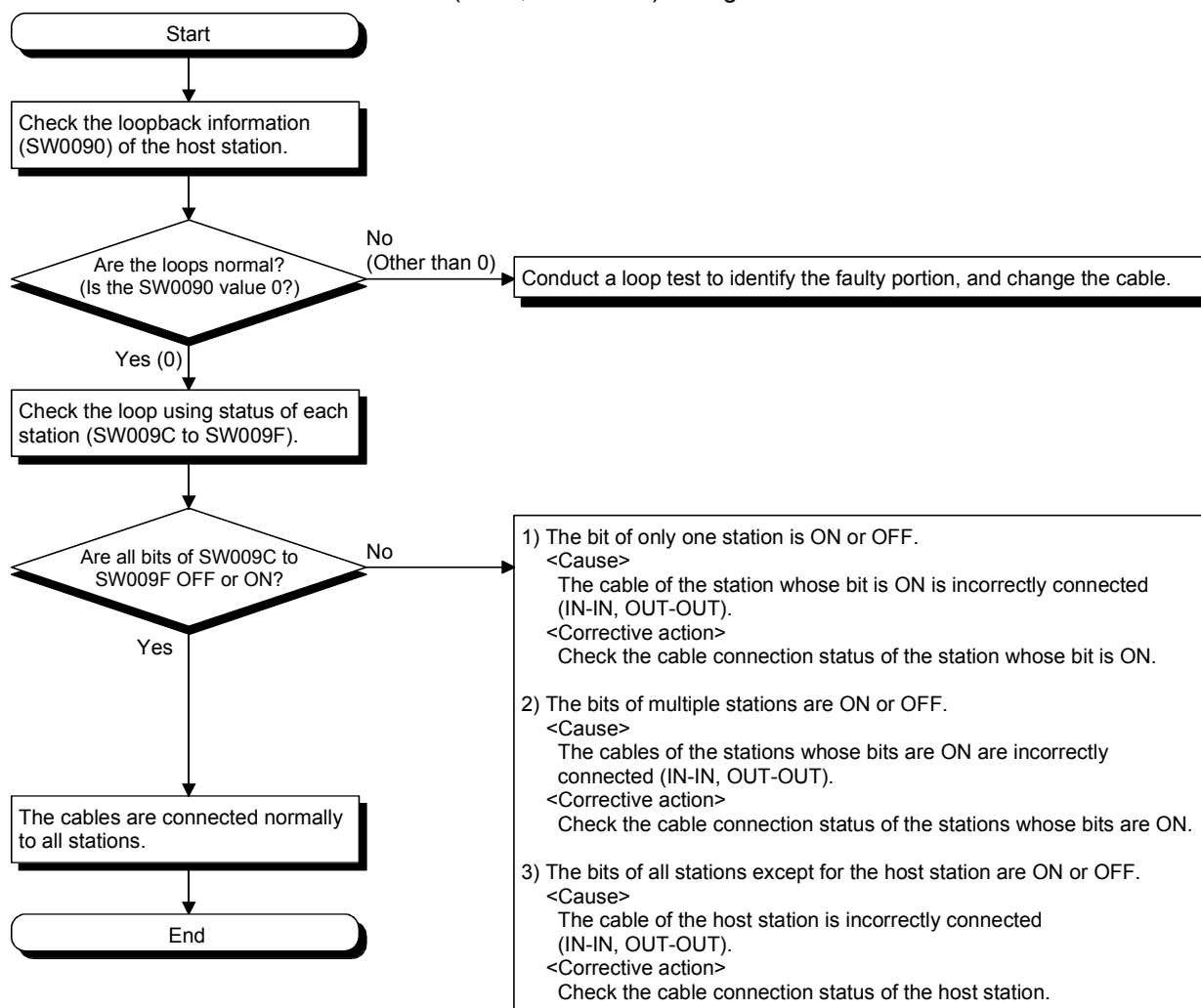
Before starting the check given in this section, make sure that the following conditions are satisfied.

If these are not satisfied, conduct a loop test to make a check.

- The optical fiber cables have no breaks. (Both the forward and reverse loop cables are normal.)
- There are no stations having data link error (power off, MELSECNET/H module failure).

(1) Checking procedure

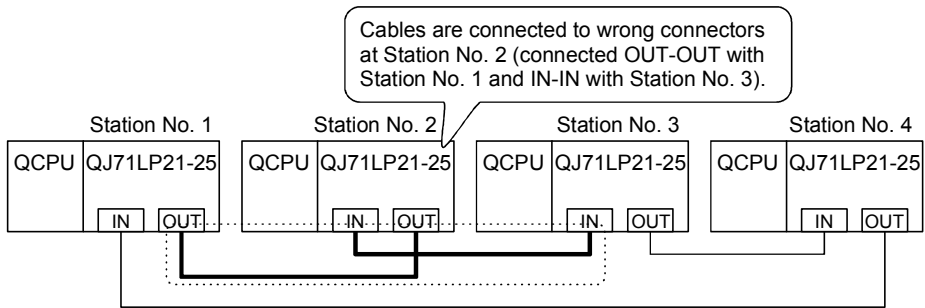
Follow the procedure given below to check for incorrect optical fiber cable connection (IN-IN, OUT-OUT) during online.



(2) Example of checking SW009C to SW009F

An example of incorrect cable connection at Station No. 2 is shown below.

(a) Wiring diagram



(b) SW009C to SW009F status

| Station No. | SW009C to SW009F status | | | | | | | | | |
|---------------|---|--|--|--|--|--|--|--|--|--|
| Station No. 1 | Only Station No. 2 (bit 1) is ON or OFF. b15 to b4 b3 b2 b1 b0 | | | | | | | | | |
| Station No. 3 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Station No. 4 | | | | | | | | | | |
| | All stations (bit 0, bit 2, bit 3) than Station No. 2 (bit 1) are ON or OFF. b15 to b4 b3 b2 b1 b0 | | | | | | | | | |
| Station No. 2 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

8.2.10 When different network types exist in the same network

Set all the network modules within the same network to the same network type.

If there are different network types within the same network, any of the symptoms 1) to 6) given in the following table will occur.

If any different network type is accidentally set, take corrective action with reference to the following table.

| Normal station Control station | | | QCPU | | | | | | QnA/ AnUCPU |
|---|--|---------------------------|--|----------------------|-----------------------|--|----------------------|-----------------------|------------------|
| | | | First 5 digits of network module's serial No. are "06092" or later | | | First 5 digits of network module's serial No. are "06091" or earlier | | | |
| | | | MELSECNET/ H Extended mode | MELSECNET/ H mode | MELSECNET/ 10 mode | MELSECNET/ H Extended mode | MELSECNET/ H mode | MELSECNET/ 10 mode | |
| QCPU | First 5 digits of network module's serial No. are "06092" or later | MELSECNET/H Extended mode | Normal operation | 1) | 1) | 2)-1 | 2)-2 | 2)-2 | 6) |
| | | MELSECNET/H mode | 1) | Normal operation | 5) | 5) | Normal operation | 5) | 6) |
| | | MELSECNET/10 mode | 1) | 5) | Normal operation | 5) | 5) | Normal operation | Normal operation |
| | First 5 digits of network module's serial No. are "06091" or earlier | MELSECNET/H Extended mode | 4)-1 | 4)-2 | 4)-2 | 4)-3 | 4)-4 | 4)-4 | 4)-5 |
| | | MELSECNET/H mode | 3) | Normal operation | 5) | 5) | Normal operation | 5) | 6) |
| | | MELSECNET/10 mode | 3) | 5) | Normal operation | 5) | 5) | Normal operation | Normal operation |
| QnA/AnUCPU | | | 3) | 5) | Normal operation | 5) | 5) | Normal operation | Normal operation |

Refer to the table below for 1) to 6).

| No. | Control station status | | Normal station status | | Network status | Corrective action |
|-----|------------------------|--------------------------------|-----------------------|--------------------------------|--|---|
| | CPU | Network module (SW0055 status) | CPU | Network module (SW0055 status) | | |
| 1) | - | F82B _H *1 | LINK PARA. ERROR | F82A _H | The normal station of a different network type is disconnected. | Change the network type of the normal station to that of the control station. |
| 2) | 1 | F82B _H *1 | LINK PARA. ERROR | F820 _H | The normal station of a different network type is disconnected. | Replace the network module of the normal station with the one compatible with the MELSECNET/H Extended mode. |
| | 2 | | | | | Replace the network module of the normal station with the one compatible with the MELSECNET/H Extended mode, and change the network type to that of the control station. |
| 3) | - | - | LINK PARA. ERROR | F82A _H | The normal station of a different network type is disconnected. | Change the network type of the normal station to that of the control station. |
| 4) | 1 | LINK PARA. ERROR | F813 _H | - | Data link stopped | Replace the network module of the control station with the one compatible with the MELSECNET/H Extended mode. |
| | 2 | | | | | <ul style="list-style-type: none"> Replace the network module of the control station with the one compatible with the MELSECNET/H Extended mode. Change the network type of the normal station to that of the control station. |
| | 3 | | | | | <ul style="list-style-type: none"> Replace the network module of the control station with the one compatible with the MELSECNET/H Extended mode. Replace the network module of the normal station with the one compatible with the MELSECNET/H Extended mode. |
| | 4 | | | | | <ul style="list-style-type: none"> Replace the network module of the control station with the one compatible with the MELSECNET/H Extended mode. Replace the network module of the normal station with the one compatible with the MELSECNET/H Extended mode, and change the network type to that of the control station. |
| | 5 | | | | | <ul style="list-style-type: none"> Replace the network module of the control station with the one compatible with the MELSECNET/H Extended mode. Replace the CPU of the normal station with a QCPU. |
| 5) | - | - | - | - | There is a mismatch in network type, but the normal station operates according to the network type of the control station. | Change the network type of the normal station to that of the control station. |
| 6) | - | - | - | - | The normal station of a different network type is disconnected. | Replace the CPU of the normal station with a QCPU. |

-: No error

*1: Error code, F82B_H is not stored in SW0055. Check it by System monitor of GX Developer.

8.3 Error Codes

When data linking cannot be performed using the cyclic transmission, or when communication cannot be performed normally using the transient transmission with an instruction of a sequence program or GX Developer, the error codes (hexadecimal) are stored in the link special register or displayed on the GX Developer's system monitor.

(1) Error code storage when data linking cannot be performed

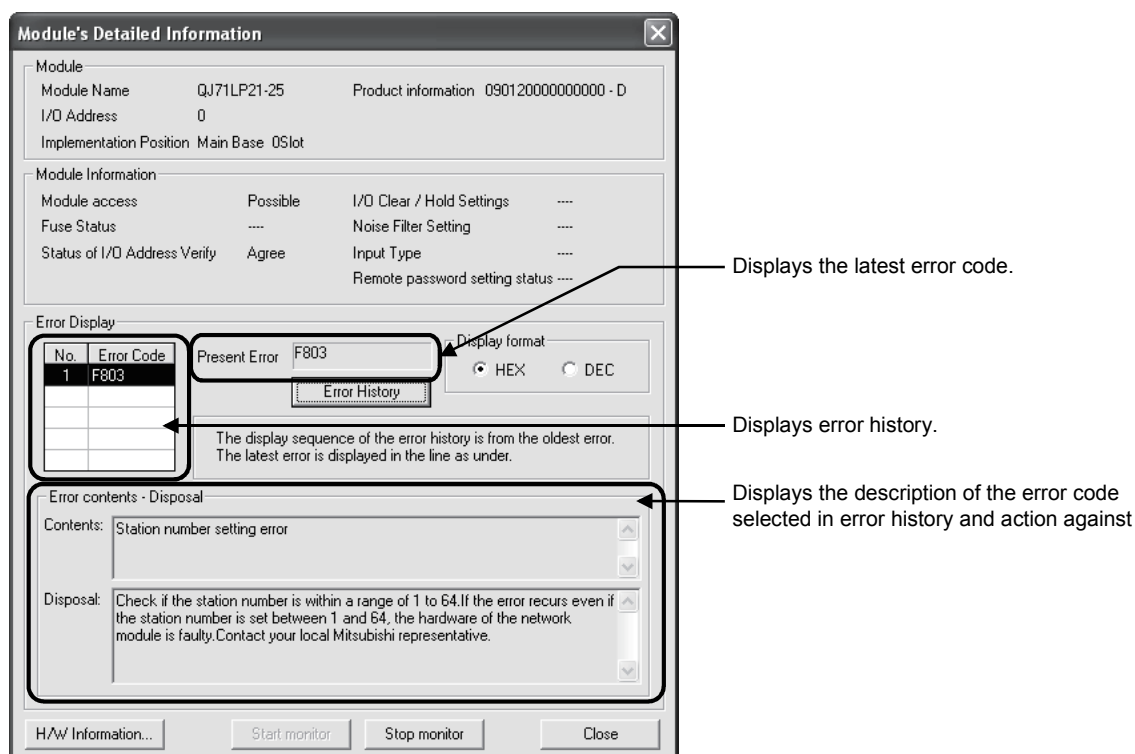
When data linking cannot be performed in the cyclic transmission, the following link special registers should be checked.

- 1) SW0048: Cause of baton pass interruption
- 2) SW0049: Cause of data link stop
- 3) SW0055: Parameter setting status

(2) Checking error codes with GX Developer

The code of the error occurred in the network module can be checked on the Module's Detailed Information screen displayed from "System Monitor". Change the designation of the connection destination to check other programmable controllers on the network.

Check the device data described in item (3) on the next page to see the error codes of the transient instructions by the sequence programs.



(3) Transient instruction error code storage location

The error codes generated during the transient instruction execution are stored in the following device data.

The error codes of the transient transmission are also stored in the link special registers SW00EE to SW00FF.

For details on the instructions, see the programming explanations for the transient transmission instructions described in Section 7.4.5.

- 1) SEND, RECV, RECVS, READ, WRITE, REQ:
Completion station (S1) + 1 of the control data
- 2) ZNRD : SW31
- 3) ZNWR : SW33
- 4) RRUN, RSTOP, RTMRD, RTMWR : SW0031 (When channel 1 is used.)
SW0033 (When channel 2 is used.)
SW0035 (When channel 3 is used.)
SW0037 (When channel 4 is used.)
SW0039 (When channel 5 is used.)
SW003B (When channel 6 is used.)
SW003D (When channel 7 is used.)
SW003F (When channel 8 is used.)

(4) Table 8.1 lists the descriptions of error codes.

Table 8.1 Error code list

| Error No. | Description of error | Corrective measure |
|--------------|---|---|
| 4000 to 4FFF | (Error detected by the programmable controller CPU) | Take measures referring to the troubleshooting section of the QCPU User's Manual (Hardware Design, Maintenance and Inspection). |
| 7000 to 7FFF | (Error detected by the serial communication module, etc.) | Take measures referring to the troubleshooting section of the Serial Communication Module User's Manual. |
| B000 to BFFF | (Error detected by the CC-Link module) | Take measures referring to the troubleshooting section of the CC-Link System Master/Local Module User's Manual. |
| C000 to CFFF | (Error detected by the Ethernet module) | Take measures referring to the troubleshooting section of the Ethernet Interface Module User's Manual. |
| E000 to EFFF | (Error detected by the CC-Link IE controller network) | Take measures referring to the troubleshooting section of the CC-Link IE Controller Network Reference Manual. |
| F101 | Initial status (Network activated) | Wait until SB0047 (baton pass status) and SB0049 (data link status) turn off (normal). |
| F102 | Initial status (Network activated) | |
| F103 | Initial status (during online test) | |
| F104 | Initial status (Control/sub-control station shift) | |
| F105 | Initial status (Parameters being processed) | |
| F106 | Shift from failed control station to sub-control station | Check the condition of the control station's power supply and of the cables and the status of the control station CPU module. |
| F107 | Baton pass error (baton lost) | Check the line status for a faulty cable or a missing terminating resistor, as well as the stations that are not powered on. In the case of the PLC to PLC network, when transient transmission is executed frequently and the link scan time may exceed 200 ms, adjust the transient setting values to reduce the link scan time. |
| F108 | Baton pass error (duplicate baton) | Check for duplicate station numbers and control stations with the setup confirmation test. Check for faulty cables, wire breakage, poor connector connections, connection errors, uninstalled or loose terminal resistors, etc. |
| F109 | Initial status (during online test) | Wait until SB0047 (baton pass status) and SB0049 (data link status) are recovered. |

Table 8.1 Error code list (Continued)

| Error No. | Description of error | Corrective measure |
|-----------|---|---|
| F10A | Initial status (online test/offline loop test) | <p><During execution of an online test> Wait until SB0047 (baton pass status) and SB0049 (data link status) are recovered.</p> <p><During execution of an offline test> Change the switch setting to online after the test has been completed.</p> |
| F10B | Duplicate station number error | <p>Review the station number setting.</p> <p>The setup confirmation test of network diagnosis is effective.</p> |
| F10C | Duplicate control station error | <p>Review the station number setting.</p> <p>The setup confirmation test of network diagnosis is effective.</p> <p>When the operation mode for redundant system is debug, connect one of the systems to the network. When connecting to both systems to the network, set the operation mode to back-up mode or to separate mode.</p> |
| F10D | Offline status | Review the mode setting, and change it to online. |
| F10E | Number of receive error retries exceeded | <p>Check for faulty cables, faulty hardware, incorrect cable wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, control stations, and remote master stations.</p> <p>The setup confirmation test and loop test of network diagnosis are effective.</p> |
| F10F | Number of send error retries exceeded | |
| F110 | Timeout error | |
| F111 | Corresponding station error (Baton pass to the corresponding station not executed) | <p>Review the status of the corresponding station and the parameter and switch settings (to see if there is a parameter error and the corresponding station is the control station and properly set).</p> <p>Confirm the power supply status of the corresponding station (to see if it is repeatedly turned on and off).</p> <p>Check for faulty cables, faulty hardware, incorrect cable wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, control stations, and remote master stations.</p> <p>The setup confirmation test and loop test of network diagnosis are effective.</p> |
| F112 | Faulty loop status | <p>Check for faulty cables, faulty hardware, incorrect wiring, and duplication of station numbers, control stations, and remote master stations.</p> <p>Confirm the power supply status of each module (to see if it is repeatedly turned on and off).</p> <p>Confirm whether network modules in MESLECNET/H and MELSECNET/10 modes exist together (confirm the control station type).</p> |
| F113 | Send failure (Baton pass to the host station not executed) | <p>Retry after a little while.</p> <p>If the error reoccurs as a result of a retry, check for faulty cables, faulty hardware, incorrect cable wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, control stations, and remote master stations.</p> <p>Wait until SB0047 (baton pass status) and SB0049 (data link status) are recovered.</p> |
| F114 | Send failure | <p>Retry after a little while.</p> <p>If the error reoccurs as a result of a retry, check for faulty cables, faulty hardware, incorrect cable wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, control stations, and remote master stations.</p> <p>Wait until SB0047 (baton pass status) and SB0049 (data link status) are recovered.</p> |
| F115 | Improper function code | <p>Check for faulty cables, faulty hardware, incorrect wiring, duplication of station numbers, and duplication of control stations.</p> |
| F116 | Delayed online test processing | |
| F117 | Send failure | Check for faulty cables, hardware failure, noise, incorrect wiring, and absence of terminal resistors (when a bus is used). |
| F118 | Send failure (baton regeneration) | Wait until SB0047 (baton pass status)/SB0049 (data link status) is turned off (normal). |
| F11A | Send failure (multiplex transmission stopped) | Wait for a while and execute again. |

Table 8.1 Error code list (Continued)

| Error No. | Description of error | Corrective measure |
|-----------|--|---|
| F11B | Being disconnected | Review the parameter and switch settings (to see if there is a parameter error and the corresponding station is the control station or remote master station and properly set). Check for faulty cables, faulty hardware, noise, incorrect wiring, and duplication of station numbers, control stations, and remote master stations. |
| F11C | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F11F | Initial status (no baton addressed to host) | Check for the operation status of the control/sub-control station, faulty cables, incorrect cable wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, control stations, and remote master stations. Confirm whether network modules in MESLECNET/H and MELSECNET/10 modes exist together (confirm the control station type). |
| F120 | Destination station specification error | Check for faulty cables, faulty hardware, incorrect wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, control stations, and remote master stations. |
| F122 | Send failure (coaxial bus system) | Check for coaxial cable connection, proper connector connection, connection of terminating resistor, or faulty cables. |
| F221 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F222 | No free area in the receive buffer (buffer-full error) | Retry after a little while. If the error reoccurs as a result of a retry, review the number of transient communication times and communication interval of the entire system. Turn off the power supply to the entire system, and turn it on again. |
| F224 | Receive data size error | The hardware of the module on the transient transmission source station is faulty. Contact your local Mitsubishi representative. |
| F225 | Logical channel number error | The hardware of the module on the transient transmission source station is faulty. Contact your local Mitsubishi representative. |
| F226 | Channel number error | Check if the logical channel number designated in the execution source of the SEND instruction is set in the target network module. Alternatively, specify the logical channel number set in the target network module. |
| F228 | SEND instruction target station error | Review the target network number and target station No. in the control data at the execution source of the SEND instruction. |
| F301 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F701 | Send-target station number error (station No. 0 specified) | The hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F702 | Send-target station number error (station No. 65 or higher number specified) | |
| F703 | Destination group number error | Review the destination group number. |
| F706 | Received data size error | The cable is faulty, or The hardware of the network module is faulty. If a communication error has occurred, review the cable. If not, the hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F707 | Number of relay stations invalid | Set stations to which data can be sent. Review the system. Review the routing parameters. |
| F708 | Receiving group number error | Review the group number of the target station. |

Table 8.1 Error code list (Continued)

| Error No. | Description of error | Corrective measure |
|-----------|--|---|
| F709 | Receiving network number error | Review the network No. of network parameter for a host station and a target station. If the parameter is not set, the network No. is preset to 1 (default); so check the network No. of other stations. |
| F70A | System error | The cable is faulty, or the hardware of the network module is faulty. If a communication error has occurred, review the cable. If not, the hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F70B | Response wait timeout | Wait until SB0047 (baton pass status) and SB0049 (data link status) are recovered. |
| F70C | System error | The cable is faulty, or the hardware of the network module is faulty. If a communication error has occurred, review the cable. |
| F70E | System error | If not, the hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F710 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F711 | System error | |
| F712 | System error | |
| F781 | System error | The hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F782 | Connection target specification error | Check if C24 connection or CC-Link connection is specified for access to other stations. If the setting is correct, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F783 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F7C1 | Host station channel in use | The same channel cannot be used at the same time. Change the channel number. Alternatively, do not use the same channel at the same time. |
| F7C2 | Target station channel in use | Retry the SEND instruction after a little while. Check if the target station uses the channel concerned to execute the instruction, or if RECV processing is executed. Check if another station executes the SEND instruction to the target station's channel. |
| F7C3 | Arrival monitoring timeout | <When this error occurs by the RECV instruction> When another station is executing the SEND instruction, increase the value of the arrival monitoring time. Alternatively, start the RECV instruction by turning the RECV instruction execution request flag to ON. <When this error occurs in other cases> Increase the value of the arrival monitoring time. Confirm the operation status of the target station, the network status, and the relay station status (in the case of sending to other network). |
| F7C4 | Resend count-out | Increase the arrival monitoring time. Re-execute the REMFR/REMTO instruction. Confirm the operation status of the target station, the network status, and the relay station status (in the case of sending to other network). |
| F7C5 | SEND instruction target station error | Review the target network number and target station No. in the request control data of send/receive instructions. |
| F7C6 | Channel number setting out of range | Set the channel numbers of the host station and of the target station in the request control data of send/receive instructions within a range between 1 and 64. |
| F7C7 | Target station specification error (host station specification) | Specify the target station number in the request control data of send/receive instructions to other than the number of host station. |

Table 8.1 Error code list (Continued)

| Error No. | Description of error | Corrective measure |
|-----------|--|---|
| F7C8 | Execution type specification error | When the execution/abnormal completion type in the request control data of send/receive instructions is specified for all stations or groups, set "No arrival confirmation" for the execution type. |
| F7C9 | Resend count setting out of range | Set the resent count of the request control data of send/receive instructions within a range between 0 and 15 (times). |
| F7CA | Arrival monitoring time setting out of range | Set the arrival monitoring time of the request control data of send/receive instructions within a range between 0 and 32767 (seconds). |
| F7CB | Sent data length setting out of range (SEND instruction) | Set the sent data length of the request control data of the SEND instruction within a range between 1 and 960 (words). |
| F7CD | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F7E1 | Control data error | Confirm the set values (mode, etc.) in the control data of a dedicated instruction. |
| F7E2 | System error | The hardware of the network module is faulty. |
| F7E3 | System error | Contact your local Mitsubishi representative. |
| F7E4 | Target CPU module type error | Check if the CPU module model of the target station specified in the WRITE, READ, REQ, RUN, RSTOP, RTMRD, and RTMWR instructions is out of applicable range. |
| F7E5 | Post-transmission event wait timer time-out | Re-execute the REMFR or REMTO instruction after a little while. Confirm the operation status of the target station, the network status, and the relay station status (in the case of sending to other network). |
| F7E7 | Buffer memory address error | Check if the buffer memory address specified in the REMFR and REMTO instructions exceeds 8000H. |
| F7E8 | Network type error | Check if the network number specified in the REMFR and REMTO instructions represents a PLC to PLC network. |
| F7E9 | Instruction not executable error | Check if the host station is data-linked when the REMFR or REMTO instruction is executed. |
| F800 | Mode switch setting error | Confirm the setting of the mode switch. If the error reoccurs after resetting, the hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F801 | Network number setting error | Create new network parameters and perform Write to PLC. |
| F802 | Group number error | If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F803 | Station number setting error | Check if the station number is within a range of 1 to 64. If the error reoccurs even if the station number is set between 1 and 64, the hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F804 | DIP switch setting error | Create new network parameters and perform Write to PLC. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F805 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F806 | System error | The hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F808 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F80A | System error | |
| F80B | System error | |
| F80C | System error | |
| F80D | System error | |
| F80E | System error | |
| F80F | System error | |
| F811 | System error | |
| F812 | System error | |

Table 8.1 Error code list (Continued)

| Error No. | Description of error | Corrective measure |
|-----------|--|---|
| F813 | Parameter data error (parameter) | Replace the network module of the control or normal station with the one compatible with the MELSECNET/H Extended mode. Change the network type of the normal station to that of the control station. Create new network parameters and perform Write to PLC. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F814 | Parameter data error (code) | Create new network parameters and perform Write to PLC. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F820 | Link parameter error | Replace the network module of the normal station with the one compatible with the MELSECNET/H Extended mode. Change the network type of the normal station to that of the control station. Create new network parameters and perform Write to PLC. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F821 | Station-specific parameter error | Review station-specific parameters. Set common parameters \geq station-specific parameters for the sending range of the host station. If no station-specific parameters are set, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F822 | System error | The hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F823 | Parameter consistency error | Set common parameters \geq station-specific parameters for the sending range of the host station. If no station-specific parameters are set, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F825 | CPU parameter check error | Perform Write to PLC on the network parameters for the control station again. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F826 | Parameter mismatch error | Set parameters suitable for the sub control station, or activate it as a control station. Review and reset the parameters for the master and sub master stations. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F828 | No control station shift setting | Set "with data link by the sub control station when the control station is down." |
| F829 | Pairing setting error | On the network parameter at control station, set the pairing setting on the Redundant CPU or unset the pairing setting on all the CPUs other than the Redundant CPU. |
| F82A | Network type mismatch (normal station detected) | Match the network type set for the normal station with the one set for the control station. |
| F82B | Network type mismatch (control station detected) | |
| F830 | System error | The hardware of the CPU or network module is faulty. |
| F831 | System error | Contact your local Mitsubishi representative. |
| F832 | Data link startup condition error | If the data link is stopped under all station specification, start it by all station specification. If the data link is stopped under specific station specification, start it from the station, or forcibly start it. |
| F833 | Keyword error | Start the data link from the station where it was discontinued, or forcibly start it. |
| F834 | System error | The cable is faulty, or the hardware of the network module is faulty. |
| F835 | System error | If a communication error has occurred, review the cable. |
| F836 | System error | If not, the hardware of the network module is faulty. Contact your local Mitsubishi representative. |

Table 8.1 Error code list (Continued)

| Error No. | Description of error | Corrective measure |
|-----------|---|--|
| F837 | Exceeded number of retries | Check the status of the control station and of the remote master station (to see if resetting or an error occurs in the middle of the operation). |
| F838 | Relevant timer timeout | Check the status of the control station and of the remote master station (to see if resetting or an error occurs in the middle of the operation). |
| F839 | No link parameter (communication impossible) | Register link parameters |
| F83A | SW0000 out of range error | Correct the contents of SW0000. |
| F83B | Forced switching impossible error | Check if the following conditions are met: <ul style="list-style-type: none"> • The system is a multiplexed remote I/O network system. • Check if "Return as a standby station" is set as the parameter for the master station. • The host station is operating as a master station. • The operating sub master station is in data-linking. |
| F840 | Low speed cyclic parameter error | Create new network parameters and perform Write to PLC. |
| F841 | System error | If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F842 | System error | Create new network parameters and perform Write to PLC. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F843 | System error | Create new network parameters and perform Write to PLC. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| F901 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| F902 | System error | Check the system configuration to see if there are eight or more relay networks in the MELSECNET/H. |
| F903 | System error | The hardware of the CPU or network module is faulty. |
| F904 | System error | Contact your local Mitsubishi representative. |
| F905 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| FD01 | CRC error (offline test) | There is no need to take corrective measures because the system retries the operation. If the error frequently occurs, check for faulty cables, faulty hardware, noise, absence of terminating resistor (in the case of the bus), and incorrect wiring. |
| FD02 | Overrun error (offline test) | |
| FD03 | AB. IF error (offline test) | |
| FD04 | TIME error (offline test) | |
| FD05 | Data error (offline test) | |
| FD06 | Under error (offline test) | |
| FD07 | Send failure | |
| FD08 | Send failure (coaxial bus system) | Check if a coaxial cable is not connected or is loose or faulty and if the terminating resistor is not connected. |
| FD09 | Loop status changed (offline loop test) | There is no need to take corrective measures because the system retries the operation (do not switch the loop in the middle of the operation). If the error frequently occurs, check the line and the wiring status. |
| FD0A | Unstable communication (offline loop test) | |
| FD0B | Wiring error (offline loop test) | Check the wiring. |
| FD0C | System error | There is a problem with the hardware of the network module. Contact your local Mitsubishi representative. |
| FD11 | Error occurred during test execution | Execute after the completion of the test from other station. |
| FD12 | Disconnecting error | Review the cause for why the station is being disconnected. |
| FD13 | System error | Set the total number of link stations with a common parameter. Set a station number that is equal to the host station number or larger. |
| FD14 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| FD15 | System error | |
| FD16 | System error | |
| FD17 | System error | |
| FD18 | System error | |

Table 8.1 Error code list (Continued)

| Error No. | Description of error | Corrective measure |
|-----------|--|--|
| FD19 | System error | |
| FD1A | Station with duplicated station number | Check the duplicate station number, and correct it. |
| FD1B | Test abort error | The ongoing test was interrupted due to the resetting of the test executing station. There is a faulty station on the networks. |
| FD1C | Interruption error due to loop switching during test | There is no need to take corrective measures because the system retries the operation (do not switch the loop in the middle of the operation). If the error frequently occurs, check the line and the wiring status. |
| FD1D | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| FD1E | Bus topology, test disabled error | Conduct a test that can be executed in the bus topology. |
| FD20 | Mode error | Create new network parameters and perform Write to PLC. If the error reoccurs, the hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| FD21 | Hardware error (send interrupt error) | The cable was disconnected during the online test. |
| FD22 | Hardware error (receive interrupt error) | Reconnect the cable, and continue the online test. |
| FD23 | Data comparison error | Check for faulty cables, faulty hardware, incorrect wiring, absence of terminating resistor (in the case of the bus), and duplication of station numbers, and control stations. |
| FD24 | Retry over | |
| FD25 | Input port initial value check error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| FD26 | Light check forward side error | There is a problem with the cable. |
| FD27 | Light check reverse side error | Connect a proper cable, and perform an online test. |
| FD28 | RAM check error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| FD29 | ROM check error | |
| FD2A | Timer function check error | |
| FD2B | WDT function check error | |
| FD31 | Duplicate online diagnostics request error | Execute online diagnostics after another is completed. |
| FD32 | System error | The hardware of the network module is faulty. |
| FD33 | System error | Contact your local Mitsubishi representative. |
| FD35 | Response wait time-out occurred | Retry after a little while. Check the status of the relevant station and of the line. |
| FD36 | Action wait time-out occurred | |
| FD37 | Another online diagnosis executed | |
| FD38 | Duplicate message error | |
| FD39 | Communication test request destination error (host station) | Change the test request destination. |
| FD3A | Communication test request destination error (station to which the test cannot be requested) | <p>A station to which a test request is not available was specified.</p> <div style="text-align: right;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">C</div> :CPU module <div style="border: 1px solid black; padding: 2px; display: inline-block;">N</div> :Network module <div style="background-color: #cccccc; width: 15px; height: 10px; display: inline-block; margin-right: 5px;"></div> :Communication request disabled station </div> |
| FE20 | Received data error | Review the routing parameters, or replace the relay CPU module with the AnU or QnA CPU module compatible with the MELECNET/10. |
| FE21 | ZNRD/ZNWR device range error | Review the range of the device to be accessed with the ZNRD/ZNWR instructions to the ACPU. |
| FE22 | AnU request error | Check if access to other station is made from GX Developer with a project of a different CPU type. |
| FE23 | System error | The hardware of the source module starting dedicated instructions and MC protocol is faulty. Contact your local Mitsubishi representative. |

Table 8.1 Error code list (Continued)

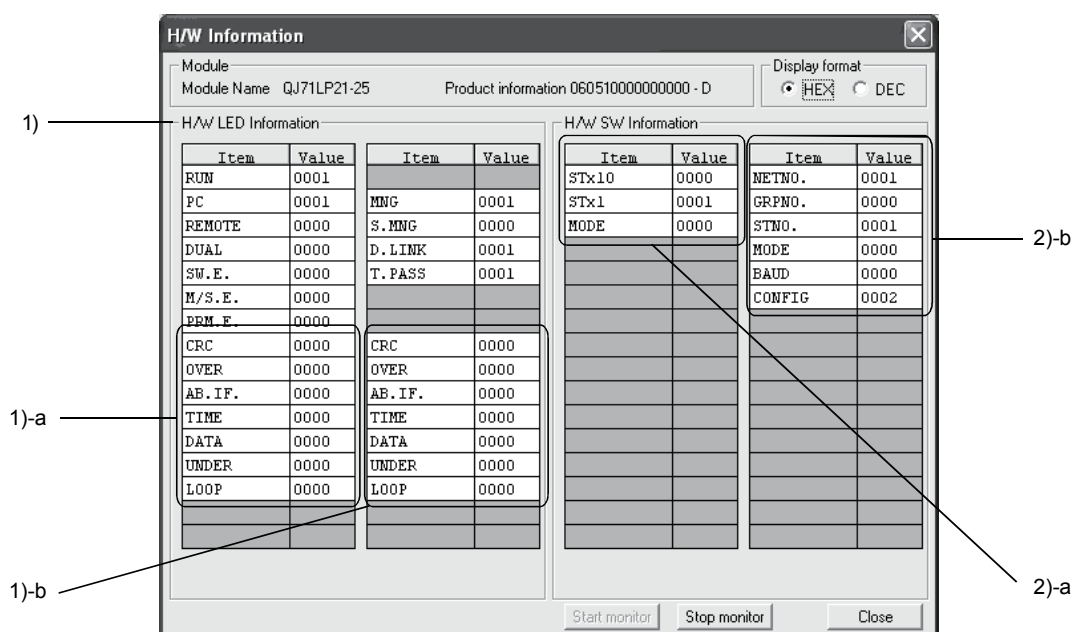
| Error No. | Description of error | Corrective measure |
|-----------|----------------------|--|
| FE24 | System error | Confirm the status of the target station and relay station CPU modules. Alternatively, change the CPU module concerned. |
| FE25 | System error | Confirm the power supply status (insufficient voltage, instantaneous interruption, overvoltage, etc.) of the target station for transient transmission and the relay station. Alternatively, change the CPU module concerned. |
| FE26 | System error | Confirm the operation status (WDT error, etc.) of the target station and relay station CPU modules. Alternatively, change the CPU module concerned. |
| FE27 | System error | The hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| FE30 | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| FE31 | System error | |
| FE32 | System error | |
| FE34 | System error | |
| FE36 | System error | |
| FE37 | System error | |
| FE38 | System error | |
| FE39 | System error | The hardware of the CPU or network module is faulty. Contact your local Mitsubishi representative. |
| FE3B | System error | The hardware of the network module is faulty. Contact your local Mitsubishi representative. |
| FE3C | System error | |
| FE3D | System error | |
| FE3E | System error | |
| FE3F | System error | |

8.4 H/W Information

With the H/W information, details of the LED and switch information of the network modules can be monitored using GX Developer. To display the H/W information, click the **[H/W information]** button on the system monitor screen of GX Developer.

The H/W information is displayed on the screen shown below with a combination of the network module's function version and the GX Developer's function version.

- (1) When the network module: function version B and the GX Developer: SW7D5C-GPPW are combined



The following details will be displayed for each item.

- 1) H/W LED information

Displays the LED information for the network module.

The values for each item is displayed as: 0001 on, 0000 off.

| Item | Description |
|--------|--|
| PC | With PLC to PLC networks: on |
| REMOTE | With remote I/O networks: on |
| DUAL | During multiplex transmission execution: on |
| SW.E | During switch setting errors: on |
| M/S.E. | When station numbers or controlled stations are duplicated on the same network: on |
| PRM.E. | When an integrity error is triggered with a common parameter and a station's unique parameter, and when the parameter received from a sub-controlled station is different to the host parameter received from the controlled station: on |
| MNG | During controlled station setup: on During normal station setup: off |
| S.MNG | When it does not exist in a sub-controlled station: on |
| D.LINK | During data links: on |
| T.PASS | During baton-pass participation: on |

| Item | Description |
|--------|---|
| CRC | During received data code check errors: Illuminated 1)-a: Forward loop side, 1)-b: Reverse loop side |
| OVER | During delayed received data processing errors: Illuminated 1)-a: Forward loop side, 1)-b: Reverse loop side |
| AB.IF. | When errors are triggered owing to values other than the stipulated "1" are received consecutively, and when errors are triggered owing to the length of the received data being too short: Illuminated 1)-a: Forward loop side, 1)-b: Reverse loop side |
| TIME | When errors are triggered owing to the data link monitoring timer being activated: Illuminated 1)-a: Forward loop side, 1)-b: Reverse loop side |
| DATA | When errors are triggered owing to abnormal data exceeding 2kbytes has been received: Illuminated 1)-a: Forward loop side, 1)-b: Reverse loop side |
| UNDER | When errors are triggered owing to the internal processing of transmission data not being completed within the specified period of time: Illuminated 1)-a: Forward loop side, 1)-b: Reverse loop side |
| LOOP | When errors are triggered owing abnormalities on the loop: Illuminated 1)-a: Forward loop side, 1)-b: Reverse loop side |

2) H/W switch information

Displays the switch information for the network module.

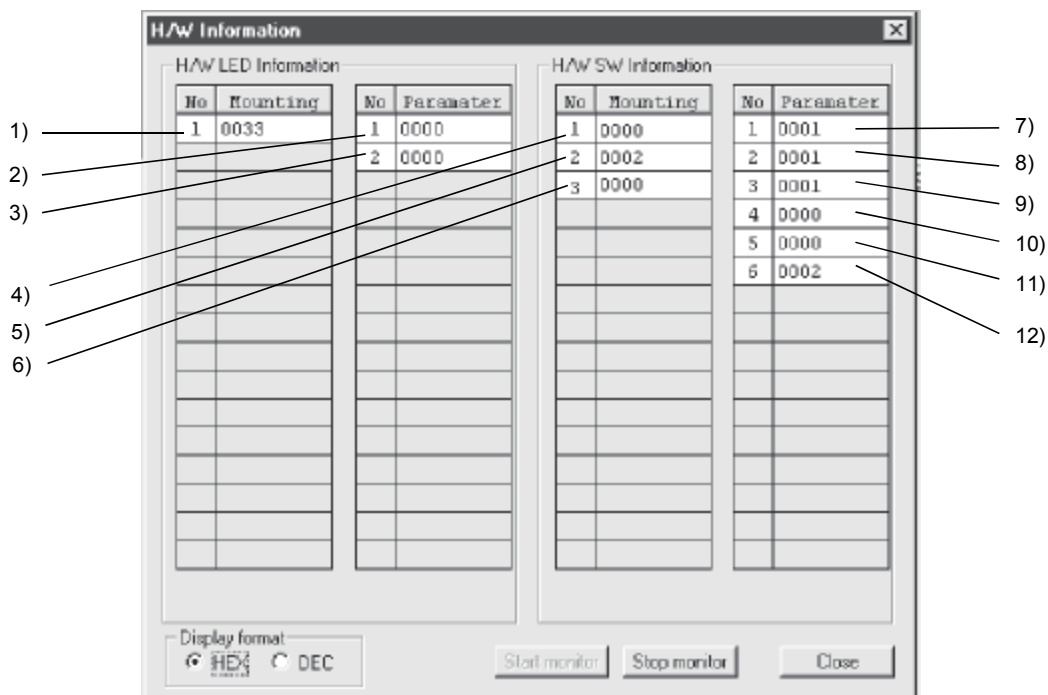
2)-a: Displays the switch settings for the H/W mounted on the network module.

| Item | Description |
|-------|--|
| STx10 | Position 10 of the station number's setting switch |
| STx1 | Position 1 of the station number's setting switch |
| MODE | Mode setting switch |

2)-b: Displays the switch information actually set up on the network module.

| Item | Description | Display range |
|--------|---|---|
| NETNO. | Network number setting | 0 to 239 |
| GRPNO. | Group number setting | 0 to 9 |
| STNO. | Station number setting | 1 to 64 |
| MODE | Operation mode setting | 0: On-line 7: Self loop-back test 8: Internal self loop-back test 9: Hardware test |
| BAUD | Supporting 25Mbps | 0: 10 Mbps 1: 25 Mbps |
| CONFIG | Station type, controlled station operations during recovery, transmission mode settings | <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> b15 All "0" </div> <div style="text-align: center;"> b8 b7 Empty </div> <div style="text-align: center;"> b5 Empty </div> <div style="text-align: center;"> b0 Empty </div> </div> <div style="margin-top: 10px;"> <div style="display: flex; justify-content: space-between;"> <div> Controlled station operations 0: Switched 1: Not switched </div> <div> Transmission mode 0: On-line mode (start) 1: Debug mode (stop) </div> <div> Station type 0: Normal station 1: Controlled station </div> </div> </div> |

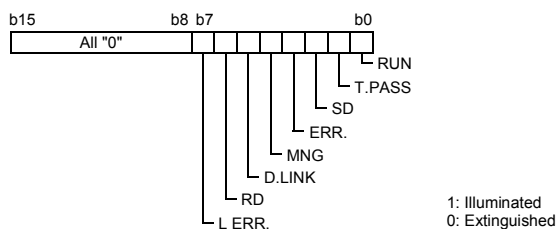
- (2) When the network module: function version B and the GX Developer: prior to SW5D5C-GPPW are combined



The following details will be displayed for each item.

1) Actual LED1 information

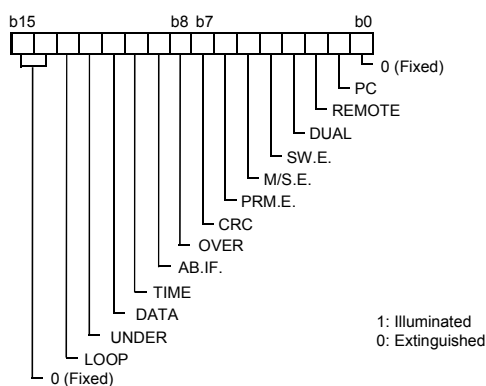
Displays the illumination status of LEDs actually mounted onto the network module.



2) LED1 information

Displays information for illuminated LEDs on the network module. The following details are displayed.

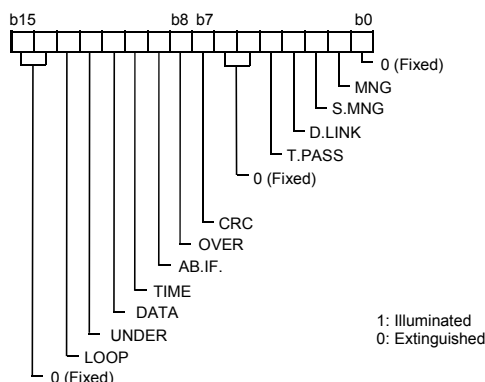
(Refer to section 8.4 (1) for details on the information for all LEDs.)



3) LED2 information

Displays information for illuminated LEDs on the network module. The following details are displayed.

(Refer to section 8.4 (1) for details on the information for all LEDs.)



4) Actual switch 1 information

Displays the station number (position 10) set with the station number setting switch (position 10) mounted onto the network module.

5) Actual switch 2 information

Displays the station number (position 1) set with the station number setting switch (position 1) mounted onto the network module.

6) Actual switch 3 information

Displays the mode number set with the mode setting switch mounted onto the network module.

7) Network number switch information

Displays the number of the network actually set on the network module.
Display range: 0 to 239

8) Group number switch information

Displays the number of the group actually set on the network module.
Display range: 0 to 32

9) Station number switch information

Displays the number of the station actually set on the network module.
Display range: 0 to 64

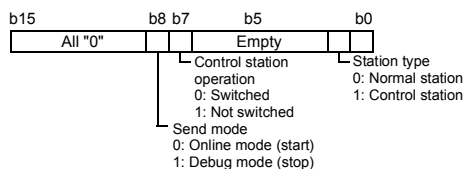
10) Mode number switch information

Displays the number of the mode actually set on the network module.
Display range: 0 to F

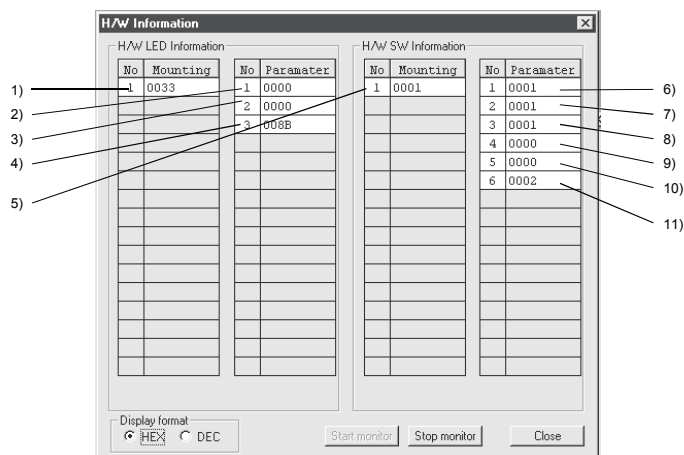
11) For future expansion purposes

12) Dip number switch information

Displays the station type, the controlled station operations during recovery, and the Send mode set up in the network module.



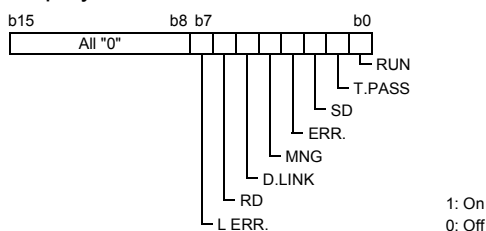
(3) When the network module: function version A and the GX Developer: prior to SW5D5C-GPPW are combined



Each item displays the following information.

1) Actual LED1 information

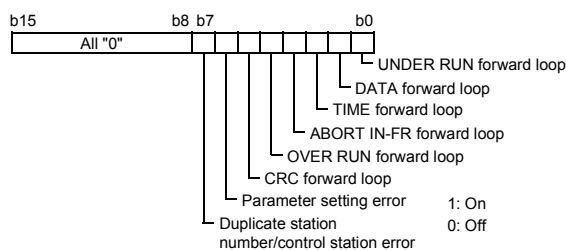
Displays the on/off status of the LEDs that are used in the network module.



2) LED1 information

Displays the information of the LEDs that are turned on by the network module. The contents are displayed in the following manner:

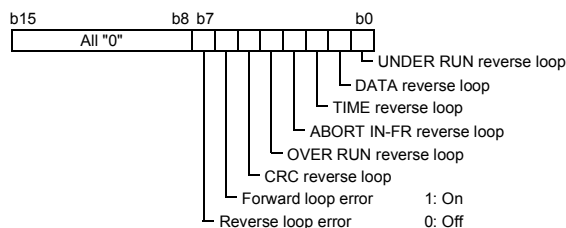
- "UNDER RUN forward loop" to "CRC forward loop" display the information of errors that have occurred on the forward loop side. The "L ERR." of 1) Actual LED1 information turns on if either one of these errors have occurred (corresponding LED information turns on) or the "UNDER RUN reverse loop" to "CRC reverse loop" LED information of 3) LED2 information is lit.
- The "ERR." signal of 1) Actual LED1 information turns on if either "Parameter setting error," "Duplicate station number/control station error" or "Switch setting error" of 4) LED3 information is lit.



3) LED2 information

Displays the information of the LEDs that are turned on by the network module. The contents are displayed in the following manner:

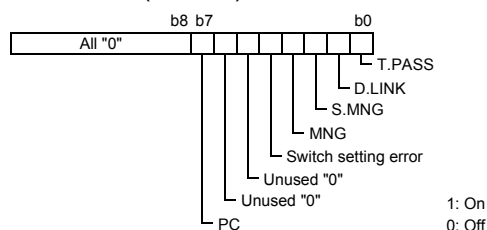
- "UNDER RUN reverse loop" to "CRC reverse loop" display information of errors that have occurred on the reverse loop side. The "L ERR." of 1) Actual LED1 information turns on if either one of these errors have occurred (corresponding LED information turns on) or the "UNDER RUN forward loop" to "CRC forward loop" LED information of 2) LED1 information is lit. Furthermore the "Forward loop error" turns on if either of "UNDER RUN forward loop" to "CRC forward loop" is on. The "Reverse loop error" turns on if either of "UNDER RUN reverse loop" to "CRC reverse loop" is on.



4) LED3 information

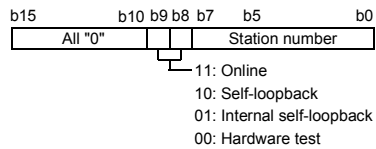
Displays the information of the LEDs that are turned on by the network module. The contents are displayed in the following manner:

- "T.PASS" turns on during baton pass. When this LED information turns on, the "T.PASS" of 1) Actual LED1 information is turned on.
- "D.LINK" turns on during data linking. When this LED information turns on, the "D.LINK" of 1) Actual LED1 information is turned on.
- "S.MNG" and "MNG" turn on when the network module is being controlled by the sub-control station and the control station, respectively. When either of this LED information turns on, the "MNG" of 1) Actual LED1 information is turned on.
- "ERR" of 1) Actual LED1 information turns on if either "Parameter setting error" or "Duplicate station number/control station error" of 2) LED1 information, or the "Switch setting error" is on.
- "PC" turns on when the network module is operating on an inter-PC network. (1: fixed)



5) Actual switch information

Displays the station number and mode number that are set by the hardware switch mounted on the network module.



6) Network No. switch information

Displays the network No. set for the network module.

Display range: 0 to 239

7) Group number switch information

Displays the group number set for the network module.

Display range: 0 to 32

8) Station number switch information

Displays the station number set for the network module.

Display range: 0 to 64

9) Mode number switch information

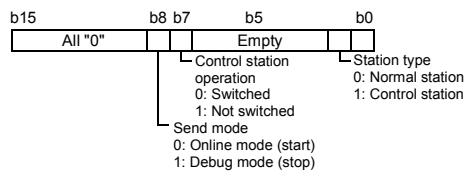
Displays the mode number set for the network module.

Display range: 0 to F

10) For future expansion

11) DIP number switch information

Displays the station type, control station operation when returning to the network, and send mode. The contents are displayed in the following manner.



APPENDIX

Appendix 1 Comparison of network module specifications, and compatibility

Appendix 1.1 List of Comparison between MELSECNET/H and MELSECNET/H Extended Modes and MELSECNET/10 Mode Specifications

The MELSECNET/H system supports the MELSECNET/H and MELSECNET/H Extended modes (high functionality/high-speed mode) and the MELSECNET/10 mode (functional and performance compatibility mode), which are explained in this manual. When the MELSECNET/10 mode is used, it is easy to make connection with the AnU/QnA corresponding MELSECNET/10. However, its specifications are different from those of the MELSECNET/10 mode, as shown in Table 1 below. Since this manual is written assuming that MELSECNET/H is used in the MELSECNET/H and MELSECNET/H Extended mode, see the "QnA/Q4AR Corresponding MELSECNET/10 Network System Reference Manual" to use it in the MELSECNET/10 mode.

Table 1 Comparison of specifications among MELSECNET/H mode, MELSECNET/H Extended mode and MELSECNET/10 mode

| Specification item | | Selected mode | |
|---|--------------------|---|--|
| | | MELSECNET/H network system | |
| | | MELSECNET/H mode, MELSECNET/H Extended mode | MELSECNET/10 mode |
| Transmission type | | Coaxial bus type/optical (SI) loop type | |
| Maximum number of link points | I/O (LX, LY) | 8,192 points | |
| | Link relay (LB) | 16,384 points | 8,192 points |
| | Link register (LW) | 16,384 points | 8,192 points |
| Maximum number of link points per station * 1 | | [MELSECNET/H mode] $\{(LY+LB)/8 + (2 \times LW)\} \leq 2000$ bytes [MELSECNET/H Extended mode] $\{(LY+LB)/8 + (2 \times LW)\} \leq 35840$ bytes | $\{(LY+LB)/8 + (2 \times LW)\} \leq 2000$ bytes |
| Transient transmission data size | | Maximum 1,920 bytes/frame | Maximum 960 bytes/frame |
| Communication speed | | 25 Mbps/10 Mbps (from switch setting) | 10 Mbps |
| Link scan time | | [MELSECNET/H mode, communication speed 10Mbps] $KB + (0.45 \times \text{total stations}) + (\text{total number of bytes used by network} \times 0.001)$ (ms) | $KB + (0.75 \times \text{total number of stations}) + (\text{total number of bytes used in the network} \times 0.001)$ (ms) |
| Transmission delay time | | Sequence scan time of sending side + refresh time of sending side + $LS \times 1$ + sequence scan time of receiving side $\times 2$ + refresh time of receiving side | Sequence scan time of sending side + refresh time of sending side + $LS \times 2$ + sequence scan time of receiving side $\times 2$ + refresh time of receiving side |
| Communication method | | Token bus method [coaxial bus type]/token ring method [optical loop type] | |
| Overall distance | | 500 m (1640.5 ft.) [coaxial bus type]/30 km (98430 ft.) [optical loop type] 2.5 km (8202.5 ft.) : When 4 repeaters are connected | |
| Distance between stations | | [optical loop type (Communication speed 10 Mbps)] 1 km (3281 ft.) : When QSI/Broad-band H-PCF/H-PCF cable is used 500 m (1640.5 ft.) : When SI cable is used [coaxial bus type] 500 m (1640.5 ft.) : 5C-2V 300 m (984.3 ft.) : 3C-2V | |
| Maximum number of networks | | 239 | |
| Maximum number of groups | | 32 | 9 |
| Maximum number of connected stations | | 32 stations (1: control station, 31: normal stations) [coaxial bus type]/ 64 stations (1: control station, 63: normal stations) [optical loop type] | |
| Maximum number of modules installed per CPU | | Total of 4 modules (Basic model CPU and safety CPU: 1 module) | |
| 32 bits data guarantee | | Supported | Not supported |
| Block guarantee per station | | Supported | Not supported |
| Transient transmission function | | Supported | |
| N:N communication (monitor, upload/download, etc.) | | Supported | |
| Number of data sending/receiving channels | | Receive channels: 64 (up to 8 channels when used at the same time) Send channels: 8 | 8 (fixed channels) |
| Compatible instructions (SEND, RECV, READ, SREAD, WRITE, SWRITE, REQ, ZNRD, ZNWR) | | Available | |
| RRUN, RSTOP, RTMRD, RTMWR instruction | | Available | |
| RECVS instruction | | Available | Not available |
| Low-speed cyclic transmission function | | Yes | No |
| Maximum number of refresh parameters that can be set (excluding SB, SW) | | 64 per module (8 for a Basic model CPU and safety CPU) | |
| Network connection applicable CPU | | QCPU (Q mode) | QCPU (Q mode) QCPU-A (A mode) QnACPU ACPU |

* 1: The number of LY points of the stations set in the I/O master station is the sum total of the LY points for output to all stations within the block.

Appendix 1.2 Upgraded functions of the network module

The network module undergoes the addition of functions and specification changes by version upgrade.

For checking of the function version of the network module, refer to Section 2.3.

(1) Compatibility with old models

When replacing a previous network module (function version A or B) with the one of function version D, there is no need to change the parameters, programs, and switch settings.

However, to use any function not available for a previous version, the parameters and programs must be modified.

(2) Additional functions

The table below shows the functions added to function version B or later.

| Additional function | Description | Function version | | |
|--|--|------------------|---|---|
| | | A | B | D |
| Multiple CPU system supported | Multiple CPU systems are supported. | × | ○ | ○ |
| Addition of link dedicated instructions | The following link dedicated instructions were added: • RRUN instruction (remote RUN instruction) • RSTOP instruction (remote STOP instruction) • RTMRD instruction (other station's clock data read instruction) • RTMWR instruction (other station's clock data write instruction) | × | ○ | ○ |
| Data length of link dedicated instructions increased to 960 words | The data length of the following link dedicated instructions was increased from 460 words to 960 words: • SEND instruction • RECV instruction • RECVS instruction • READ/SREAD instructions • WRITE/SWRITE instructions | × | ○ | ○ |
| Redundant system supported | • The network module can be mounted on the base unit of the redundant system and used (redundant network module). • A system switching request is automatically issued to the control system CPU in case of a data link error or malfunction. | × | × | ○ |
| Target station CPU type designation in link dedicated instruction (System specification in redundant system) | In the following link dedicated instructions, the target station CPU type can be designated (the redundant system's control system/standby system and system A/B can be designated): • READ/SREAD instructions • WRITE/SWRITE instructions • REQ instruction • RRUN instruction • RSTOP instruction • RTMRD instruction • RTMWR instruction | × | × | ○ |
| MELSECNET/H Extended mode compatibility | Compatibility with the MELSECNET/H Extended mode (The maximum number of link points per station has been increased from 2000 bytes to 35840 bytes) | × | × | △ (First 5 digits of the serial No. is "06092" or later, or "07102" or later.) |
| Target station CPU type specification in link dedicated instruction (Multiple CPU No. specification) | In the following link dedicated instructions, the target station CPU type can be specified. (The CPU No. in the multiple CPU system can be specified.) • READ/SREAD instruction • WRITE/SWRITE instruction • REQ instruction | × | × | △ (First 5 digits of the serial No. is "06092" or later.) |

○: Available/compatible

△: Available/compatible (restricted by the serial No. of the product)

×: Unavailable/incompatible

Appendix 2 Differences Between the AJ71QLP21/AJ71QLP21G/AJ71QBR11, the A1SJ71QLP21/A1SJ71QBR11 and the QJ71LP21/QJ71LP21-25/QJ71LP21G/QJ71BR11

Appendix 2.1 Differences in LED displays and switch settings

The MELSECNET/H network modules QJ71LP21, QJ71LP21-25, QJ71LP21G and QJ71BR11 have the same LED displays and switch settings as those of the MELSECNET/10 network modules AJ71QLP21, AJ71QLP21G, AJ71QBR11, A1SJ71QLP21, and A1SJ71QBR11. However, each network module has the following differences from others as shown in Appendix Table 2. Please consider these differences when operating the network modules.

Table 2 Difference of LED indications, switch setting and others

| Item | Model name | QJ71LP21, QJ71LP21-25 QJ71LP21G, QJ71BR21 | AJ71QLP21 AJ71QLP21G | AJ71QBR11 | A1SJ71QLP21 | A1SJ71QBR11 |
|-------------------------------|------------|---|--|---|--|---|
| LED display | | RUN | RUN | | RUN | |
| | | — | POWER | | (PW) * 1 | |
| | | — | PC | | (PC) * 1 | |
| | | — | REMOTE | | (REM.) * 1 | |
| | | — | DUAL | — | DUAL | — |
| | | MNG | MNG, S.MNG | | MNG, S.MNG | |
| | | T.PASS | T.PASS | | T.PASS | |
| | | D.LINK | D.LINK | | D.LINK | |
| | | SD | SD | | SD | |
| | | RD | RD | | RD | |
| | | ERR. * 2 | SW.E. M/S.E. PRM.E. CPU RW | | (SW.E.) * 1 (M/S.E.) * 1 (PRM.E.) * 1 CPU RW | |
| | | L ERR. * 2 | CRC OVER AB.IF TIME DATA UNDER LOOP | CRC OVER AB.IF TIME DATA UNDER | CRC OVER AB.IF TIME DATA UNDER F.E. (R.E.) * 1 | CRC OVER AB.IF TIME DATA UNDER |
| Network No. setting switch | | — * 3 | NETWORK NO. × 100, × 10, × 1 | | NETWORK NO. × 100, × 10, × 1 | |
| Group No. setting switch | | — * 3 | GROUP NO. | | GR.NO. | |
| Station number setting switch | | STATION NO. × 10, × 1 | STATION NO. × 10, × 1 | | ST NO. × 10, × 1 | |
| Mode setting switch | | MODE 0: Online * 3 (parameters are valid) 1: Self-loopback test 2: Internal self-loopback test 3: Hardware test 4: Online * 4 5: Self-loopback test * 4 6: Internal self-loopback test * 4 7: Hardware test * 4 8: and up: Use prohibited | MODE 0: Online 1: Use prohibited 2: Offline (disconnected) 3: Forward loop test 4: Reverse loop test 5: Station-to-station test (master station) 6: Station-to-station test (host) 7: Self-loopback test 8: Internal self-loopback test 9: Hardware test D: Network No. confirmation E: Group No. confirmation F: Station number confirmation | | MODE 0: Online 1: Use prohibited 2: Offline (disconnected) 3: Forward loop test 4: Reverse loop test 5: Station-to-station test (master station) 6: Station-to-station test (host) 7: Self-loopback test 8: Internal self-loopback test 9: Hardware test | |
| Display select switch | | — | — | | DISPLAY L ↔ R | |
| Condition setting switch | | — * 3 | SW1 : PC ↔ REMOTE SW2 : N.ST ↔ MNG SW3 : PRM ↔ D.PRM SW4,5 : STATION SIZE SW6,7 : LB/LW SIZE | | SW1 : PC ↔ REM SW2 : N.ST ↔ MNG SW3 : PRM D. ↔ PRM SW4,5 : STATION SIZE SW6,7 : LB/LW SIZE | |
| Applicable CPU | | QCPU | Q4ARCPU, QnACPU, Q2ASCPU | | Q2ASCPU | |
| Applicable base | | Q3 □ B, Q6 □ B | A3□B, A5□B, A6□B, A38HB, A37RHB, A3□RB, A68RB | | A1S3□B, A1S5□B, A1S6□B, A1S38HB | |
| External dimensions | | 98 (3.86) (H) × 27.4 (1.08) (W) × 90 (3.54) (D) [mm (inch)] | AJ71QLP21, AJ71QLP21G: 250 (9.84) (H) × 37.5 (1.48) (W) × 111 (4.37) (D) [mm (inch)] AJ71QBR11: 250 (9.84) (H) × 37.5 (1.48) (W) × 113 (4.45) (D) [mm (inch)] | | A1SJ71QLP21: 130 (5.12) (H) × 34.5 (1.36) (W) × 93.6 (3.69) (D) [mm (inch)] A1SJ71QBR11: 130 (5.12) (H) × 34.5 (1.36) (W) × 104.6 (4.12) (D) [mm (inch)] | |
| Weight | | 0.11kg | 0.45kg | | 0.3kg | |

* 1: The LED display is activated with the display selection switch.

* 2: The detailed contents of an error code can be checked by the network diagnostics.

* 3: Set with a network parameter.

* 4: Only possible with the QJ71LP21-25. Use with the QJ71LP21, QJ71LP21G and QJ71BR11 is prohibited.

Appendix 2.2 Precautions when replacing the AJ71QLP21/AJ71QLP21G/AJ71QBR11 and the A1SJ71QLP21/A1SJ71QBR11 with the QJ71LP21/QJ71LP21-25/QJ71LP21G/QJ71BR11

The following are the precautions when replacing the QnACPU MELSECNET/10 network system with the QCPU MELSECNET/H network system:

(1) Switch settings of the network module

The MELSECNET/H network module does not have a network number setting switch, a group number setting switch and a condition setting switch (default parameter setting). Thus, these switches must be set with the network parameters.

(2) Correcting the network parameters

The corrections as described in item (1) above are required for the network parameters.

In particular, when the default parameter is set in SW3 of the network module, there will be no parameter information about the network after converting from a QnA to a Q with GX Developer.

When the default parameter is used, make sure to set the network parameters with GX Developer after the conversion.

(3) Correcting the sequence programs

It is not necessary to fix the sequence programs, such as an interlock program that uses a link special relay (SB) or a link special register (SW) and a program for accessing other stations using the data link instructions.

- The operations of the link special relays and link special registers used in the MELSECNET/10 network are the same as those in the MELSECNET/H.
- The interlock link special relay is required to use data link instruction in the MELSECNET/10 network, but it is not required for the MELSECNET/H network. However, the sequence program will operate normally even if the interlock link special relay remains in the sequence program after conversion.

(4) Distance between optical fiber cable stations

The distance between stations will become shorter when overwriting network systems at a communication speed of 25Mbps depending on the optical fiber cable in use.

In this event, set the communication speed to 10Mbps, or rewire the system with different optical fiber cables.

Appendix 3 Link Special Relay (SB) List

The link special relay (SB) turns on/off by various factors that occur during data linking. Thus, by monitoring or using it in the sequence program, the abnormal status of the data link can be checked.

Moreover, the link special relay (SB) that stores the link status is used for the detailed information of the network diagnostics of GX Developer. For a list of the device numbers for each display item, refer to Section 8.1, "Network Diagnostics (Line Monitor)."

(1) Mounting multiple network modules

The link special relay (SB) of each network module is refreshed by the link special relay (SB) of the CPU module shown below when the refresh parameters of each network module remain default.

| Module installing position | Module 1 | Module 2 | Module 3 | Module 4 |
|----------------------------|----------------|----------------|----------------|----------------|
| Device number | SB0000 to 01FF | SB0200 to 03FF | SB0400 to 05FF | SB0600 to 07FF |

(2) Range turned ON/OFF by user and range turned ON/OFF by system

In the link special relay (SB), there are ranges the user can set on and off (SB0000 to SB001F) and ranges the system can set on and off (SB0020 to SB01FF). (When the module is installed in the position of Module 1.)

(3) Link special relay (SB) list

Assignments of SB0000 to SB01FF are shown in the special relay (SB) list.

| POINT |
|---|
| <p>(1) Do not turn ON the area of the No. which does not exist in the link special relay (SB) list. Turning ON the area of the number which does not exist in the list may cause malfunction of the programmable controller system.</p> <p>(2) For how to use link special relays (SB), refer to Section 6.4.</p> |

Table 3 Link special relay (SB) list

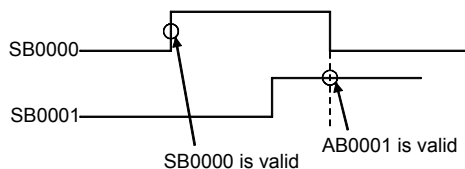
| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|--------------------------|---------------------------------|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 1 * 3 SB0000 (0) | Link startup (host) | Restarts the host's cyclic transmission. Off: Start not instructed On: Start instructed (valid at rise) * 2 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 1 * 3 SB0001 (1) | Link stop (host) | Stops the host's cyclic transmission. Off: Stop not instructed On: Stop instructed (valid at rise) * 2 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 1 * 3 SB0002 (2) | System link startup | Restarts the cyclic transmission according to the contents of SW0000 to SW0004. Off: Start not instructed On: Start instructed (valid at rise) * 2 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 1 * 3 SB0003 (3) | System link stop | Stops the cyclic transmission according to the contents of SW0000 to SW0004. Off: Stop not instructed On: Stop instructed (valid at rise) * 2 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0005 (5) | Clear retry count | Clears the retry count (SW00C8 to SW00C9) to 0. Off: Clear not instructed On: Clear instructed (valid when on) * 2 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 1 SB0006 (6) | Clear communication error count | Clears the communication error (SW00B8 to SW00C7) to 0. Off: Clear not instructed On: Clear instructed (valid when on) * 2 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

[Availability column] Optical: optical loop, Coaxial: coaxial bus

○: Available, ×: Not available

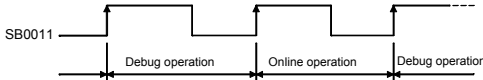
* 1: Used in the network tests of GX Developer.

* 2: SB0000 to SB0003 become valid when only one point turns on.



* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|---------------------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SB0007 (7) | Clear forward loop transmission errors | Clears the line abnormal detection (SW00CC) of the forward loop side to 0. Off: Clear not instructed On: Clear instructed (valid when on) | ○ | × | ○ | × | ○ | × | ○ | × |
| SB0008 (8) | Clear reverse loop transmission errors | Clears the line abnormal detection (SW00CD) of the reverse loop side to 0. Off: Clear not instructed On: Clear instructed (valid when on) | ○ | × | ○ | × | ○ | × | ○ | × |
| * 6 SB0009 (9) | Clear loop switch count | Clears the loop switch count (SW00CE to SW00E7) to 0. Off: Clear not instructed On: Clear instructed (valid when on) | ○ | × | ○ | × | ○ | × | ○ | × |
| SB000A (10) | Clear transient transmission errors | Clears the transient transmission errors (SW00EE, SW00EF) to 0. Off: Clear not instructed On: Clear instructed (valid when on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB000B (11) | Transient transmission error area setting | Designates whether to overwrite or retain the transient transmission errors (SW00F0 to SW00FF). Off: Overwrite On: Retain | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 * 4 SB000F (15) | Clear minor errors | Clears all of the minor errors detected by remote I/O stations. This is executed on all the remote I/O stations. While SB000F is ON, any minor error is not detected on all of the remote I/O stations. On multiplexed remote I/O networks or redundant multiplexed remote I/O networks, this can be operated only from the master station. Off: Clear not instructed On: Clear instructed (valid when on) | × | × | × | × | ○ | ○ | × | × |
| SB0011 (17) | Data link operation designation | Designates the data link operation. Off: No switch instruction On: Switch instruction (valid when on) When On is detected, data link switches from Online (normal data link) operation to Online (debug) operation, or from Online (debug) operation to Online (normal operation).  | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0014 (20) | Remote sub-master station switching command | Forcibly directs the remote sub-master station that is performing master operation to shift to sub-master operation. (It is invalid for the redundant system.) Off: Without directive On: With directive | × | × | × | × | ○ | ○ | × | × |
| SB0018 (24) | System switching monitoring time setting valid flag | Indicates whether the system switching monitoring time setting (SW0018) is valid or invalid in case of a data link error. Off: Invalid On: Valid (valid at the time of startup) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SB0020 (32) | Module status | Indicates the network module status. Off: Normal On: Abnormal | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SB0040 (64) | Network type (host) | Indicates the network type set with the parameters of the host's network module. Off: PLC to PLC network On: Remote I/O network | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0041 (65) | Host station's redundant function support information | Indicates the station supports the redundant function or not. Off: Redundant function not supported On: Redundant function supported | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0042 (66) | Power supply status of host | Indicates the external power supply status to the host's QJ71LP21S-25. (When using QJ71LP21-25, 0 is ON.) Off: Not supplied (EXT.PW LED is OFF.) On: Supplied (EXT.PW LED is ON.) | ○ | × | ○ | × | ○ | × | ○ | × |

* 6: The SB0009 should be kept on until the SW00CE becomes "0."

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|-----------------------|--|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SB0043 (67) | Online switch (host) | Indicates the mode set by the switch of the host's network module. Off: Online (mode setting is 0 or 4); "Parameter setting mode becomes valid" On: Other than online (mode setting is other than 0) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0044 (68) | Station setting (host) | When PLC to PLC network Indicates the station type set with the parameter of the host's network module. Off: Normal station On: Control station | ○ | ○ | ○ | ○ | × | × | × | × |
| | | When remote I/O network Indicates the station type set with the parameter of the host's network module. Off: Remote I/O station or multiplexed remote sub-master station On: Remote master station or multiplexed remote master station | × | × | × | × | ○ | ○ | ○ | ○ |
| SB0045 (69) | Setting information (host) | Indicates the switch setting information (including parameter settings) of the host's network module. Off: Normal On: Abnormal setting | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0046 (70) | Data link operation designation result (host) | Indicates the switch setting information (including parameter settings) of the host's network module. Off: Normal data linking On: Operating in debug mode | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0047 (71) | Baton pass status (host) | Indicates the host's baton pass status (transient transmission enabled). Off: Normal On: Abnormal When an error is identified, the cause of the error can be checked in Baton pass status (host) (SW0047) and Cause of baton pass interruption (SW0048). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0048 (72) | Control station status (host) | When PLC to PLC network Indicates the host's status. Off: Normal station On: Control station (SB0044 is on) Sub-control station (SB0044 is off) | ○ | ○ | ○ | ○ | × | × | × | × |
| | Remote master station status (host) | When remote I/O network Indicate the host status Off: Remote I/O station On: SB0044=On Remote master station or multiplexed remote master station SB0044=Off Remote I/O station or multiplexed remote sub-master station | × | × | × | × | ○ | ○ | ○ | ○ |
| SB0049 (73) | Host data link status | Indicates the host's data link operation status. Off: Normal On: Abnormal When an error is identified, the cause of the error can be checked in Cause of data link stop (SW0049). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 4 SB004A (74) | Host CPU status (1) | Indicates the host's CPU status. Off: Normal On: Minor error occurred | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| * 5 SB004B (75) | Host CPU status (2) | Indicates the host's CPU status. Off: Normal On: A serious or fatal error occurred | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| * 3 SB004C (76) | Cyclic transmission start acknowledgment status (host) | Indicates the startup acknowledgment status of the cyclic transmission. Off: Not acknowledged (SB0000 is off) On: Start acknowledged (SB0000 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB004D (77) | Cyclic transmission start completion status (host) | Indicates the completion status of the cyclic transmission. Off: Not completed (SB0000 is off) On: Start completed (SB0000 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

* 4: Minor errors are the type of errors that do not affect the CPU operation.

* 5: Serious errors are the type of errors that stop the CPU operation.

Fatal errors are also the type of errors that stop the CPU operation.

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|-----------------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 3 SB004E (78) | Cyclic transmission stop acknowledgment status (host) | Indicates the stop acknowledgment status of the cyclic transmission. Off: Not acknowledged (SB0001 is off) On: Stop acknowledged (SB0001 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB004F (79) | Cyclic transmission stop completion status (host) | Indicates the stop completion status of the cyclic transmission. Off: Not completed (SB0001 is off) On: Stop completed (SB0001 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0050 (80) | Cyclic transmission start acknowledgment status (system) | Indicates the startup acknowledgment status of the cyclic transmission. Off: Not acknowledged (SB0002 is off) On: Start acknowledged (SB0002 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0051 (81) | Cyclic transmission start completion status (system) | Indicates the completion status of the cyclic transmission. Off: Not completed (SB0002 is off) On: Start completed (SB0002 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0052 (82) | Cyclic transmission stop acknowledgment status (system) | Indicates the stop acknowledgment status of the cyclic transmission. Off: Not acknowledged (SB0003 is off) On: Stop acknowledged (SB0003 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0053 (83) | Cyclic transmission stop completion status (system) | Indicates the stop completion status of the cyclic transmission. Off: Not completed (SB0003 is off) On: Stop completed (SB0003 is on) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0054 (84) | Parameter receive status | Indicates the parameter receive status. Off: Receive completed On: Not received | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0055 (85) | Received parameter error | Indicates the status of the received parameters. Off: Parameters normal On: Parameters abnormal | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0056 (86) | Communication status | Indicates the status of the transient transmission Off: Transient transmission by the control station On: Transient transmission by the sub-control station | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0057 (87) | Parameter type | Indicates the parameter type. Off: MELSECNET/10 parameter On: MELSECNET/H parameter | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0058 (88) | Operation designation at fault of control station | On PLC to PLC network Indicates the setting of "With data link by sub control station when control station is down." Off: Cyclic transmission made by sub control station when control station fails. On: Cyclic transmission not made by sub control station when control station becomes faulty | ○ | ○ | ○ | ○ | × | × | × | × |
| | Operation designation at fault of (multiplexed) remote master station | On remote I/O network Indicates the status of designating cyclic transmission when the (multiplexed) remote master station fails. Off: Cyclic transmission made by multiplexed remote sub-master station when multiplexed remote master station fails (multiplexed remote I/O network) On: Cyclic transmission not made when remote master station fails (remote I/O network) | × | × | × | × | ○ | ○ | ○ | ○ |
| SB0059 (89) | Low-speed cyclic designation | Indicates whether or not there are any parameter settings for the low-speed cyclic transmission. Off: No settings On: Settings exist | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB005A (90) | Parameter type 2 | Indicates the parameter type of the control station. Off: MELSECNET/10 mode, MELSECNET/H mode On: MELSECNET/H Extended mode | ○ | ○ | ○ | ○ | × | × | × | × |
| SB005B (91) | END asynchronous settings | Indicates the END asynchronous settings status of the remote I/O network. Off: END asynchronous settings disabled On: END asynchronous settings enabled | × | × | × | × | ○ | ○ | × | × |
| SB005C (92) | I/O master station (Block 1) | Indicates the I/O master station setting (Common parameter setting) of block 1. (Valid when SB0049 is OFF) Off: No setting On: Setting exists. (Station No. is stored in SW005C.) | ○ | ○ | ○ | ○ | × | × | × | × |

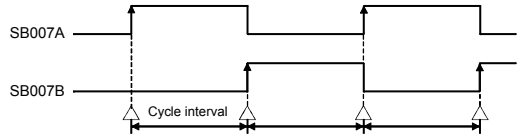
* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|------------------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SB005D (93) | I/O master station (Block 2) | Indicates the I/O master station setting (Common parameter setting) of block 2. (Valid when SB0049 is OFF) Off: No setting On: Setting exists. (Station No. is stored in SW005D.) | ○ | ○ | ○ | ○ | × | × | × | × |
| SB0064 (100) | Reserved station designation | Indicates whether or not the station is reserved. (Valid when the SB0049 is off.) Off: No reserved station On: Reserved station exists Turns off when the SW0064 to SW0067 are all "0." | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0068 (104) | Communication mode | Indicates the link scan mode (status of supplementary settings of the common parameters). (Valid when the SB0049 is off.) Off: Normal mode On: Constant scan mode | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB0069 (105) | Multiplex transmission designation | Indicates the transmission designation status (status of supplementary settings of the common parameters). (Valid when the SB0049 is off.) Off: Normal transmission designation On: Multiplex transmission designation | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SB006A (106) | Multiplex transmission status | Indicates the transmission status. Off: Normal transmission On: Multiplex transmission In the case of multiplex transmission, the status of each station can be checked in Multiplex transmission status (1) (SW00B0 to SW00B3) and (2) (SW00B4 to SW00B7). | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SB006B (107) | Multiplex remote function designation | Indicates the status of designating the multiplex remote function. Off: Not designated. On: Designated. | × | × | × | × | ○ | ○ | ○ | ○ |
| * 3 SB0070 (112) | Baton pass status of each station | Indicates the baton pass status of each station. (Not applicable to reserved stations and the station with the maximum station number or higher) 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 (SW0070 to SW0073). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0071 (113) | Baton pass status of the remote master station | Indicates the baton pass status of the master station. (Including when there is an online loop test.) Off: Master station baton pass normal. On: Master station baton pass error. | × | × | × | × | ○ | ○ | ○ | ○ |
| * 3 SB0072 (114) | Remote sub-master station transient transmission status | Indicates the transient transmission status of the remote sub-master station. Off: Normal On: Abnormal | × | × | × | × | ○ | ○ | ○ | ○ |
| * 3 SB0074 (116) | Cyclic transmission status of each station | Indicates the cyclic transmission status of each station. (Not applicable to reserved stations and the station with the maximum station number or higher) Off: All stations are executing data linking On: Stations that are not executing data linking exist When any non-executing station exists, each station status can be checked in Cyclic transmission status of each station (SW0074 to SW0077). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB0075 (117) | Cyclic transmission status of the remote master station | Indicates the master station cyclic transmission status. (Includes online loop test.) Off: Master station cyclic transmission normal. On: Master station cyclic transmission error. | × | × | × | × | ○ | ○ | ○ | ○ |
| * 3 SB0076 (118) | Remote sub-master station cyclic transmission status | Indicates the cyclic transmission status of the remote sub-master station. (Including the status at an online loop test) Off: Cyclic transmission normal On: Cyclic transmission abnormal | × | × | × | × | ○ | ○ | ○ | ○ |

* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|----------------------------|--|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 3 SB0077 (119) | Remote master station cyclic transmission control status | Indicates the station type that is controlling cyclic transmission at the remote I/O stations. Off: Remote master station On: Remote sub-master station | × | × | × | × | ○ | ○ | ○ | ○ |
| * 3 SB0078 (120) | Parameter communication status of each station | Indicates the parameter transmission status of each station. (Not applicable to reserved stations and the station with the maximum station number or higher) Off: Executing communication other than parameter communication On: Executing parameter communication Stations that are communicating parameters can be checked in Parameter communication status of each station (SW0078 to SW007B). | ○ | ○ | × | × | ○ | ○ | × | × |
| * 3 SB007A (122) | Low-speed cyclic communication status | Indicates the low-speed cycle communication status. It is indicated to have transmitted by turning the bit on for either the SB007A or SB007B.  | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB007B (123) | | | | | | | | | | |
| * 3 SB007C (124) | Parameter status of each station | Indicates the parameter status of each station. (Not applicable to reserved stations and the station with the maximum station number and higher) Off: No station detected parameter errors On: A station detected parameter errors Stations that have parameter errors can be checked in Parameter error status of each station (SW007C to SW007F). | ○ | ○ | × | × | ○ | ○ | × | × |
| * 3 * 5 SB0080 (128) | CPU operation status of each station (1) | Indicates the operation status of each station's CPU on the PLC-to-PLC network (including the host station). Off: All stations normal On: A moderate or serious error identified If a moderate or serious error is identified, the status of each station can be checked in CPU operation status of each station (1) (SW0080 to SW0083). | ○ | ○ | ○ | ○ | × | × | × | × |
| | | Indicates the operation status of each remote I/O station on the remote I/O network (including the host station). Off: All stations normal On: Error station identified If any error station is identified, the status of each station can be checked in CPU operation status of each station (1) (SW0080 to SW0083). | × | × | × | × | ○ | ○ | ○ | ○ |
| * 3 SB0084 (132) | CPU RUN status of each station | Indicates the CPU RUN status of each station. Off: All stations are in the RUN or STEP RUN status On: Stations in the STOP or PAUSE status exist (including the host) When some stations are in the STOP or PAUSE status, each station status can be checked in CPU RUN status of each station (SW0084 to SW0087). | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB0085 (133) | CPU RUN status of the remote master station | Indicates the CPU run status of remote master station. Off: Run or STEP RUN status On: STOP or PAUSE status | × | × | × | × | ○ | ○ | ○ | ○ |

* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

* 5: Serious errors are the type of errors that stop the CPU operation.

Fatal errors are also the type of errors that stop the CPU operation.

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|----------------------------|--|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 3 SB0086 (134) | Remote sub-master station CPU RUN status | Indicates the CPU status of the multiplexed remote sub-master station. Off: RUN or STEP RUN status On: STOP or PAUSE status | × | × | × | × | ○ | ○ | ○ | ○ |
| * 3 * 4 SB0088 (136) | CPU operation status of each station (2) | Indicates the operation status of each station's CPU or of each remote I/O station (including the host station). Off: All stations normal On: Stations with minor errors exist If any station with a minor error exists, the status of each station can be checked in CPU operation status of each station (2) (SW0088 to SW008B). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB008C (140) | External power supply information | Indicates the information of the external power supply (including the host). Off: All stations are without external power supply On: Stations with external power supply exist When any station with external power supply exists, the status of each station can be checked in Power supply status of each station (SW008C to SW008F). | ○ | × | ○ | × | × | × | × | × |
| * 3 SB008D (141) | Module type of each station | Indicates the module type of each station. Off: All stations are NET/10 type modules On: NET/10H type modules exist | ○ | ○ | ○ | ○ | × | × | × | × |
| SB0090 (144) | Host loop status | Indicates the host's loop status. Off: Normal On: Abnormal When an error is identified, the error details can be checked by Loopback information (SW0090). | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SB0091 (145) | Forward loop status | Indicates the status of stations connected to the forward loop. Off: All stations normal On: Faulty station exists When any faulty station exists, the status of each station can be checked in Forward loop status of each station (SW0091 to SW0094). | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SB0092 (146) | Forward loop status of remort master station | Indicates the forward loop status of the remort master station. Off: Normal On: Error | × | × | × | × | × | × | ○ | × |
| * 3 SB0095 (149) | Reverse loop status | Indicates the status of stations connected to the reverse loop. Off: All stations normal On: Faulty station exists When any faulty station exists, the status of each station can be checked in Reverse loop status of each station (SW0095 to SW0098). | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SB0096 (150) | Reverse loop status of remort master station | Indicates the reverse loop status of the remort master station. Off: Normal On: Error | × | × | × | × | × | × | ○ | × |
| * 3 SB0099 (153) | Forward loop loopback | Indicates the loopback status of the forward loop while the system is operating. Off: Not executed On: Executing stations exist (Executing stations are stored in the SW0099) | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SB009A (154) | Reverse loop loopback | Indicates the loopback status of the reverse loop while the system is operating. Off: Not executed On: Executing stations exist (Executing stations are stored in the SW009A) | ○ | × | ○ | × | ○ | × | ○ | × |

* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

* 4: Minor errors are the type of errors that do not affect the CPU operation.

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|------------------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 3 SB009C (156) | Send transmission path mismatch status | Indicates the status of the transmission path used for sending by other stations. Off: All matched On: Mismatching stations exist | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB00A0 (160) | RECV instruction execution request flag (1) | Stores the data reception status of channel 1 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB00A1 (161) | RECV instruction execution request flag (2) | Stores the data reception status of channel 2 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB00A2 (162) | RECV instruction execution request flag (3) | Stores the data reception status of channel 3 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB00A3 (163) | RECV instruction execution request flag (4) | Stores the data reception status of channel 4 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB00A4 (164) | RECV instruction execution request flag (5) | Stores the data reception status of channel 5 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB00A5 (165) | RECV instruction execution request flag (6) | Stores the data reception status of channel 6 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB00A6 (166) | RECV instruction execution request flag (7) | Stores the data reception status of channel 7 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB00A7 (167) | RECV instruction execution request flag (8) | Stores the data reception status of channel 8 of the host station. Off: No data reception On: Data received | ○ | ○ | ○ | ○ | × | × | × | × |
| SB00A8 (168) | Online test instruction | Indicates the online test instruction status. Off: Not instructed On: Instructed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB00A9 (169) | Online test completion | Indicates the online test completion status. Off: Not completed On: Completed If "Completed" is indicated, the online test information can be obtained in Online test execution item/faulty station (requesting side) (SW00A8) and Online test result (requesting side) (SW00A9). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB00AA (170) | Online test response instruction | Indicates the online test response status. Off: No response On: Responded | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB00AB (171) | Online test response completion | Indicates the online test response completion status. Off: Response not completed On: Response completed If "Response completed" is indicated, the online test information can be obtained in Online test execution item/faulty station (responding side) (SW00AA) and Online test result (responding side) (SW00AB). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB00AC (172) | Offline test instruction | Indicates the offline test instruction status. Off: Not instructed On: Instructed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB00AD (173) | Offline test completion | Indicates the offline test completion status. Off: Not completed On: Completed If "Completed" is indicated, the offline test information can be obtained in Offline test execution item/faulty station (requesting side) (SW00AC) and Offline test result (requesting side) (SW00AD). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB00AE (174) | Offline test response | Indicates the response status for offline test. Off: No response On: Response | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 3 Link special relay (SB) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|------------------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SB00AF (175) | Offline test response completion | Indicates the response status for offline test end. Off: Response not completed On: Response completed If "Response completed" is indicated, the offline test information can be obtained in Offline test execution item (responding side) (SW00AE) and Offline test result (responding side) (SW00AF). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SB00EE (238) | Transient error | Indicates the transient transmission error status. Off: No error On: Errors exist | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SB01C4 (452) | Remote sub-master station switching acceptance status | Indicates the status of accepting the directive to shift from master operation to sub-master operation. Off: Without acceptance On: With acceptance | × | × | × | × | ○ | ○ | × | × |
| * 3 SB01C5 (453) | Remote sub-master station switching status | Indicates the operation status of a shift from master operation to sub-master operation. Off: Without shift On: Shift completion | × | × | × | × | ○ | ○ | × | × |
| * 3 SB01C8 (456) | Send/receive device number valid/invalid status | Indicates whether the send/receive device numbers (SW01C8 to SW01CF) of the remote master station or remote sub-master station are valid or invalid. Off: Invalid On: Valid | × | × | × | × | ○ | ○ | × | × |
| * 3 SB01E0 (480) | Network type consistency check | Indicates whether there is a mismatch between the network types of the control station and normal stations on the network. • When the control station is in the MELSECNET/H Extended mode Off: All normal stations are set to the MELSECNET/H Extended mode. On: There is a normal station set to the MELSECNET/H mode or MELSECNET/10 mode. • When the control station is in the MELSECNET/H mode or MELSECNET/10 mode Off: All normal stations are set to the MELSECNET/H mode or MELSECNET/10 mode. On: There is a normal station set to the MELSECNET/H Extended mode. | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB01F4 (500) | Redundant system status (1) | Indicates the operation mode of each station's CPU. Off: CPUs of all stations in backup mode On: Separate mode (excluding reserved stations and stations of the number exceeding the maximum) This relay turns off when all of SW01F4 to SW01F7 are "0." | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB01F8 (504) | Redundant system status (2) | Indicates the pairing setting status of each station. Off: No pairing setting On: Pairing set station exists (excluding stations after the maximum station number) This relay turns off when all of SW01F8 to SW01FB are "0." | ○ | ○ | ○ | ○ | × | × | × | × |
| * 3 SB01FC (508) | Redundant system status (3) | Indicates the operation status of each station's CPU (control system/standby system). Off: Control system CPUs on all stations On: Standby system CPU exists (excluding reserved stations and stations after the maximum station number) This relay turns off when all of SW01FC to SW01FF are "0." | ○ | ○ | ○ | ○ | × | × | × | × |

* 3: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Appendix 4 Link Special Register (SW) List

In the link special register (SW), the data linking information is stored as numeric values. Thus, faulty areas and causes of errors can be checked using or monitoring the link special registers in the sequence programs.

Moreover, the link special register (SW) that stores the link status is used for the detailed information of the network diagnostics of GX Developer. For a list of the device numbers for each display item, refer to Section 8.1, "Network Diagnostics (Line Monitor)."

(1) Mounting multiple network modules

The link special register (SW) of each network module is refreshed by the link special register (SW) of the CPU module shown below when the refresh parameters of each network module remain default.

| Module installing position | Module 1 | Module 2 | Module 3 | Module 4 |
|----------------------------|----------------|----------------|----------------|----------------|
| Device number | SW0000 to 01FF | SW0200 to 03FF | SW0400 to 05FF | SW0600 to 07FF |

(2) Range turned ON/OFF by user and range turned ON/OFF by system

The link special register (SW) has the user setting area range (SW0000 to SW001F) and the system setting area range (SW0020 to SW01FF). (When the module is installed in the position of Module 1)

(3) Link special register (SW) list

Assignments of SW0000 to SW01FF are shown in the special register (SW) list.

| POINT |
|--|
| <p>(1) Do not write data to the area of the No. which does not exist in the link special register (SW) list. Writing data to the area of the No. which does not exist in the list may cause malfunction of the programmable controller system.</p> <p>(2) For how to use link special register (SW), refer to Section 6.4.</p> |

Table 4 Link special register (SW) list

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 1 SW0000 (0) | Link stop/startup direction content | Sets the station that stops/restarts data linking. 00 _H : Host 01 _H : All stations 02 _H : Designated station 80 _H : Host (forced stop/restart) 81 _H : All stations (forced stop/restart) 82 _H : Designated station (forced stop/restart) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 1 SW0001 (1)/ SW0002 (2)/ SW0003 (3)/ SW0004 (4) | | Sets whether the designated station should execute data linking. (When the SW0000 is 02 _H or 82 _H .) Sets the bits to 1 for stations whose data linking is stopped/restarted. 0: Invalid data linking stop/restart instruction 1: Valid data linking stop/restart instruction <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0001</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</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>to</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>to</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>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> <p>The numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0001 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0002 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0003 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0004 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0001 | | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0002 | | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0003 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0004 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0008 (8) | Logical channel setting (channel 1) | Sets the logical channel number for physical channel number 1. (Valid only for channels on the receiving side) 0 : Logical channel number 1 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0009 (9) | Logical channel setting (channel 2) | Sets the logical channel number for physical channel number 2. (Valid only for channels on the receiving side) 0 : Logical channel number 2 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW000A (10) | Logical channel setting (channel 3) | Sets the logical channel number for physical channel number 3. (Valid only for channels on the receiving side) 0 : Logical channel number 3 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[Availability column] Optical: optical loop, Coaxial: coaxial bus

○: Available, ×: Not available

* 1: Used in the network test of GX Developer.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|-----------------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SW000B (11) | Logical channel setting (channel 4) | Sets the logical channel number for physical channel number 4. (Valid only for channels on the receiving side) 0 : Logical channel number 4 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × |
| SW000C (12) | Logical channel setting (channel 5) | Sets the logical channel number for physical channel number 5. (Valid only for channels on the receiving side) 0 : Logical channel number 5 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × |
| SW000D (13) | Logical channel setting (channel 6) | Sets the logical channel number for physical channel number 6. (Valid only for channels on the receiving side) 0 : Logical channel number 6 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × |
| SW000E (14) | Logical channel setting (channel 7) | Sets the logical channel number for physical channel number 7. (Valid only for channels on the receiving side) 0 : Logical channel number 7 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × |
| SW000F (15) | Logical channel setting (channel 8) | Sets the logical channel number for physical channel number 8. (Valid only for channels on the receiving side) 0 : Logical channel number 8 (default) 1 to 64 : Other logical channel number is set. | ○ | ○ | ○ | ○ | × | × | × | × |
| SW0018 (24) | System switching monitoring time setting | Set the time from the occurrence of a data link error to the recognition of data link stop in the redundant system. 0 : 2 seconds (default) 1 to 500 : Units of 10 ms (Units of 10 ms for 10 ms to 5 seconds) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| * 2 SW001C (28) | Number of retries | Indicates the change of the number of retries for the time of the issue of a request in send and receive instructions. 0 : 7 times (default) 1 to 7 : Setting exists | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| * 2 SW001D (29) | Retry interval | Indicates the change of the retry interval for the time of the issue of a request in send and receive instructions. 0 : 100 ms (default) 1 to FE _H : Setting exists (unit: ms) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| * 2 SW001E (30) | Number of gates | Indicates the change of the number of gates for the time of the issue of a request in send and receive instructions. 0 : 7 (default) 1 to EF _H : Setting exists | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW0020 (32) | Module status | Stores the status of the network module. 0 : Normal Other than 0 : Abnormal (see the error codes in Section 8.3) FF _H : Module error | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW0031 (49) | ZNRD instruction processing result | Indicates the processing result of the ZNRD instruction. 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | × | × | × | × |
| | Send/receive instruction (1) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 1 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 4 Link special Register (SW) List (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|----------------|--|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SW0033 (51) | ZNWR instruction processing result | Indicates the processing result of the ZNWR instruction. 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | × | × | × | × |
| | Send/receive instruction (2) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 2 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW0035 (53) | Send/receive instruction (3) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 3 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW0037 (55) | Send/receive instruction (4) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 4 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW0039 (57) | Send/receive instruction (5) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 5 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW003B (59) | Send/receive instruction (6) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 6 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW003D (61) | Send/receive instruction (7) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 7 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW003F (63) | Send/receive instruction (8) processing result | Indicates the processing results of the SEND/RECV/READ/ WRITE/REQ/RECVS/RRUN/RSTOP/RTMRD/RTMWR/REMFR/ REMTO instructions (when physical channel 8 is used). 0 : Normal completion Other than 0 : Abnormal completion (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| SW0040 (64) | Network No. | Stores the network number of the host. Range: 1 to 239 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW0041 (65) | Group No. | Stores the group number of the host. 0 : No group designation 1 to 32 : Group No. | ○ | ○ | ○ | ○ | × | × | × | × |
| SW0042 (66) | Station No. | Stores the station No. of host station. 1 to 64 : Station No. 7D _H : Remote master station | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW0043 (67) | Mode status | Stores the mode status of the host. 0 : Online 2 : Offline 3 or more : Applicable test | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|----------------|----------------------------------|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SW0044 (68) | Station setting | <p>On inter-PLC network: Stores the condition setting switch status of the host.</p> <p>0: Off 1: On</p> <p>b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 to b2 b1 b0</p> <p>SW0044 0 0 0 0 0 0 0 0 to 0 0</p> <p>Network type (0: PLC to PLC network)</p> <p>Station type (0: Normal station, 1: Control station)</p> <p>Control station operation (0: Switch to designated control station, 1: Keep current control station)</p> <p>Operation mode (0: Online mode, 1: Debug mode)</p> <p>Host station network type (0: MELSECNET/H mode, MELSECNET/10 mode, 1: MELSECNET/H Extended mode)</p> | ○ | ○ | ○ | ○ | × | × | × | × |
| | | <p>On remote I/O network: Stores the condition setting switch status of the host.</p> <p>0: Off 1: On</p> <p>b15 to b10 b9 b8 b7 b6 to b2 b1 b0</p> <p>SW0044 0 to 0 0 0 0 to 0 1</p> <p>Network type (1: Remote I/O network)</p> <p>Station type (0: Multiplexed remote sub-master station, remote I/O station 1: Multiplexed remote master station)</p> <p>Return mode (0: Master station returns as master operating station (control station). 1: Master station returns as sub-master operating station (standby station).)</p> <p>Parameter status (0: Without parameters for remote sub-master station 1: With parameters for master station and sub-master station)</p> | × | × | × | × | ○ | ○ | ○ | ○ |
| SW0046 (70) | Module type | <p>Stores the network module type of the host.</p> <p>b15 b14 b13 to b2 b1 b0</p> <p>SW0046 0 to 0 1</p> <p>01: Optical 10: Coaxial 11: Twisted</p> <p>0: Duplex 1: Single</p> <p>0: Loop 1: Bus</p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW0047 (71) | Baton pass status (host) | <p>Stores the baton pass status of the host.</p> <p>00H: Executing data linking 01H: Data linking stopped (instructed by other station) 02H: Data linking stopped (instructed by host) 03H: Executing baton pass (parameter received (no transmission area in the host)) 04H: Executing baton pass (parameter error) 05H: Executing baton pass (parameter not received) 06H: Being disconnected (no baton pass) 07H: Being disconnected (line error) 11H: Loop test 12H: Setup confirmation test 13H: Station order check test 14H: Communication test 1FH: Offline test</p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW0048 (72) | Cause of baton pass interruption | <p>Stores the cause of baton pass interruption of the host.</p> <p>0 : Normal communication 1 : Offline 2 : Offline test 3 or more : Cause of interruption (see the error codes in Section 8.3)</p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW0049 (73) | Cause of data link stop | <p>Stores the cause of data linking stop of the host.</p> <p>0: Normal 1: Stop instructed 2: No common parameters 3: Common parameter error 4: Host CPU error 6: Communication aborted</p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | |
|-----------------------|---|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | |
| * 2 SW004A (74) | Data linking stop request station | Stores the station that stopped the host data linking. (Valid when the SW0049 is 1.) <div><div>b15 b14 to b7 b6 b5 b4 b3 b2 b1 b0</div><div>SW004A<div><div>0 to 0</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div><div>0: Host 1 to 64: Station number 0: Station number designated 1: All stations designated</div> b0 to b6 store 7D_H if a data link stop request is received from the remote master station/multiplexed remote master station.</div> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 2 SW004B (75) | Host CPU status | Indicates the CPU status of the host. 0 : Normal Other than 0 : Abnormal (For the error codes, refer to Section 8.3 or the "Error Code" chapter of QCPU User's Manual (Hardware Design, Maintenance and Inspection).) | ○ | ○ | ○ | ○ | ○ | ○ | × | × | |
| * 2 SW004D (77) | Data linking start status (host) | Stores the result of starting cyclic transmission with Link startup (host) (SB0000). 0 : Normal Other than 0 : Abnormal (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| * 2 SW004F (79) | Data linking stop status (host) | Stores the result of stopping cyclic transmission with Link stop (host) (SB0001). 0 : Normal Other than 0 : Abnormal (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| * 2 SW0051 (81) | Data linking start status (entire system) | Stores the result of starting cyclic transmission with System link startup (SB0002). 0 : Normal Other than 0 : Abnormal (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| * 2 SW0053 (83) | Data linking stop status (entire system) | Stores the result of stopping cyclic transmission with System link stop (SB0003). 0 : Normal Other than 0 : Abnormal (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| SW0054 (84) | Parameter information | At the PLC to PLC network. Stores the parameter information. (When the SB0054 and SB0055 are off.) <div><div>b15 b14 to b2 b1 b0</div><div><div>0 to 0</div><div></div><div></div><div></div><div></div></div></div> <div>└ MELSECNET/H Type 0: Not designated 00: Use only common parameters 1: Designated 01: Common parameters + station specific parameters 10: Use only default parameters 11: Default parameters + station specific parameters</div> (When the SB0055 is on.) <div><div>b15 b4 b3 b2 b1 b0</div><div><div>0 to 0</div><div>0</div><div>1</div><div>1</div><div>1</div><div>1</div></div></div> <div>= 0F_H: Parameter error Check the error code in the SW0055.</div> When remote I/O net Stores the parameter information. (When the SB0054 and SB0055 are off.) <div><div>b15 to b3 b2 b1 b0</div><div><div>0 to 0</div><div>0</div><div>0</div><div>0</div></div></div> <div>└ Intelligent function module parameter 0: No 1: Yes</div> | ○ | ○ | ○ | ○ | × | × | × | × | |
| | | | × | × | × | × | × | × | ○ | ○ | |

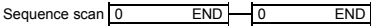


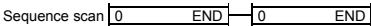


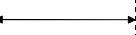
* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------------------------|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0055 (85) | Parameter setting status | At the PLC to PLC network. Stores the status of the parameters. 0 : Normal parameter 1 or more : Abnormal parameter (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0056 (86) | Current control station | At the PLC to PLC network. Stores the number of the station that actually operates as the control station (including a sub-control station). Range: 1 to 64 | ○ | ○ | ○ | ○ | × | × | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Current remote master station | When remote I/O network Stores the station number controlling the current baton pass. 7DH : Remote master station or multiplexed remote master station 1 to 64 : Multiplexed remote sub-master station | × | × | × | × | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0057 (87) | Designated control station | At the PLC to PLC network. Stores the number of the station that is set as the control station. Range: 1 to 64 0: Designated control station error | ○ | ○ | ○ | ○ | × | × | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Designated remote master station | When remote I/O network. 7DH : Remote master station Other than 7DH : Remote master station error. | × | × | × | × | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0059 (89) | Total number of link stations | Stores the total number of link stations that is set with the parameters. Range: 1 to 64 (64 when there is no parameter.) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW005A (90) | Maximum baton pass station | Stores the maximum station number among the stations executing the baton pass. Range: 1 to 64 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW005B (91) | Maximum cyclic transmission station | Stores the maximum station number among the stations executing the cyclic transmission. Range: 1 to 64 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW005C (92) | I/O master station (block 1) | Stores the station number of the I/O master station of block 1 with PLC to PLC network. 0 : None 1 to 64 : Station number Valid when the SB0049 is off. | ○ | ○ | ○ | ○ | × | × | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW005D (93) | I/O master station (block 2) | Stores the station number of the I/O master station of block 2 with PLC to PLC network. 0 : None 1 to 64 : Station number Valid when the SB0049 is off. | ○ | ○ | ○ | ○ | × | × | × | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0064 (100)/ SW0065 (101)/ SW0066 (102)/ SW0067 (103) | Reserved station designation | Stores the stations that are set as reserved stations. 0: Other than reserved station 1: Reserved station Valid when the SB0049 is off. <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW0064</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW0065</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW0066</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW0067</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0064 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0065 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0066 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0067 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0064 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0065 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0066 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0067 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0068 (104) | Communication mode | Stores the status of the constant link scan settings. 0 : No storage 1 to 500 : Setting time (ms) Valid when the SB0049 is off. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------------------------------|--|--------------------------|-----------------------|-----------------------|-----------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW006B (107) | Maximum link scan time | Stores the maximum/minimum/current values of the link scan time (unit (ms)). The values for the control station and normal stations vary. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW006C (108) | Minimum link scan time | | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW006D (109) | Current link scan time | | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>(PLC to PLC network)</p> <p>Sequence scan </p> <p>Link scan </p> <p>Control station/normal station </p> <p>When the constant scan is set, the values are as follows:</p> <p>Control station</p> <p>(Setting value) < { Measured link scan value + KB of the link scan time equation } → Measured link scan value + KB of the link scan time equation</p> <p>(Setting value) > { Measured link scan value + KB of the link scan time equation } → Measured link scan value</p> <p>Normal station → Constant link scan that has been set.</p> <p>(Remote I/O network)</p> <p>Sequence scan </p> <p>Link scan </p> <p>Remote master station </p> <p>Remote I/O station </p> | | | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW006E (110) | Low-speed cyclic scan time | Stores the number of link scans in the send interval of the low-speed cyclic transmission. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0070 (112)/ SW0071 (113)/ SW0072 (114)/ SW0073 (115) | Baton pass status of each station | Stores the baton pass status of each station (including the host). <Online> 0: Normal (including the stations with the maximum station number and smaller numbers as well as reserved stations) 1: Abnormal <Offline test> 0: Normal 1: Abnormal (including the stations with the maximum station number and smaller numbers as well as reserved stations) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0070</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0071</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0072</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0073</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0070 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0071 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0072 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0073 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0070 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0071 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0072 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0073 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0074 (116)/ SW0075 (117)/ SW0076 (118)/ SW0077 (119) | Cyclic transmission status of each station | <p>Stores the cyclic transmission status of each station (including the host).</p> <p>0: Executing cyclic transmission (including the station with the maximum station number and smaller number as well as reserved stations)</p> <p>1: Cyclic transmission not executed</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW0074</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW0075</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW0076</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW0077</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> <p>If a CPU module installed together with QJ71LP21S-25 is turned OFF, detection of a data link error may take more time than usual.</p> <p>For immediate detection of a data link error, program an interlock using the link relay (LB) in each station's send range. (Refer to Section 6.2.3)</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0074 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0075 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0076 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0077 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0074 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0075 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0076 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0077 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0078 (120)/ SW0079 (121)/ SW007A (122)/ SW007B (123) | Parameter communication status of each station | <p>Stores the parameter communication status of each station.</p> <p>0: Executing communication other than parameter communication (including the stations with the maximum station number and smaller numbers as well as reserved stations)</p> <p>1: Executing parameter communication</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW0078</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW0079</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW007A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW007B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0078 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0079 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW007A | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW007B | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | × | × | ○ | ○ | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0078 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0079 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW007A | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW007B | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW007C (124)/ SW007D (125)/ SW007E (126)/ SW007F (127) | Parameter error status of each station | <p>Stores the parameter status of each station</p> <p>0: Normal parameter (including the maximum station number and smaller numbers as well as reserved stations)</p> <p>1: Abnormal parameter</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW007C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW007D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW007E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW007F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW007C | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW007D | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW007E | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW007F | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | × | × | ○ | ○ | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW007C | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW007D | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW007E | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW007F | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 * 11 SW0080 (128)/ SW0081 (129)/ SW0082 (130)/ SW0083 (131) | CPU operation status of each station (1) | <p>Stores each station's CPU status (including the host). Valid only for stations registered as normal in the SW0070 to SW0073.</p> <p>0: Normal (including the stations with the maximum station number and smaller numbers as well as reserved stations) 1: Serious/fatal error</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW0080</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW0081</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW0082</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW0083</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0080 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0081 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0082 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0083 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0080 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0081 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0082 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0083 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0084 (132)/ SW0085 (133)/ SW0086 (134)/ SW0087 (135) | CPU RUN status of each station | <p>Stores the CPU RUN status of each station (including the host). The standby-system Q4ARCPU stores the key switch status at normal state. Valid only for stations registered as normal in the SW0070 to SW0073.</p> <p>0: RUN or STEP RUN (including the stations with the maximum station number and smaller numbers as well as reserved stations) 1: STOP, PAUSE, ERROR</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW0084</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW0085</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW0086</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW0087</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0084 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0085 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0086 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0087 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0084 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0085 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0086 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0087 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 * 10 SW0088 (136)/ SW0089 (137)/ SW008A (138)/ SW008B (139) | CPU operation status of each station (2) | <p>Stores each station's CPU status (including the host). Valid only for stations registered as normal in the SW0070 to SW0073.</p> <p>0: Normal (including the stations with the maximum station number and smaller numbers as well as reserved stations) 1: Minor error</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0088 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0089 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW008A | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW008B | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0088 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0089 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW008A | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW008B | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

* 10: Minor errors are the type of errors that do not affect the CPU operation.

* 11: Serious errors are the type of errors that stop the CPU operation.

Fatal errors are also the type of errors that stop the CPU operation.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------------------------|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW008C (140)/ SW008D (141)/ SW008E (142)/ SW008F (143)/ | Power supply status of each station | <p>Indicates whether external power supply is available to each station (For QJ71LP21-25, 0 is ON.)</p> <p>Valid only for stations registered as normal in the SW0070 to SW0073.</p> <p>0: Without external power supply (Including stations reserved or numbered greater than the maximum)</p> <p>1: With external power supply</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW008C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW008D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW008E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW008F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW008C | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW008D | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW008E | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW008F | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | × | ○ | × | ○ | × | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW008C | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW008D | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW008E | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW008F | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0090 (144) | Loopback information | <p>Stores the loop status of the host.</p> <p>0: Loop normal</p> <p>1: Forward loop error</p> <p>2: Reverse loop error</p> <p>3: Loopback</p> <p>4: Data linking disabled</p> | ○ | × | ○ | × | ○ | × | ○ | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0091 (145)/ SW0092 (146)/ SW0093 (147)/ SW0094 (148) | Forward loop status of each station | <p>Stores the forward loop status of each station (including the host).</p> <p>0: Normal (including the station with the maximum station number and smaller stations as well as reserved stations)</p> <p>1: Abnormal</p> <p>Disconnected station remains in the status when it was disconnected.</p> <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW0091</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW0092</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW0093</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW0094</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0091 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0092 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0093 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0094 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | × | ○ | × | ○ | × | ○ | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0091 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0092 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0093 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0094 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|----|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0095 (149)/ SW0096 (150)/ SW0097 (151)/ SW0098 (152) | Reverse loop status of each station | Stores the reverse loop status of each station (including the host). 0: Normal (including the stations with the maximum station number and smaller numbers as well as reserved stations) 1: Abnormal Disconnected station remains in the status when it was disconnected. <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0095</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0096</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0097</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0098</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> Numbers 1 to 64 in the above table indicate the station numbers. | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW0095 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW0096 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW0097 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW0098 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | × | ○ | × | ○ | × | ○ | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0095 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0096 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0097 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW0098 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW0099 (153) | Loopback station (forward loop side) | Stores the number of stations executing the loopback on the forward loop side. 1 to 64 : Station No. 7DH : Remote master station | ○ | × | ○ | × | ○ | × | ○ | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW009A (154) | Loopback station (reverse loop side) | Stores the number of stations executing the loopback on the reverse loop side. 1 to 64 : Station No. 7DH : Remote master station | ○ | × | ○ | × | ○ | × | ○ | × | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW009C (156)/ SW009D (157)/ SW009E (158)/ SW009F (159) | Loop usage status of each station | Stores the loop usage status during transmission at each station, separately for each of the forward and reverse loops. 0: Using the forward loop side (including the stations with the maximum station number and smaller numbers as well as reserved stations) 1: Using the reverse loop side <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW009C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW009D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> Numbers 1 to 64 in the above table indicate the station numbers. | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW009C | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW009D | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW009E | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW009F | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | × | ○ | × | ○ | × | ○ | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW009C | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW009D | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW009E | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW009F | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00A8 (168) | Online test execution item/faulty station (requesting side) | Stores both the online test item requested by the requesting station and the faulty station. (Valid when the SB00A9 is on.) Stations disconnected from the network are not included among the faulty stations because there is no response. <table><tr><td></td><td>b15</td><td></td><td>to</td><td></td><td>b8</td><td>b7</td><td></td><td>to</td><td></td><td>b0</td></tr><tr><td>SW00A8</td><td></td><td></td><td>to</td><td></td><td></td><td></td><td></td><td>to</td><td></td><td></td></tr></table> <div><div>Faulty station number</div><div>Test item number</div></div> <div><div>When there are multiple faulty stations, the station number detected first is stored.</div><div>10H: Loop test 20H: Setup confirmation test 30H: Station order check test 40H: Communication test</div></div> | | b15 | | to | | b8 | b7 | | to | | b0 | SW00A8 | | | to | | | | | to | | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | b15 | | to | | b8 | b7 | | to | | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00A8 | | | to | | | | | to | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00A9 (169) | Online test result (requesting side) | Stores the online result on the requesting side. (Valid when the SB00A9 is on.) 0 : Test normal Other than 0 : Test error content (see the error codes in Section 8.3) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|-----------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| SW00AA (170) | Online test execution item (responding side) | <p>Stores the online test items on the responding side. (Valid when the SB00AB is on.) Stations disconnected from the network are not included among the faulty stations because there is no response.</p> <p> </p> <p> 10H: Loop test 20H: Setup confirmation test 30H: Station order check test 40H: Communication test </p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW00AB (171) | Online test result (responding side) | <p>Stores the online test result of the responding side. (Valid when the SB00AB is on.)</p> <p>0 : Test normal Other than 0 : Test error content (see the error codes in Section 8.3)</p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW00AC (172) | Offline test execution item/faulty station (requesting side) | <p>Stores the offline test items and faulty station on the requesting side. (Valid when the SB00AD is on.) Stations disconnected from the network are not included among the faulty stations because there is no response. Any given station number (0 to 64, 7DH) is saved in the maximum faulty station number (b8 to b15) for the loop test.</p> <p> </p> <p> 3: Loop test (forward loop) 4: Loop test (reverse loop) 5: Station-to-station test (master station) 6: Station-to-station test (slave station) 7: Self-loopback test 8: Internal self-loopback test </p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW00AD (173) | Offline test result (requesting side) | <p>Stores the offline result of the requesting side. (Valid when the SB00AD is on.)</p> <p>0 : Test normal Other than 0 : Test error content (see the error codes in Section 8.3)</p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW00AE (174) | Offline test execution item (responding side) | <p>Stores the request-side offline test items and error stations. (Enabled when SB00AF is on.) When station breaks from network, it is not included with error stations because there is no response.</p> <p> </p> <p> 3: Loop test (forward loop) 4: Loop test (reverse loop) </p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| SW00AF (175) | Offline test result (responding side) | <p>Stores results of request-side offline test. (Enabled when SB00AF is on.)</p> <p>0 : Test normal Other than 0 : Test error content (see the error codes in Section 8.3)</p> | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW00B0 (176)/ SW00B1 (177)/ SW00B2 (178)/ SW00B3 (179) | Multiplex transmission status (1) | Stores each station's forward loop usage status during multiplex transmission. 0: Uses other than the forward loop 1: Uses the forward loop <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00B0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</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>to</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>to</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>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW00B0 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW00B1 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW00B2 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW00B3 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | × | ○ | × | ○ | × | ○ | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B0 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B1 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B2 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B3 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW00B4 (180)/ SW00B5 (181)/ SW00B6 (182)/ SW00B7 (183) | Multiplex transmission status (2) | Stores each station's reverse loop usage status during multiplex transmission. 0: Uses other than the reverse loop 1: Uses the reverse loop <table><tr><td></td><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW00B4</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00B5</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00B6</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00B7</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW00B4 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW00B5 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW00B6 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW00B7 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | × | ○ | × | ○ | × | ○ | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B4 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B5 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B6 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW00B7 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 3 SW00B8 (184) | UNDER on the forward loop side/coaxial bus UNDER | Accumulates and stores the number of "UNDER" errors on the forward loop side for the optical loop, or the number of "UNDER" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 3 SW00B9 (185) | CRC on the forward loop side/coaxial bus CRC | Accumulates and stores the number of "CRC" errors on the forward loop side for the optical loop, or the number of "CRC" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 3 SW00BA (186) | OVER on the forward loop side/coaxial bus OVER | Accumulates and stores the number of "OVER" errors on the forward loop side for the optical loop, or the number of "OVER" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 3 SW00BB (187) | Short frame on the forward loop side/coaxial bus short frame | Accumulates and stores the number of "short frame" errors on the forward loop side for the optical loop, or the number of "short frame" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 3 SW00BC (188) | Abort on the forward loop side (AB, IF)/coaxial bus abort (AB, IF) | Accumulates and stores the number of "AB, IF" errors on the forward loop side for the optical loop, or the number of "AB, IF" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

* 3: To reset the SW00B8 to SW00C7, turn on the SB0006.

The number of times information stored in the SW00B8 to SW00C7 will not cause any problems if they are counted up gradually over a long period of time. If they are counted up rapidly in a short period of time (while monitoring with GX Developer, etc.), the cable may be faulty.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|------------------------|--|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 3 SW00BD (189) | Timeout on the forward loop side (TIME)/ coaxial bus timeout (TIME) | Accumulates and stores the number of "TIME" errors on the forward loop side for the optical loop, or the number of "TIME" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SW00BE (190) | Receiving 2k bytes or more on forward loop side (DATA)/coaxial bus receiving 2k bytes or more (DATA) | Accumulates and stores the number of "DATA" errors on the forward loop side for the optical loop, or the number of "DATA" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SW00BF (191) | DPLL error on the forward loop side/coaxial bus DPLL error | Accumulates and stores the number of "DPLL" errors on the forward loop side for the optical loop, or the number of "DPLL" errors of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 3 SW00C0 (192) | UNDER on the reverse loop side | Accumulates and stores the number of "UNDER" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SW00C1 (193) | CRC on the reverse loop side | Accumulates and stores the number of "CRC" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SW00C2 (194) | OVER on the reverse loop side | Accumulates and stores the number of "OVER" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SW00C3 (195) | Short frame on the reverse loop side | Accumulates and stores the number of "Short frame" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SW00C4 (196) | Abort on the reverse loop side (AB, IF) | Accumulates and stores the number of "AB.IF" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SW00C5 (197) | Timeout on the reverse loop side (TIME) | Accumulates and stores the number of "TIME" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 3 SW00C6 (198) | Receiving 2k bytes or more on reverse loop side (DATA) | Accumulates and stores the number of "DATA" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |

* 3: To reset from the SW00B8 to C7, turn on the SB0006.

The numbers of times stored in the SW00B8 to SW00C7 will not cause any problems if they are counting up gradually over a long period of time. If they are counted up rapidly in a short period of time (while monitoring with GX Developer, etc.), the cable may be faulty.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|------------------------|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 3 SW00C7 (199) | DPLL error on reverse loop side | Accumulates and stores the number of "DPLL" errors on the reverse loop side. Other than 0: Number of errors Turning ON Clear communication error count (SB0006) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 4 SW00C8 (200) | Number of retries on the forward loop side/ coaxial bus retries error | Accumulates and stores the number of retries on the forward loop side for the optical loop, or the number of retries of the coaxial bus for the coaxial bus. Other than 0: Number of errors Turning ON Clear retry count (SB0005) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 4 SW00C9 (201) | Number of retries on the reverse loop side | Accumulates and stores the number of retries on the reverse loop side. Other than 0: Number of errors Turning ON Clear retry count (SB0005) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 5 SW00CC (204) | Line error on the forward loop side | Accumulates and stores the number of detected line errors on the forward loop side. Other than 0: Number of detected line errors Turning ON Clear forward loop transmission errors (SB0007) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 6 SW00CD (205) | Line error on the reverse loop side | Accumulates and stores the number of detected line errors on the reverse loop side. Other than 0: Number of detected line errors Turning ON Clear reverse loop transmission errors (SB0008) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 7 SW00CE (206) | Number of loop switches | Accumulates and stores the number of loop checks conducted. Other than 0: Number of loop switches Turning ON Clear loop switch count (SB0009) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |
| * 7 SW00CF (207) | Loop switch data pointer | Stores the pointer that indicates the next loop switch data. 0 to 15: Loop switch data (SW00D0 to SW00DF) Turning ON Clear loop switch count (SB0009) clears the stored value. | ○ | × | ○ | × | ○ | × | ○ | × |

* 3: To reset from the SW00B8 to C7, turn on the SB0006.

The numbers of times stored in the SW00B8 to SW00C7 will not cause any problems if they are counting up gradually over a long period of time. If they are counted up rapidly in a short period of time (while monitoring with GX Developer, etc.), the cable may be faulty.

* 4: This may be counted up at power on/reset, but it is not an error.

Clear with the SB0005 when the number of retries is not required before starting data linking.

* 5: To reset the SW00CC, turn on the SB0007.

* 6: To reset the SW00CD, turn on the SB0008.

* 7: To reset the SW00CE to SW00E7, turn on the SB0009.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|---|---|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 7 SW00D0 (208) to SW00DF (223) | Loop switch data | <p>Stores the cause and status of the loop switch. Whether the data should be overwritten or retained is set in the common parameters.</p> <p> </p> <p><Cause> The bit corresponding to each error is set to 1.</p> <p>All 0: Return direction</p> <p>b0: Forward loop H/W error</p> <p>b1: Reverse loop H/W error</p> <p>b2: Forward loop forced error</p> <p>b3: Reverse loop forced error</p> <p>b4: Forward loop continuous communication error</p> <p>b5: Reverse loop continuous communication error</p> <p>b6: Forward loop continuous line error</p> <p>b7: Reverse loop continuous line error</p> <p>Turning ON Clear loop switch count (SB0009) clears the stored value.</p> <p><Status after the switching></p> <p>0: Multiplex transmission (Forward loop/reverse loop normal)</p> <p>1: Data link by forward loop</p> <p>2: Data linking by reverse loop</p> <p>3: Data linking by loopback</p> | ○ | × | ○ | × | ○ | × | ○ | × |
| * 7 * 8 SW00E0 (224) to SW00E7 (231) | Switch request station | <p>Stores the number of the stations that requested the loop switch.</p> <p> </p> <p>Turning ON Clear loop switch count (SB0009) clears the stored value.</p> | ○ | × | ○ | × | ○ | × | ○ | × |
| * 2 SW00E8 (232) to SW00EB (235) | Module type of each station | <p>Stores each station's module type.</p> <p>0: MELSECNET/10 module</p> <p>1: MELSECNET/H module</p> <p> </p> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | ○ | ○ | ○ | ○ | × | × | × | × |
| * 2 SW00EC (236) | Low-speed cyclic transmission start execution results | <p>Stores execution results for low-speed cyclic transmission start execution results.</p> <p>0 : Test normal</p> <p>Other than 0 : Test error content (see the error codes in Section 8.3)</p> | ○ | ○ | ○ | ○ | × | × | × | × |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

* 7: To reset the SW00CE to SW00E7, turn on the SB0009.

* 8: For the loop switch request station, stations other than the ones at both ends of the loop may be stored because the loop switch request is issued by the station that first detected the loop error.

Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | |
|---|--|--|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial |
| * 9 SW00EE (238) | Transient transmission error | Accumulates and stores the number of transient transmission errors. Other than 0: Number of errors Turning ON Clear transient transmission errors (SB000A) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 9 SW00EF (239) | Transient transmission error pointer | Stores the pointer that sets the data for the next transient transmission error. Turning ON Clear transient transmission errors (SB000A) clears the stored value. | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 2 SW00F0 (240) to SW00FF (255) | Transient transmission error history | Stores the error codes of the transient transmission errors (see the error codes in Section 8.3). | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| * 2 SW01C4 (452) | Remote sub-master station switching result | Stores the result of a shift from master operation to sub-master operation. 0 : Normal completion 1 or later : Abnormal completion (refer to Section 8.3 for error codes) | × | × | × | × | ○ | ○ | × | × |
| * 2 SW01C8 (456) | Send LY device number | (Valid only when SB01C8 is ON) For remote master station : The send LY device number to the remote sub-master station is stored. In 1 point units. For remote sub-master station : The send LY device number to the remote master station is stored. In 1 point units. | × | × | × | × | ○ | ○ | × | × |
| * 2 SW01C9 (457) | Receive LX device number | (Valid only when SB01C8 is ON) For remote master station : The receive LX device number from the remote sub-master station is stored. In 1 point units. For remote sub-master station : The receive LX device number from the remote master station is stored. In 1 point units. | × | × | × | × | ○ | ○ | × | × |
| * 2 SW01CC (460) | Send LB device number | (Valid only when SB01C8 is ON) For remote master station : The send LB device number to the remote sub-master station is stored. In 1 point units. For remote sub-master station : The send LB device number to the remote master station is stored. In 1 point units. | × | × | × | × | ○ | ○ | × | × |
| * 2 SW01CD (461) | Receive LB device number | (Valid only when SB01C8 is ON) For remote master station : The receive LB device number from the remote sub-master station is stored. In 1 point units. For remote sub-master station : The receive LB device number from the remote master station is stored. In 1 point units. | × | × | × | × | ○ | ○ | × | × |
| * 2 SW01CE (462) | Send LW device number | (Valid only when SB01C8 is ON) For remote master station : The send LW device number to the remote sub-master station is stored. In 1 point units. For remote sub-master station : The send LW device number to the remote master station is stored. In 1 point units. | × | × | × | × | ○ | ○ | × | × |
| * 2 SW01CF (463) | Receive LW device number | (Valid only when SB01C8 is ON) For remote master station : The receive LW device number from the remote sub-master station is stored. In 1 point units. For remote sub-master station : The receive LW device number from the remote master station is stored. In 1 point units. | × | × | × | × | ○ | ○ | × | × |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

* 9: To reset the SW00EE to SW00EF, turn on the SB000A.

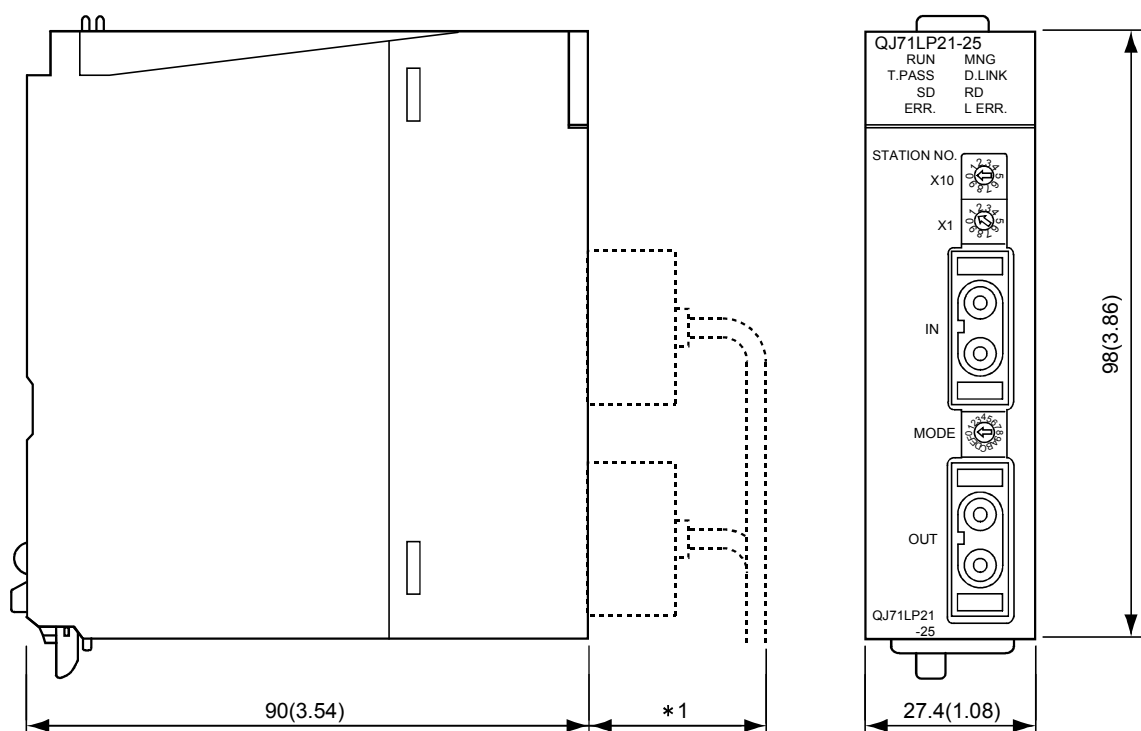
Table 4 Link special register (SW) list (Continued)

| No. | Name | Description | Use permitted/prohibited | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------------------------|---|--------------------------|---------|----------------|---------|-----------------------|---------|--------------------|---------|----|----|----|--------|----|----|----|----|----|---|---|---|---|---|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|--------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|
| | | | Control station | | Normal station | | Remote master station | | Remote I/O station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | Optical | Coaxial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW01E0 (480)/ SW01E1 (481)/ SW01E2 (482)/ SW01E3 (483) | Network type consistency check | <p>Indicates whether there is a mismatch between the network types of the control station and normal stations on the network.</p> <ul style="list-style-type: none"> When the control station is in the MELSECNET/H Extended mode <ul style="list-style-type: none"> 0: Set to the MELSECNET/H Extended mode. (Including stations of station Nos. greater than the maximum, reserved stations and communication error stations) 1: Set to the MELSECNET/H mode or MELSECNET/10 mode. When the control station is in the MELSECNET/H mode or MELSECNET/10 mode <ul style="list-style-type: none"> 0: Set to the MELSECNET/H mode or MELSECNET/10 mode. (Including stations of station Nos. greater than the maximum, reserved stations and communication error stations) 1: Set to the MELSECNET/H Extended mode. <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW01E0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW01E1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW01E2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW01E3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>1 to 64 in the table indicate the station Nos.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW01E0 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW01E1 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW01E2 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW01E3 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | × | × | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01E0 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01E1 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01E2 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01E3 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW01F4 (500)/ SW01F5 (501)/ SW01F6 (502)/ SW01F7 (503) | Redundant system status (1) | <p>Indicates the operation mode of each station's CPU.</p> <ul style="list-style-type: none"> 0: Backup mode (including the single CPU system) (including stations exceeding the maximum station number and reserved stations) 1: Separate mode <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW01F4</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW01F5</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW01F6</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW01F7</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW01F4 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW01F5 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW01F6 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW01F7 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | × | × | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01F4 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01F5 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01F6 | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01F7 | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW01F8 (504)/ SW01F9 (505)/ SW01FA (506)/ SW01FB (507) | Redundant system status (2) | <p>Indicates the pairing setting status of each station.</p> <p>In the case of a redundant system, the bit of the station with the larger number is turned on (1).</p> <ul style="list-style-type: none"> 0: No pairing designation (including the single CPU system) (including stations exceeding the maximum station number) 1: Station with pairing designation <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW01F8</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW01F9</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW01FA</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW01FB</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW01F8 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW01F9 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW01FA | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW01FB | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | × | × | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01F8 | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01F9 | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FA | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FB | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 2 SW01FC (508)/ SW01FD (509)/ SW01FE (510)/ SW01FF (511) | Redundant system status (3) | <p>Indicates the operation status of each station's CPU (control system/standby system).</p> <ul style="list-style-type: none"> 0: The host station CPU is on the control system (including the single CPU system) (including stations exceeding the maximum station number and reserved stations). 1: The host system CPU is on the standby system. <table border="1"> <thead> <tr> <th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr> </thead> <tbody> <tr> <td>SW01FC</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> <tr> <td>SW01FD</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr> <tr> <td>SW01FE</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr> <tr> <td>SW01FF</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr> </tbody> </table> <p>Numbers 1 to 64 in the above table indicate the station numbers.</p> | | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | SW01FC | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | SW01FD | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | SW01FE | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | SW01FF | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | ○ | ○ | ○ | ○ | × | × | × | × |
| | b15 | b14 | b13 | b12 | to | b4 | b3 | b2 | b1 | b0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FC | 16 | 15 | 14 | 13 | to | 5 | 4 | 3 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FD | 32 | 31 | 30 | 29 | to | 21 | 20 | 19 | 18 | 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FE | 48 | 47 | 46 | 45 | to | 37 | 36 | 35 | 34 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SW01FF | 64 | 63 | 62 | 61 | to | 53 | 52 | 51 | 50 | 49 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* 2: Valid only when SB0047 is off. When it turns on (error), the last data are retained.

Appendix 5 External Dimensions

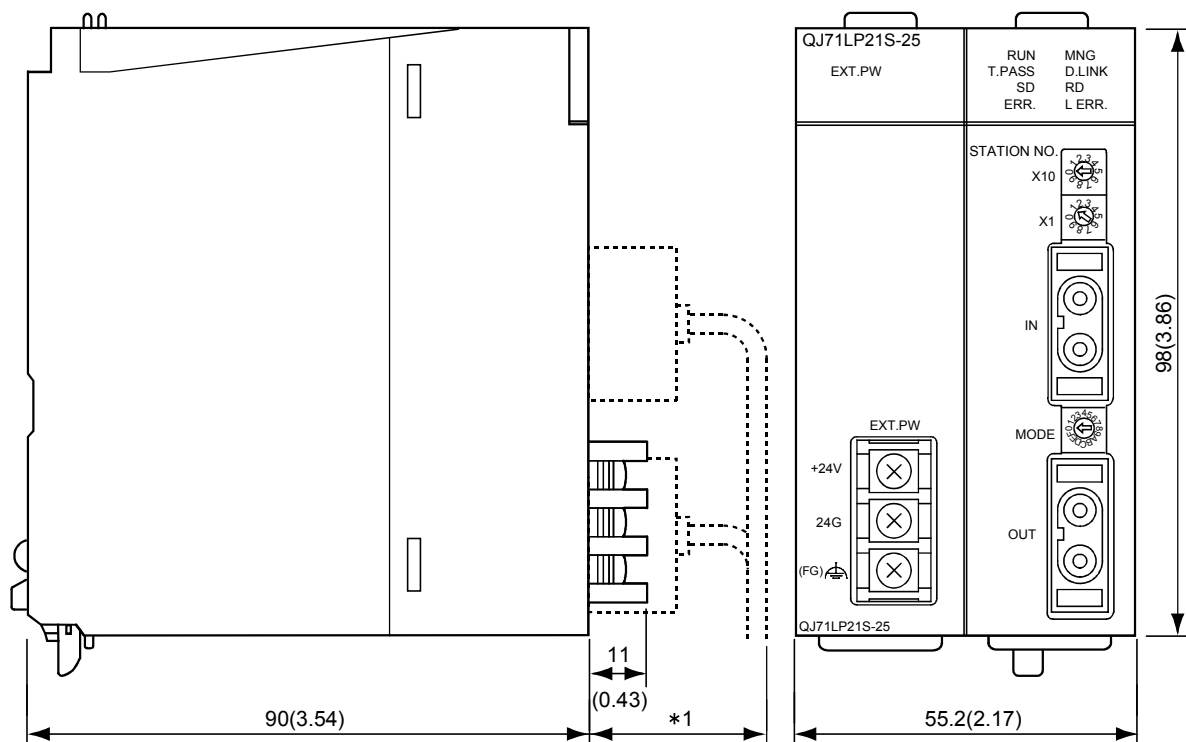
(1) QJ71LP21, QJ71LP21-25, QJ71LP21G, QJ71LP21GE



Unit: mm (in.)

*1: Please contact your nearest Mitsubishi Electric System Service Corporation for detail.

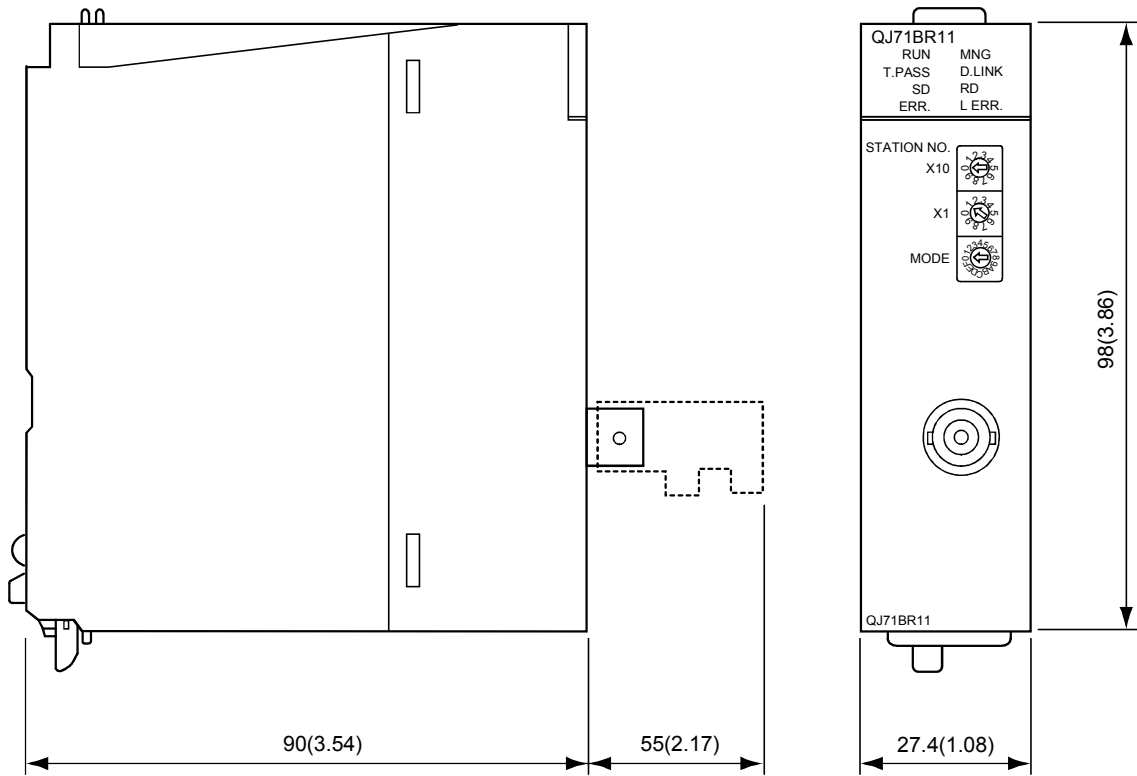
(2) QJ71LP21S-25



Unit: mm (in.)

*1: Please contact your nearest Mitsubishi Electric System Service Corporation for detail.

(3) QJ71BR11



Unit: mm (in.)

MEMO

[illegible]

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.

Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
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 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
 2. Failure caused by unapproved modifications, etc., to the product by the user.
 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
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 6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
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3. Overseas service

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5. Changes in product specifications

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6. Product application

- (1) In using the Mitsubishi MELSEC programmable controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
- (2) The Mitsubishi programmable controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable controller applications.

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Q Corresponding MELSECNET/H Network System

Reference Manual (PLC to PLC network)

| | |
|--------------------------|---------------|
| MODEL | Q-NET/10H-R-E |
| MODEL CODE | 13JF92 |
| SH(NA)-080049-K(0807)MEE | |



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