MITSUBISHI ELECTRIC

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FATEC

Mitsubishi Programmable Controllers
Training Manual
CC-Link (for GX Works3)

SAFETY PRECAUTIONS

(Always read these instructions before using the products.)

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

[EXERCISE PRECAUTIONS]

⚠WARNING

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

⚠CAUTION

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

MEMO

REVISIONS

*The text number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
November 2017	SH(NA)-081676ENG-A	First edition

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CONTENTS

CONTENTS

A - 7

MEMO

INTRODUCTION

This school textbook helps you to easily understand a CC-Link system using MELSEC iQ-R series modules.

For a good understanding of the CC-Link system features, this textbook describes GX Works3, a basic system in which remote I/O modules or remote device modules are connected, and an application system in which an inverter is connected.

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Startup) [SH-081269ENG]	Procedures, system configuration, and wiring required for using the MELSEC iQ-R CC-Link system master/local module	e-Manual PDF
MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application) [SH-081270ENG]	Functions, programming, and troubleshooting required for using the MELSEC iQ-R CC-Link system master/local module	e-Manual PDF
GX Works3 Operating Manual [SH-081215ENG]	System configuration of GX Works3, parameter settings, and operation method of the online function	e-Manual PDF
Digital-Analog Converter Module type AJ65BT-64DAV/DAI User's Manual [SH-3615]	Specifications and handling of the AJ65BT-64DAV/DAI digital-analog converter module	PDF
AJ65BT-64AD Analog-Digital Converter Module User's Manual [SH-3614]	Specifications, handling, and programming method of the AJ65BT-64AD analog-digital converter module	PDF
FR-E500(CC-Link) INSTRUCTION MANUAL [IB-66864]	Handling and precautions for using the FREQROL-E500 series (CC-Link type) general purpose inverter	PDF

Point

e-Manual refers to the Mitsubishi FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:
- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- The hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.

ABBREVIATIONS AND TERMS

The following table lists the abbreviations and terms used in this textbook.

Abbreviations and terms	Description
Buffer memory	A memory in an intelligent function module, where data (such as setting values and monitoring values) is stored. When using the CPU module, the memory is indicated for storing data (such as setting values and monitored values) of the Ethernet function and data used for data communications of the multiple CPU function.
CPU module	A generic term for the MELSEC iQ-R series CPU module
Cyclic transmission	A function by which data is periodically exchanged between the master station and other stations on the same system using link devices
Data link	A generic term for cyclic transmission and transient transmission
Dedicated instruction	An instruction for using functions of the module
Device	A device (X, Y, M, D, or others) in a CPU module
Disconnection	A process of stopping data link if a data link error occurs
Engineering tool	Another term for the software package for the MELSEC programmable controllers
Global label	A label that is enabled for all program data when multiple program data is created in the project. There are two types of global labels: module labels that are automatically generated by GX Works3 and labels that can be created for any of the specified devices.
Intelligent device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with another station by cyclic transmission. This station responds to a transient transmission request from another station and also issues a transient transmission request to another station.
Intelligent function module	A module that has functions other than input and output, such as an A/D converter module and D/A converter module
Label	A label that represents a device in a given character string
Link device	A device (RX, RY, RWr, RWw, SB, or SW) in a CC-Link module
Link scan (link scan time)	Time required for all stations in a system to transmit data. The link scan time depends on data volume and the number of transient transmission requests.
Link special register (SW)	Word data that indicates the operating status and data link status of modules on the master and local stations
Link special relay (SB)	Bit data that indicates the operating status and data link status of modules on the master and local stations
Local station	A station that performs cyclic transmission and transient transmission with the master station and other local stations
Master station	A station that controls the entire system. This station can perform cyclic transmission and transient transmission with all stations. Only one master station can be used in a system.
Master/local module	The abbreviation for the RJ61BT11 CC-Link system master/local module
Message transmission	A function to communicate data between a master station and slave stations when the model names of slave stations are read or the dedicated instructions are requested
Module label	A label that represents one of memory areas (I/O signals and buffer memory areas) specific to each module in a given character string. GX Works3 automatically generates this label, which can be used as a global label.
RAS	The abbreviation for Reliability, Availability, and Serviceability. This term refers to the overall usability of automated equipment.
RDMSG	A generic term for the G.RDMSG and GP.RDMSG
Remote device net mode	A generic term for the remote device net Ver.1 mode and remote device net Ver.2 mode
Remote device net Ver.1 mode	A mode used to configure a system only with a master station and Ver.1-compatible remote stations
Remote device net Ver.2 mode	A mode used to configure a system only with a master station and remote stations including Ver.2-compatible slave stations or to add Ver.2-compatible slave stations in future (a system only with a master station and Ver.1-compatible remote stations).
Remote device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with the master station by cyclic transmission. This station cannot perform transient transmission.
Remote I/O net mode	A mode used to perform high-speed communications in a system consisting of a master station and remote I/O station(s) only
Remote I/O station	A station that exchanges I/O signals (bit data) with the master station by cyclic transmission. This station cannot perform transient transmission.
Remote input (RX)	Bit data input from a slave station to the master station (For some areas in a local station, data is output in the opposite direction.)
Remote net mode	A mode used to communicate data with all stations (remote I/O station, remote device station, local station, intelligent device station, and standby master station) in a CC-Link system. There are two modes: remote net Ver.1 mode and remote net Ver.2 mode.

Abbreviations and terms	Description
Remote net Ver.1 mode	A mode used to configure a system only with a master station and Ver.1-compatible slave stations. Data can be communicated with all stations (remote I/O station, remote device station, local station, intelligent device station, and standby master station) in a CC-Link system.
Remote net Ver.2 mode	A mode used to configure a system containing a master station and Ver.2-compatible slave stations or to add Ver.2-compatible slave stations in future. Data can be communicated with all stations (remote I/O station, remote device station, local station, intelligent device station, and standby master station) in a CC-Link system. Compared to the remote net Ver.1 mode, the number of cyclic points per station is increased from 128 to 896 for RX/RY, and from 16 to 128 for RWr/RWw.
Remote output (RY)	Bit data output from the master station to a slave station (For some areas in a local station, data is output in the opposite direction.)
Remote register (RWr)	Word data input from a slave station to the master station (For some areas in a local station, data is output in the opposite direction.)
Remote register (RWw)	Word data output from the master station to a slave station (For some areas in a local station, data is output in the opposite direction.)
Remote station	A generic term for a remote I/O station and a remote device station
Return	A process of restarting data link when a station recovers from an error
RIFR	A generic term for the G.RIFR and GP.RIFR
RIRCV	A generic term for the G.RIRCV and GP.RIRCV
RIRD	A generic term for the G.RIRD and GP.RIRD
RISEND	A generic term for the G.RISEND and GP.RISEND
RITO	A generic term for the G.RITO and GP.RITO
RIWT	A generic term for the G.RIWT and GP.RIWT
RLPASET	A generic term for the G.RLPASET and GP.RLPASET
Slave station	A generic term for a remote I/O station, remote device station, local station, intelligent device station, and standby master station
Transient transmission	A function of communications with another station, which is used when requested by a dedicated instruction or the engineering tool
Ver.1-compatible slave station	A slave station that supports the remote net Ver.1 mode or remote device net Ver.1 mode
Ver.2-compatible slave station	A slave station that supports the remote net Ver.2 mode or remote device net Ver.2 mode

MEMO

1 OVERVIEW

CC-Link (Control & Communication Link) is a network suitable for configuring a distributed system enabling wiring and cost reduction.

This chapter describes the features of CC-Link and how the CC-Link system operates.

1.1 Features

(1) Reduced wiring and space by distributed control
Since modules can be installed to devices and equipment such as conveyor lines and machinery by using the bus network for distributed control, the wiring of the entire system can be reduced. In addition, the distributed control enables an efficient installation of modules, resulting in reduced space.

Machinery   Machinery

Master station
CC-Link dedicated cable

Remote station   Remote station

Machinery   Machinery
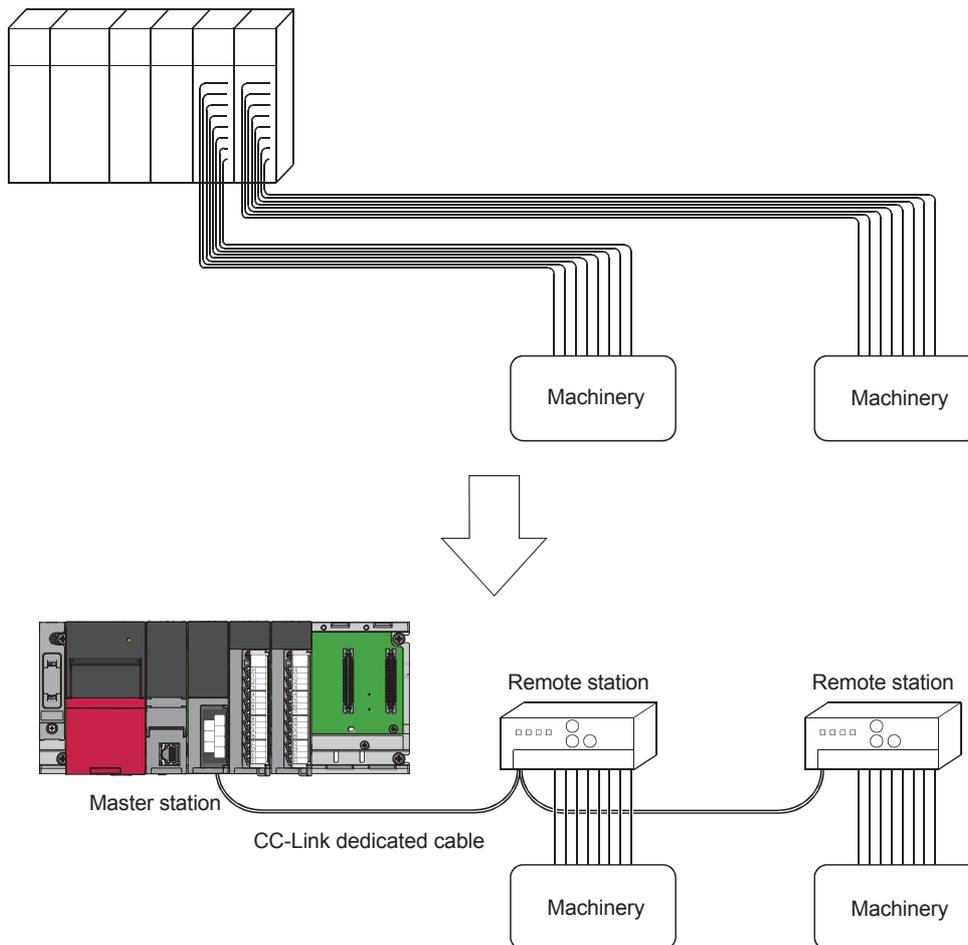
(2) Connecting intelligent devices
Transient transmission is available besides cyclic transmission of bit/word data. Thus, data communications with intelligent devices, such as an HMI, or a personal computer is allowed.

(3) Reliable open field network
Since the network technique is disclosed, many domestic and foreign manufacturers have developed extensive CC-Link-compatible products. Thus, a reliable open field network system can be configured using the most appropriate field devices selected from these many choices.

(4) Configuring systems meeting needs

    (a) Transmission distance

        The overall cable distance varies depending on the transmission speed. It ranges from 100m (at 10Mbps) to 1.2km (at 156kbps).

    (b) Number of connectable stations

        Up to 64 stations (remote I/O station, remote device station, and local station) can be connected to one master station.

        In remote net Ver.1 mode, the maximum number of stations is 64 for remote I/O stations, 42 for remote device stations, and 26 for local stations.

(5) Number of link points

    The number of link points per system is 2048 for the remote input (RX), 2048 for the remote output (RY), 256 for the remote register (RWr), and 256 for the remote register (RWw).

    In CC-Link Ver.1 mode, the number of link points per occupied remote or local station is 32 for the remote input (RX), 32 for the remote output (RY), 4 for the remote register (RWr), and 4 for the remote register (RWw).

(6) Preventing a system failure (slave station cutoff function)

    Since a bus network is employed, data communications with normal modules continue even if a module goes down due to power-off or other causes.

    A module with a two-piece terminal block can be replaced during data link. (Power off the module to be replaced before removal.)

    Note that if a cable is disconnected, data link fails among all stations.
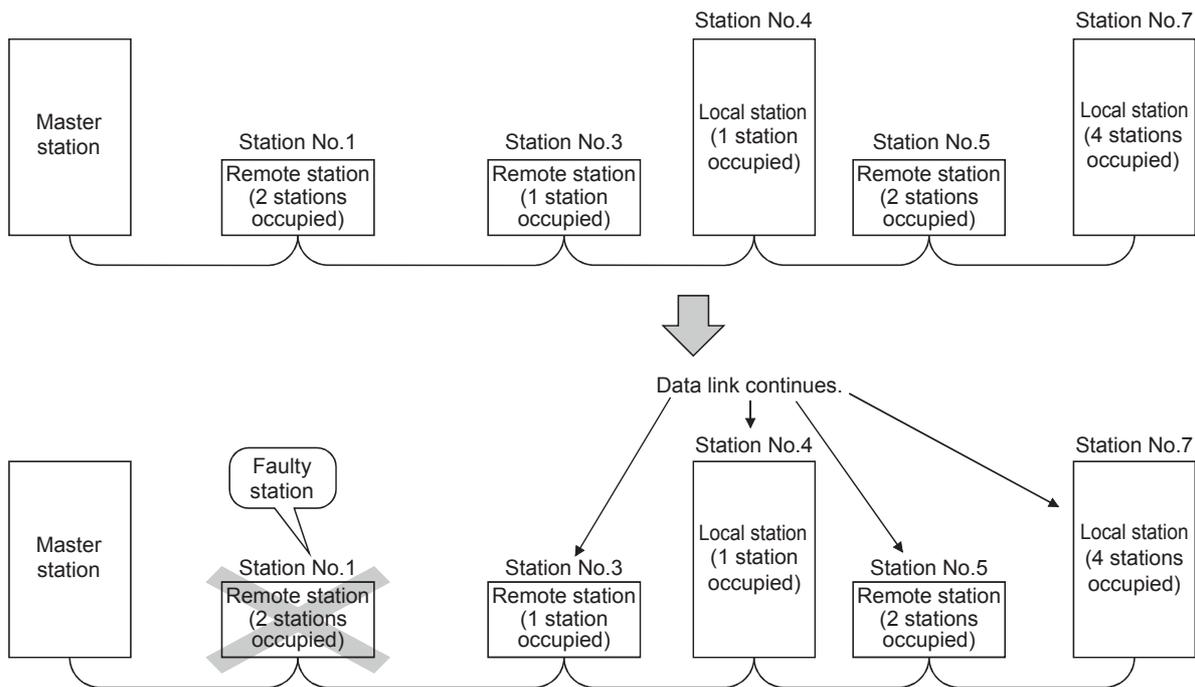
(7) Automatic return function

    When a module which was disconnected due to power-off or other causes recovers, it automatically returns to the system.

(8) Setting the data link status when an error occurs in the CPU module of the master station

    The data link status (stop or continue) when an operation stop error such as SP.UNIT ERROR occurs in the CPU module of the master station can be set.

    When an operation continuation error such as BATTERY ERROR occurs, data link continues regardless of the setting.

(9) Setting the status of data input from a data link faulty station

    Data input (received) from a data link faulty station can be cleared or held. (The data just before the error has occurred can be held.)

(10) Standby master function

If the master station goes down due to an error in the CPU module or power supply, data link can be continued by switching the control to the standby master station (a backup station for the master station). This function is used not to stop the entire system even if the master station goes down.

The master station controls data link.

Master station
Controlling

Remote device station
(station No.: 2, number of
occupied stations: 2)

Intelligent device station
(station No.: 4, number of
occupied stations: 1)

Standby master station
(station No.: 1, number of
occupied stations: 1)
Standby status

Cyclic transmission   Cyclic transmission   Cyclic transmission
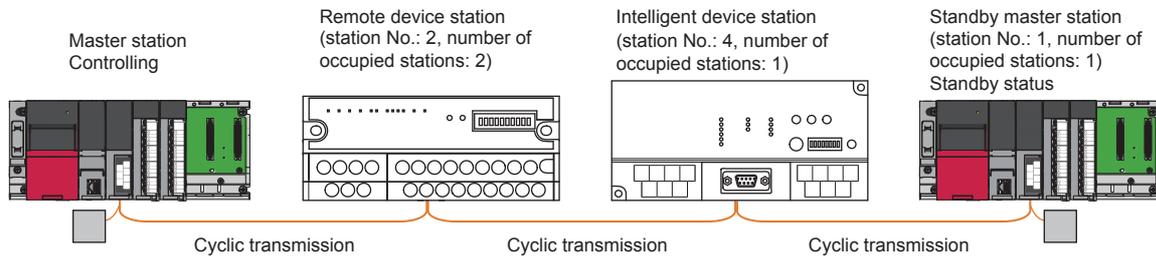
The master station is down. → The standby master station controls data link.

Master station

Remote device station
(station No.: 2, number of
occupied stations: 2)

Intelligent device station
(station No.: 4, number of
occupied stations: 1)

Standby master station
(station No.: 1 → 0[*1])
Controlling

Cyclic transmission   Cyclic transmission   Cyclic transmission
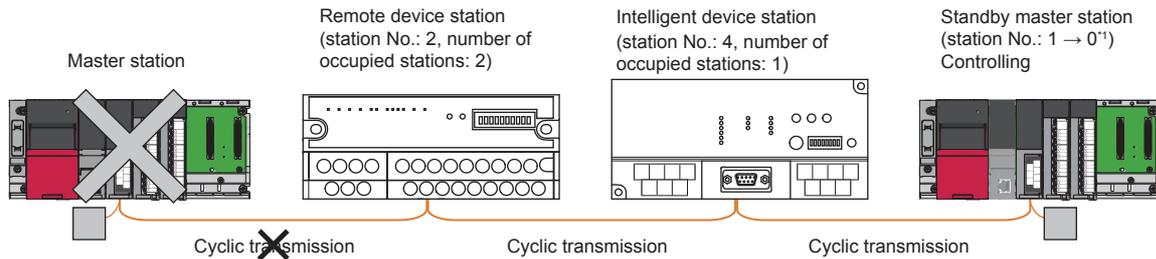
The master station in the normal state returns to the system. → The master station is on standby in case of a standby master station failure.

Master station
(station No.: 0 → 1[*2], number of
occupied stations: 1)
Standby status

Remote device station
(station No.: 2, number of
occupied stations: 2)

Intelligent device station
(station No.: 4, number of
occupied stations: 1)

Standby master station
(station No.: 0)
Controlling

Cyclic transmission   Cyclic transmission   Cyclic transmission
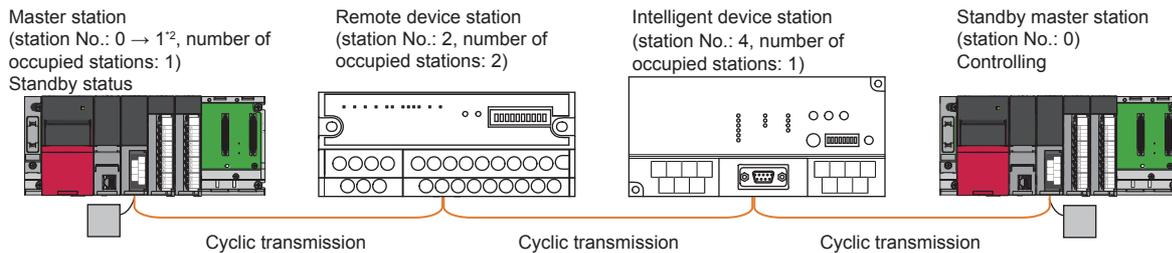
An error has occurred in the standby master station. → The master station controls data link.

Master station
(station No.: 1 → 0)
Controlling

Remote device station
(station No.: 2, number of
occupied stations: 2)

Intelligent device station
(station No.: 4, number of
occupied stations: 1)

Standby master station

Cyclic transmission   Cyclic transmission   Cyclic transmission
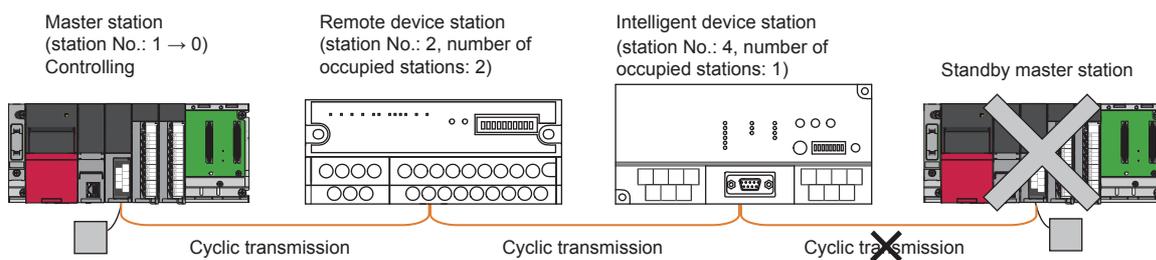
The standby master station in the normal state returns to the system. → The standby master station is on standby in case of a master station failure.

Master station
Controlling

Remote device station
(station No.: 2, number of
occupied stations: 2)

Intelligent device station
(station No.: 4, number of
occupied stations: 1)

Standby master station
(station No.: 1, number of
occupied stations: 1)
Standby status

Cyclic transmission   Cyclic transmission   Cyclic transmission
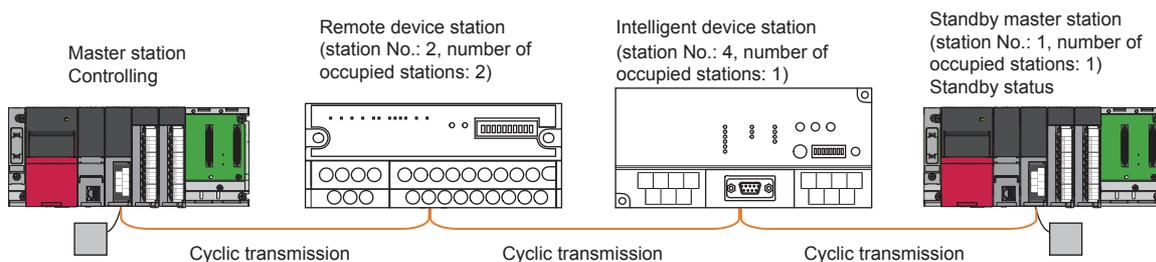
*1 The dot matrix LED displays the station number set in the module instead of "0". The MST LED turns on and the S MST LED turns off.
*2 When the master station returns to the system, it operates with the station number of the standby master station, but the dot matrix LED displays the station number set in the module ("0" for the master station). The MST LED turns off and the S MST LED turns on.

(11) Remote device station initialization procedure registration function

This function is used for initial settings of remote device stations by using GX Works3 without creating a sequence program.

(12) Event issuance for the interrupt program

This function issues an event when the condition that has been set by using GX Works3 is satisfied and allow a CPU module to execute the interrupt program.

(13) Selecting a mode according to the system used

Select a mode according to the system used for the master/local module. Depending on the mode, the addresses of storage positions for RX, RY, RWr, and RWw differ.

Mode	Description	Connectable slave station
Remote net Ver.1 mode	Configures a new system (only with Ver.1-compatible slave stations).	Ver.1-compatible slave station
Remote net Ver.2 mode	• Configures a system including Ver.2-compatible slave stations. • Uses more points compared to the remote net Ver.1 mode.	Ver.1-compatible slave station and Ver.2-compatible slave station
Remote device net Ver.1 mode[*1]	• Configures a system only with Ver.1-compatible remote stations. • Uses more remote device stations compared to the remote net Ver.1 mode.	Ver.1-compatible remote station
Remote device net Ver.2 mode[*1]	• Configures a system only with remote stations including Ver.2-compatible remote stations. • Uses more remote device stations compared to the remote net Ver.2 mode.	Ver.1-compatible remote station and Ver.2-compatible remote station
Remote I/O net mode[*1]	Configures a system only with remote I/O stations.	Remote I/O station

*1 This mode cannot be selected when "Station Type" under "Required Settings" is set to something other than "Master Station".

(14) Reserved station function

This function prevents the stations that are not actually connected (but will be connected in future) from being handled as faulty stations by setting them as reserved stations.
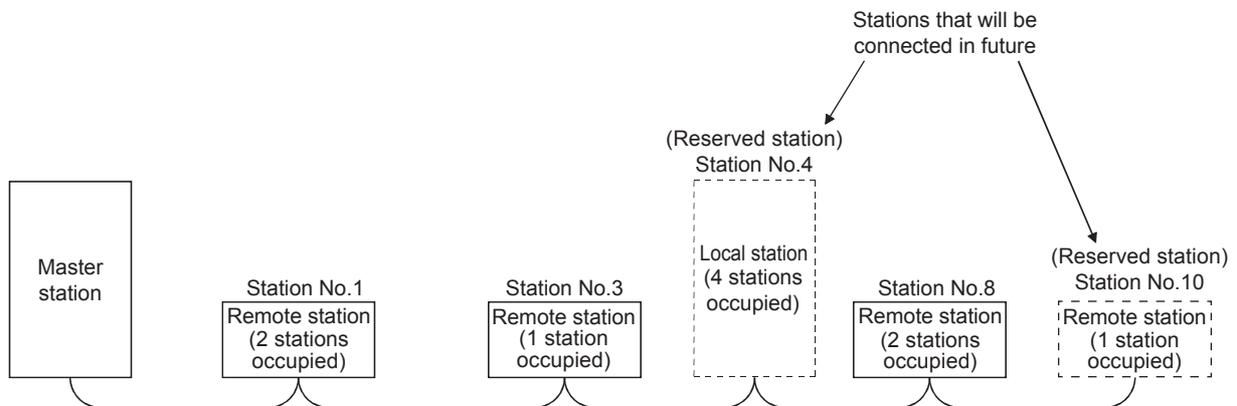
(15) Error invalid station setting function

This function prevents the module that is powered off from being handled as a data link faulty station by the master station and local stations by setting the network parameters.

Note that errors are no longer detected.
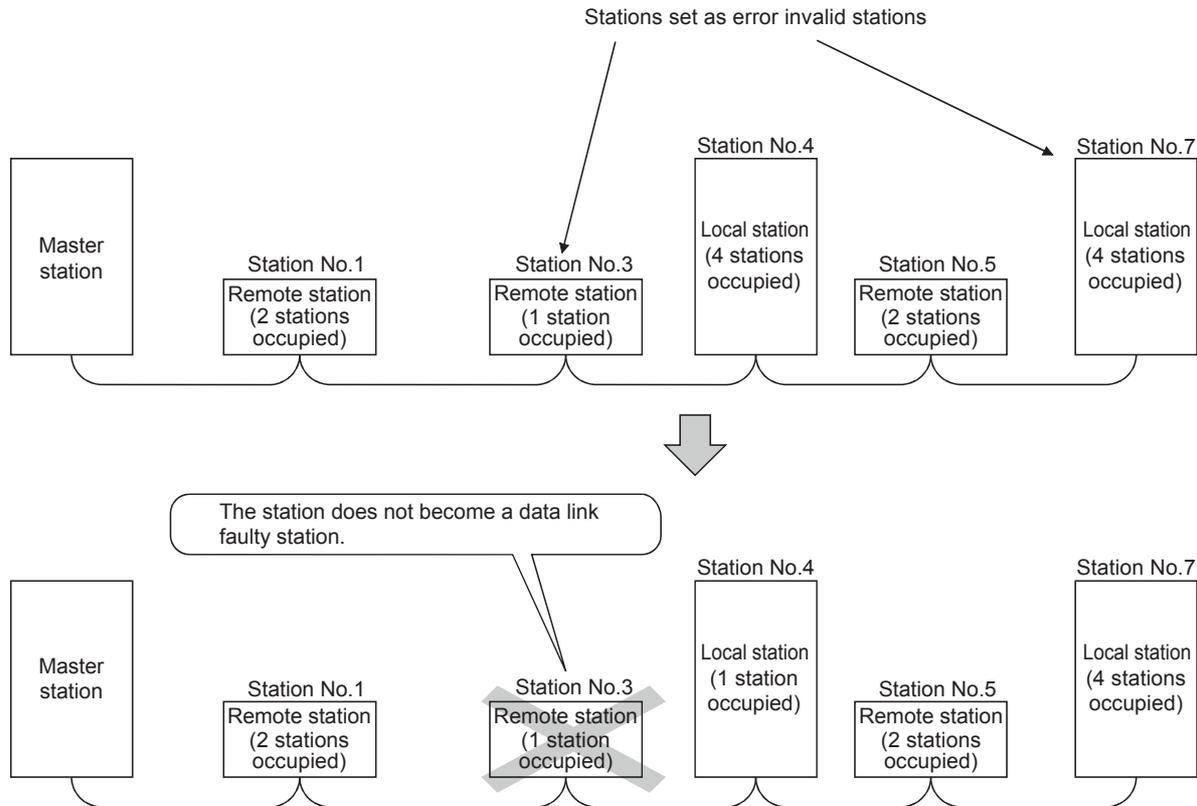
(16) Scan synchronous function

This function synchronizes a link scan with a sequence scan.

(17) Temporary error invalid station setting function

This function prevents the module specified with GX Works3 from being handled as a data link faulty station by the master station and local stations during online.

Modules can be replaced during online without an error being detected.

(18) Data link stop/restart

While data link is performed, it can be stopped or restarted.

(19) Station number overlap checking function

This function checks the status of connected stations and checks that occupied station numbers do not overlap and the station number 0 is not set to multiple stations in the system.

1.2 CC-Link System Operation

This section describes the basic configuration of the CC-Link system and how the system operates.

(1) Basic CC-Link system example

Master station   Local station   HMI/Operation terminal

• Inverter
• Servo
• Sensor
and others

Terminating resistor

Terminating resistor

Remote I/O station
(I/O module)

Remote device station
• A/D converter module
• D/A converter module
• High-speed counter module
• Temperature input module
  or other modules

Intelligent device station
• Positioning module
• RS-232 interface module
  or other modules

(2) Station types

The stations used in the CC-Link system are classified broadly into four types.

• Master station

This station has the master/local module on the base unit and manages/controls the entire CC-Link system.

• Local station

This station has the master/local module on the base unit and communicates with the master station or other local stations. The model of the master/local module is the same as that of the master station. (Selection of master/local station depends on the network parameter setting.)

• Remote station

I/O modules and special function modules are classified into this type. They actually input/output data.
Other devices such as an inverter, HMI, and sensor are also included in this type. The remote stations are further classified into the remote I/O station (equivalent to the I/O module) and the remote device station (equivalent to the special function module, such as an inverter, HMI, and sensor).

• Intelligent device station

This station is used for data communications with transient transmission (message transmission). Positioning modules and HMIs are classified into this type.

(3) Basic communication flow in the CC-Link system (Master station ↔ Remote I/O station)

Only on/off information (remote input RX and remote output RY) is communicated.
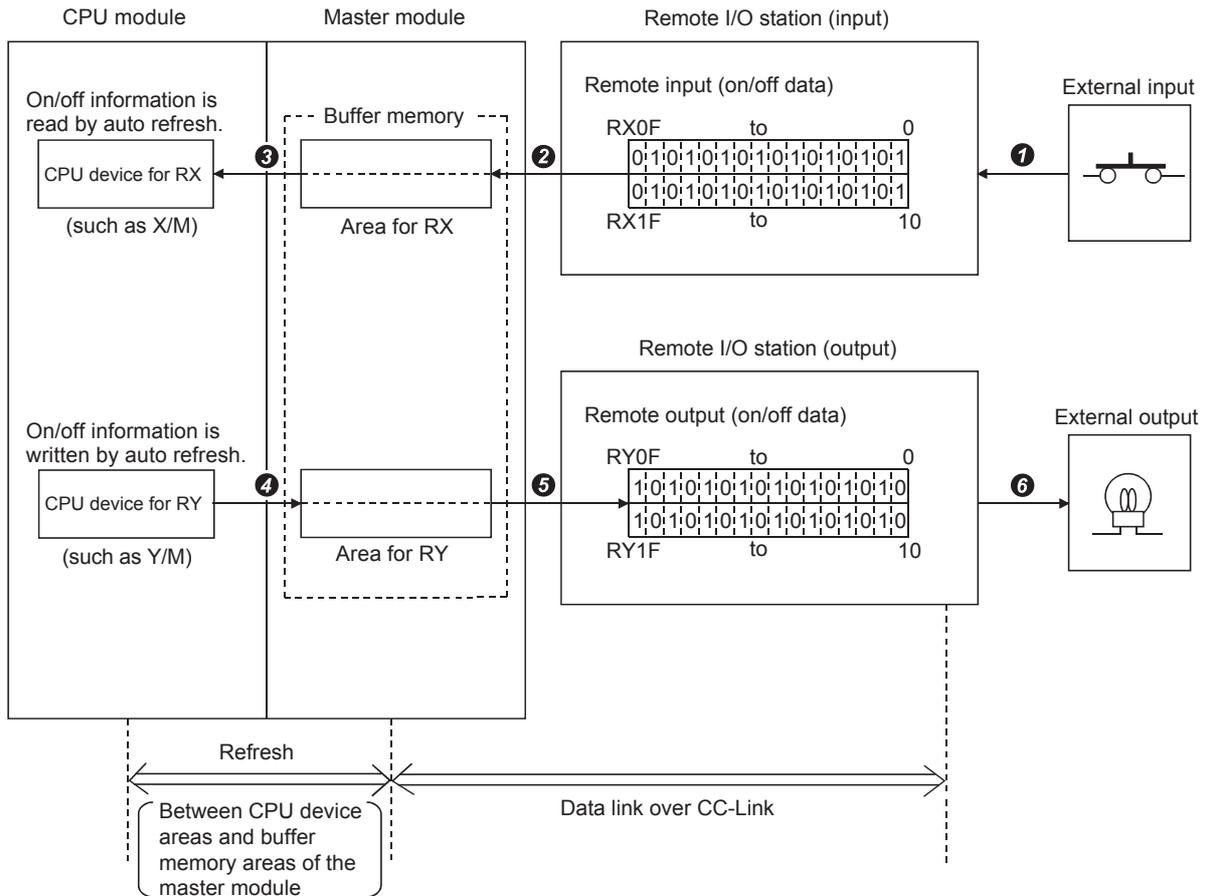
❶ Signals are input from the external device to the remote I/O station.

❷ The remote input signals (on/off) of the remote I/O station are stored in the buffer memory (areas for remote input signals) of the master module by data link.

❸ The remote input signal information of the remote I/O station is read from the buffer memory (areas for remote input signals) of the master module to the CPU module by auto refresh. (This information is used for operations as device data of the CPU module.)

❹ The operation result is written from the CPU module to the buffer memory (areas for remote output signals) of the master module by auto refresh.

❺ The on/off information in the buffer memory (areas for remote output signals) of the master module is stored as the remote output signals of the remote I/O station by data link.

❻ Signals are output from the remote I/O station to the external device.

Point

In the "Data link over CC-Link" part of the figure above, the master module operates according to the set condition.

In "Refresh (Between CPU device areas and buffer memory areas of the master module)", the CPU module operates according to the link refresh parameters.

As shown in the figure above, the remote device can be used like the CPU device.

Note) The refresh method varies depending on the CPU module type.

(4) Basic communication flow in the CC-Link system (Master station ↔ Remote device station)
On/off information (remote input RX and remote output RY) and numerical value data (remote register) are communicated.
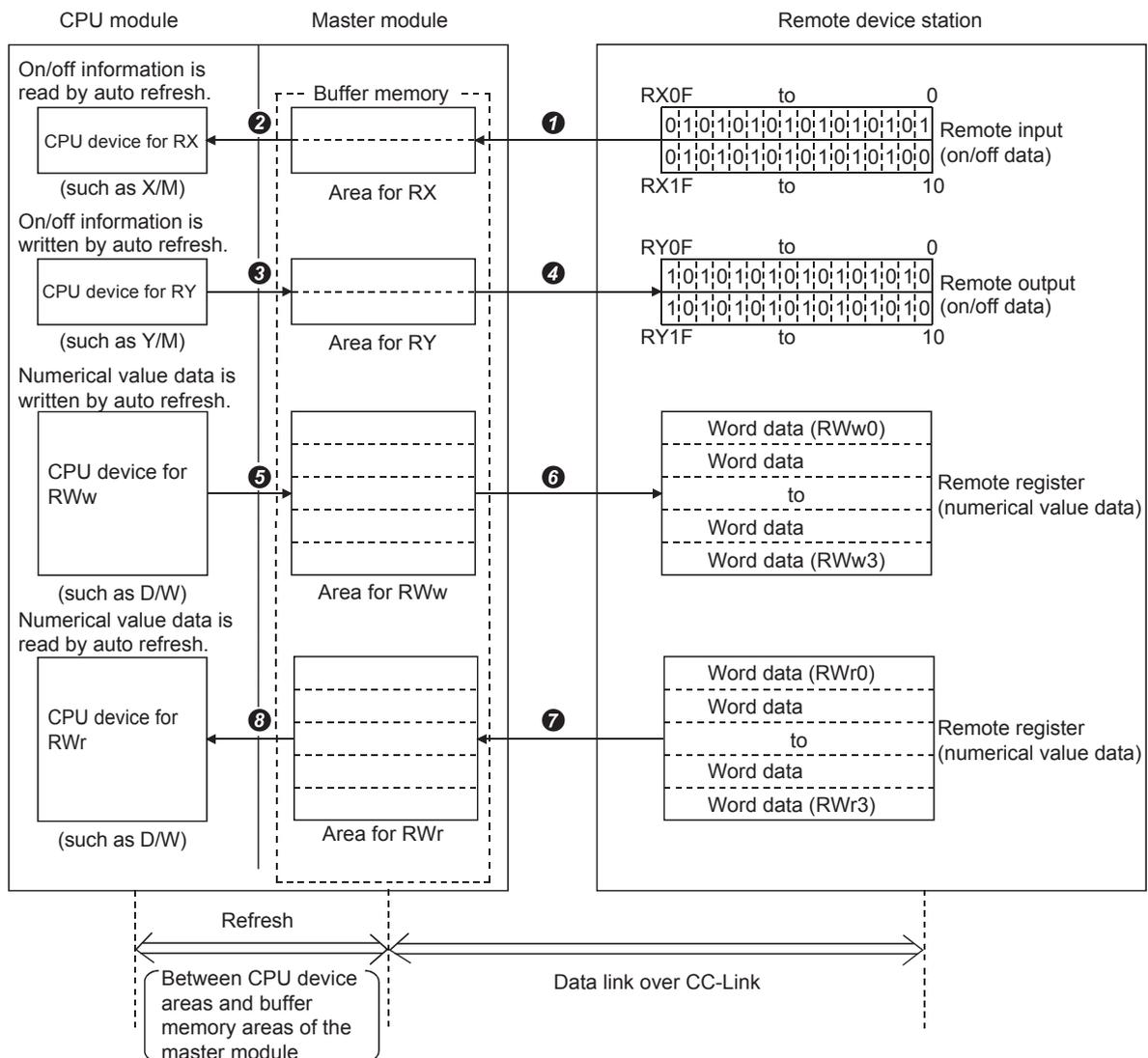
❶ The remote input signals (on/off) of the remote device station are stored in the buffer memory (areas for remote input signals) of the master module by data link.

❷ The remote input signal information of the remote device station is read from the buffer memory (areas for remote input signals) of the master module to the CPU module by auto refresh. (This information is used for operations as device data of the CPU module.)

❸ The operation result is written from the CPU module to the buffer memory (areas for remote output signals) of the master module by auto refresh.

❹ The on/off information in the buffer memory (areas for remote output signals) of the master module is stored as the remote output signals of the remote device station by data link.

❺ The numerical value data is written from the CPU module to the buffer memory (areas for sending to the remote register) of the master module by auto refresh.

❻ The numerical value data in the buffer memory (areas for sending to the remote register) of the master module is written to the remote register of the remote device station by data link.

❼ The remote register (numerical value data) of the remote device station is stored in the buffer memory (areas for receiving from the remote register) of the master module by data link.

❽ The numerical value data of the remote device station is read from the buffer memory (areas for receiving from the remote register) of the master module to the CPU module by auto refresh.

(5) Basic communication flow in the CC-Link system (Master station ↔ Local station)

Bit information (remote input RX and remote output RY) and word information (remote register) is communicated between CPU modules on an N-to-N (N:N) basis.
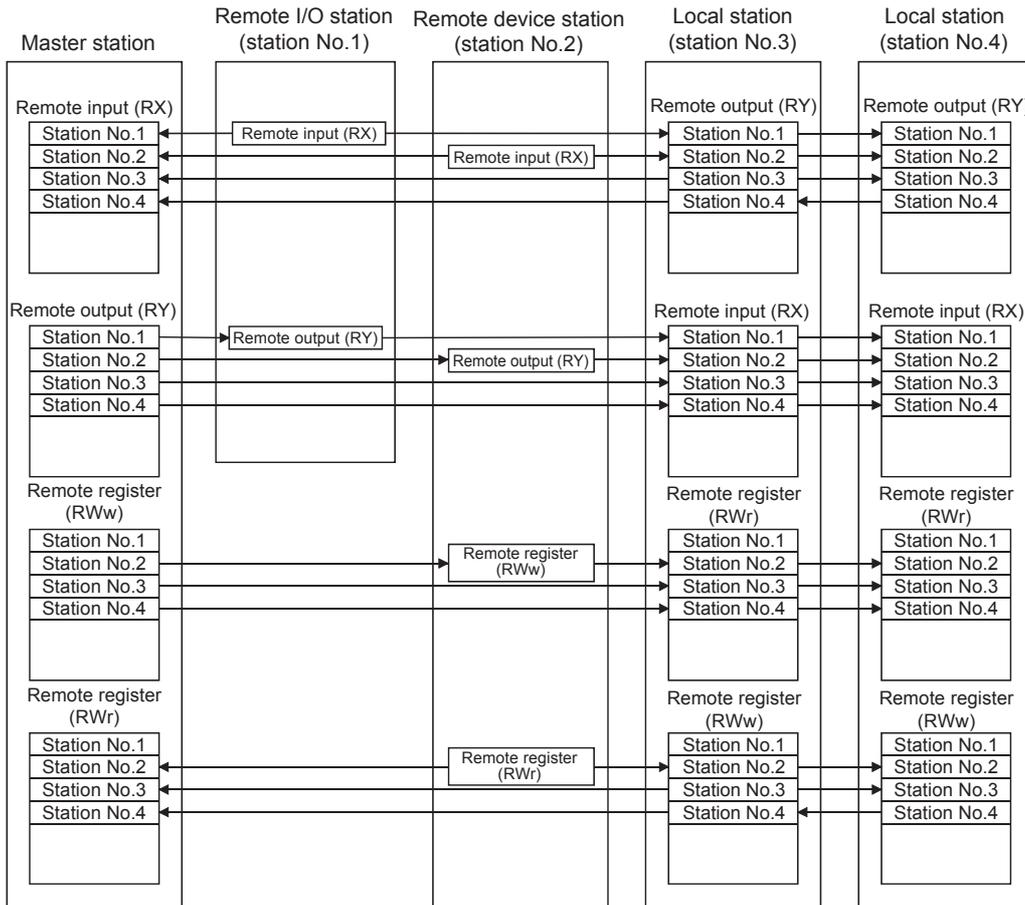
Since the master station and local stations have a CPU module independently, data in RY of the own station is sent to RX of the destination station in communications between the master station and a local station, as shown below.

The operation differs as that of the communications between the master station and remote station.
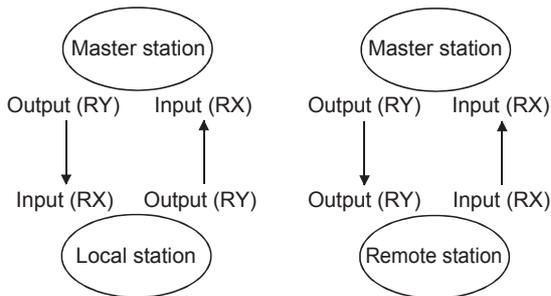
The operation is the same as that for the remote registers RWw and RWr.

MEMO

2 SPECIFICATIONS AND OPERATION SETTINGS

This chapter describes the specifications and operation settings of CC-Link for the MELSEC iQ-R series.
For details, refer to the following.
📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Startup)

2.1 Specifications

2.1.1 Performance specifications

The following table lists the performance specifications of the master/local module.

Item		Description
Transmission speed		Selected from 156kbps, 625kbps, 2.5Mbps, 5Mbps, and 10Mbps.
Maximum number of connectable modules (master station)		64
Number of occupied stations (local station)		1 to 4 stations (The number of stations can be changed using the engineering tool.)
Maximum number of link points per system	CC-Link Ver.1	• Remote I/O (RX, RY): 2048 points • Remote register (RWw): 256 points (master station → remote device station/local station/intelligent device station/standby master station) • Remote register (RWr): 256 points (remote device station/local station/intelligent device station/standby master station → master station)
	CC-Link Ver.2	• Remote I/O (RX, RY): 8192 points • Remote register (RWw): 2048 points (master station → remote device station/local station/intelligent device station/standby master station) • Remote register (RWr): 2048 points (remote device station/local station/intelligent device station/standby master station → master station)
Number of link points per remote station/local station/intelligent device station/standby master station		☞ Page 2 - 2 Number of link points by the number of occupied stations
Communication method		Broadcast polling method
Synchronization method		Frame synchronization method
Encoding method		NRZI method
Network topology		Bus (RS-485)
Transmission format		HDLC compliant
Error control system		CRC ($X^{16} + X^{12} + X^5 + 1$)
Connection cable		Ver.1.10-compatible CC-Link dedicated cable
Maximum overall cable length (maximum transmission distance)		Depends on the transmission speed (☞ Page App. - 1 Specifications of CC-Link Cables)
RAS function		• Standby master function • Automatic return function • Slave station cutoff function • Error detection using link special relay areas (SB) and link special register areas (SW)
Number of occupied I/O points		32 points
Internal current consumption (5VDC)		0.34A
Weight		0.16kg

Number of link points by the number of occupied stations

The following table lists the number of link points by the number of occupied stations.

Item			CC-Link Ver.1	CC-Link Ver.2			
				Extended cyclic setting			
				Single	Double	Quadruple	Octuple
Number of link points by the number of occupied stations	1 station occupied	Remote I/O (RX, RY)	32 points (30 points for a local station)	32 points (30 points for a local station)	32 points (30 points for a local station)	64 points (62 points for a local station)	128 points (126 points for a local station)
		Remote register (RWw)	4 points	4 points	8 points	16 points	32 points
		Remote register (RWr)	4 points	4 points	8 points	16 points	32 points
	2 stations occupied	Remote I/O (RX, RY)	64 points (62 points for a local station)	64 points (62 points for a local station)	96 points (94 points for a local station)	192 points (190 points for a local station)	384 points (382 points for a local station)
		Remote register (RWw)	8 points	8 points	16 points	32 points	64 points
		Remote register (RWr)	8 points	8 points	16 points	32 points	64 points
	3 stations occupied	Remote I/O (RX, RY)	96 points (94 points for a local station)	96 points (94 points for a local station)	160 points (158 points for a local station)	320 points (318 points for a local station)	640 points (638 points for a local station)
		Remote register (RWw)	12 points	12 points	24 points	48 points	96 points
		Remote register (RWr)	12 points	12 points	24 points	48 points	96 points
	4 stations occupied	Remote I/O (RX, RY)	128 points (126 points for a local station)	128 points (126 points for a local station)	224 points (222 points for a local station)	448 points (446 points for a local station)	896 points (894 points for a local station)
		Remote register (RWw)	16 points	16 points	32 points	64 points	128 points
		Remote register (RWr)	16 points	16 points	32 points	64 points	128 points

Number of occupied stations, station numbers, and numbers of modules and stations

The following describes how the number of occupied stations, station numbers, and the numbers of modules and stations are related.

(1) Number of occupied stations

The number of occupied remote I/O stations, remote device stations, and local stations are fixed for each module.

However, the number of occupied local stations can be set (1 to 4 stations).

Module		Number of occupied stations
Remote I/O station (8-point, 16-point, and 32-point module)		1 station
Remote device station	AJ65BT-64AD	2 stations
	AJ65BT-64DAV	2 stations
	AJ65BT-64DAI	2 stations
	AJ65BT-D62 AJ65BT-D62D(S1)	4 stations
	AJ65BT-68TD	4 stations
	AJ65BT-64RD3 AJ65BT-64RD4	4 stations
Local station	RJ61BT11	1 to 4 stations (The number of stations can be changed in the parameter settings.)
Intelligent device station	AJ65BT-R2N	1 station
	AJ65BT-D75P2-S3	4 stations
	GT15-J61BT13	1 or 4 stations

(2) Station number

When the number of occupied stations of all the connected stations is 1, set serial numbers from 1 (such as 1, 2, 3...) as station numbers.

However, when a station that occupies two or more stations is connected, set station numbers considering the number of occupied stations.

| Station No.1 | Station No.2 | Station No.3 | Station No.4 | Station No.5 | Station No.6 | Station No.7 | Station No.8 | Station No.9 |

Master station

Station No.1
Remote station (2 stations occupied)

Station No.3
Remote station (1 station occupied)

Station No.4
Local station (4 stations occupied)

Station No.8
Remote station (1 station occupied)

Station No.9
Local station (1 station occupied)
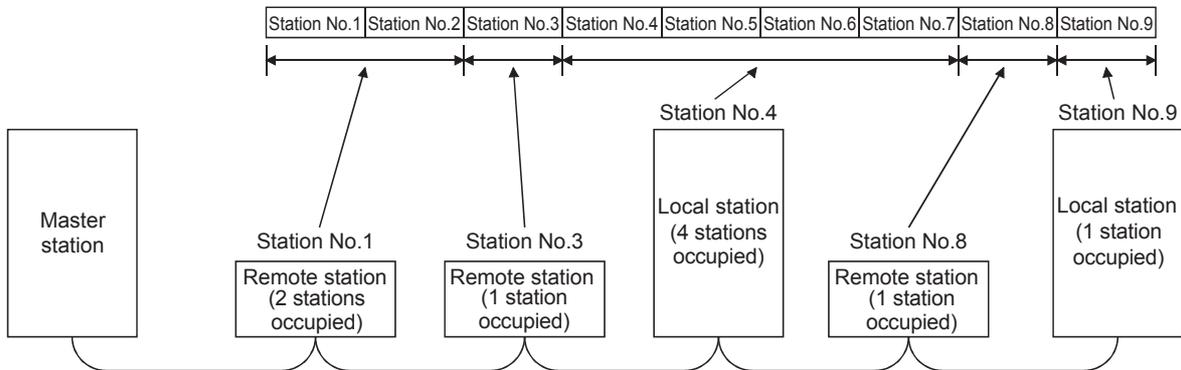
(3) Numbers of modules and stations

The number of modules is the number of modules actually connected.

The number of stations is the total number of stations occupied by the modules listed in (1).

In the system configuration example in (2), the number of modules is 5 and the number of stations is 9.

Precautions for system configuration

To prevent incorrect inputs from remote stations, observe the following when designing the system.

(1) When powering on and off the system

Power on the remote station, and start data link. In addition, stop data link before powering off the remote station. Failure to do so may cause an incorrect input.

Data link starts.   Data link stops.

Master station (data link status)

During execution

Stopped

Remote station (power supply status)

ON

OFF
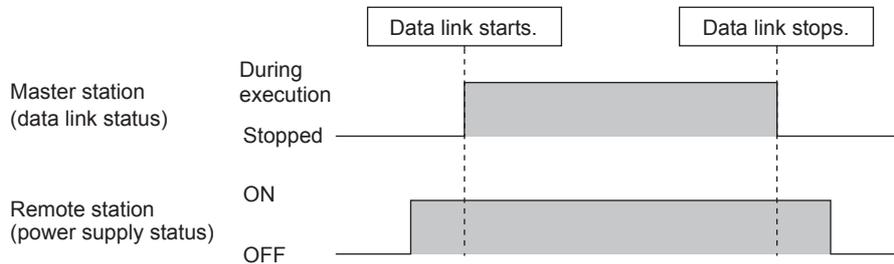
(2) Upon a momentary power failure of a remote station

If a momentary power failure occurs in the power supply (24VDC) of the remote station, an incorrect input may occur.

(a) Cause of an incorrect input due to a momentary power failure

The hardware of a remote station internally converts the module power supply (24VDC) into 5VDC. If a momentary power failure occurs at a remote station, (the time until the 5VDC power supply in the remote station turns off) > (the response time after an input module turns on and off); therefore, refreshing data within the time as shown in ❶ below causes an incorrect input.

Turning off the input external power supply turns off an input (Xn) after the response time between the input module turning on and it turning off.
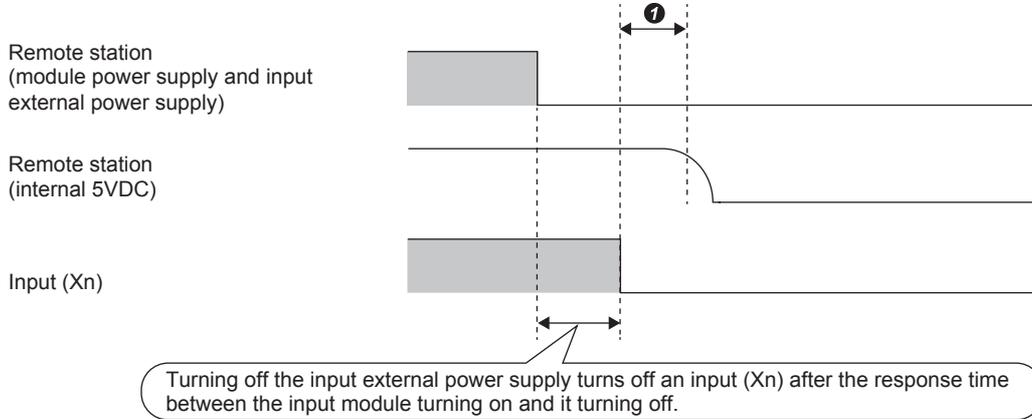
(b) Countermeasure against an incorrect input

Supply power to the power supply module, stabilized power supply, and AC input external power supply from the same power supply.

Point
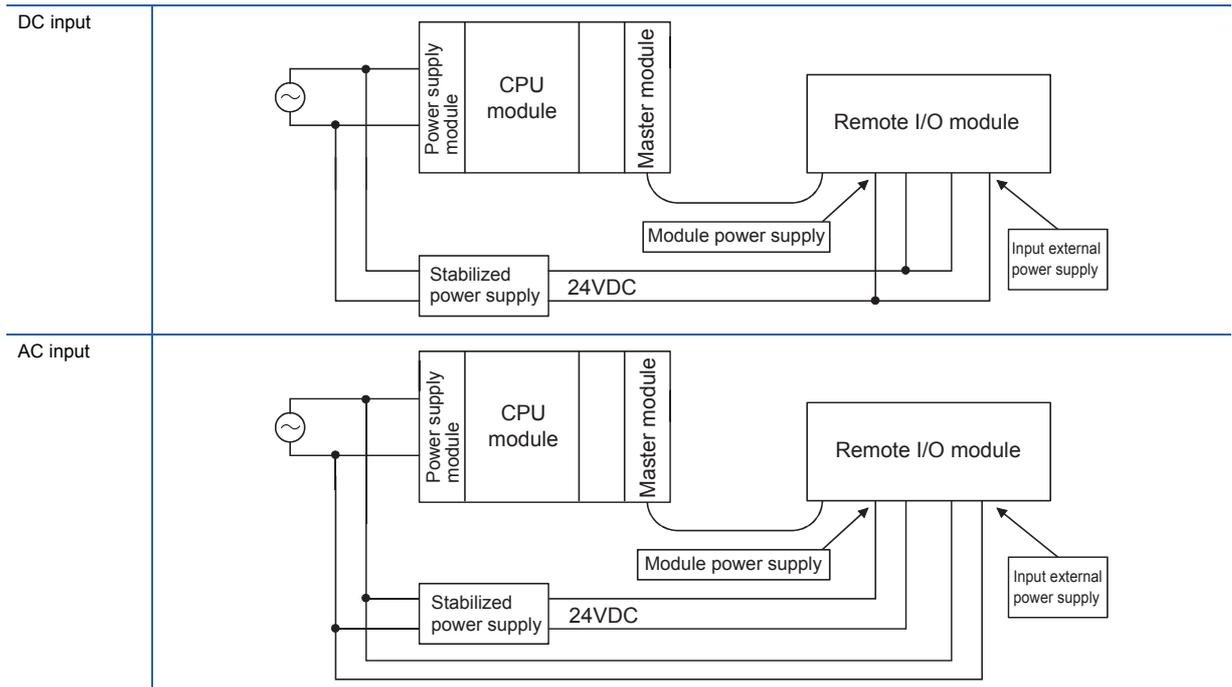
When supplying power to multiple remote stations from one power supply, select applicable cables and properly wire them to prevent a voltage drop caused by the power supply. When a remote station has a receiving end voltage within the specified range for the remote station used, it can be connected.
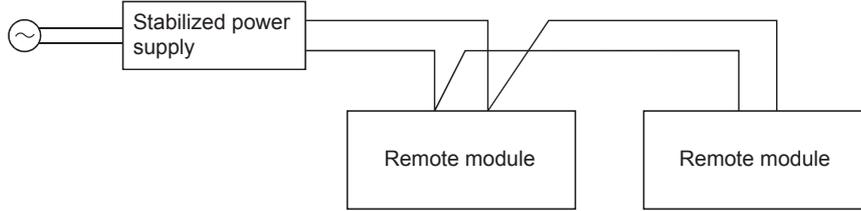
(c) Access to a station with the station number 64

• Access to a local station with the station number 64 cannot be performed from other stations with GX Works3 and GOTs.
Changing the station number to the one other than 64 allows access from other stations.

• Access to a local station and intelligent device station with the station number 64 cannot be performed from other stations with the CC-Link board.
Changing the station number to the one other than 64 allows access from other stations.

2.1.2 I/O signals of the master/local module

This section describes the I/O signals for the CPU module. The I/O signal assignment of when the start I/O number of the master/local module is "0" is listed below.

List of I/O signals

The following table lists I/O signals. The device X is an input signal from the master/local module to the CPU module. The device Y is an output signal from the CPU module to the master/local module.

■Input signals

Device No.	Signal name
X0	Module failure
X1	Own station data link status
X2	Use prohibited
X3	Data link status of other stations
X4 to XE	Use prohibited
XF	Module ready
X10 to X1F	Use prohibited

■Output signals

Device No.	Signal name
Y0 to Y1F	Use prohibited

Point

Do not use (turn on) any "use prohibited" signals as an input or output signal to the CPU module.
Doing so may cause malfunction of the programmable controller system.

Details of I/O signals

The following describes on/off timing and conditions of I/O signals.

■Module failure: X0
This signal indicates whether the module is normal or faulty.
Off: Module normal
On: Module failure
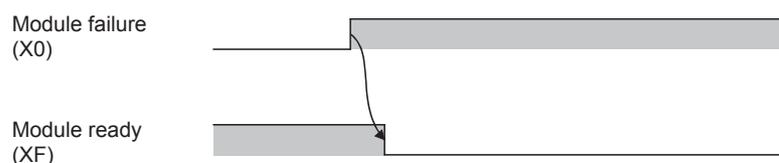
■Own station data link status: X1
This signal indicates the data link status of the own station.
'Operation status of own station' (SB006E) has the same functionality. Use either of X1 or 'Operation status of own station' (SB006E) for programming.
Note that the on/off conditions of X1 are the opposite to those of 'Operation status of own station' (SB006E). The conditions of X1 are as follows:
Off: Data link stop
On: Data link in progress

■Data link status of other stations: X3

This signal indicates the data link status of other stations (remote station, local station, intelligent device station, and standby master station).

'Data link status of other stations' (SB0080) has the same functionality. Use either of X3 or 'Data link status of other stations' (SB0080) for programming.

Off: All stations normal

On: Faulty station found (The status of the faulty station is stored in 'Data link status of other stations' (SW0080 to SW0083).)

> **Point**
>
> It takes maximum of six seconds for Data link status of other stations (X3) to turn on after a slave station connected to the master station or local station becomes faulty. The time until this signal turns on differs depending on the system configuration and error status.

■Module ready: XF

This signal indicates whether the module is ready for operation. When the module becomes ready, this signal turns on. When the module is in the following state, this signal turns off.

• When Module failure (X0) turns on
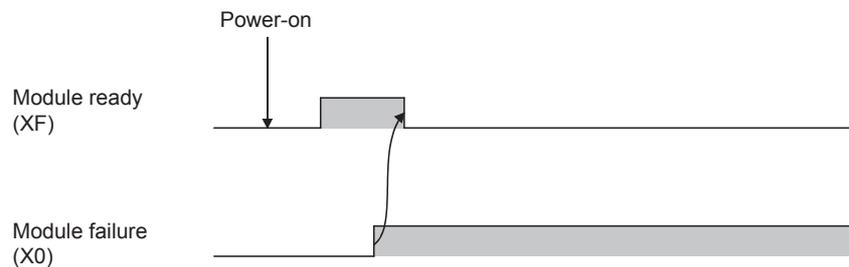
2.1.3 Buffer memory of the master/local module

The buffer memory is used to exchange data between the master/local module and the CPU module.

Buffer memory values are defaulted when the CPU module is reset or the system is powered off.

For details, refer to Page App. - 2 Buffer Memory Assignment of RX, RY, RWr, and RWw and the following.

📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

List of buffer memory addresses

When a standby master station is used, refer to the respective columns under "Availability" in the table as explained below.

 • When a standby master station is operating as a master station: "Master station" column
 • When a standby master station is operating as a standby master station: "Local station" column

○: Available, —: Not available

Address		Name	Description	Read/Write	Availability	
Hexadecimal	Decimal				Master station	Local station
0H to DFH	0 to 223	Parameter information area	Stores parameter settings.	Read	○[*1]	—
E0H to 15FH	224 to 351	Remote input (RX)[*2]	■Master station Stores the data input from slave stations.	Read	○	—
			■Local station Stores the data input from the master station.		—	○
160H to 1DFH	352 to 479	Remote output (RY)[*2]	■Master station Stores the data output to slave stations.	Read, write	○	—
			■Local station Stores the data output to the master station. Data input from other slave stations are also stored.		—	○
1E0H to 2DFH	480 to 735	Remote register (RWw)[*2]	■Master station Stores the data to be sent to slave stations.	Read, write	○	—
			■Local station Stores the data to be sent to the master station and other salve stations. Data received from other slave stations are also stored.		—	○
2E0H to 3DFH	736 to 991	Remote register (RWr)[*2]	■Master station Stores the data received from slave stations.	Read	○	—
			■Local station Stores the data received from the master station.		—	○
3E0H to 5DFH	992 to 1503	Slave station offset, size information (512 words)	Stores the offset and size of RX, RY, RWw, and RWr in each slave station.	Read	○	○
5E0H to 5FFH	1504 to 1535	Link special relay (SB)	Stores the data link status.	Read, write (Data can be written only to areas with the first 32 addresses.)	○	○
600H to 7FFH	1536 to 2047	Link special register (SW)	Stores the data link status.		○	○
800H to 9FFH	2048 to 2559	System area	—	—	—	—
A00H to FFFH	2560 to 4095	Random access buffer	Stores any data and is used for transient transmission.	Read, write	○	○
1000H to 1FFFH	4096 to 8191	System area	—	—	—	—
2000H to 2FFFH	8192 to 12287	Automatic update buffer	Stores data automatically updated when transient transmission (communications using the automatic update buffer) is performed with an intelligent device station.	Read, write	○	—
3000H to 3FFFH	12288 to 16383	System area	—	—	—	—

Address		Name	Description	Read/Write	Availability	
Hexadecimal	Decimal				Master station	Local station
4000H to 41FFH	16384 to 16895	Ver.2-compatible remote input (RX)[*3]	■Master station Stores the data input from slave stations.	Read	○	—
			■Local station Stores the data input from the master station.		—	○
4200H to 43FFH	16896 to 17407	Ver.2-compatible remote output (RY)[*3]	■Master station Stores the data output to slave stations.	Read, write	○	—
			■Local station Stores the data output to the master station. Data input from other slave stations are also stored.		—	○
4400H to 4BFFH	17408 to 19455	Ver.2-compatible remote register (RWw)[*3]	■Master station Stores the data to be sent to slave stations.	Read, write	○	—
			■Local station Stores the data to be sent to the master station and other salve stations. Data received from other slave stations are also stored.		—	○
4C00H to 53FFH	19456 to 21503	Ver.2-compatible remote register (RWr)[*3]	■Master station Stores the data received from slave stations.	Read	○	—
			■Local station Stores the data received from the master station.		—	○
5400H to 5C7FH	21504 to 23679	System area	—	—	—	—
5C80H to 5CBFH	23680 to 23743	Remote device station initialization procedure registration execution individual information	Stores the execution progress of the remote device station initial setting procedure registration function.	Read	○	—
5CC0H to 7FFFH	5CC0H to 7FFFH	System area	—	—	—	—

*1 Not available when a standby master station is controlling the system.

*2 This buffer memory area is used when the remote net Ver.1 mode, remote device net Ver.1 mode, or remote I/O net mode is selected.

*3 This buffer memory area is used when the remote net Ver.2 mode or remote device net Ver.2 mode is selected.

Point

Do not write data to "System area".

Doing so may cause malfunction of the programmable controller system.

2.1.4 Parameter information area

This area stores parameter settings.

Do not write data in this area. Doing so may cause an error.

Setting item	Description
Number of connected stations	Stores the number of slave stations (including a reserved station) connected to the master station. Default: 64 (stations) Range: 1 to 64 (stations)
Number of retries	Stores the number of retries to a station where a communication failure has occurred. Default: 3 (times) Range: 1 to 7 (times)
Number of automatic return stations	Stores the number of slave stations that return to system operation by one link scan. Default: 1 (station) Range: 1 to 10 (stations)
Standby master station specification	Stores the standby master station number. Default: 0 (0: No standby master station specified) Range: 0 to 64 (0: No standby master station specified, 1 to 64: Station number of the corresponding station)
Data link setting when CPU is down	Stores the specified data link status if a CPU module error occurs in the mater station. Default: 0 (Data link stopped) Range: 0 (Data link stopped), 1 (Data link continued)
Scan mode setting	Stores whether to synchronize a link scan with a sequence scan. Default: 0 (Asynchronous with a sequence scan) Range: 0 (Asynchronous with a sequence scan), 1 (Synchronous with a sequence scan)
Reserved station setting	Stores the reserved station specification status. Only the bit corresponding to the start station number turns on. Default: 0 (Not set) Range: The bit corresponding to the station number turns on.
Error invalid station setting	Stores the error invalid station specification status. Only the bit corresponding to the start station number turns on. Default: 0 (Not set) Range: The bit corresponding to the station number turns on.

Reserved station setting table:

	b15	b14	b13	b12	to	b3	b2	b1	b0
10H (16)	16	15	14	13	to	4	3	2	1
11H (17)	32	31	30	29	to	20	19	18	17
12H (18)	48	47	46	45	to	36	35	34	33
13H (19)	64	63	62	61	to	52	51	50	49

1 to 64 in the table indicate station numbers.

Error invalid station setting table:

	b15	b14	b13	b12	to	b3	b2	b1	b0
14H (20)	16	15	14	13	to	4	3	2	1
15H (21)	32	31	30	29	to	20	19	18	17
16H (22)	48	47	46	45	to	36	35	34	33
17H (23)	64	63	62	61	to	52	51	50	49

1 to 64 in the table indicate station numbers.

Setting item	Description
Station information	Stores the status of the station type, the number of occupied stations, and the extended cyclic settings specified in the module parameters for slave stations. Default: 0101H (Ver.1-compatible remote I/O station, one station occupied, and station number 1) ⋮ 0140H (Ver.1-compatible remote I/O station, one station occupied, and station number 64) Range: Refer to the following. b15　to　b12 b11　to　b8 b7　　　to　　　b0 Station type │ Number of occupied stations │ Station No. 1 to 64 (01H to 40H) 1H: Number of occupied stations: 1 2H: Number of occupied stations: 2 3H: Number of occupied stations: 3 4H: Number of occupied stations: 4 0H: Ver.1-compatible remote I/O station 1H: Ver.1-compatible remote device station 2H: Ver.1-compatible intelligent device station 5H: Ver.2-compatible remote device station (single) 6H: Ver.2-compatible intelligent device station (single) 8H: Ver.2-compatible remote device station (double) 9H: Ver.2-compatible intelligent device station (double) BH: Ver.2-compatible remote device station (quadruple) CH: Ver.2-compatible intelligent device station (quadruple) EH: Ver.2-compatible remote device station (octuple) FH: Ver.2-compatible intelligent device station (octuple)
Automatic update buffer assignment	Stores the buffer memory sizes assigned for a local station, intelligent device station, and standby master station during transient transmission. Default: 128 words Range: 0 (word) (not set) or 128 (words) to 4096 (words) Note that the total size must be within 4096 (words). ■1st station • 80H (128): Use prohibited • 81H (129): Use prohibited • 82H (130): Automatic update buffer size only for intelligent device stations ⋮ ■26th station • CBH (203): Use prohibited • CCH (204): Use prohibited • CDH (205): Automatic update buffer size only for intelligent device stations
8-point remote I/O station setting	Stores the station number of the remote I/O station where 8 points have been set in the remote I/O station points setting. When "8 Points + 8 Points (Reserved)" has been set, the station number is stored in both 8-point remote I/O station setting and 16-point remote I/O station setting. Default: 0 (Not set) Range: The bit corresponding to the station number turns on. (see table below) 1 to 64 in the table indicate station numbers.
16-point remote I/O station setting	Stores the station number of the remote I/O station where 16 points have been set in the remote I/O station points setting. When "8 Points + 8 Points (Reserved)" has been set, the station number is stored in both 8-point remote I/O station setting and 16-point remote I/O station setting. Default: 0 (Not set) Range: The bit corresponding to the station number turns on. (see table below) 1 to 64 in the table indicate station numbers.

8-point remote I/O station setting table:

	b15	b14	b13	b12	to	b3	b2	b1	b0
D0H (208)	16	15	14	13	to	4	3	2	1
D1H (209)	32	31	30	29	to	20	19	18	17
D2H (210)	48	47	46	45	to	36	35	34	33
D3H (211)	64	63	62	61	to	52	51	50	49

16-point remote I/O station setting table:

	b15	b14	b13	b12	to	b3	b2	b1	b0
D4H (212)	16	15	14	13	to	4	3	2	1
D5H (213)	32	31	30	29	to	20	19	18	17
D6H (214)	48	47	46	45	to	36	35	34	33
D7H (215)	64	63	62	61	to	52	51	50	49

Setting item	Description
0-point reserved station specification	Stores the station number of the reserved station where 0 points have been set. Default: 0 (Not set) Range: The bit corresponding to the station number turns on.

	b15	b14	b13	b12	to	b3	b2	b1	b0
D8H (216)	16	15	14	13	to	4	3	2	1
D9H (217)	32	31	30	29	to	20	19	18	17
DAH (218)	48	47	46	45	to	36	35	34	33
DBH (219)	64	63	62	61	to	52	51	50	49

1 to 64 in the table indicate station numbers.

Point

(1) Communications and automatic update buffer assignment
- Add seven words to the size of data to send/receive and specify it as the communication buffer size.
- Assign necessary automatic update buffer size for each intelligent device.

(2) Parameters required for data link

Set parameters required for data link over CC-Link by using either of the following.
- GX Works3 (Refer to Page 2 - 14 Setting network parameters and link refresh parameters and exercises in Chapter 3 or later.)
- RLPASET instruction (dedicated instruction) (Refer to Page App. - 59 RLPASET (Setting network parameters).)

For the procedures from parameter settings by using the RLPASET instruction to data link start, refer to the following.

📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

2.2　Operation Settings

2.2.1　Required settings

This section describes the procedures before operation. The detailed procedures are described in exercises in Chapter 3 or later, and therefore omitted here.

1. System configuration

Configure the CC-Link system and set parameters required for start-up, the station number for slave stations, and the transmission speed.

- Wiring
- Parameter settings
- Slave station number and transmission speed settings

2. Operation check using LEDs

Power on the system and check whether the data link is being performed properly.

If the data link is performed properly, the LED on/off status will be as follows.

- L RUN LED: On
- ERR. LED: Off

3. Programming

Create a program. For details, refer to the following.

📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

2.2.2 Setting network parameters and link refresh parameters

(1) Setting network parameters for the MELSEC iQ-R series

Network parameters for controlling CC-Link are set with GX Works3 and written into parameter areas of the CPU module.

(2) Areas for storing network parameters

Network parameters written in the CPU module are transferred to the parameter memory of the master station when the system is powered on or the CPU module is reset.

Data in the parameter memory of the master station is deleted when the system is powered off or when the CPU module is reset.

(Data is transferred again from the CPU module when the system is powered on or the CPU module is reset.)
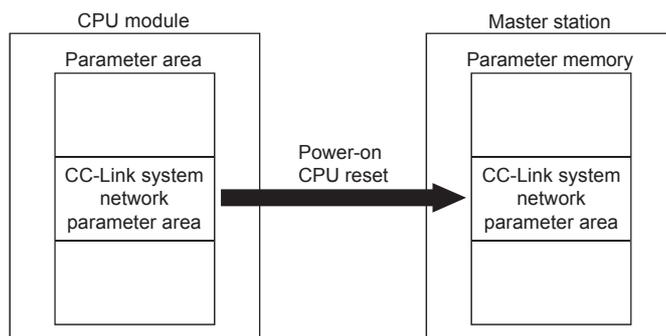
(3) Setting link refresh parameters for the MELSEC iQ-R series

Link refresh parameters for updating devices between the master/local module and the CPU module are set with GX Works3 and written into parameter areas of the CPU module.

(Link refresh parameters are not transferred to the master station.)

Link refresh parameters cannot be set with a sequence program.

Note) Link refresh parameters are set on the window for network parameters with GX Works3. Link refresh parameters and network parameters are written to the CPU module at the same time.

(4) Procedures from parameter settings to data link startup

Follow the procedures below.
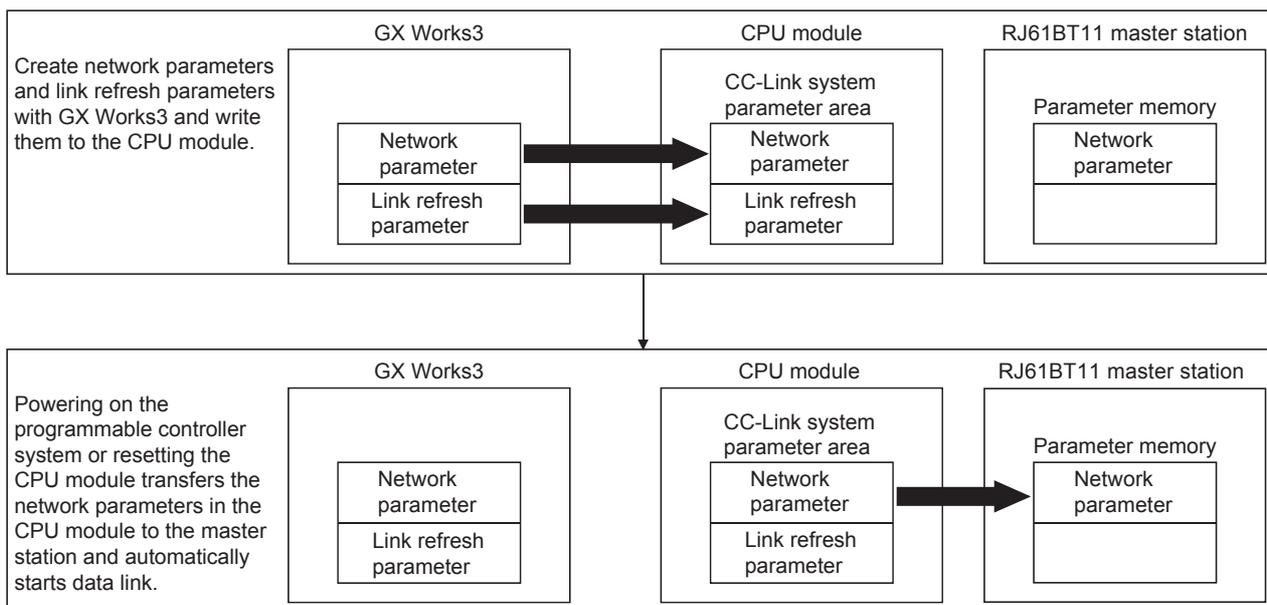
3   EXERCISE 1 (REMOTE NET MODE: PART 1)

This exercise is for the system where only remote I/O modules have been connected in the CC-Link remote net Ver.1 mode.

3.1   System Configuration

The following figure shows the system configuration of the demonstration machine for Exercise 1.

(1)   Module configuration

(2) I/O assignment

R61P (Power supply module)	RCPU (CPU No.1)	Empty	R60 AD4 (16 points)	R60 DA4 (16 points)	RJ61 BT11 (32 points) X30 Y30 to to X4F Y4F

X100 to X10F   Y170 to Y17F

GOT2000

Screen 1

Initial indication device D0   Initial indication device D1   Initial indication device D10 (32 bits)

Initial input device D20   Initial input device D21   Initial input device D30 (32 bits)

Screen 2

Screen 3   Screen 4

Upper section: The indication device can be changed.
Lower section: Data is displayed.

Upper section: The input device can be changed.
Lower section: The input data can be set and displayed.

- Touching [🗘] switches the screen.
- The initial value is automatically set to a device number in the upper section (trigger action function).
- Touching the "Initialize Input/Indication Device" button also initializes the device number.

3.2   Setting Modules

3.2.1   Part names of the master/local module

This section describes the part names of the master station RJ61BT11.

No.	Name		Description
(1)	RUN LED		Indicates the operating status. On: Normal operation Off: A hardware error or a watchdog timer error has occurred.
	ERR. LED		Indicates the error status of the module. The details of errors can be checked by using the following. • CC-Link diagnostics (📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)) • 'Detailed LED display status' (SW0058) (📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)) On: One of the following errors has occurred. • The error on all the stations was detected. • Two or more master stations are connected on the same line. • Settings are incorrect. • A cable is disconnected or a transmission path is affected by noise. Flashing: A station with a data link error was detected. Or the station number set for a remote station is already in use. Off: Normal operation
	MST LED		Indicates whether the module is operating as a master station. On: Operating as a master station (during data link control) Off: Operating as a local station or a standby master station (in standby status)
	S MST LED		Indicates whether the module is operating as a standby master station. On: Operating as a standby master station (in standby) Off: Operating as a master station or a local station
	B RATE LED	156K	Indicates the transmission speed that is normally operating. On: Operating at the indicated transmission speed All off: Transmission speed auto-tracking (When succeeded, the LED of the followed transmission speed turns on.)
		625K	
		2.5M	
		5M	
		10M	
	L RUN LED		Indicates the data link status. On: Data link in progress Off: Data link not performed
	L ERR. LED		Indicates the error status of a data link. On: A data link error has occurred at own station. Flashing: The communications are unstable due to the following reasons. • A terminating resistor is not connected. • The communications are affected by noise. Off: Normal operation
	SD LED		Indicates whether the module is sending data. On: Data being sent Off: Data not sent
	RD LED		Indicates whether the module is receiving data. On: Data being received Off: Data not received

No.	Name	Description
(2)	Dot matrix LED	Displays the station number set in the module. Indicates the following during the offline or test mode. Offline: "..." Line test based on module parameter settings: "L.T." Hardware test: "H.T."
(3)	Terminal block	Used to connect Ver.1.10-compatible CC-Link dedicated cables. For the connection method, refer to Page 3 - 11 Connecting CC-Link dedicated cables. The SLD and FG terminals are connected inside the module. Because a two-piece terminal block is used, the module can be replaced without disconnecting the signal line to the terminal block. Before installing or removing the terminal block, power off the module.
(4)	Production information marking	Shows the production information (16 digits) of the module.

3.2.2 Setting parameters of the master/local module

This section describes the parameter settings required for the master/local module.

Setting parameters

The parameter settings of the RJ61BT11 are described on Page 3 - 18 Parameter settings (master station) or later. Thus, detailed explanations are omitted here.

1. Select program elements (objects) from the "Element Selection" window and arrange them in the "Module Configuration" window.

☜ Double-click [Module Configuration] in the "Navigation" window.

2. The parameters of the master/local module includes the required settings, basic settings, and application settings. Double-click the master/local module on the Module Configuration window to set parameters.

3. After setting parameters, click the [Apply] button.

4. Write the parameters to the CPU module using the engineering tool.

☜ [Online] ⇨ [Write to PLC]

5. The parameters are reflected by resetting the CPU module or powering off and on the system.

Required Settings

Set the station type and mode of the master/local module.
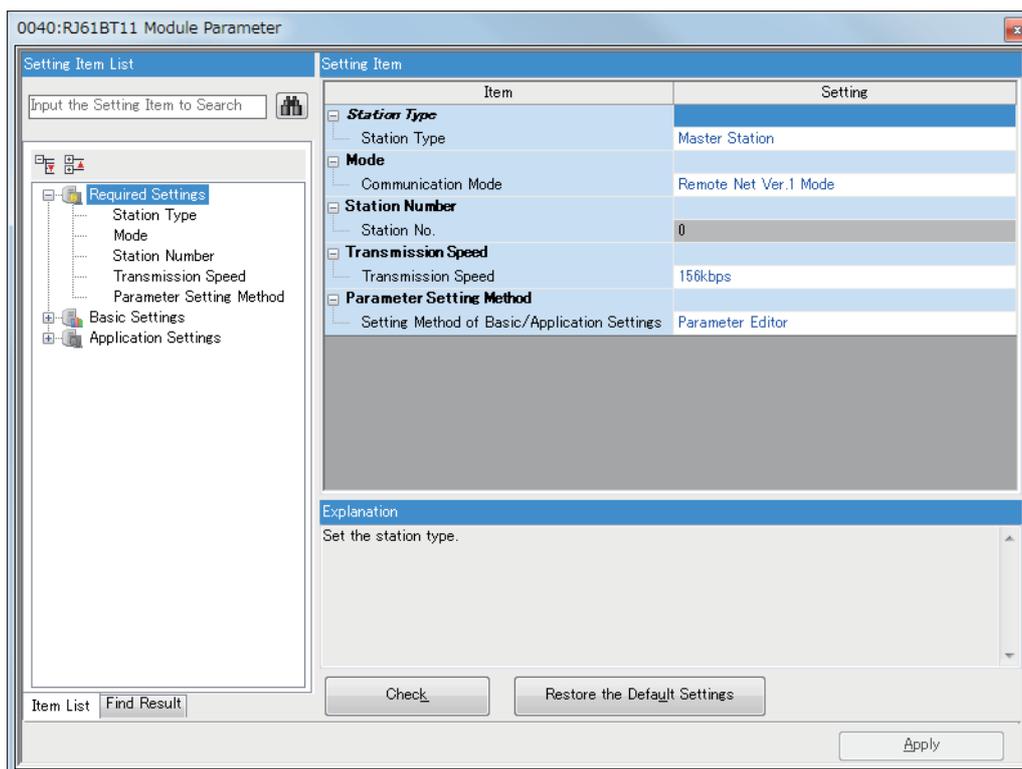
○: Can be set, ×: Cannot be set

Item	Availability		
	Master station	Master station (duplex function)	Local station/standby master station
Station Type	○	○	○
Mode	○	○	○
Station Number	×	○	○
Transmission Speed	○	○	○
Parameter Setting Method	○	×	×

Station Type

Set the station type of the master/local module.

Item	Description	Setting range[*1]
Station Type	Set the station type of the master/local module. • To use this module as a standby master station, select "Master Station (Duplex Function)" or "Standby Master Station". • When "Master Station (Duplex Function)" is set, the master station returns as a standby master operating station while data link is performed by a standby master station.	• Master Station • Master Station (Duplex Function) • Standby Master Station • Local Station (Default: Master Station)

*1 When "Setting Method of Basic/Application Settings" in "Parameter Setting Method" is set to "Program", the setting range is fixed to "Master Station".

Mode

Set the mode of the master/local module.

Item	Description	Setting range		
		Master station[*1]	Master station (duplex function)	Standby master station, local station
Mode	Set the mode of the master/local module.	• Remote Net Ver.1 Mode • Remote Net Ver.2 Mode • Remote Device Net Ver.1 Mode • Remote Device Net Ver.2 Mode • Remote I/O Net Mode • Offline • Line Test • Hardware Test (Default: Remote Net Ver.1 Mode)	• Remote Net Ver.1 Mode • Remote Net Ver.2 Mode • Offline • Line Test • Hardware Test (Default: Remote Net Ver.1 Mode)	• Remote Net Ver.1 Mode • Remote Net Ver.2 Mode • Offline • Hardware Test (Default: Remote Net Ver.1 Mode)

*1 When "Setting Method of Basic/Application Settings" in "Parameter Setting Method" is set to "Program", "Remote I/O Net Mode" cannot be set.

Station Number

Set the station number of the master/local module.

Item	Description	Setting range		
		Master station	Master station (duplex function)	Standby master station, local station
Station No.	Set the station number of the master/local module.	Fixed to 0[*1] (Default: 0)	0 to 64 (Default: Blank)	1 to 64 (Default: Blank)

*1 When "Mode" is set to "Line Test", the setting range is 0 to 64.

Transmission Speed

Set the transmission speed of the master/local module.

Item	Description	Setting range	
		Master station, master station (duplex function)	Standby master station, local station
Transmission Speed	Set the transmission speed of the master/local module.	• 156kbps • 625kbps • 2.5Mbps • 5Mbps • 10Mbps (Default: 156kbps)	• 156kbps • 625kbps • 2.5Mbps • 5Mbps • 10Mbps • Auto-tracking (Default: Auto-tracking)

Point

(1) Set sequential station numbers.

Station numbers can be set regardless of the connection order of stations. For a module that occupies two or more stations, set the start station number.

If set station numbers are not sequential, an unoccupied station number will be handled as a "data link faulty station".

When not setting station numbers sequentially, set unoccupied station numbers as reserved stations. (Set reserved stations in the CC-Link configuration setting of the module parameters.)

(2) Set station numbers not to overlap each other.

Otherwise, an installation error will occur.

(3) Use the same transmission speed for the master station, remote stations, local stations, intelligent device stations, and the standby master station.

If the setting for even one of the stations is different, data link cannot be performed properly.

3

3.2.3 Part names and settings of the remote I/O module

This section describes the part names and settings of the AJ65BTB2-16D and AJ65SBTC1-32T.

■AJ65BTB2-16D

(2) Set "0" according to the master module setting (156kbps).

(3) Station No.: 1

No.	Name	Description		
(1)	Operation status indicator LED			
		LED name	**Details**	
		PW	Turns on when the remote I/O module is powered on.	
		L RUN	Used to check if the remote I/O station communicates with the master station without errors. This LED turns on when the remote I/O module receives normal data from the master station, and turns off for timeout. (This LED turns on when the module receives normal data.)	
		SD	Turns on when data is sent.	
		RD	Turns on when the module receives data.	
		L ERR	This LED turns on when a transmission error (CRC error) has occurred. This LED turns off for timeout. (The L RUN LED also turns off.) This LED turns on when the station number setting or transmission speed setting is incorrect. (This LED turns off by correcting the setting and powering off and on the module.) This LED flashes when the station number setting or transmission speed setting is changed after start-up. (The L RUN LED remains on. The module keeps operating with the station number and transmission speed settings at power-on.)	
		0 to F	This LED indicates the on/off state of each input. This LED turns on when the input is turned on, or turns off when the input is turned off.	
(2)	Transmission speed setting switch	Set the transmission speed setting switch within the range of 0 to 4.		
		Setting	**Transmission speed**	
		0	156Kbps	
		1	625Kbps	
		2	2.5Mbps	
		3	5Mbps	
		4	10Mbps	
(3)	Station number setting switch	Set a station number within the range of 01 to 64. Set a unique station number. Use "×10" to set the tens place. Use "×1" to set the ones place.		
(4)	External wiring terminal block	Terminal block for power supply, transmission, and input signals		

■AJ65SBTC1-32T

(3) Set only "2" to "ON". (station No.: 2)

(2) Set all to "OFF" according to the master module setting (156kbps).

No.	Name	Description		
(1)	Operation status indicator LED	**LED name**	**Details**	
		PW	On: Power supply ON Off: Power supply OFF	
		L RUN	On: Normal communications Off: No communications (timeout error)	
		L ERR	On: Communication error Flashing regularly: The station number or transmission speed setting switch is changed while power is on. Flashing irregularly: The terminating resistor setting is incorrect. The module or CC-Link dedicated cable is affected by noise. Off: Normal communications	
		Y0 to 1F	On: Output ON Off: Output OFF	

No.	Name	Description

(2) Transmission speed setting switch

Setting value	Switch status			Transmission speed
	4	**2**	**1**	
0	OFF	OFF	OFF	156Kbps
1	OFF	OFF	ON	625Kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5Mbps
4	ON	OFF	OFF	10Mbps

Set the transmission speed within the above range.

(3) Station number setting switch

Select "10", "20", or "40" of STATION NO. for the tens place.
Select "1", "2", "4", or "8" of STATION NO. for the ones place.
Set a station number within the range of 1 to 64.[*1]

Station number	Tens place			Ones place			
	40	**20**	**10**	**8**	**4**	**2**	**1**
1	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	OFF	OFF	OFF	ON	ON
4	OFF	OFF	OFF	OFF	ON	OFF	OFF
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
10	OFF	OFF	ON	OFF	OFF	OFF	OFF
11	OFF	OFF	ON	OFF	OFF	OFF	ON
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
64	ON	ON	OFF	OFF	ON	OFF	OFF

No.	Name	Description
(4)	Indication selector switch[*2]	When the switch is set to "Y0-YF", LEDs indicate the on/off state of Y0 to YF.
		When the switch is set to "Y10-Y1F", LEDs indicate the on/off state of Y10 to Y1F.
(5)	Terminal block	Terminal block for module power supply, transmission, and output signals
(6)	Connector	Connector for output signals
(7)	DIN rail hook	When mounting the module on a DIN rail, push the DIN rail hook on its center line until it clicks.

*1　Set a unique station number.

*2　To operate the indication selector switch, do not use a tool such as a screwdriver.
Doing so may damage the switch.

3.3   Wiring

3.3.1   Connecting CC-Link dedicated cables

This section describes the connection of modules with CC-Link dedicated cables.

When wiring modules, always power off the system.
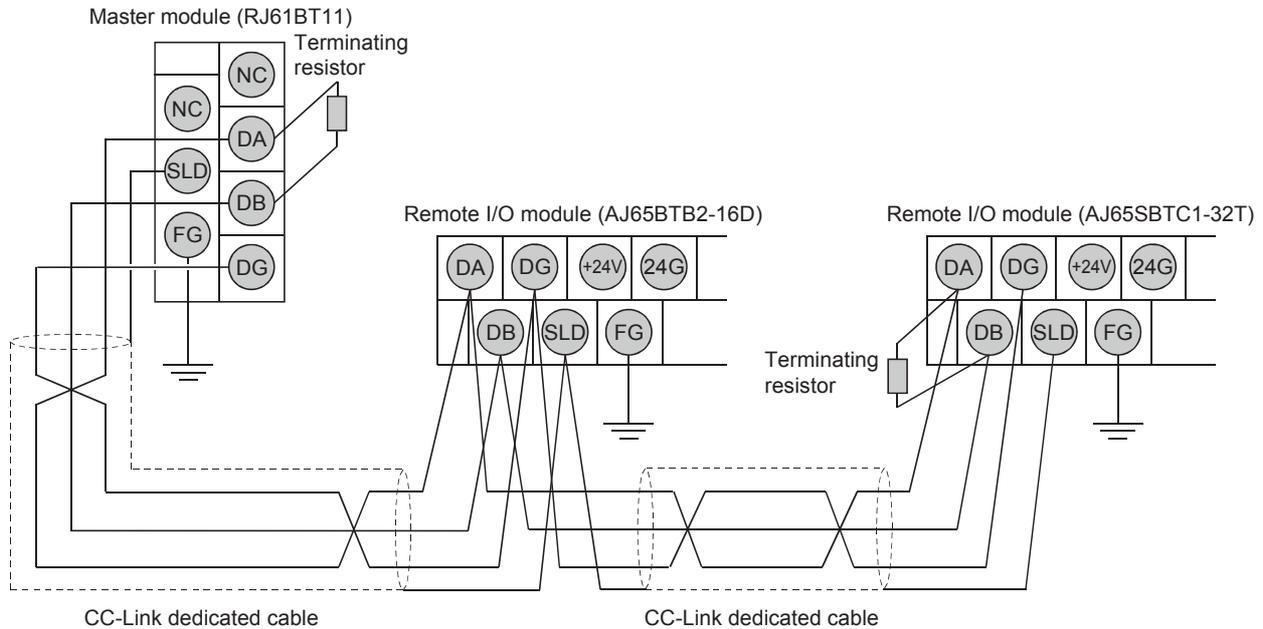
Point

- Connect a terminating resistor between the DA and DB terminals.
- Connect the shield cable of a Ver.1.10-compatible CC-Link dedicated cable to the SLD terminal of each module via the FG terminal. Then ground the cable at both ends with a ground resistance of 100 ohms or less. The SLD and FG terminals have been connected inside the module.
- For the terminal processing for connecting a Ver.1.10-compatible CC-Link dedicated cable to the terminal block, do not detangle the DA/DB/DG cable (three wires in one cable) or remove the sheath more than necessary. (For cables with fillers, cut them using a tool.)

3.3.2   Connecting 24V power supply cables

This section describes the connection of the 24V power supply cables (for internal module, external I/O) for remote I/O modules. (CC-Link dedicated cables and terminating resistors are omitted in the figure below.)

When wiring modules, always power off the system.
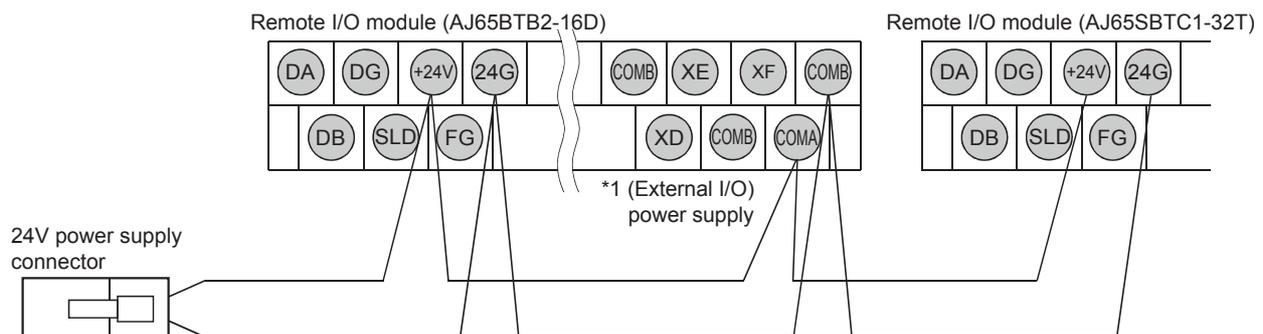
*1   The external I/O power supply of the AJ65BTB2-16D has both polarities. (Both the combination of COMA+ and COMB- and the combination of COMA- and COMB+ are available.)

3.4 Setting and Writing Parameters

3.4.1 Starting GX Works3

Start GX Works3 to set parameters of the master station.

Operating procedure
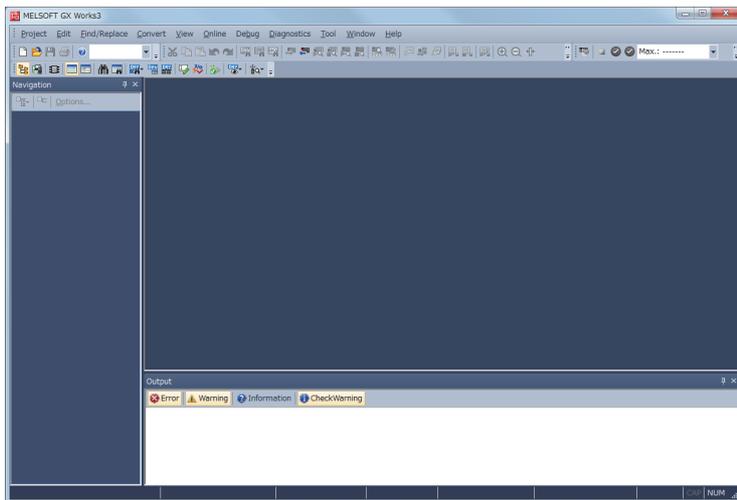
1. Click [MELSOFT] ⇨ [GX Works3] ⇨ [GX Works3] from the Windows® Start menu[*1].

*1 Select [Start] ⇨ [All apps] or [Start]⇨ [All Programs].
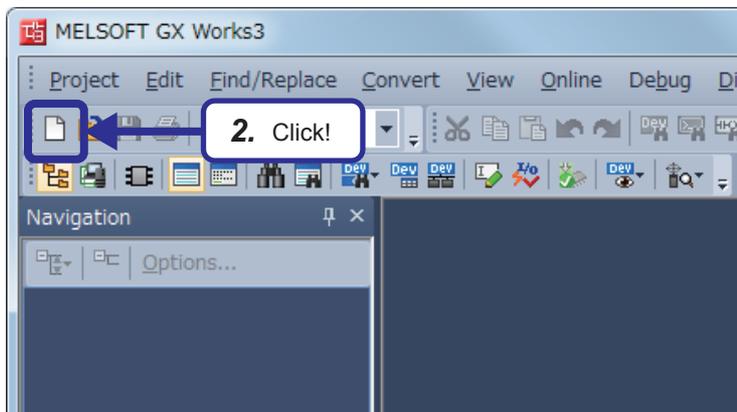
2. Click 🗋 on the toolbar or select [Project] ⇨ [New] (Ctrl + N) from the menu.

(To the next page)

(From the previous page)
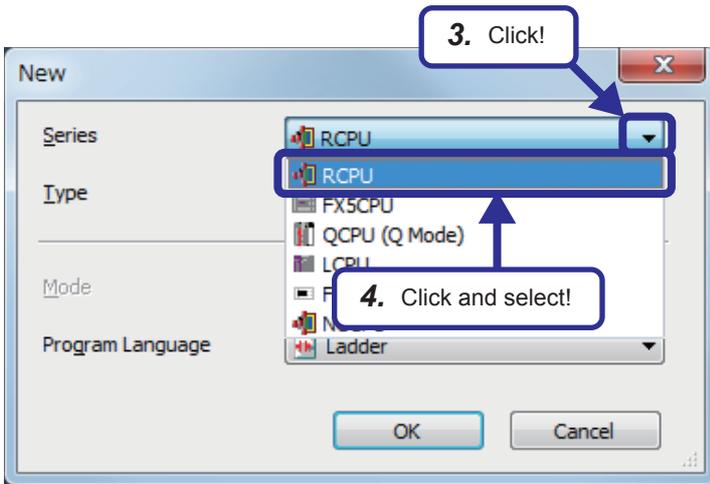
3. Click the list button of "Series".

3. Click!

New

Series   RCPU ▼

       RCPU

Type   FX5CPU

       QCPU (Q Mode)

       LCPU

Mode   F

       N

Program Language   Ladder ▼

OK   Cancel

4. Click and select!

4. Select "RCPU" from the drop-down menu.

3

New

Series   RCPU ▼

Type   R08 ▼

       R04

       R04EN

Mode   R08

       R08EN

Program Language   R08P

       R

       R

       R16EN

       R16P

5. Click!

6. Click and select!
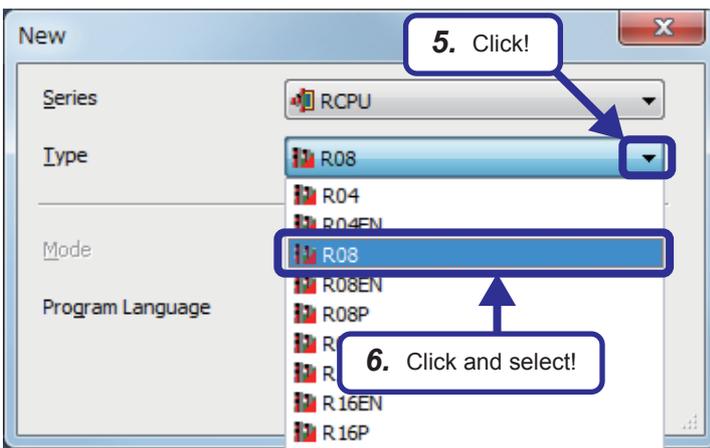
5. Click the list button of "Type".

6. Select "R08" from the drop-down menu.

New

Series   RCPU ▼

Type   R08 ▼

Mode ▼

Program Language   Ladder ▼

       Ladder

       ST

       SFC

       F

7. Click!

8. Click and select!
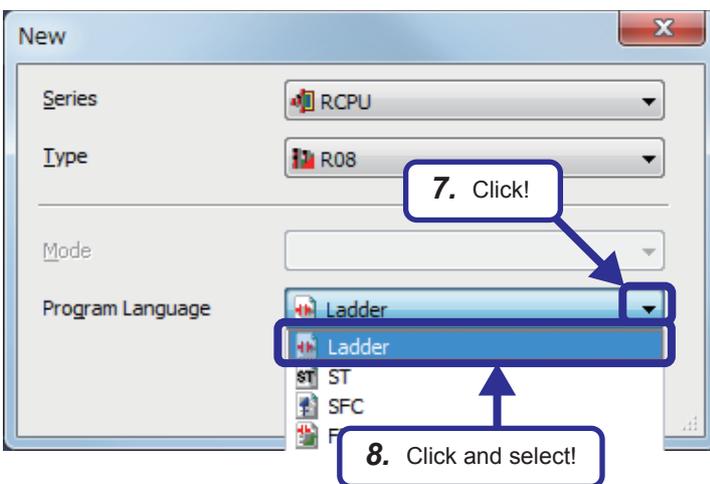
7. Click the list button of "Program Language".

8. Select "Ladder" from the drop-down menu.

(To the next page)

(From the previous page)

9. Click the [OK] button.

New

Series	RCPU
Type	R08

9. Click!

Mode	
Program Language	Ladder

OK   Cancel

10. Click the [OK] button.

MELSOFT GX Works3

Add a module.
  [Module Name] R08CPU
  [Start I/O No.] 3E00

Module Setting   Setting Change

Module Label:Not use

10. Click!

☐ Do Not Show this Dialog Again   OK
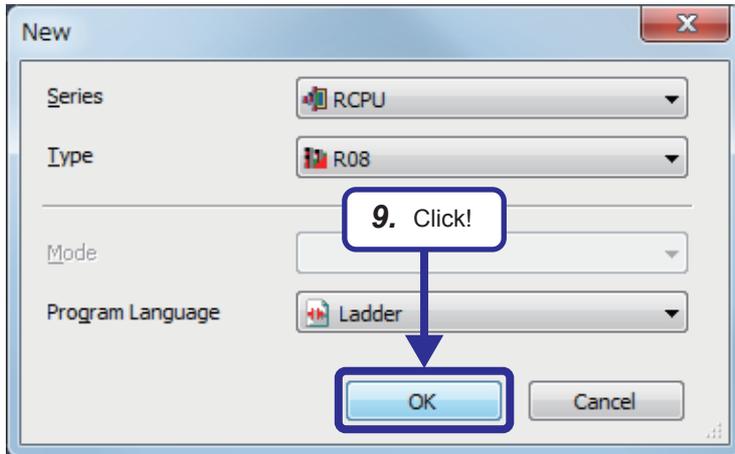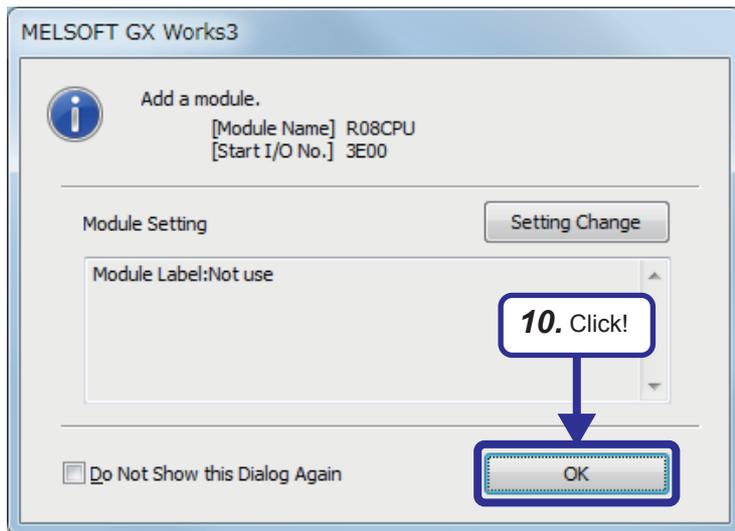
3.4.2 Adding master/local module data

Adding a master/local module in the module configuration enables users to set parameters of the master/local module.

Operating procedure
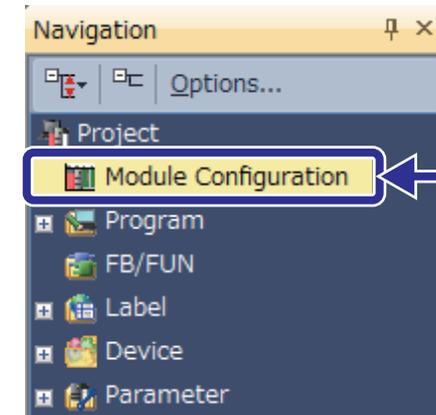
1. Double-click [Module Configuration] in the "Navigation" window.
When the dialog box about parameter information appears, click the [OK] button.

1. Double-click!
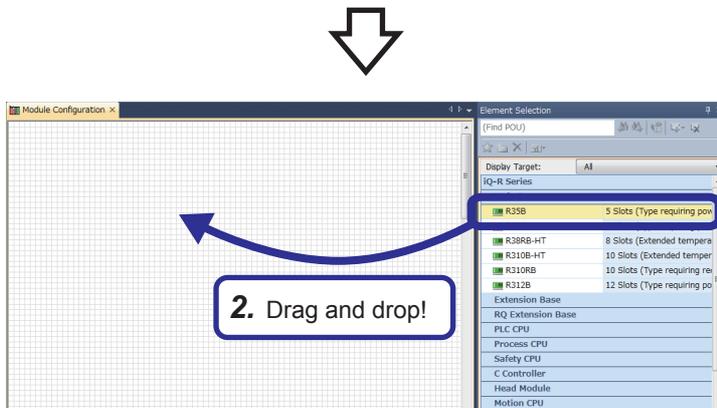
2. The "Module Configuration" window appears. Select "R35B" from "Main Base" in the "Element Selection" window, and drag and drop it to the "Module Configuration" window.
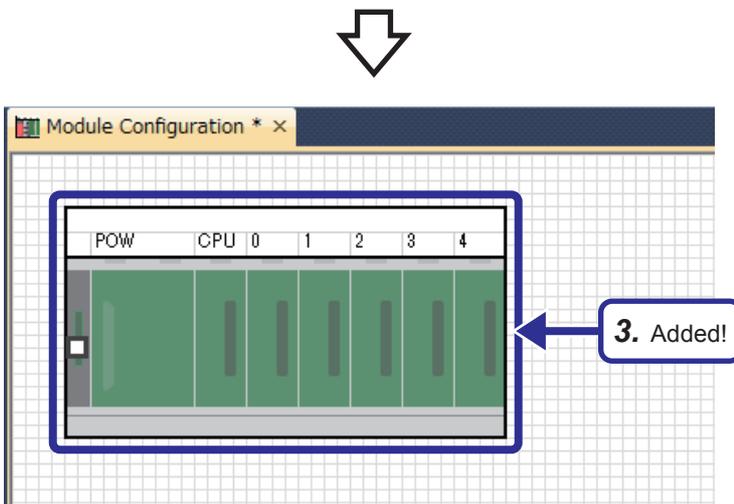
2. Drag and drop!

3. "R35B" is added on the "Module Configuration" window.

3. Added!

(To the next page)
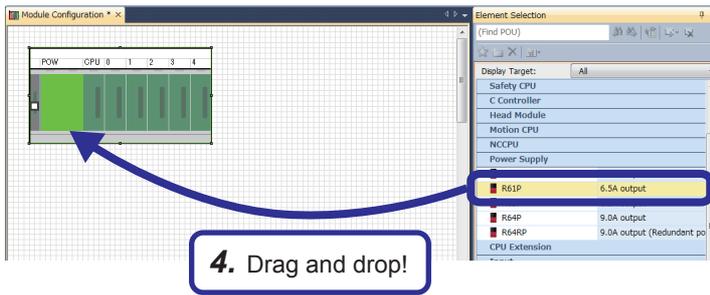
4. Select "R61P" from "Power Supply" in the "Element Selection" window, and drag and drop it to the power supply slot of the R35B on the "Module Configuration" window.
While the power supply module is being dragged and dropped, the slot where the power supply module can be arranged is highlighted.

4. Drag and drop!
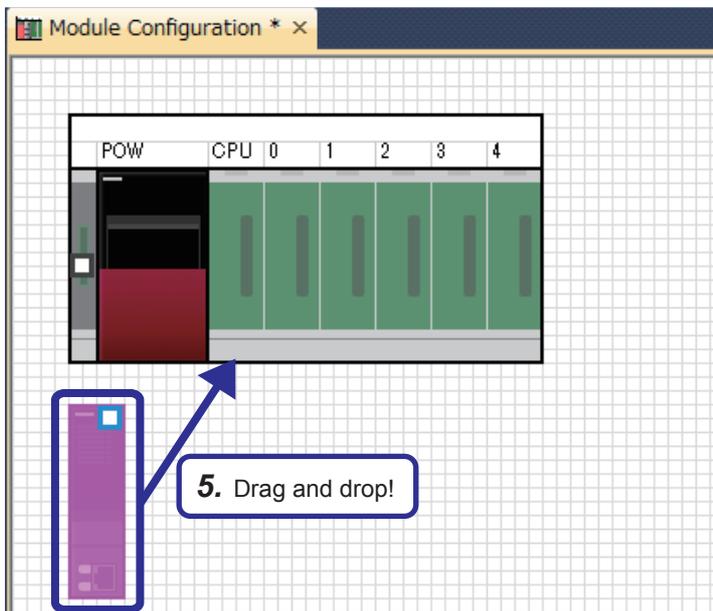
5. Add the R08CPU that has already been arranged in the module configuration to the CPU slot of the R35B.
When the R08CPU has not been arranged in the module configuration, add the R08CPU from the "Element Selection" window in the same way as for the power supply module.

5. Drag and drop!
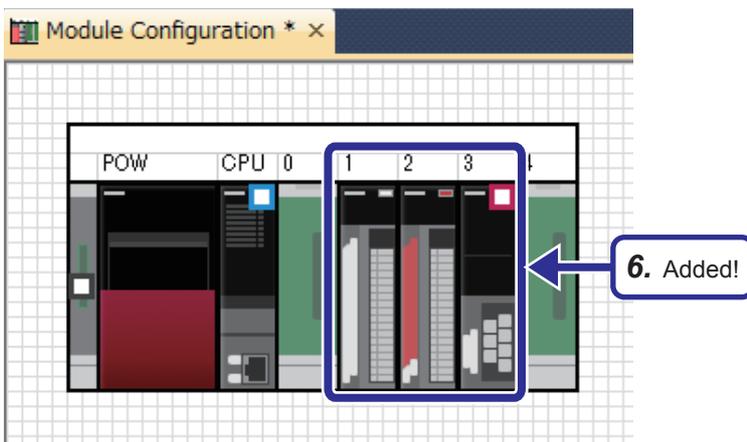
6. Add the following modules from the "Element Selection" window.

Slot No.1:
Analog input "R60AD4"

Slot No.2:
Analog output "R60DA4"

Slot No.3:
Network module "RJ61BT11"

6. Added!

(From the previous page)
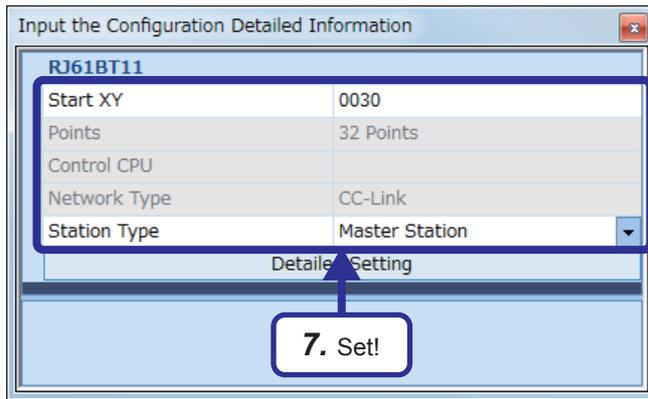
7. Right-click the RJ61BT11, and click [Parameter] ⇨ [Input Detailed Configuration Information Window] from the menu to display the "Input the Configuration Detailed Information" window. Set parameters as follows.

[Parameters to be set]
Start XY: 0030
Station Type: Master Station

Input the Configuration Detailed Information

RJ61BT11

Start XY	0030
Points	32 Points
Control CPU	
Network Type	CC-Link
Station Type	Master Station

Detailed Setting

7. Set!
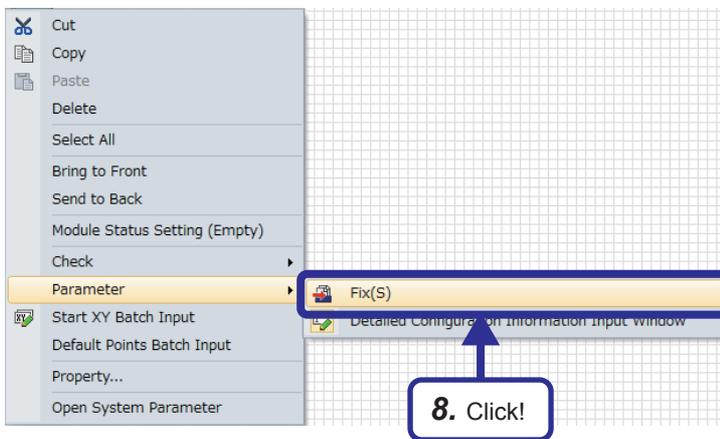
8. After the settings, right-click the RJ61BT11 and click [Parameter] ⇨ [Fix] from the menu to fix the parameters.
(Click the [No] button on the confirmation window for adding the module label.)

Cut
Copy
Paste
Delete
Select All
Bring to Front
Send to Back
Module Status Setting (Empty)
Check
Parameter   Fix(S)
Start XY Batch Input   Detailed Configuration Information Input Window
Default Points Batch Input
Property...
Open System Parameter
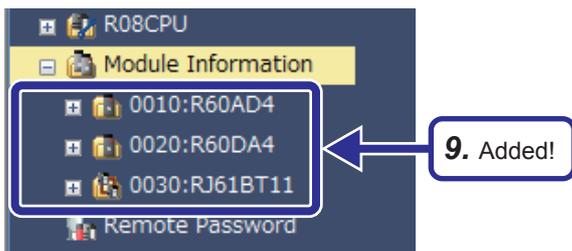
8. Click!

9. The data of the specified modules are added to the "Navigation" window.

R08CPU
Module Information
  0010:R60AD4
  0020:R60DA4
  0030:RJ61BT11
Remote Password

9. Added!

3 EXERCISE 1 (REMOTE NET MODE: PART 1)
3.4 Setting and Writing Parameters   **3 - 17**

3

3.4.3 Parameter settings (master station)

Set parameters of the master station.

Operating procedure
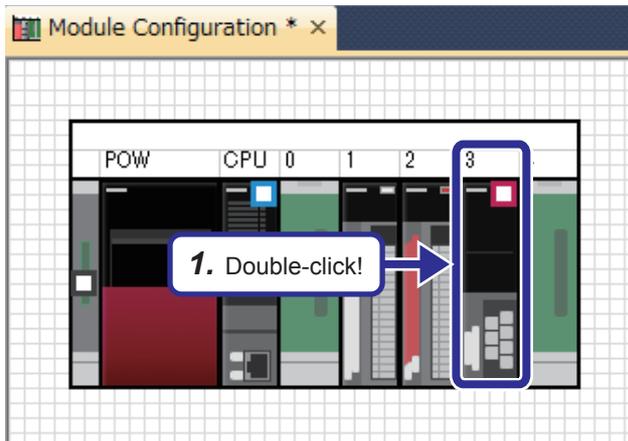
1. Double-click the RJ61BT11 module in the module configuration.

1. Double-click!
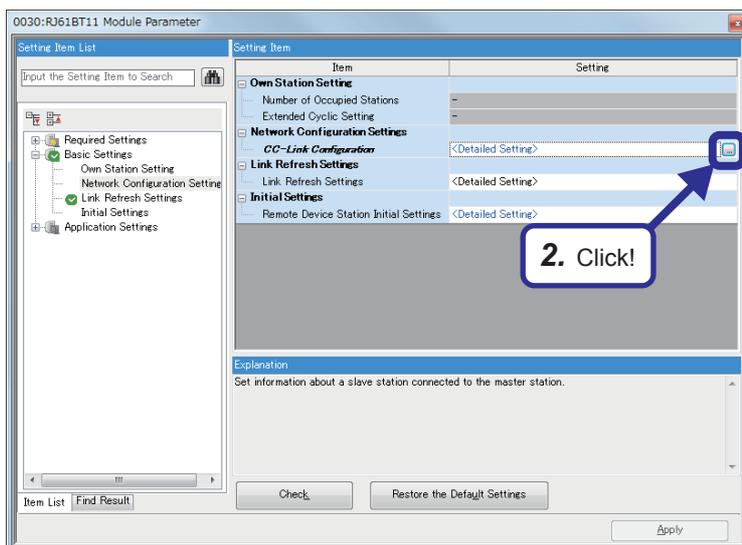
2. The "RJ61BT11 Module Parameter" dialog box appears. Select "Network Configuration Settings" of "Basic Settings" in "Setting Item List" and click the ⬜ button of "CC-Link Configuration".

2. Click!

(To the next page)
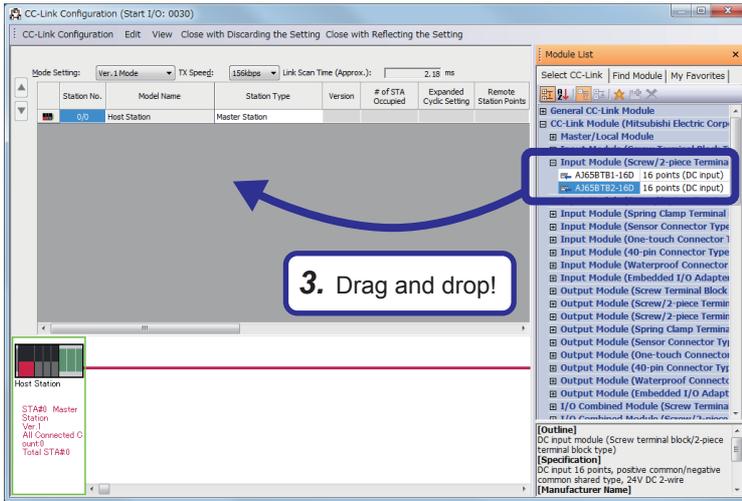
3. The "CC-Link Configuration" dialog box appears. Select "AJ65BTB2-16D" from "Input Module (Screw/2-piece Terminal Block Type)" in "Module List" and drag and drop it to the list of stations or the network map.
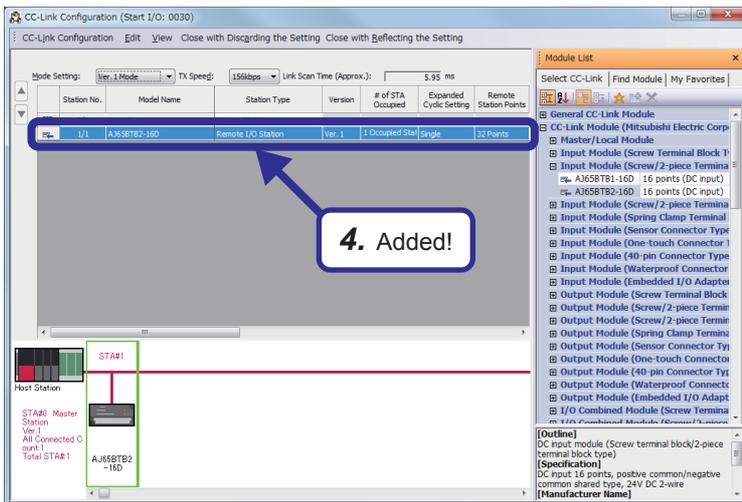
4. "AJ65BTB2-16D" is added to the list of stations.
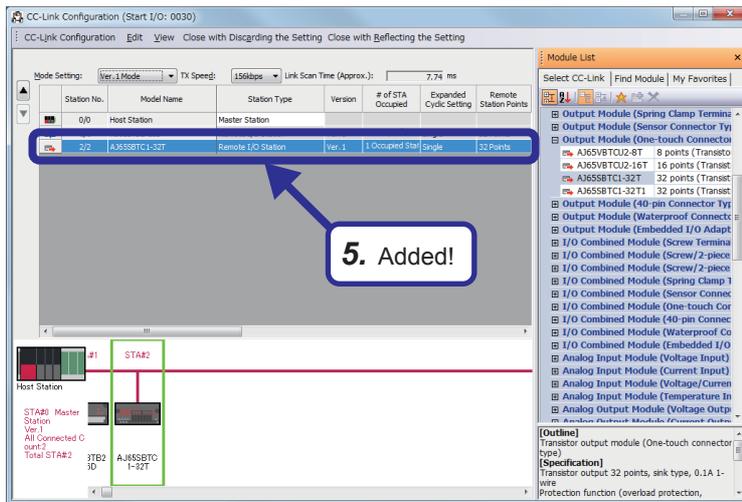
5. Add "AJ65SBTC1-32T" from "Output Module (One-touch Connector Type)" in "Module List" in the same way.
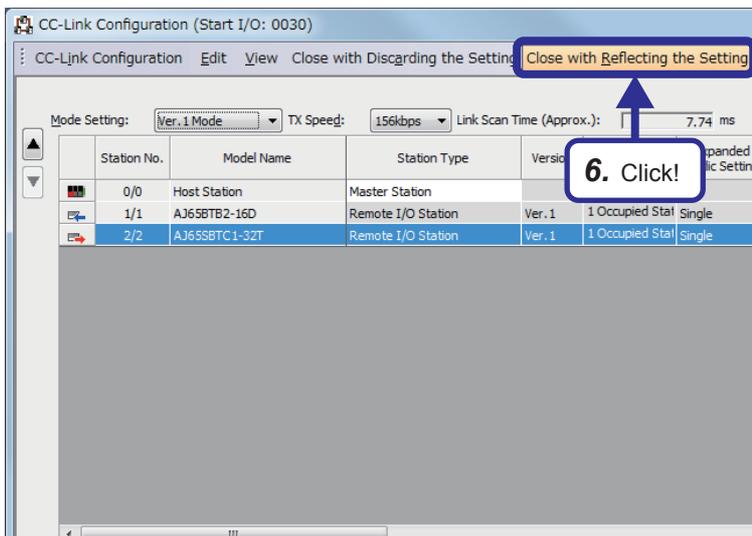
6. After the settings, click "Close with Reflecting the Setting" in the menu to close the "CC-Link Configuration" dialog box.

3 EXERCISE 1 (REMOTE NET MODE: PART 1)

3.4 Setting and Writing Parameters

(From the previous page)

7. Select "Link Refresh Settings" and click the ⊡ button.

7. Click!

8. Set link devices and ranges as shown on the left.

8. Set!

9. Click the [Apply] button to close the "RJ61BT11 Module Parameter" dialog box.

9. Click!

3.4.4 Parameter settings (intelligent function module)

Since no intelligent function module is used in this exercise, disable the refresh settings.

Operating procedure
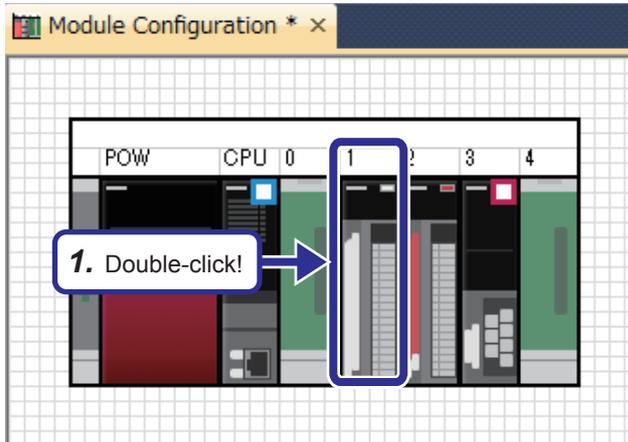
1. Double-click the R60AD4 module in the module configuration.
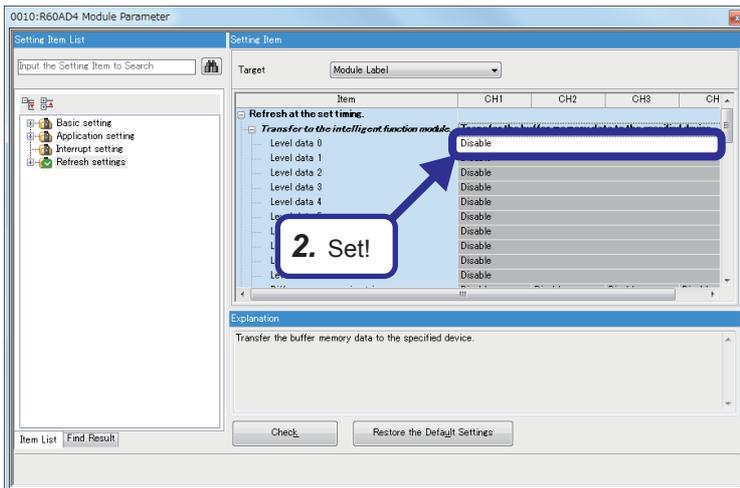
2. The "R60AD4 Module Parameter" dialog box appears. Select "Refresh settings" in "Setting Item List" and set the refresh settings to "Disable".

Disable the refresh settings for the R60DA4 module in the same way.

3.4.5 Specifying a connection destination

Specify a connection destination to write parameters to the CPU module of the master station.
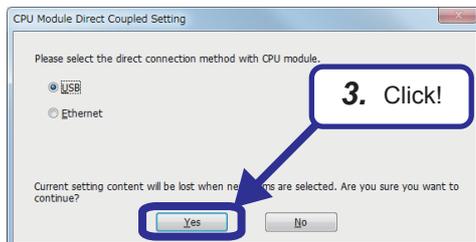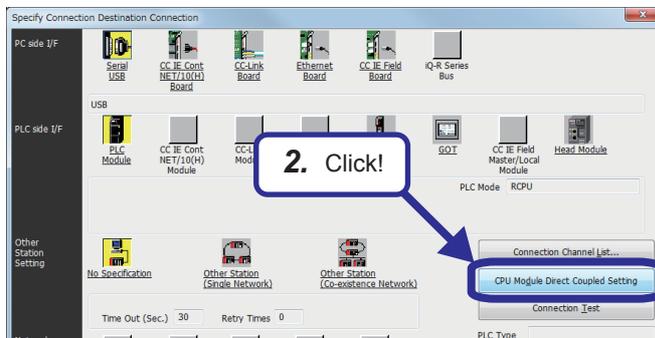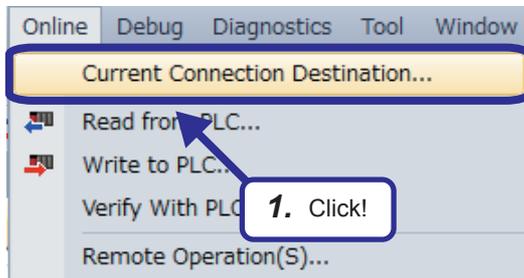
Operating procedure

1. Select [Online] ⇨ [Current Connection Destination] from the menu of the engineering tool.

2. Click the [CPU Module Direct Coupled Setting] button on the "Specify Connection Destination Connection" window.

The "CPU Module Direct Coupled Setting" dialog box appears.

3. Select the connection method, and click the [Yes] button.

4. Click "No Specification" of "Other Station Setting".

(To the next page)

(From the previous page)

CPU Module Direct Coupled Setting

5. Click! → Connection Test

PLC Type
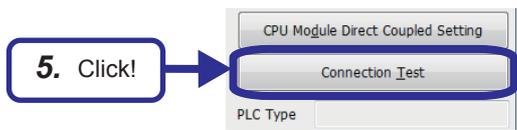
5. Click the [Connection Test] button.

MELSOFT GX Works3

Successfully connected with the R08CPU.

OK
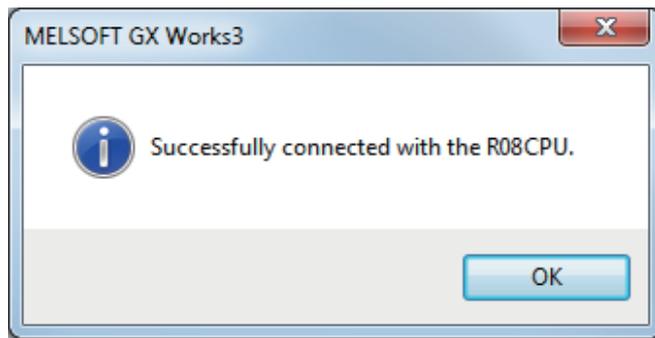
6. Check that the CPU module is successfully connected.

Specify Connection Destination Connection

PC side I/F
Serial USB | CC IE Cont NET/10(H) Board | CC-Link Board | Ethernet Board | CC IE Field Board | iQ-R Series Bus

USB

PLC side I/F
PLC Module | CC IE Cont NET/10(H) Module | CC-Link Module | Ethernet Module | C24 | GOT | CC IE Field Master/Local Module | Head Module

PLC Mode   RCPU

Other Station Setting
No Specification | Other Station (Single Network) | Other Station (Co-existence Network)

Connection Channel List...

CPU Module Direct Coupled Setting

Connection Test

Time Out (Sec.) 30   Retry Times 0

PLC Type
Details

Network Communication Route
CC IE Cont NET/10(H) | CC IE Field | Ethernet | CC-Link | C24

System Image...

Co-existence Network Route
CC IE Cont NET/10(H) | CC IE Field | Ethernet | CC-Link | C24

Accessing Host Station

Multiple CPU Setting
1 2 3 4   Target PLC Not Specified

Target System

7. Click! → OK

Cancel

7. Click the [OK] button.

3.4.6 Writing parameters

Write the set parameters of the master station to the CPU module.
When the CPU module already has written data, select [Online] ⇨ [CPU Memory Operation] to initialize the memory before writing parameters of the master station.

Operating procedure
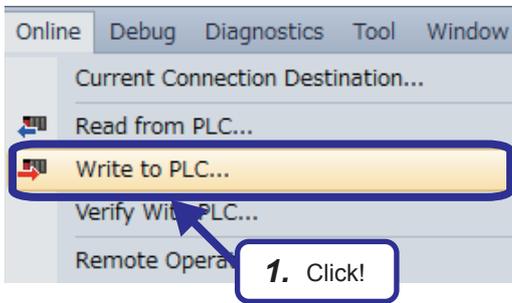
1. Select [Online] ⇨ [Write to PLC] from the menu of the engineering tool.
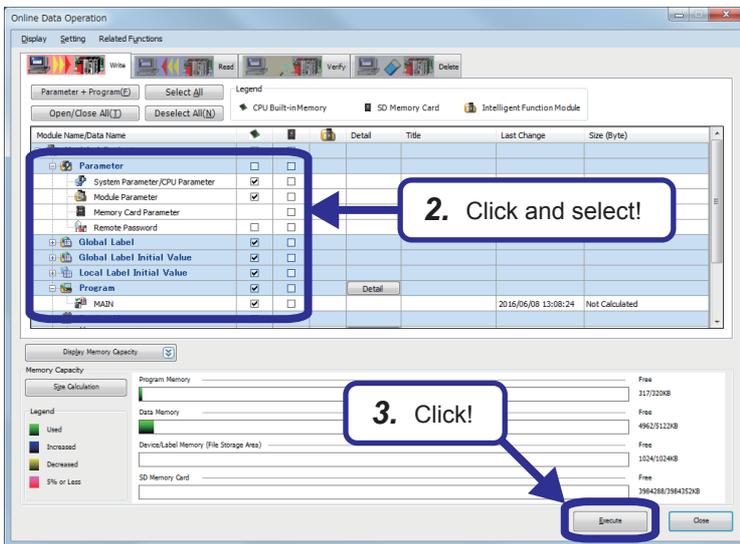
2. The "Online Data Operation" dialog box appears. Select the following items.

- System Parameter/CPU Parameter
- Module Parameter

3. Click the [Execute] button.

(To the next page)

(From the previous page)
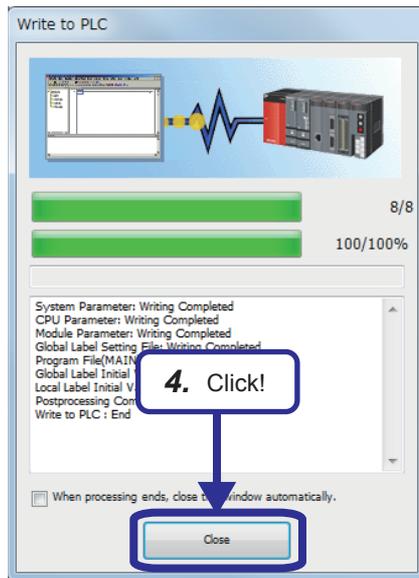
4. The "Write to PLC" dialog box appears.

5. When writing the data is completed, the message "Completed" is displayed. Click the [Close] button.

Write to PLC

8/8

100/100%

System Parameter: Writing Completed
CPU Parameter: Writing Completed
Module Parameter: Writing Completed
Global Label Setting File: Writing Completed
Program File(MAIN)
Global Label Initial V
Local Label Initial V
Postprocessing Con
Write to PLC : End

4. Click!

☐ When processing ends, close the window automatically.

Close
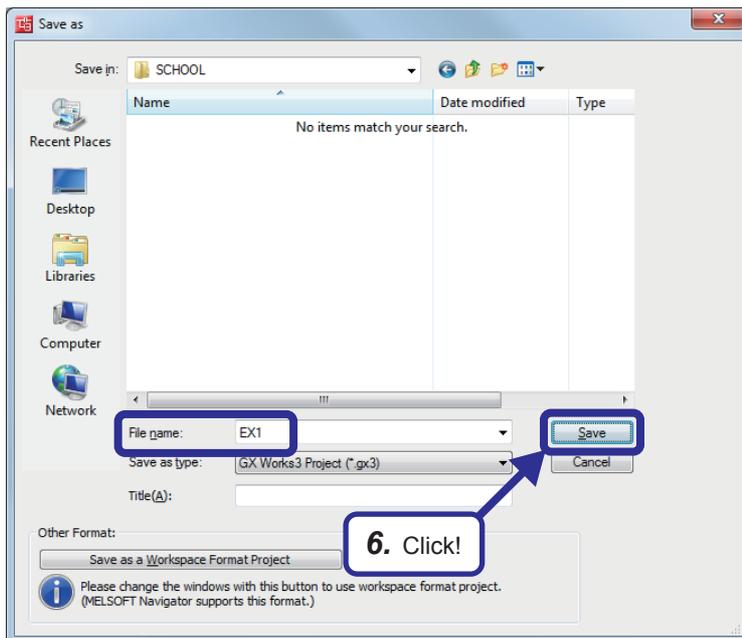
6. After writing parameters, click [Project] ⇨ [Save As] from the menu to save the project.

Save destination: Desired location
File name: EX1
Title: Blank

Save as

Save in: SCHOOL

Name | Date modified | Type

No items match your search.

Recent Places

Desktop

Libraries

Computer

Network

File name: EX1

Save as type: GX Works3 Project (*.gx3)

Title(A):

Save

Cancel

6. Click!

Other Format:

Save as a Workspace Format Project

Please change the windows with this button to use workspace format project. (MELSOFT Navigator supports this format.)

3.5   Module Unit Test (Hardware Test)

Temporarily change the settings of the created project "EX1" to check if each master/local module properly functions alone. Create the module configuration and configure the link refresh settings in advance. (☞ Page 3 - 12 Setting and Writing Parameters)

Procedure

1. Check the following before powering on the module.

- Module mounting status
- Input power supply voltage
- The RUN/STOP/RESET switch of the CPU module is in the STOP position.

2. Set the following item to "Hardware Test".

🖰 [Navigation] window ⇨ [Parameter] ⇨ [Module Information] ⇨ RJ61BT11 ⇨ [Module Parameter] ⇨ [Required Settings] ⇨ [Mode]

3. Write the module parameters to the CPU module.

4. Power off and on the system or reset the CPU module to start the hardware test.

> *Point*
>
> Do not perform a hardware test during connection with another station. Doing so may result in a failure of the test.

Checking the status and result of hardware test

The test status and result can be checked with the LED display of the module.

Test status	LED display
Test in progress	The dot matrix LED displays "H.T.".
Normal completion	The dot matrix LED displays "OK".
Abnormal end	The dot matrix LED displays "ERR".

If the test fails, check if the terminating resistor provided with the master/local module has been connected between the DA and DB terminals. If the terminating resistor has been connected, the possible cause is a hardware failure. Replace the master/local module.

3.6 Line Test

Check whether Ver.1.10-compatible CC-Link dedicated cables have properly been connected and data link can be performed with slave stations.

Execute the test from the master station.

Procedure

1. Open the "CC-Link Diagnostics" window.

✎ [Diagnostics] ⇨ [CC-Link Diagnostics]

2. Double-click "Operation Test" in "Related Functions".

3. Select "Line Test" under "Test Type".

4. Select the slave station where the line test is performed under "Test Target".

• Select "All stations (Station 1-64)" to perform the test for all stations connected.

• Select "Specified station" to perform the test for the station specified. Specify the start station number when the number of occupied stations is two or more.

5. Click the [Execute] button to start the line test. After the line test is completed, the result is displayed on the right side in the window.

• Do not write data to the buffer memory areas (buffer memory address: 5E0H and 608H) during line test.

• Do not perform a line test using a program and other peripherals at the same time. The line test may not be normally performed.
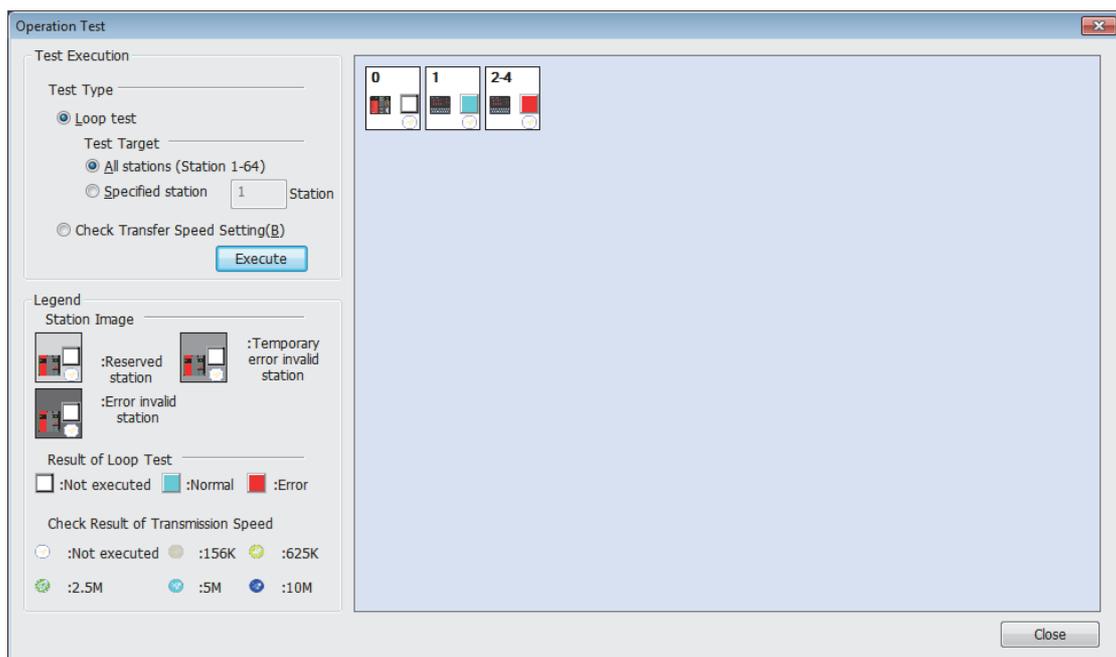
Point ✎

When performing a line test, do not set the transmission speed of slave stations to auto-tracking. The transmission speed of slave stations needs to be the same as that of the master station. An error may occur during the line test for slave stations whose transmission speed is set only to auto-tracking. If the error has occurred, check the cable connection status and the network line status by following the troubleshooting procedure.

3.7 Monitoring/Test of the Remote I/O Station

To check that parameters have been properly set and that data link and device refresh have been performed, monitor and test I/O signals of the remote I/O station.

Set the RUN/STOP/RESET switch of the CPU module to the STOP position.

Operating procedure

1. Select [Online] ⇨ [Monitor] ⇨ [Device/Buffer Memory Batch Monitor] from the menu of the engineering tool.
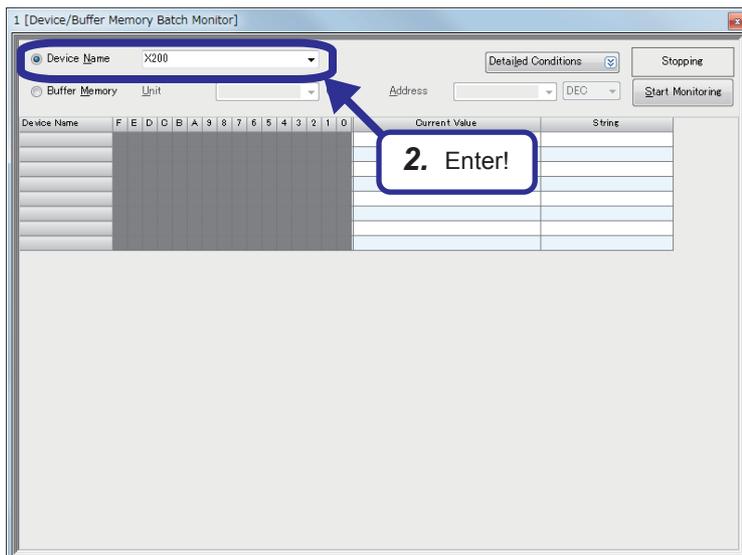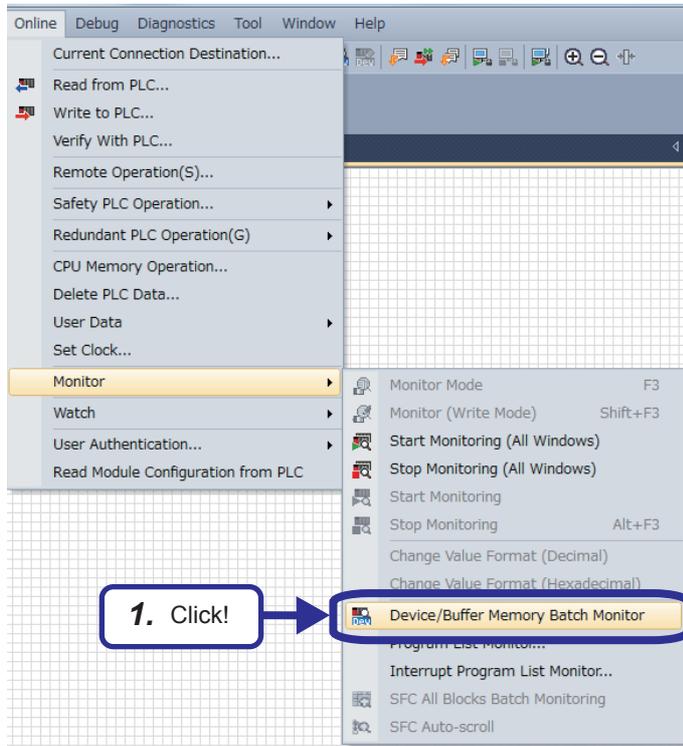
2. The "Device/Buffer Memory Batch Monitor" dialog box appears. Enter "X200" in "Device Name" and press the ⌜Enter⌟ key.

3. Turn on the switch connected to the terminal block "X1" of the AJ65BTB2-16D.

(To the next page)

(From the previous page)
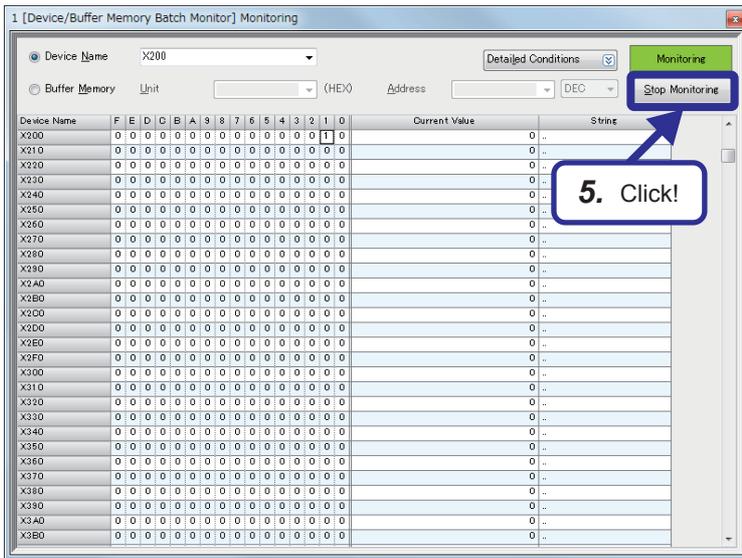
4. Check that X201 turns on in the "Device/Buffer Memory Batch Monitor" dialog box. This means that data link and link refresh of the input (RX) were performed normally.

5. Click the [Stop Monitoring] button.
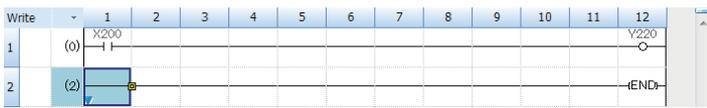
6. Create a temporal ladder program as shown in the left figure and write it to the CPU module. Reset the CPU module with the RUN/STOP/RESET switch and set the switch to the RUN position.
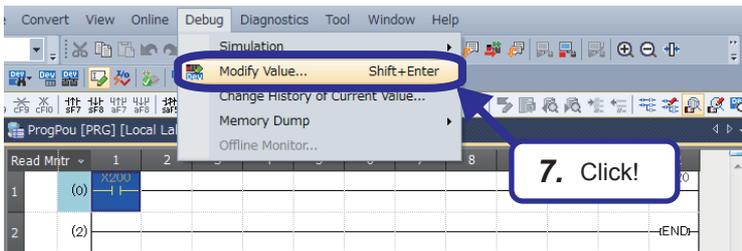
7. Select [Online] ⇨ [Monitor] ⇨ [Monitor Mode] to switch the mode to the monitor mode. Click [Debug] ⇨ [Modify Value] with "X200" being selected.

8. Check that turning on or off "X200" turns on or off Y0 of the AJ65SBTC1-32T. This means that data link and link refresh of the output (RY) were performed normally.

Monitoring and test of the remote I/O station are completed.

3.8   Creating a Sequence Program

Refresh device assignment

The following figure shows the refresh relationship among the CPU module, buffer memory of the master station, and remote I/O stations.

■Remote input (RX) and remote output (RY)

Setting sheet

■Station information setting sheet

Station No.	Station type	No. of occupied stations	Reserved/invalid station specification	Intelligent buffer specification (word)		
				Send	Receive	Automatic update
1	Remote I/O station	1	No setting	—	—	—
2	Remote I/O station	1	No setting	—	—	—

■Device assignment table

Station No.	Device							
	RX → (X)		RY ← (Y)		RWw → (D)		RWr ← (D)	
	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side
1	0000 to 000F	00200 to 0020F						
	—	00210 to 0021F						
2			0020 to 002F	00220 to 0022F				
			0030 to 003F	00230 to 0023F				

Sequence program

Create the following sequence program and write it to the CPU module.

Project name	EX1

```
        X30      X3F      X31      SW80.0                                    ┌────┬────┬──────┐
        ─│/│──────│ │──────│ │──────│/│────────────────────────────────────┤ MC │ N0 │ M800 │
(0)     Module   Module   Own      Data link                                └────┴────┴──────┘
        failure  ready    station  status of
                          data link other
                          status   stations
                                    SM413                                                    Y170
                                  ───│ │──────────────────────────────────────────────────────( )
                                    2 second                                              Flash this
                                    clock                                                 device
                                                                                         when the
                                                                                         own station
                                                                                         data link is
                                                                                         normally
                                                                                         operating.
N0 ──┤├── M800


        SM400    SW80.0                                                                       Y171
(8)     ───│ │──────│ │─────────────────────────────────────────────────────────────────────( )
        Always On Data link                                                               Display a
                  status of                                                               station
                  other                                                                   No.1 error.
                  stations
        SW80.0   X201                                                                         Y176
(11)    ───│/│──────│ │─────────────────────────────────────────────────────────────────────( )
        Data link                                                                         Turn on this
        status of                                                                         device when
        other                                                                            RX1 of the
        stations                                                                         station No.1
                                                                                         is on.
                                                                             ┌─────┬──────┐
(14)                                                                         │ MCR │  N0  │
                                                                             └─────┴──────┘


        X30      X3F      X31      SW80.1                                    ┌────┬────┬──────┐
        ─│/│──────│ │──────│ │──────│/│────────────────────────────────────┤ MC │ N1 │ M801 │
(15)    Module   Module   Own      Data link                                └────┴────┴──────┘
        failure  ready    station  status of
                          data link other
                          status   stations
                                    SM413                                                     Y170
                                  ───│ │──────────────────────────────────────────────────────( )
                                    2 second                                              Flash this
                                    clock                                                 device
                                                                                         when the
                                                                                         own station
                                                                                         data link is
                                                                                         normally
                                                                                         operating.
N1 ──┤├── M801


        SM400    SW80.1                                                                       Y172
(23)    ───│ │──────│ │─────────────────────────────────────────────────────────────────────( )
        Always On Data link                                                               Display a
                  status of                                                               station
                  other                                                                   No.2 error.
                  stations
        SW80.1   X102                                                                         Y222
(26)    ───│/│──────│ │─────────────────────────────────────────────────────────────────────( )
        Data link                                                                         RY2 of the
        status of                                                                         station
        other                                                                            No.2 is on.
        stations
                                                                             ┌─────┬──────┐
(29)                                                                         │ MCR │  N1  │
                                                                             └─────┴──────┘


(30)                                                                                       ─[END]─
```

<Reference> Operation check with the LED display

The following describes the LED display status of the master station, remote I/O station, remote device station, and local station when the data link is performed properly.

(1) LED display of the master station
   Check that the LED display is as follows.

	RJ61BT11N	
This module is normal. →	RUN ■ ERR. □	
This module is the master station. →	MST ■ S MST □	← Data link is normally performed.
	B RATE	
Set transmission speed →	156K ■ L RUN ■	
	625K □ L ERR. □	
	2.5M □ SD ■	← This module is sending data.
	5M □ RD ■	
	10M □	← This module is receiving data.
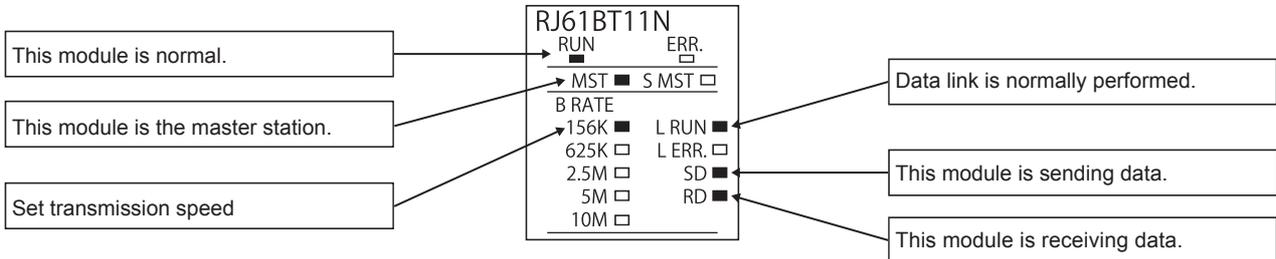
(2) LED display of the remote I/O station
   Check that the LED display is as follows.

AJ65BTB1-16DT

PW   L RUN   SD   RD   L ERR.
●   ●   ●   ●   ○

Power (24VDC) has been supplied. | Data link is normally performed. | This module is sending data. | This module is receiving data.
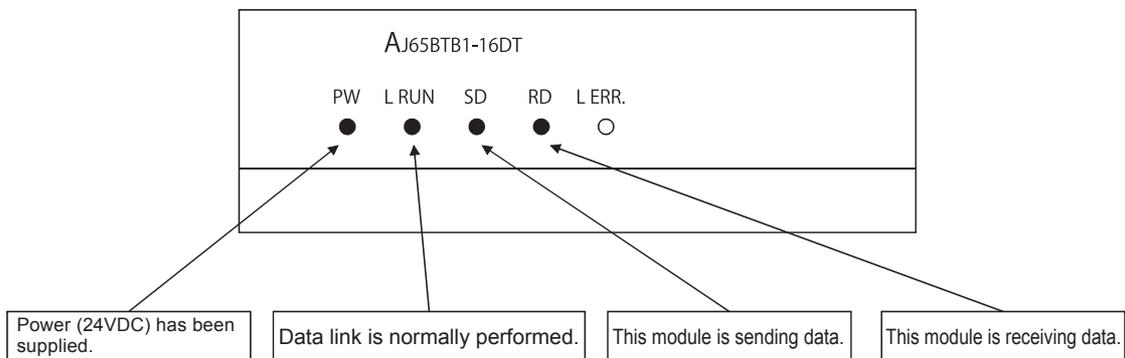
(3) LED display of the remote device station
   Check that the LED display is as follows.

Power (24VDC) has been supplied.

	PW ●	← Power (24VDC) has been supplied.
	RUN ●	← This module is normal.
	L RUN ●	← Data link is normally performed.
	SD ●	
AJ65BT-64AD	RD ●	← This module is sending data.
	L ERR. ○	← This module is receiving data.
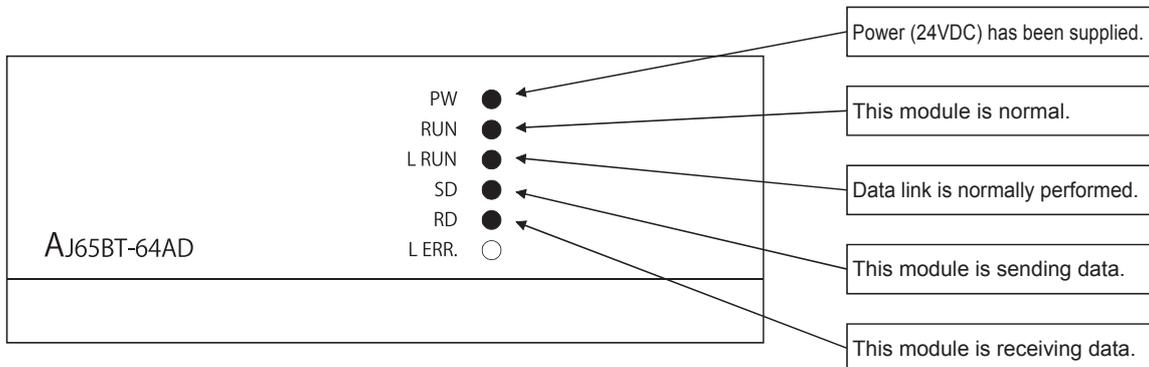
(4) LED display of a local station
   Check that the LED display is as follows.

	RJ61BT11N	
This module is normal. →	RUN ■ ERR. □	
This module is not the master station. →	MST □ S MST □	← Data link is normally performed.
	B RATE	
Set transmission speed →	156K ■ L RUN ■	
	625K □ L ERR. □	
	2.5M □ SD ■	← This module is sending data.
	5M □ RD ■	
	10M □	← This module is receiving data.
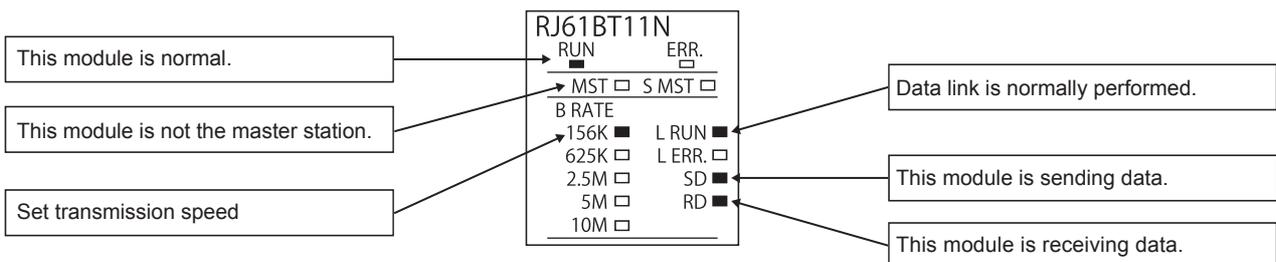
3.9 Communications with the Remote I/O Station

With the GOT, monitor that an input signal (RX) from the remote I/O station triggers turning on of Y170 in a sequence program.

Turning on X102 on the GOT turns on an output signal (RY) in the remote I/O station.

Switch operation of the demonstration machine

❶ Set the RUN/STOP/RESET switch of the CPU module to the RESET position (for approximately one second) to reset the CPU module.

❷ Set the RUN/STOP/RESET switch of the CPU module to the RUN position.

Y170 flashes depending on the own station data link status (Data link normal).

❸ Turn on the switch of the terminal block of the AJ65BTB2-16D. (RX1 turns on.)

Y176 turns on.

❹ Turn on X102.

The LED "Y2" of the AJ65SBTC1-32T turns on.

MEMO

4 EXERCISE 2 (REMOTE NET MODE: PART 2)

This exercise is for the system where remote I/O modules and remote device modules (A/D, D/A) are connected in the CC-Link remote net Ver.1 mode.

4.1 System Configuration

The following figure shows the system configuration of the demonstration machine for Exercise 2.

Station No.: 0
Master (RJ61BT11)

Demonstration machine

R61P | R08 CPU | Empty | R60 AD4 | R60 DA4

Ethernet cable

GOT2000

Terminating resistor

24V power supply cable

CC-Link dedicated cable

Station No.: 1
Remote I/O module
AJ65BTB2-16D

Station No.: 2
Remote I/O module
AJ65SBTC1-32T

Station No.: 5
Remote device module
AJ65BT-64DAV

Station No.: 3
Remote device module
AJ65BT-64AD

Terminating resistor

4.2   Setting and Connecting Remote Device Stations

This section describes the settings and connections of remote device stations (AJ65BT-64AD analog-digital converter module and AJ65BT-64DAV digital-analog converter module).

4.2.1   Setting modules

This section describes the settings of the AJ65BT-64AD and the AJ65BT-64DAV.
For details on the functions and specifications of the modules, refer to the Digital-Analog Converter Module type AJ65BT-64DAV/DAI User's Manual and AJ65BT-64AD Analog-Digital Converter Module User's Manual.

(1)   Settings of the AJ65BT-64AD (2 stations occupied)

Set "0" according to the master module setting (156kbps).

Set "0".

Set "3".

Set "•" (other than 1 to 4).
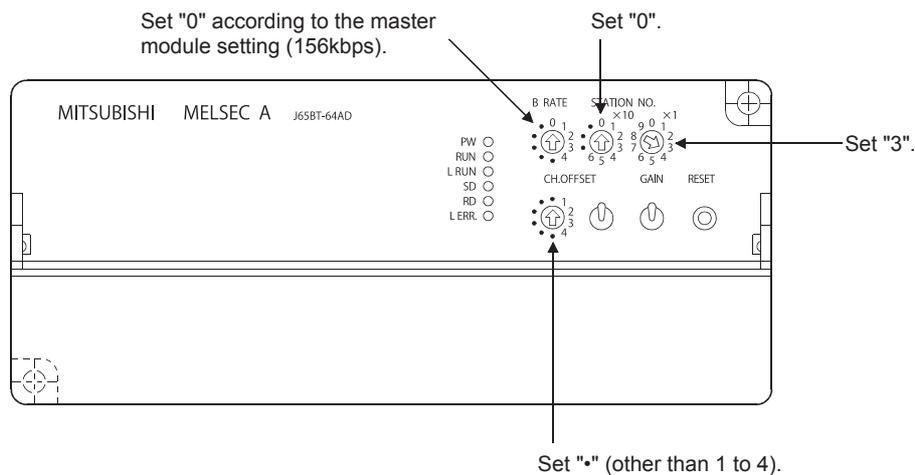
(2)   Settings of the AJ65BT-64DAV (2 stations occupied)

Set "0" according to the master module setting (156kbps).

Set "0".

Set "5".

Set "•" (other than 1 to 4).
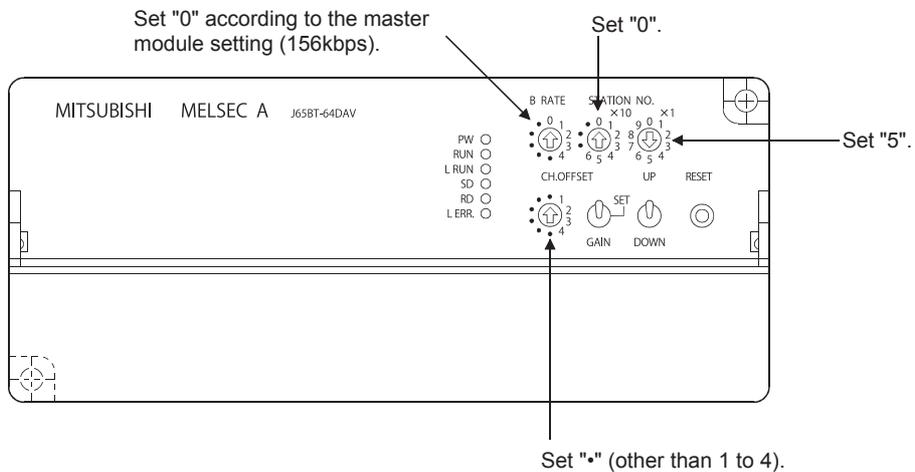
4.2.2 Connecting modules

The following figure shows the connections of CC-Link dedicated cables and terminating resistors in Exercise 2.
Before connecting CC-Link dedicated cables or 24V power supply cables, always shut off the power supply.

(1) Connecting CC-Link dedicated cables
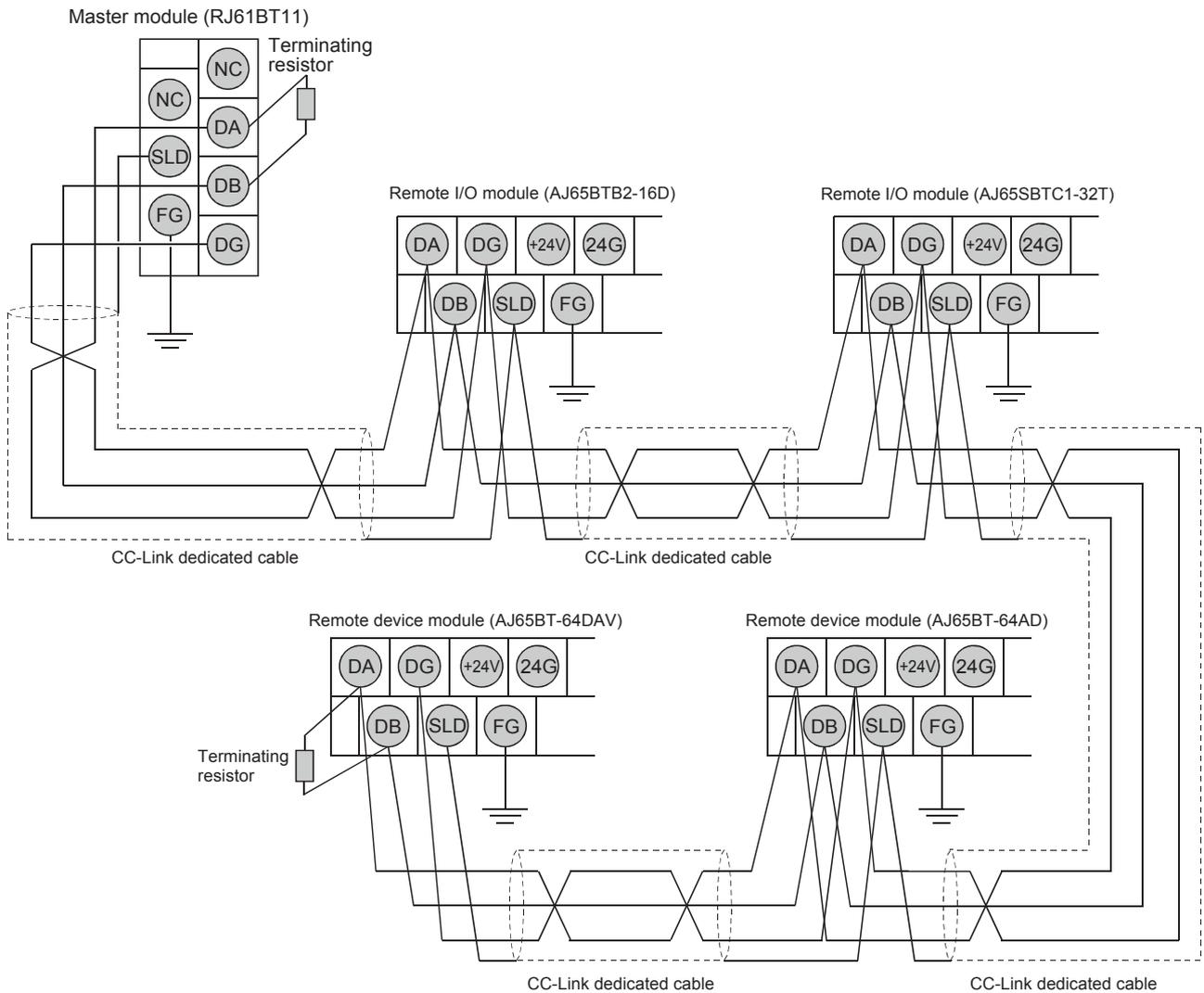
After connecting CC-Link dedicated cables and 24V power supply cables, check if the connection status is normal through a line test. (☞ Page 3 - 28 Writing parameters)

(2) Connecting 24V power supply cables
Connect 24V power supply cables in the same way as that of remote I/O stations. (☞ Page 3 - 11 Connecting 24V power supply cables)

(3) Connections to analog inputs
Connect cables from the demonstration machine to analog inputs of the AJ65BT-64AD.
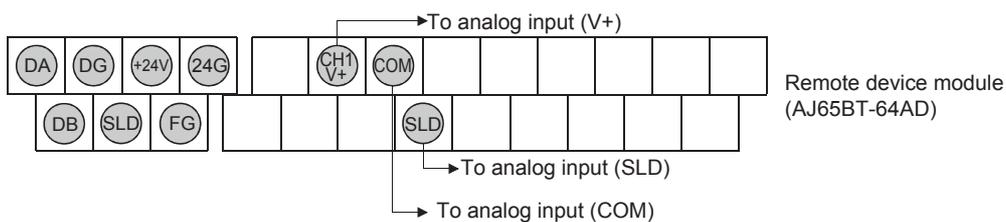
4.3 Parameter Settings

Set parameters of the master station and initial settings of the remote device stations.

After setting, write the parameters to the CPU module.

For how to write parameters, refer to Page 3 - 25 Writing parameters.

4.3.1 Parameter settings (master station)

Set parameters of the master station.

For how to set parameters, refer to Page 3 - 18 Parameter settings (master station).

Operating procedure

1. In the "CC-Link Configuration" dialog box, drag and drop the following modules from "Module List" to the list of stations or the network map.
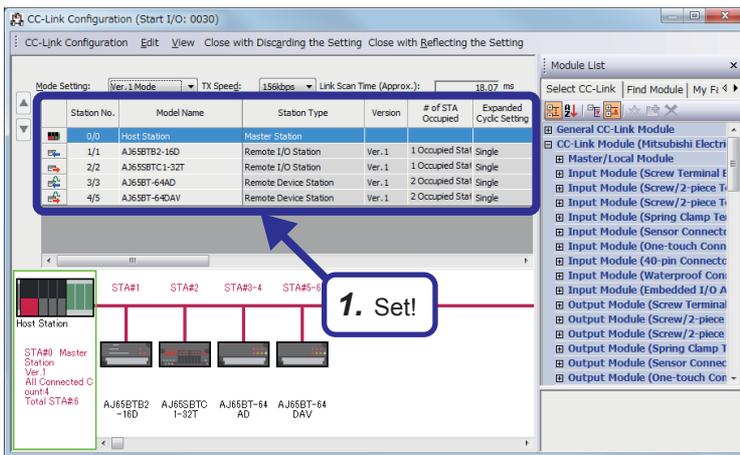
   Analog Input Module (Voltage/Current Input): AJ65BT-64AD

   Analog Output Module (Voltage Output): AJ65BT-64DAV

2. Set the link refresh parameters as shown on the left.

(To the next page)

(From the previous page)

3. Click the [Apply] button to close the "RJ61BT11 Module Parameter" dialog box.

4.3.2 Initial procedure registration of the remote device stations

The AJ65BT-64AD and AJ65BT-64DAV require initial settings.

(For details, refer to the Digital-Analog Converter Module type AJ65BT-64DAV/DAI User's Manual and AJ65BT-64AD Analog-Digital Converter Module User's Manual.)

For the MELSEC iQ-R series master station, the initial settings of the remote device stations can be performed automatically and the sequence program can be simplified by registering procedures to network parameters.

The following describes the initial procedure registration by using initial settings as an example.

Operating procedure
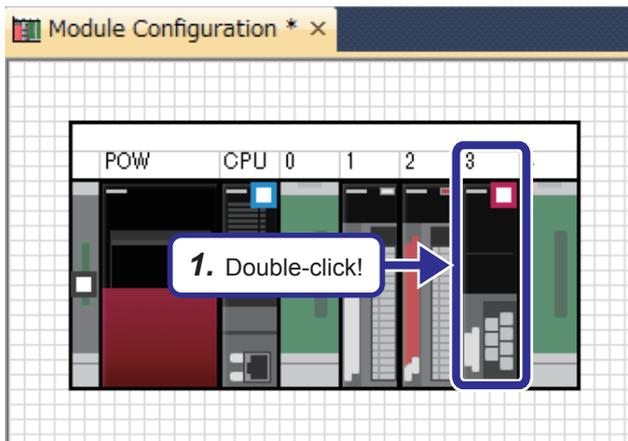
1. Double-click the RJ61BT11 module in the module configuration.

1. Double-click!
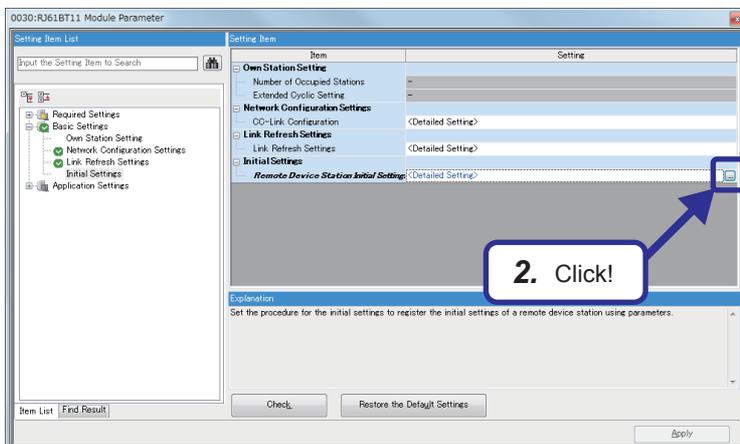
2. The "RJ61BT11 Module Parameter" dialog box appears. Select "Initial Settings" of "Basic Settings" in "Setting Item List" and click the [...] button of "Remote Device Station Initial Settings".

2. Click!

(To the next page)

(From the previous page)

3. The "Remote Device Initial Setting Target Station No. Setting" dialog box appears. Enter "3" in "Target Station No.".

4. The reference button appears at the right edge of "Registered Procedure Information" field for the registered target station number. Click this button.

5. The "Remote Device Initial Setting Procedure Registration" dialog box appears.

6. Set the following values in the top row as follows.
• Execution Condition: RX, 18, ON
• Details of Execution: RY, 0, ON
(With the above setting, turning on RX18 turns on RY0.)

7. Set "Operational Condition" of the second row to "Same as Prev. Set".
(When "Same as Prev. Set" is set, the same condition as the above row is set to the second row.)

(To the next page)

(From the previous page)

Execution Flag	Operational Condition	Execution Condition				Details of Execution		
		Condition Device	Device No.	Execution Condition		Write Device	Device No.	Write Data
Execute	Set New	RX	18	ON		RY	0	ON
Execute	Same as Prev. Set	RX	18	ON		RWw	0	257
Execute	Same as Prev. Set	RX	18	ON		RWw	1	500
Execute	Same as Prev. Set	RX	18	ON		RWw	6	1
Execute	Same as Prev. Set	RX	18	ON		RY	18	ON
Execute	Same as Prev. Set	RX	18	ON		RY	19	ON
Execute	Set New	RX	18	OFF		RY	18	OFF
Execute	Set New	RX	19	ON		RY	19	OFF

8. Repeat step 6 to step 7 to set as shown on the left.

The following shows execution details of each device.
RY0: ON ••• The offset/gain value is the factory default value.
RWw0: 257 (101H) ••• CH1 is Average processing (time average).
RWw1: 500 ••• Average time (ms)
RWw6: 1 ••• A/D conversion of CH1 is enabled.

Execute	Set New							
Execute	Set New							
Execute	Set New							

Check   Default   OK   Cancel

9. Click!

9. Click the [OK] button in the "Remote Device Initial Setting Procedure Registration" dialog box.

Remote Device Initial Setting Target Station No. Setting 0030: RJ61BT11

	Target Station No.	Registered Procedure Information
1	3	No. of Registered Procedures: 8
2	5	No. of Registered Procedures: 0
3		
4		
5		
6		
7		
8		
9		
10		

Check   Clear   OK   Cancel

11. Click!
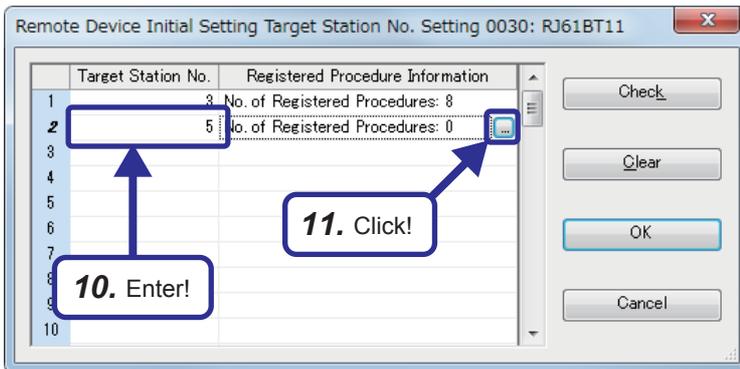
10. Enter!

10. Enter "5" in "Target Station No." of the second row.

11. The reference button appears at the right edge of "Registered Procedure Information" field for the registered target station number. Click this button.

(To the next page)

(From the previous page)

Execution Flag	Operational Condition	Execution Condition			Details of Execution		
		Condition Device	Device No.	Execution Condition	Write Device	Device No.	Write Data
Execute	Set New	RX	18	ON	RY	4	ON
Execute	Same as Prev. Set	RX	18	ON	RWw	4	14
Execute	Same as Prev. Set	RX	18	ON	RY	18	ON
Execute	Same as Prev. Set	RX	18	ON	RY	19	ON
Execute	Set New	RX	18	OFF	RY	18	OFF
Execute	Set New	RX	19	ON	RY	19	OFF

12. Set devices as shown on the left.

The following shows execution details of each device.
RY4: ON ••• The offset/gain value is the factory default value.
RWw4: 14 (000EH) ••• CH1 Analog output is enabled.

4

Execute	Set New						
Execute	Set New						
Execute	Set New						

[Check] [Default] [OK] [Cancel]
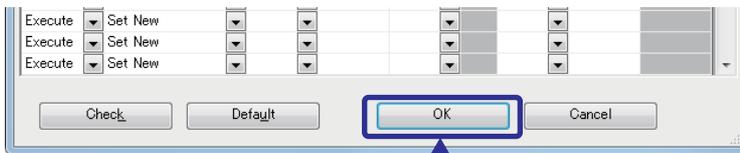
13. Click the [OK] button in the "Remote Device Initial Setting Procedure Registration" dialog box.

13. Click!

Remote Device Initial Setting Target Station No. Setting 0030: RJ61BT11

Target Station No.	Registered Procedure Information
1	3 No. of Registered Procedures: 8
2	5 No. of Registered Procedures: 6
3	
4	
5	
6	
7	
8	
9	
10	

[Check] [Clear] [OK] [Cancel]
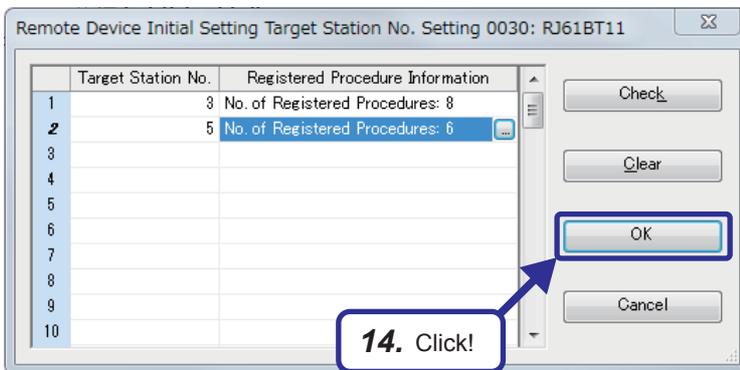
14. Click!

14. Click the [OK] button in the "Remote Device Initial Setting Target Station No. Setting" dialog box.

The remote device station initial setting is completed.
After completion of the initial setting, click the [Apply] button in the "Module Parameter" dialog box and write the settings to the CPU module.

When performing the initial settings with sequence programs

To perform the initial settings in Page 4 - 6 Initial procedure registration of the remote device stations with sequence programs, use the following sequence programs.

(The following sequence programs are not used in this exercise because the initial settings are performed with the parameter settings.)

■Initial settings for station No.3 (AJ65BT-64AD)

(0)	X258 (RX18)			SET Y240 (RY0)	Offset/gain value (factory default value)
			MOVP H101 D1008 (RWw0)		CH1 Averaging processing (Time average)
			MOVP K500 D1009 (RWw1)		Averaging processing time: 500ms
			MOVP H1 D1014 (RWw6)		CH1 A/D conversion enable
		TO H0A H1E8 D1108 K7 (RWr0)			Write to the master module.
				SET Y258 (RY18)	
				SET Y259 (RY19)	Initial data processing
(18)	X258 (RX18)			RST Y258 (RY18)	
(20)	X259 (RX19)			RST Y259 (RY19)	
(22)				[END]	
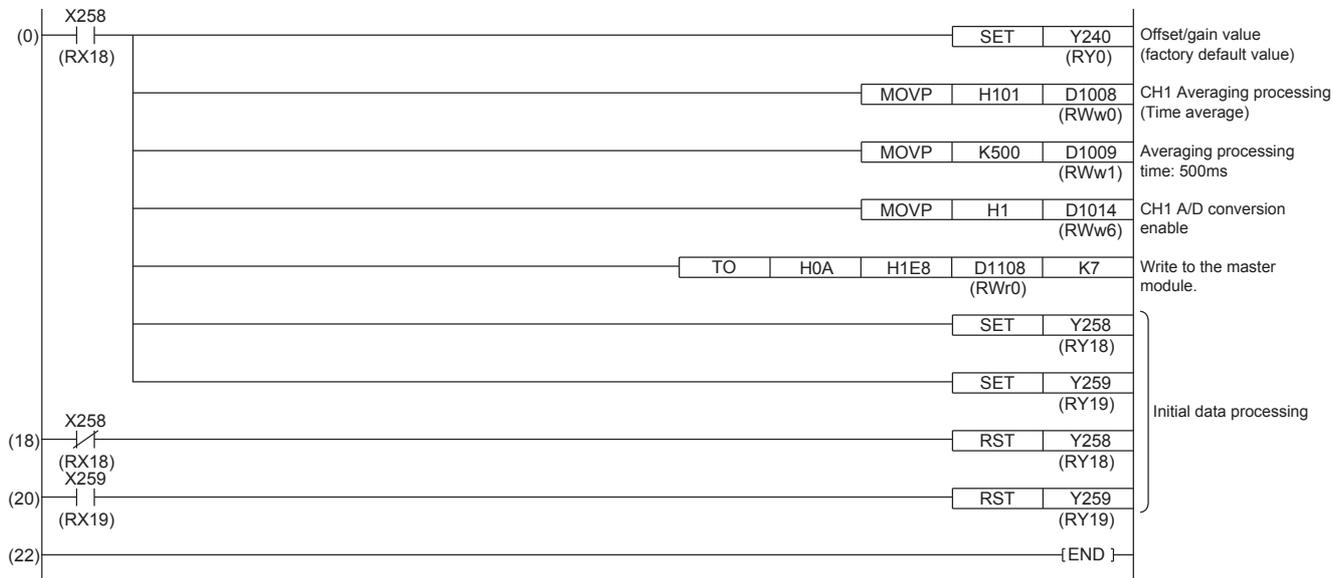
■Initial settings for station No.5 (AJ65BT-64DAV)

(0)	X298 (RX18)			SET Y284 (RY4)	Offset/gain value (factory default value)
			MOVP H0E D1020 (RWw4)		CH1 Analog output enabled
		TO H0A H1F4 D1020 K1 (RWw4)			Write to the master module.
				SET Y298 (RY18)	
				SET Y299 (RY19)	Initial data processing
(12)	X298 (RX18)			RST Y298 (RY18)	
(14)	X299 (RX19)			RST Y299 (RY19)	
(16)				[END]	
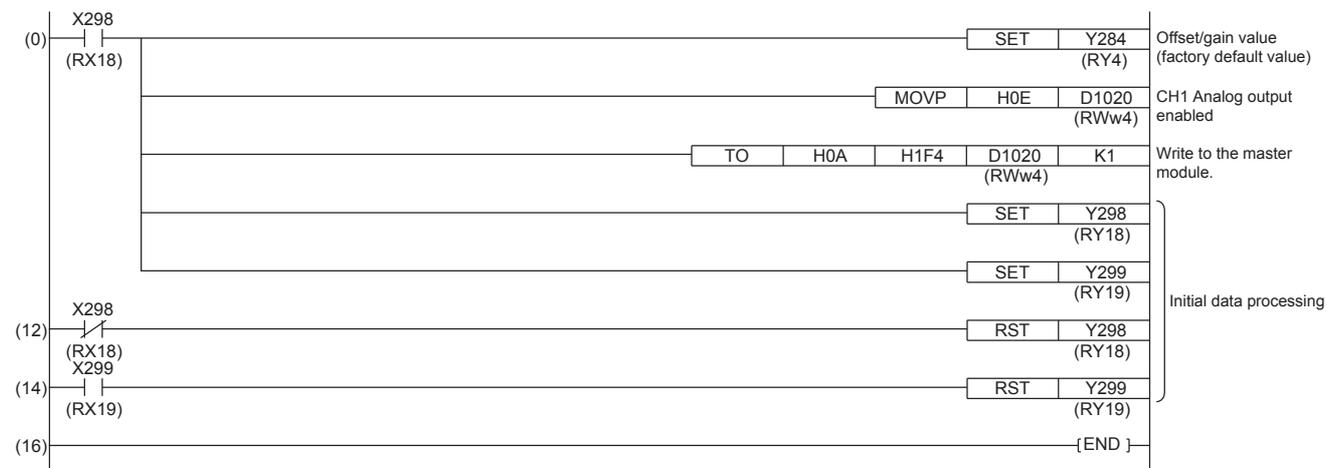
4.4 Monitoring and Test of the Remote Device Station

In the communications with the remote device station, monitoring and test are performed by GX Works3.

For monitoring and device test, refer to the operation described in Page 3 - 29 Monitoring/Test of the Remote I/O Station.

Operating procedure
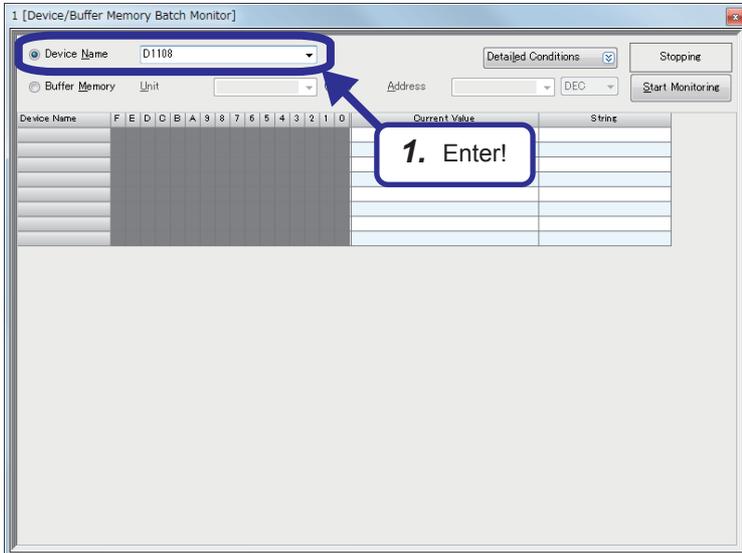
1. Enter "D1108" in "Device Name" and press the `Enter` key on the "Device/Buffer Memory Batch Monitor" dialog box.
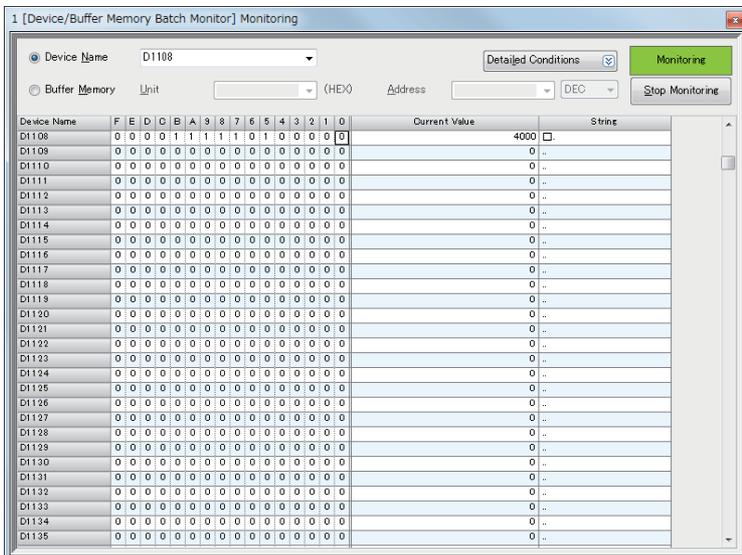
2. Check that a digital output value is stored in D1108.

(To the next page)

(From the previous page)
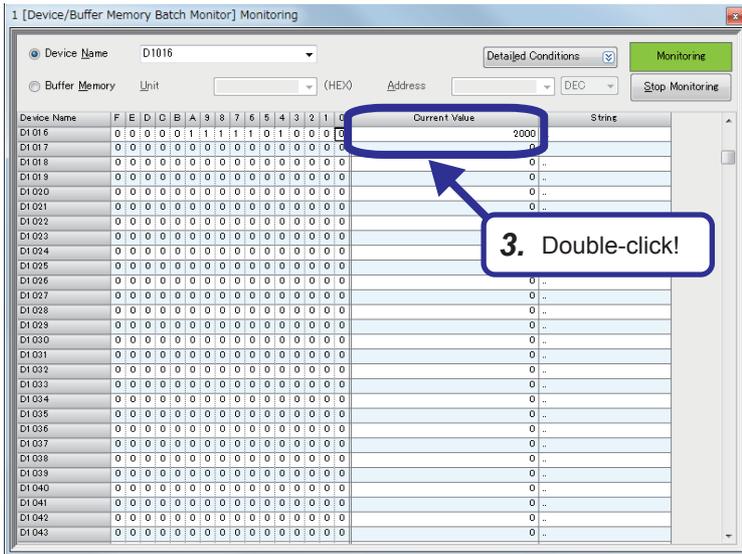
3. Check the device "D1016" and double-click the "Current Value" row.

3. Double-click!
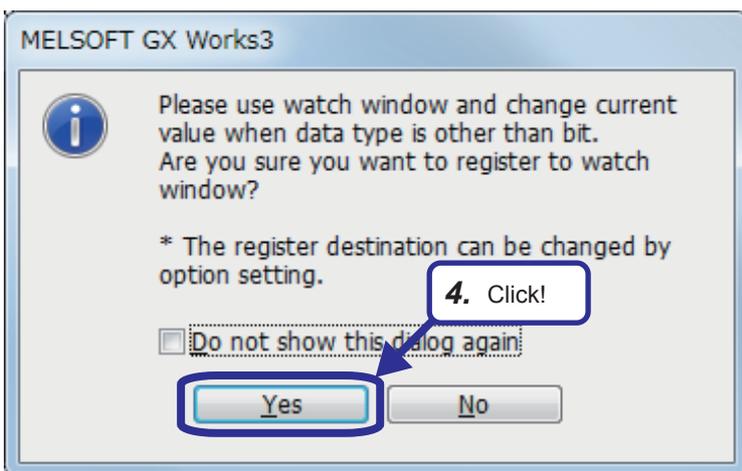
4. The dialog box shown on the left appears. Click the [Yes] button.

MELSOFT GX Works3

Please use watch window and change current value when data type is other than bit.
Are you sure you want to register to watch window?

* The register destination can be changed by option setting.

4. Click!

☐ Do not show this dialog again

[Yes]   [No]

5. A watch window appears.
Set "1000" in "Current Value".

Name	Current Value	Display Format	Data Type	Comment
D1016	1000	Decimal	[Word [Signed]]	CH1 Digital value setting area

5. Set!

(To the next page)

6. The value "1000" is stored in CH1 Digital value setting area of the AJ65BT-64DAV, and the output voltmeter (D/A OUTPUT) on the screen 4 indicates approximately 2.5V.

Monitoring and test of the remote device station are completed.

4

4.5 Creating a Sequence Program

Refresh device assignment

The following figure shows the refresh relationship among the CPU module, buffer memory of the master station, and remote device stations.

The refresh relationship among the CPU module, buffer memory of the master station, and remote I/O stations is the same as that of Exercise 1.

For details on each remote device station, refer to the Digital-Analog Converter Module type AJ65BT-64DAV/DAI User's Manual and AJ65BT-64AD Analog-Digital Converter Module User's Manual.

■Remote input (RX) and remote output (RY)

■Remote register (RWw, RWr)

CPU module	Master station	Remote device station (station No.3) AJ65BT-64AD
Devices	Buffer memory	

CPU module / Devices (upper block)

D1008
D1009
D1010
D1011
D1012
D1013
D1014
D1015
D1016
D1017
D1018
D1019
D1020
D1021
D1022
D1023

Master station / Buffer memory / Remote register (RWw)

Address	Content
1E8H	Averaging process setting
1E9H	CH1 Time Average/Count Average
1EAH	CH2 Time Average/Count Average
1EBH	CH3 Time Average/Count Average
1ECH	CH4 Time Average/Count Average
1EDH	Data format
1EEH	A/D conversion enable/disable setting
1EFH	
1F0H	CH1 Digital value
1F1H	CH2 Digital value
1F2H	CH3 Digital value
1F3H	CH4 Digital value
1F4H	D/A conversion enable/disable setting
1F5H	
1F6H	
1F7H	
1F8H	
to	
2DFH	

Remote device station (station No.3) AJ65BT-64AD / Remote register (RWw)

Content
Averaging process setting
CH1 Time Average/Count Average
CH2 Time Average/Count Average
CH3 Time Average/Count Average
CH4 Time Average/Count Average
Data format
A/D conversion enable/disable setting
(Not used)

Remote register (RWr) (station No.3)

Content
CH1 Digital output value
CH2 Digital output value
CH3 Digital output value
CH4 Digital output value
Error code
(Not used)
(Not used)
(Not used)

Master station / Remote register (RWr)

Address	Content
2E0H	
to	
2E7H	
2E8H	CH1 Digital output value
2E9H	CH2 Digital output value
2EAH	CH3 Digital output value
2EBH	CH4 Digital output value
2ECH	Error code
2EDH	
2EEH	
2EFH	
2F0H	CH1 Setting value check code
2F1H	CH2 Setting value check code
2F2H	CH3 Setting value check code
2F3H	CH4 Setting value check code
2F4H	Error code
2F5H	
2F6H	
2F7H	
2F8H	
to	
3DFH	

CPU module / Devices (lower block)

D1108
D1109
D1110
D1111
D1112
D1113
D1114
D1115
D1116
D1117
D1118
D1119
D1120
D1121
D1122
D1123

Remote device station (station No.5) AJ65BT-64DAV / Remote register (RWw)

Content
CH1 Digital value
CH2 Digital value
CH3 Digital value
CH4 Digital value
D/A conversion enable/disable setting
(Not used)
(Not used)
(Not used)

Remote register (RWr) (station No.5)

Content
CH1 Setting value check code
CH2 Setting value check code
CH3 Setting value check code
CH4 Setting value check code
Error code
(Not used)
(Not used)
(Not used)

4

Setting sheet

■Station information setting sheet

Station No.	Station type	No. of occupied stations	Reserved/invalid station specification	Intelligent buffer specification (word)		
				Send	Receive	Automatic update
1	Remote I/O station	1	No setting	—	—	—
2	Remote I/O station	1	No setting	—	—	—
3	Remote device station	2	No setting	—	—	—
4						
5	Remote device station	2	No setting	—	—	—
6						

■Device assignment table

Station No.	Device							
	RX → (X)		RY ← (Y)		RWw → (D)		RWr ← (D)	
	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side
1	0000 to 000F	00200 to 0020F						
	—	00210 to 0021F						
2			0020 to 002F	00220 to 0022F				
			0030 to 003F	00230 to 0023F				
3	0040 to 004F	00240 to 0024F	0040 to 004F	00240 to 0024F	0008 to 000B	1008 to 1011	0008 to 000B	1108 to 1111
	0050 to 005F	00250 to 0025F	0050 to 005F	00250 to 0025F				
4	—	00260 to 0026F	—	00260 to 0026F	000C to 000F	1012 to 1015	000C to 000F	1112 to 1115
	—	00270 to 0027F	—	00270 to 0027F				
5	0080 to 008F	00280 to 0028F	0080 to 008F	00280 to 0028F	0010 to 0013	1016 to 1019	0010 to 0013	1116 to 1119
	0090 to 009F	00290 to 0029F	0090 to 009F	00290 to 0029F				
6		002A0 to 002AF		002A0 to 002AF	0014 to 0017	1020 to 1023	0014 to 0017	1120 to 1123
		002B0 to 002BF		002B0 to 002BF				

Sequence program

Create the following sequence program and write it to the CPU module.

The areas surrounded by broken lines indicate changes from the sequence program of Exercise 1.

Project name	EX2


```
          X30      X3F      X31    SW80.0                                         ┌──────┬────┬──────┐
          ─┤/├─────┤ ├──────┤ ├─────┤/├─────────────────────────────────────────│  MC  │ N0 │ M800 │
(0)      Module   Module   Own     Data link                                     └──────┴────┴──────┘
         failure  ready    station status of
                          data link other
                          status   stations
                                          SM413                                                  Y170
                                          ─┤ ├──────────────────────────────────────────────────( )──
                                          2 second                                          Flash this
                                          clock                                             device
                                                                                           when the
                                                                                           own station
N0 ──── M800                                                                                data link is
                                                                                           normally
                                                                                           operating.
```

```
*Data link status
          SM400   SW80.0                                                                          Y171
          ─┤ ├─────┤/├──────────────────────────────────────────────────────────────────────────( )──
(8)      Always On Data link                                                                Display a
                  status of                                                                 station
                  other                                                                     No.1 error.
                  stations
          SW80.0   X201                                                                           Y176
          ─┤/├─────┤ ├──────────────────────────────────────────────────────────────────────────( )──
(12)     Data link                                                                          Turn on
         status of                                                                          this device
         other                                                                              when RX1
         stations                                                                           of the station
                                                                                           No.1 is on.
                                                                                 ┌──────┬──────────┐
(15)                                                                             │  MCR │    N0    │
                                                                                 └──────┴──────────┘
```

```
          X30      X3F      X31    SW80.1                                         ┌──────┬────┬──────┐
          ─┤/├─────┤ ├──────┤ ├─────┤/├─────────────────────────────────────────│  MC  │ N1 │ M801 │
(16)     Module   Module   Own     Data link                                     └──────┴────┴──────┘
         failure  ready    station status of
                          data link other
                          status   stations
                                          SM413                                                  Y170
                                          ─┤ ├──────────────────────────────────────────────────( )──
                                          2 second                                          Flash this
                                          clock                                             device
                                                                                           when the
                                                                                           own station
N1 ──── M801                                                                                data link is
                                                                                           normally
                                                                                           operating.
```

```
*Data link status
          SM400   SW80.1                                                                          Y172
          ─┤ ├─────┤ ├──────────────────────────────────────────────────────────────────────────( )──
(24)     Always On Data link                                                                Display a
                  status of                                                                 station
                  other                                                                     No.2 error.
                  stations
          SW80.1   X102                                                                           Y222
          ─┤/├─────┤ ├──────────────────────────────────────────────────────────────────────────( )──
(28)     Data link                                                                          RY2 of the
         status of                                                                          station
         other                                                                              No.2 is on.
         stations
                                                                                 ┌──────┬──────────┐
(31)                                                                             │  MCR │    N1    │
                                                                                 └──────┴──────────┘
```

Ladder Diagram

(32)
```
 X30      X3F      X31      SW80.2                                    ┌────────────┐
──┤/├──────┤├───────┤├──────┤/├────────────────────────────────────┤ MC  N2 M802│
 Module   Module   Own      Data link                                └────────────┘
 failure  ready    station  status of
                   data     other
                   link     stations
                   status
                            SM413                                         (Y170)
                           ──┤├──────────────────────────────────────────────────
                            2 second                                  Flash this
                            clock                                     device when
                                                                     the own station
                                                                     data link is
                                                                     normally
                                                                     operating.
```

```
N2┬─M802
  │
  │  *Data link status
  │   SM400    SW80.2                                                      (Y173)
  │  ──┤├──────┤├──────────────────────────────────────────────────────────────
(40)  Always On Data link                                             Display a
                status of                                             station
                other                                                No.3 error.
                stations
```

```
      *Execution of the station No.3 program
       SW80.2                                                      ┌────────────┐
      ──┤/├──────────────────────────────────────────────────────┤ CALL   P3  │
(44)  Data link                                                    │ Processing │
      status of                                                    │ of station │
      other                                                        │ No.3       │
      stations                                                     └────────────┘
```

```
                                                                  ┌────────────┐
(49)                                                              │ MCR     N2 │
                                                                  └────────────┘
```

(50)
```
 X30      X3F      X31      SW80.4                                    ┌────────────┐
──┤/├──────┤├───────┤├──────┤/├────────────────────────────────────┤ MC  N4 M804│
 Module   Module   Own      Data link                                └────────────┘
 failure  ready    station  status of
                   data     other
                   link     stations
                   status
                            SM413                                         (Y170)
                           ──┤├──────────────────────────────────────────────────
                            2 second                                  Flash this
                            clock                                     device when
                                                                     the own station
                                                                     data link is
                                                                     normally
                                                                     operating.
```

```
N4┬─M804
  │
  │  *Data link status
  │   SM400    SW80.4                                                      (Y174)
  │  ──┤├──────┤├──────────────────────────────────────────────────────────────
(58)  Always On Data link                                             Display a
                status of                                             station
                other                                                No.5 error.
                stations
```

```
      *Execution of the station No.5 program
       SW80.4                                                      ┌────────────┐
      ──┤/├──────────────────────────────────────────────────────┤ CALL   P5  │
(62)  Data link                                                    │ Processing │
      status of                                                    │ of station │
      other                                                        │ No.5       │
      stations                                                     └────────────┘
```

```
                                                                  ┌────────────┐
(67)                                                              │ MCR     N4 │
                                                                  └────────────┘
```

```
                                                                                              FEND
(68)

     *Station No.3 AJ65BT-64AD communication program
P3       X258                                                                                   SB0D
         ┤ ├                                                                         SET    Initial
Processing(70) Initial                                                                     procedure
of station    processing                                                                   registration
No.3          request                                                                      instruction
              flag
         X298
         ┤ ├

         Initial
         processing
         request
         flag
         SB5F                                                                                   SB0D
(75)     ┤ ├                                                                        RST    Initial
         Initial                                                                           procedure
         procedure                                                                         registration
         execution                                                                         instruction
         completed flag
         X25B      X29B
         ┤ ├       ┤ ├

         Remote    Remote
         ready     ready

         X25B      X240                                                    D1108      D10
(80)     ┤ ├       ┤ ├                                                 MOV CH1
         Remote    CH1 A/D                                                 Digital
         ready     conversion                                              output
                   completed                                               value
                   flag
         X25A                                                                                  Y25A
         ┤ ├                                                                                    ( )
(84)     Error flag                                                                        Error reset


                                                                                              RET
(86)


     *Station No.5 AJ65BT-64DAV communication program
P5       X298                                                                                   SB0D
         ┤ ├                                                                         SET    Initial
Processing(87) Initial                                                                     procedure
of station    processing                                                                   registration
No.5          request                                                                      instruction
              flag
         X258
         ┤ ├

         Initial
         processing
         request
         flag
         SB5F                                                                                   SB0D
(92)     ┤ ├                                                                        RST    Initial
         Initial                                                                           procedure
         procedure                                                                         registration
         execution                                                                         instruction
         completed flag
         X25B      X29B
         ┤ ├       ┤ ├

         Remote    Remote
         ready     ready
```

```
           X29B    X104                                     ┌──────┬────────┬──────────┐
           ├─┤ ├───┤ ├──────────────────────────────────────│ MOVP │   D20  │  D1016   │
(97)       Remote                                            │      │        │ CH1      │
           ready                                             │      │        │ Digital  │
                                                             │      │        │ value    │
                                                             │      │        │ setting  │
                                                             │      │        │ area     │
                                                             └──────┴────────┴──────────┘
                   ┌───┬───────┬──────┐                      ┌──────┬────────┬──────────┐
                   │   │ K4000 │  D20 │──────────────────────│ MOV  │ K4000  │  D1016   │
                   │ < │       │      │                      │      │        │ CH1      │
                   └───┴───────┴──────┘                      │      │        │ Digital  │
                                                             │      │        │ value    │
                                                             │      │        │ setting  │
                                                             │      │        │ area     │
                                                             └──────┴────────┴──────────┘
                                                             ┌──────┬────────┬──────────┐
                                                             │ MOV  │ D1016  │   D0     │
                                                             │      │ CH1    │          │
                                                             │      │ Digital│          │
                                                             │      │ value  │          │
                                                             │      │ setting│          │
                                                             │      │ area   │          │
                                                             └──────┴────────┴──────────┘
           X105    X29B                                                             Y280
           ├─┤ ├───┤ ├─────────────────────────────────────────────────────────────( )──
(112)              Remote                                                           CH1
                   ready                                                            Analog
                                                                                   output
                                                                                   enable
           X29A                                                                     Y29A
           ├─┤ ├───────────────────────────────────────────────────────────────────( )──
(115)      Error flag                                                               Error reset

                                                                            ┌──────────┐
(117)                                                                       │   RET    │
                                                                            └──────────┘
                                                                                   ─{END }─
(118)
```

4.6 Communications with the Remote Device Station

The communications with the remote device station are performed using the sequence program written to the CPU module.

Switch operation of the demonstration machine

❶ Set the RUN/STOP/RESET switch of the CPU module to the RESET position (for approximately one second) to reset the CPU module.

❷ Set the RUN/STOP/RESET switch of the CPU module to the RUN position.
Y170 flashes depending on the own station data link status (Data link normal).

❸ The initial indication device (D10) displays a digital output value.
Turn the volume for input of the demonstration machine.
The digital output value changes in response to changes of the input voltmeter (A/D INPUT).

❹ Set "2000" to the initial input device (D20) as an example and turn on X104.
The initial indication device (D0) displays "2000".

❺ Turn on X105 for DA output.
The output voltmeter (D/A OUTPUT) on the screen 4 indicates approximately 5V.

❻ Change the setting of the initial input device D20 (range: 0 to 4000) in the same way, and turn on X104 again (on → off → on) for DA output.

MEMO

5 EXERCISE 3 (REMOTE NET MODE: PART 3)

This exercise is for when a CC-Link local station is added to the system for Exercise 2.

5.1 System Configuration

The following figure shows the system configuration of the demonstration machine for Exercise 3.
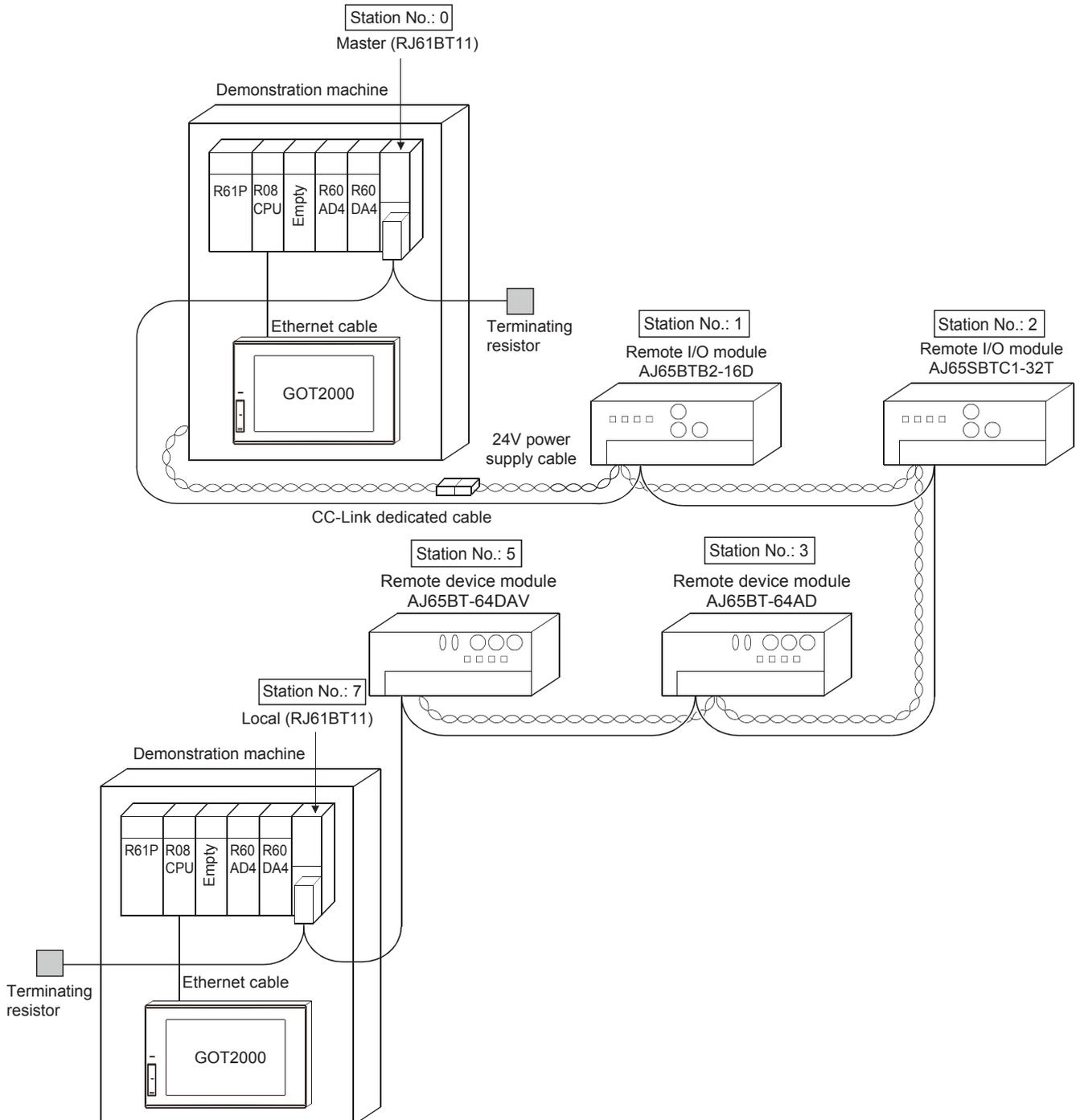
5.2 Connecting Modules

The following figure shows the connections of CC-Link dedicated cables and terminating resistors in Exercise 3.

For the connection method of 24V power supply cables, refer to Exercise 2.

Before connecting CC-Link dedicated cables, always shut off the power supply.
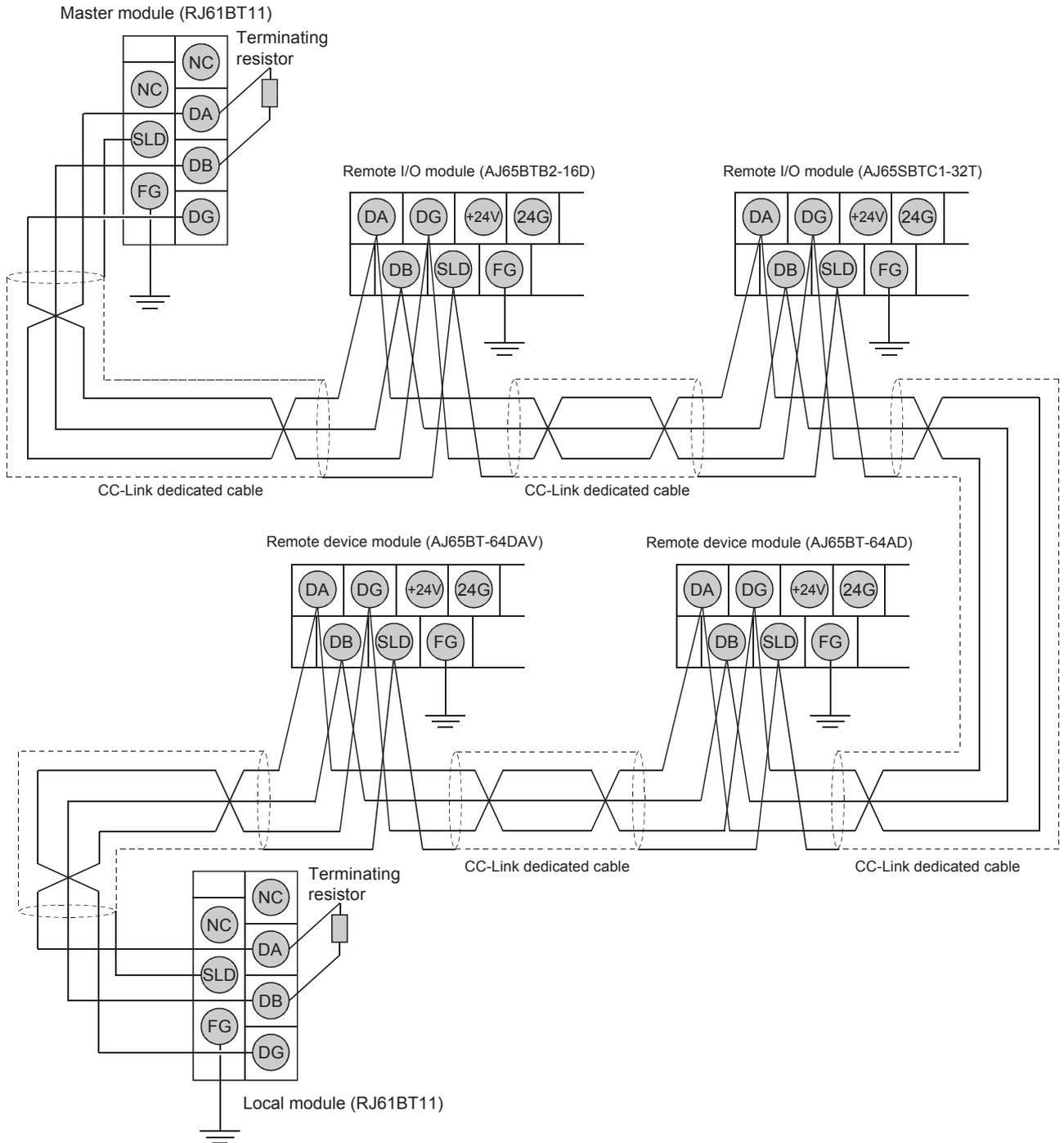
5.3 Parameter Settings

Set parameters of the master station and local station.

After setting, write the parameters to the CPU module.

For how to write parameters, refer to Page 3 - 25 Writing parameters.

5.3.1 Parameter settings (master station)

Set parameters of the master station.

For how to set parameters, refer to Page 3 - 18 Parameter settings (master station).

(The initial settings are the same as those of Exercise 2.)

Operating procedure
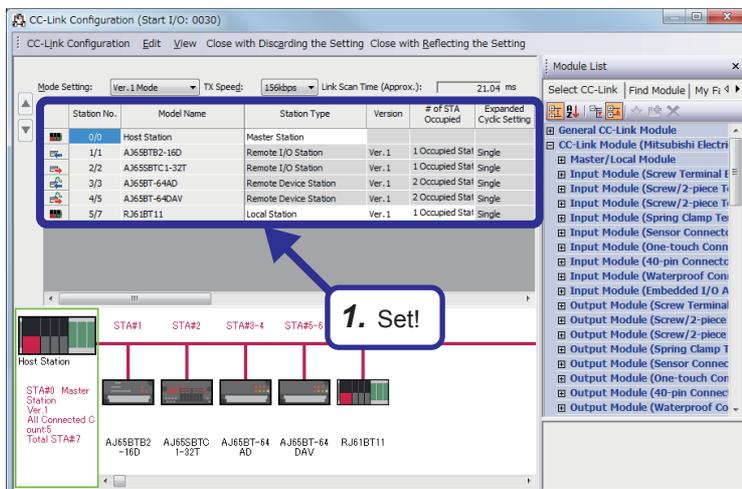
1. In the "CC-Link Configuration" dialog box, select "RJ61BT11" from "Master/Local Module" in "Module List" and drag and drop it to the list of stations or the network map.

2. Set the link refresh parameters as shown on the left.

(To the next page)

(From the previous page)

3. Click the [Apply] button to close the "RJ61BT11 Module Parameter" dialog box.

4. After setting parameters, save the project with the file name "EX3-M".

5.3.2 Parameter settings (local station)

In a project different from the one in which parameters of the master station have been set, add a local module in the module configuration and set parameters of the local station.

For how to create a module configuration, refer to Page 3 - 15 Adding master/local module data.

Operating procedure

1. Added!
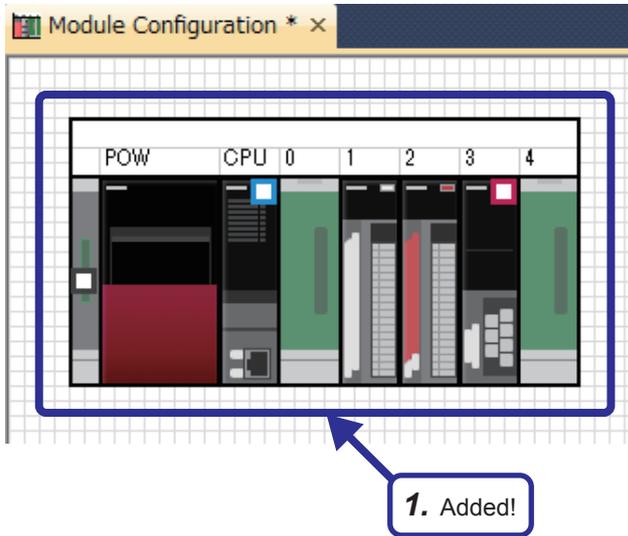
1. Create a new project and add modules by following the procedure described in Page 3 - 15 Adding master/local module data. After configuring the following settings, fix parameters.
(Click the [No] button on the confirmation window for adding the module label.)

[Parameters to be set]
RJ61BT11
Start XY: 0030
Station Type: Local Station

2. Set!
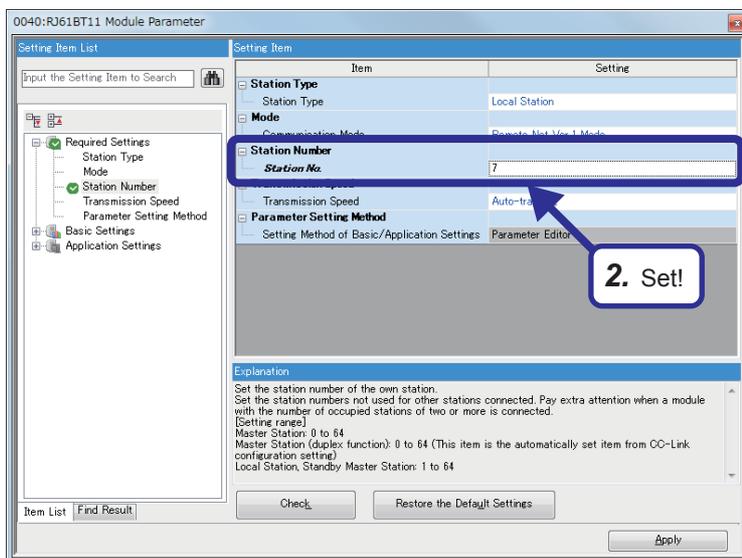
2. Double-click the RJ61BT11 on the "Module Configuration" window to open the "RJ61BT11 Module Parameter" dialog box. Set "7" for "Station No.".

(To the next page)

(From the previous page)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB	512	00000	001FF	⬌	Specif	SB	512	00000	001FF
–	SW	512	00000	001FF	⬌	Specif	SW	512	00000	001FF
1	RX	224	00000	000DF	⬌	Specif	X	224	00200	002DF
2	RY	224	00000	000DF	⬌	Specif	Y	224	00200	002DF
3	RWr	20	00008	0001B	⬌	Specif	D	20	1008	1027
4	RWw	20	00008	0001B	⬌	Specif	D	20	1108	1127
5										

3. Set!
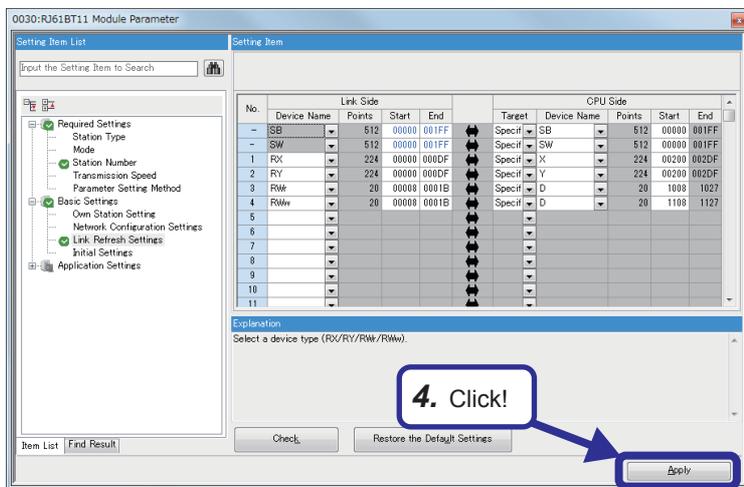
3. Set the link refresh parameters as shown on the left.

4. Click!

4. Click the [Apply] button to close the "RJ61BT11 Module Parameter" dialog box.

5. After setting parameters, save the project with the file name "EX3-L".

5.4 Creating a Sequence Program

Refresh device assignment

The following figure shows the refresh relationship among device areas of the CPU modules, buffer memory of the master station, and buffer memory of the local station.

The refresh relationship among the CPU modules, buffer memory of the master station, and remote I/O stations are the same as that of Exercise 2.

Note that RX and RY are placed diagonally between the master station and the local station.

■Remote input (RX) and remote output (RY)
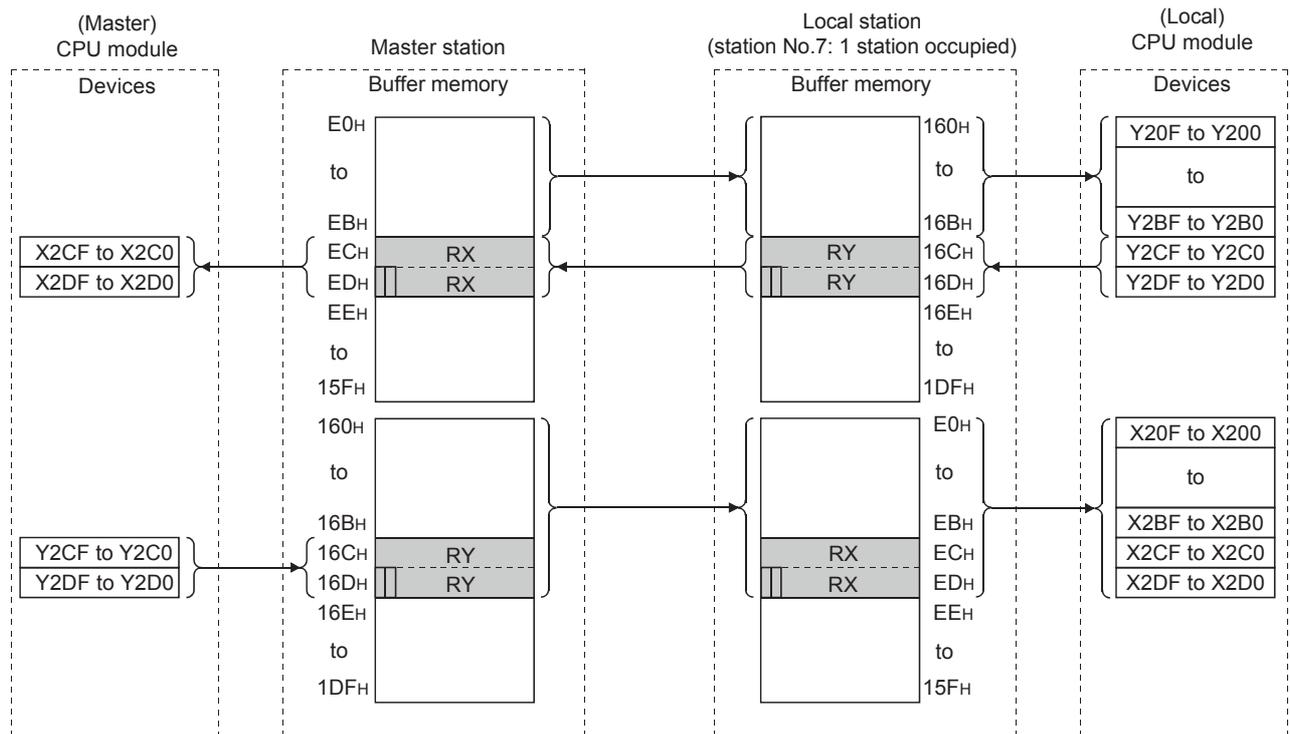
▯▯ ••• The last two bits cannot be used for communications between the master station and a local station.

■Remote register (RWw, RWr)
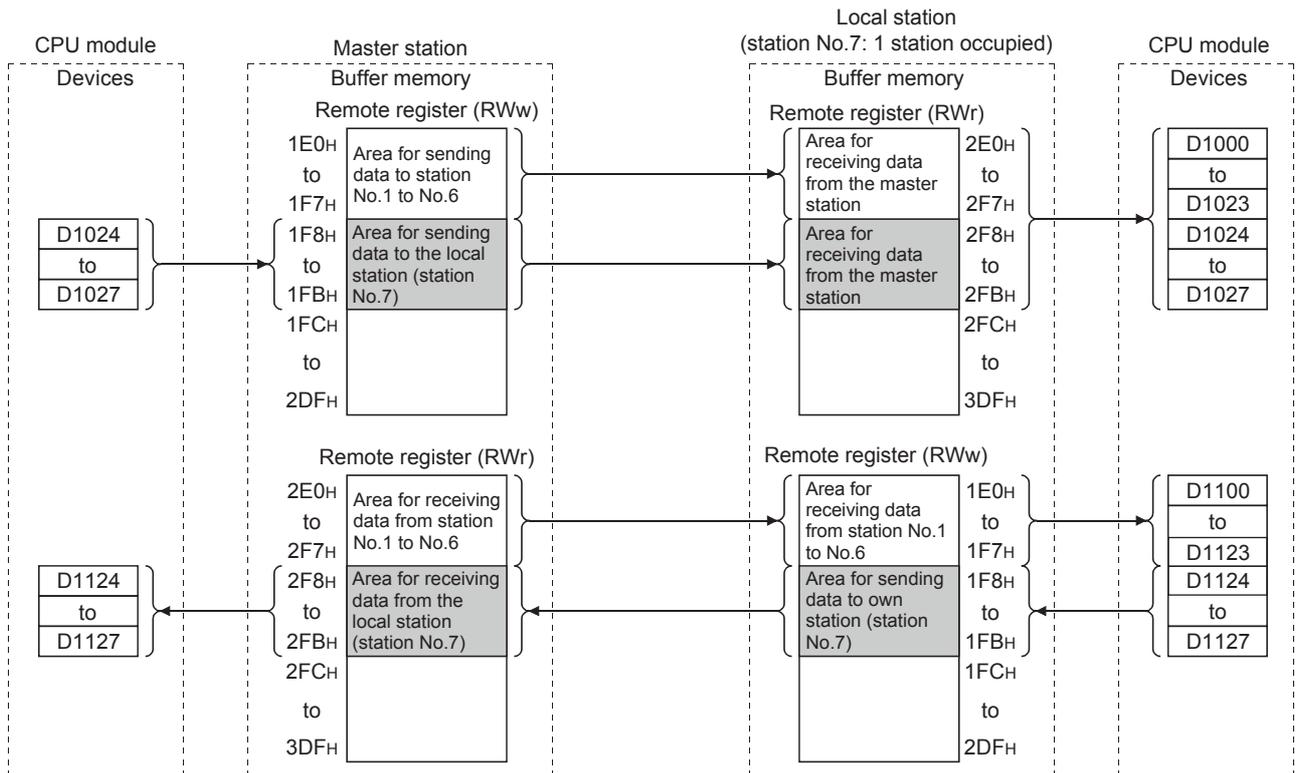
Between the master station and the local station, each data is stored diagonally.

The following table shows the flow of data between the master station and the local station (station No.7: 1 station occupied).

Master station		Flow of data	Local station (Station No.7)	
Device	Buffer memory address		Device	Buffer memory address
RX	ECH to EDH	←	RY	16CH to 16DH
RY	16CH to 16DH	→	RX	ECH to EDH
RWw	1F8H to 1FBH	→	RWr	2F8H to 2FBH
RWr	2F8H to 2FBH	←	RWw	1F8H to 1FBH

Setting sheet

■Station information setting sheet

Station No.	Station type	No. of occupied stations	Reserved/invalid station specification	Intelligent buffer specification (word)		
				Send	Receive	Automatic update
1	Remote I/O station	1	No setting	—	—	—
2	Remote I/O station	1	No setting	—	—	—
3	Remote device station	2	No setting	—	—	—
4						
5	Remote device station	2	No setting	—	—	—
6						
7	Local station	1	No setting	—	—	—

■Device assignment table

Station No.	Device							
	RX → (X)		RY ← (Y)		RWw → (D)		RWr ← (D)	
	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side
1	0000 to 000F	00200 to 0020F						
	—	00210 to 0021F						
2			0020 to 002F	00220 to 0022F				
			0030 to 003F	00230 to 0023F				
3	0040 to 004F	00240 to 0024F	0040 to 004F	00240 to 0024F	0008 to 000B	1008 to 1011	0008 to 000B	1108 to 1111
	0050 to 005F	00250 to 0025F	0050 to 005F	00250 to 0025F				
4	—	00260 to 0026F	—	00260 to 0026F	000C to 000F	1012 to 1015	000C to 000F	1112 to 1115
	—	00270 to 0027F	—	00270 to 0027F				
5	0080 to 008F	00280 to 0028F	0080 to 008F	00280 to 0028F	0010 to 0013	1016 to 1019	0010 to 0013	1116 to 1119
	0090 to 009F	00290 to 0029F	0090 to 009F	00290 to 0029F				
6		002A0 to 002AF		002A0 to 002AF	0014 to 0017	1020 to 1023	0014 to 0017	1120 to 1123
		002B0 to 002BF		002B0 to 002BF				
7	00C0 to 00CF	002C0 to 002CF	00C0 to 00CF	002C0 to 002CF	0018 to 001B	1024 to 1027	0018 to 001B	1124 to 1127
	00D0 to 00DF	002D0 to 002DF	00D0 to 00DF	002D0 to 002DF				

5

5.4.1 Master station side sequence program

Create the following sequence program and write it to the CPU module of the master station.

The areas surrounded by broken lines indicate changes from the sequence program of Exercise 2.

Project name	EX3-M

Ladder Diagram

(32)

```
     X30      X3F      X31     SW80.2                                    ┌────────┬──────┬──────┐
─────┤/├──────┤ ├──────┤ ├──────┤/├──────────────────────────────────────┤   MC   │  N2  │ M802 │
   Module   Module    Own    Data link                                  └────────┴──────┴──────┘
   failure   ready   station  status of
                     data link other
                     status   stations

                            SM413                                                          Y170
                          ───┤ ├──────────────────────────────────────────────────────────( )───
                          2 second                                                     Flash this
                          clock                                                        device
                                                                                      when the
N2                                                                                    own station
──┤├── M802                                                                           data link is
                                                                                      normally
                                                                                      operating.
```

*Data link status

(40)

```
     SM400   SW80.2                                                                         Y173
─────┤ ├──────┤ ├──────────────────────────────────────────────────────────────────────( )───
   Always On  Data link                                                              Display a
             status of                                                               station
             other                                                                   No.3 error.
             stations
```

*Execution of the station No.3 program

(44)

```
     SW80.2                                                                    ┌────────┬──────────┐
─────┤/├──────────────────────────────────────────────────────────────────────┤  CALL  │    P3    │
   Data link                                                                   │        │Processing│
   status of                                                                   │        │of station│
   other                                                                       │        │  No.3    │
   stations                                                                    └────────┴──────────┘
```

(49)

```
                                                                              ┌────────┬──────┐
─────────────────────────────────────────────────────────────────────────────┤  MCR   │  N2  │
                                                                              └────────┴──────┘
```

(50)

```
     X30      X3F      X31     SW80.4                                    ┌────────┬──────┬──────┐
─────┤/├──────┤ ├──────┤ ├──────┤/├──────────────────────────────────────┤   MC   │  N4  │ M804 │
   Module   Module    Own    Data link                                  └────────┴──────┴──────┘
   failure   ready   station  status of
                     data link other
                     status   stations

                            SM413                                                          Y170
                          ───┤ ├──────────────────────────────────────────────────────────( )───
                          2 second                                                     Flash this
                          clock                                                        device
                                                                                      when the
N4                                                                                    own station
──┤├── M804                                                                           data link is
                                                                                      normally
                                                                                      operating.
```

*Data link status

(58)

```
     SM400   SW80.4                                                                         Y174
─────┤ ├──────┤ ├──────────────────────────────────────────────────────────────────────( )───
   Always On  Data link                                                              Display a
             status of                                                               station
             other                                                                   No.5 error.
             stations
```

*Execution of the station No.5 program

(62)

```
     SW80.4                                                                    ┌────────┬──────────┐
─────┤/├──────────────────────────────────────────────────────────────────────┤  CALL  │    P5    │
   Data link                                                                   │        │Processing│
   status of                                                                   │        │of station│
   other                                                                       │        │  No.5    │
   stations                                                                    └────────┴──────────┘
```

(67) MCR N4

(68)
X30 Module failure — X3F Module ready — X31 Own station data link status — SW80.6 Data link status of other stations — MC N6 M806

SM413 2 second clock — Y170 Flash this device when the own station data link is normally operating.

N6 M806

*Data link status

(76) SM400 Always On — SW80.6 Data link status of other stations — Y175 Display a station No.7 error.

*Execution of the station No.7 program

(80) SW80.6 Data link status of other stations — CALL P7 Processing of station No.7

(85) MCR N6

(86) FEND

*Station No.3 AJ65BT-64AD communication program

P3 Processing of station No.3

(88) X258 Initial processing request flag / X298 Initial processing request flag — SET SB0D Initial procedure registration instruction

(93) SB5F Initial procedure execution completed flag / X25B Remote ready — X29B Remote ready — RST SB0D Initial procedure registration instruction

```
(98)   X25B        X240                                          ┌─────┬──────────┬──────┐
       ─┤├─────────┤├──                                          │ MOV │  D1108   │ D10  │
       Remote      CH1 A/D                                       │     │CH1 Digital│      │
       ready       conversion                                    │     │output value│     │
                   completed                                     └─────┴──────────┴──────┘
                   flag

(102)  X25A                                                                          ( Y25A )
       ─┤├──
       Error flag                                                                    Error reset


(104)                                                                            ┌──────┐
                                                                                 │ RET  │
                                                                                 └──────┘
```

*Station No.5 AJ65BT-64DAV communication program

```
P5

Processing
of station   (105)  X298                                        ┌─────┬──────────┐
No.5                ─┤├──                                        │ SET │  SB0D    │
                    Initial                                      │     │Initial   │
                    processing                                   │     │procedure │
                    request                                      │     │registration│
                    flag                                         │     │instruction│
                    X258                                         └─────┴──────────┘
                    ─┤├──
                    Initial
                    processing
                    request
                    flag

                    SB5F                                         ┌─────┬──────────┐
(110)               ─┤├───────────────┐                         │ RST │  SB0D    │
                    Initial           │                         │     │Initial   │
                    procedure         │                         │     │procedure │
                    execution         │                         │     │registration│
                    completed         │                         │     │instruction│
                    flag              │                         └─────┴──────────┘
                    X25B     X29B     │
                    ─┤├──────┤├───────┘
                    Remote   Remote
                    ready    ready

                    X29B     X104                               ┌──────┬──────┬──────────┐
(115)               ─┤├──────┤├──                               │ MOVP │ D20  │  D1016   │
                    Remote                                      │      │      │CH1       │
                    ready                                       │      │      │Digital   │
                              │                                 │      │      │value     │
                              │                                 │      │      │setting area│
                              │                                 └──────┴──────┴──────────┘
                              │   ┌───┬──────┬──────┐           ┌──────┬──────┬──────────┐
                              ├───┤ < │K4000 │ D20  │           │ MOV  │K4000 │  D1016   │
                              │   └───┴──────┴──────┘           │      │      │CH1       │
                              │                                 │      │      │Digital   │
                              │                                 │      │      │value     │
                              │                                 │      │      │setting area│
                              │                                 └──────┴──────┴──────────┘
                              │                                 ┌──────┬──────────┬──────┐
                              └─────────────────────────────── │ MOV  │  D1016   │  D0  │
                                                                │      │CH1       │      │
                                                                │      │Digital   │      │
                                                                │      │value     │      │
                                                                │      │setting area│     │
                                                                └──────┴──────────┴──────┘

                    X105     X29B                                                   ( Y280 )
(130)               ─┤├──────┤├──                                                   CH1
                             Remote                                                 Analog
                             ready                                                  output
                                                                                   enable

                    X29A                                                            ( Y29A )
(133)               ─┤├──
                    Error flag                                                      Error reset
```

```
                                                                                                    RET
(135)

┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
│       *Program for communications with the station No.7 (local station)                         │
│  P7      X2C2                                                                            Y177    │
│          ─┤ ├─                                                                           ─( )─   │
│  Processing                                                                                      │
│  of station (136)                                                                       Turn on  │
│  No.7                                                                                   this device │
│                                                                                        when X2   │
│                                                                                        of the local │
│                                                                                        station is on. │
│                                                                              ┌──────┬──────┬──────┐│
│          SM400                                                               │      │ D1124│  D1  ││
│          ─┤ ├─                                                               │      │ Data │      ││
│                                                                              │ MOV  │received│    ││
│  (140)  Always On                                                            │      │from local│  ││
│                                                                              │      │stations│    ││
│                                                                              └──────┴──────┴──────┘│
│                                                                              ┌──────┬──────┬──────┐│
│          X106                                                                │      │ D21  │ D1024││
│          ─┤ ├─                                                               │      │      │Data sent││
│                                                                              │ MOV  │      │to local ││
│  (143)                                                                       │      │      │stations ││
│                                                                              └──────┴──────┴──────┘│
│                                                                                                    │
│                                                                                         ┌────────┐ │
│                                                                                         │  RET   │ │
│  (146)                                                                                  └────────┘ │
│                                                                                                    │
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
                                                                                         ─[END ]─
(147)
```

5.4.2 Local station side sequence program

Create the following sequence program and write it to the CPU module of the local station.

Project name	EX3-L


```
        X30      X3F      X31     SW80.0                              ┌────┬──────┬──────┐
        ─|/|─────| |──────| |──────|/|────────────────────────────── │ MC │  N0  │ M800 │
(0)                                                                   └────┴──────┴──────┘
       Module   Module    Own     Data link
       failure  ready    station  status of
                         data link other
                         status   stations
                                  SM413                                              Y170
                                  ─| |─────────────────────────────────────────────( )
                                  2 second
                                  clock

N0 ── M800


      *Data link status
        SM400    SW80.0                                                              Y171
        ─| |──────| |────────────────────────────────────────────────────────────( )
(8)    Always On Data link                                                        Display a
                 status of                                                        station
                 other                                                            No.1 error.
                 stations
                                                                     ┌─────┬──────┐
(12)                                                                 │ MCR │  N0  │
                                                                     └─────┴──────┘


        X30      X3F      X31     SW80.1                              ┌────┬──────┬──────┐
        ─|/|─────| |──────| |──────|/|────────────────────────────── │ MC │  N1  │ M801 │
(13)                                                                  └────┴──────┴──────┘
       Module   Module    Own     Data link
       failure  ready    station  status of
                         data link other
                         status   stations
                                  SM413                                              Y170
                                  ─| |─────────────────────────────────────────────( )
                                  2 second
                                  clock

N1 ── M801


      *Data link status
        SM400    SW80.1                                                              Y172
        ─| |──────| |────────────────────────────────────────────────────────────( )
(21)   Always On Data link                                                        Display a
                 status of                                                        station
                 other                                                            No.2 error.
                 stations
                                                                     ┌─────┬──────┐
(25)                                                                 │ MCR │  N1  │
                                                                     └─────┴──────┘


        X30      X3F      X31     SW80.2                              ┌────┬──────┬──────┐
        ─|/|─────| |──────| |──────|/|────────────────────────────── │ MC │  N2  │ M802 │
(26)                                                                  └────┴──────┴──────┘
       Module   Module    Own     Data link
       failure  ready    station  status of
                         data link other
                         status   stations
                                  SM413                                              Y170
                                  ─| |─────────────────────────────────────────────( )
                                  2 second
                                  clock

N2 ── M802
```

```
        *Data link status
        SM400      SW80.2                                                            Y173
(34)    ──┤├──────┤/├──────────────────────────────────────────────────────────────( )──
        Always On  Data link                                                         Display a
                   status of                                                         station
                   other                                                             No.3 error.
                   stations

                                                                                N2
(38)                                                                        ┌────┬──────┐
                                                                           │ MCR │      │
                                                                            └────┴──────┘

        X30        X3F        X31        SW80.4                              N4    M804
(39)    ──┤/├──────┤├────────┤├────────┤/├──────────────────────────┌────┬────┬──────┐
        Module     Module     Own        Data link                   │ MC │    │      │
        failure    ready      station    status of                   └────┴────┴──────┘
                              data link  other
                              status     stations
                                         SM413                                      Y170
                                         ──┤├────────────────────────────────────────( )──

                                         2 second
                                         clock

N4 ───┤ M804
        │

        *Data link status
        SM400      SW80.4                                                            Y174
(47)    ──┤├──────┤/├──────────────────────────────────────────────────────────────( )──
        Always On  Data link                                                         Display a
                   status of                                                         station
                   other                                                             No.5 error.
                   stations

                                                                                N4
(51)                                                                        ┌────┬──────┐
                                                                           │ MCR │      │
                                                                            └────┴──────┘

        X30        X3F        X31        SW80.6                              N6    M806
(52)    ──┤/├──────┤├────────┤├────────┤/├──────────────────────────┌────┬────┬──────┐
        Module     Module     Own        Data link                   │ MC │    │      │
        failure    ready      station    status of                   └────┴────┴──────┘
                              data link  other
                              status     stations
                                         SM413                                      Y170
                                         ──┤├────────────────────────────────────────( )──

                                         2 second
                                         clock

N6 ───┤ M806
        │

        *Data link status
        SM400      SW80.6                                                            Y175
(60)    ──┤├──────┤/├──────────────────────────────────────────────────────────────( )──
        Always On  Data link                                                         Display a
                   status of                                                         station
                   other                                                             No.7 error.
                   stations
        X102                                                                        Y2C2
(64)    ──┤├──────────────────────────────────────────────────────────────────────( )──
                                                                                   Output to
                                                                                   the master
                                                                                   station
                                                                                   (RY2)
```

```
          X106
          ┤├                                              ┌─────┬──────┬──────────┐
(66)                                                      │     │ D21  │  D1124   │
                                                          │ MOV │      │ Data sent│
                                                          │     │      │ to the   │
                                                          │     │      │ master   │
                                                          │     │      │ station  │
                                                          └─────┴──────┴──────────┘

          SM400
          ┤├                                              ┌─────┬──────────┬──────┐
(69) Always On                                            │     │ D1024    │  D1  │
                                                          │ MOV │ Data     │      │
                                                          │     │ received │      │
                                                          │     │ from     │      │
                                                          │     │ the master│     │
                                                          │     │ station  │      │
                                                          └─────┴──────────┴──────┘

          Y201                                                              Y176
          ┤├──────────────────────────────────────────────────────────────( )
(72)                                                                        Turn on
                                                                           this device
                                                                           when the
                                                                           remote input
                                                                           station (RX1)
                                                                           is on.

                                                          ┌─────┬──────┐
(74)                                                      │ MCR │  N6  │
                                                          └─────┴──────┘

(75)  ─────────────────────────────────────────────────────────────[END]─
```

5

5.5 Communications Between the Master Station and Local Station

The communications between the master station and local station are performed using the sequence programs written to the CPU modules.

Switch operation of the demonstration machine

❶ Set the RUN/STOP/RESET switches of the CPU modules of both the master station and local station to the "RESET" position (for approximately one second) to reset the CPU modules.

❷ Set the RUN/STOP/RESET switches of the CPU modules of both the master station and local station to the "RUN" position.
Y170 flashes depending on the own station data link status (Data link normal).

❸ Turn on X102 of the local station.
When X102 in the local station program turns on, Y2C2 turns on.
When X2C2 in the master station program turns on, Y177 turns on.
• Master station side
Y177 turns on.

❹ Check that the values set in the initial input device (D21) of the master station and that of the local station are sent to each other.
   • Master station → Local station
   (1) Set "1234" in the initial input device (D21) of the master station.
   (2) Turn on X106 of the master station.
   (3) Check that the initial indication device (D1) of the local station indicates "1234".
   • Local station → Master station
   (1) Set "5678" in the initial input device (D21) of the local station.
   (2) Turn on X106 of the local station.
   (3) Check that the initial indication device (D1) of the master station indicates "5678".

❺ Turn on the terminal block switch of the remote I/O station (AJ65BTB2-16D).
Y176 turns on when Y201 (RY1) turns on in the local station program.
* X201 (RX1) of the master station corresponds to Y201 (RY1) of the local station.

6 EXERCISE 4 (REMOTE I/O NET MODE)

6.1 Features of Remote I/O Net Mode

The remote I/O net mode can be used for a system consisting of only a master station and remote I/O stations.

The remote I/O net mode enables high-speed cyclic transmissions, shortening the link scan time.

The following table lists differences in link scan time for each mode. (Values as a guide)

(When the transmission speed is 10Mbps)

Number of stations	Remote I/O net mode	Remote net Ver.1 mode Remote net Ver.2 mode Remote device net Ver.1 mode Remote device net Ver.2 mode
8	0.61ms	1.20ms
16	0.94ms	1.57ms
32	1.61ms	2.32ms
64	2.94ms	3.81ms

6.2 System Configuration

The following figure shows the system configuration of the demonstration machine for Exercise 4.
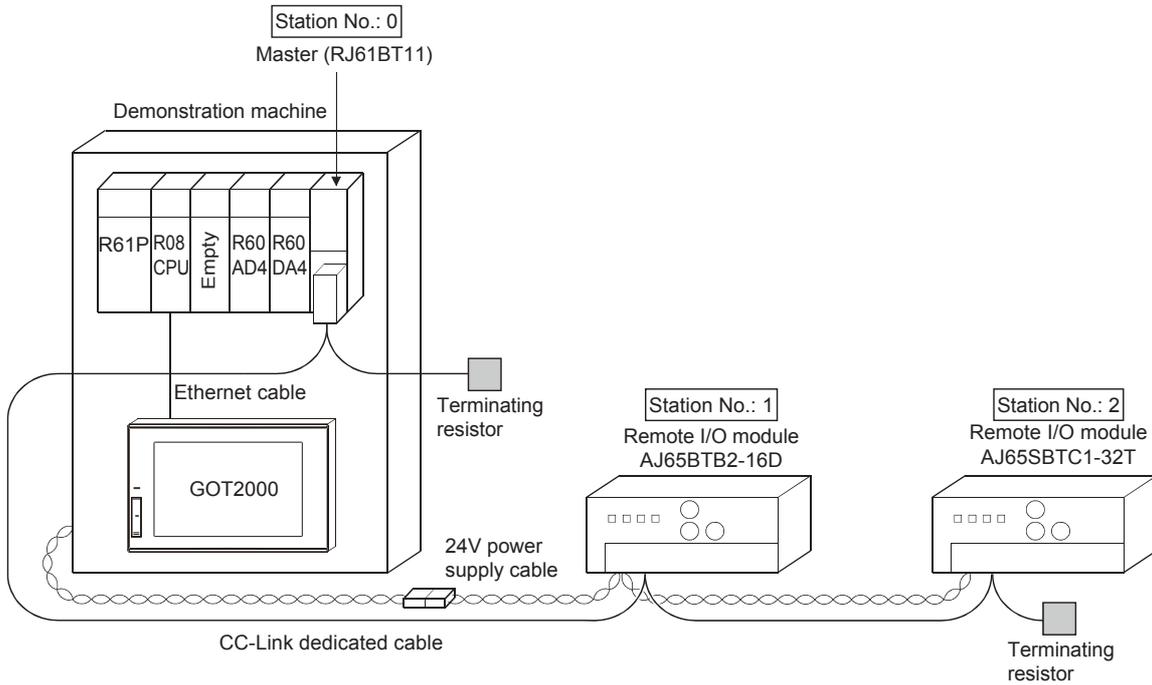
*1 The settings of modules used in the master station and remote I/O stations and the connection methods of CC-Link dedicated cables and 24V power supply cables are the same as those for Exercise 1.
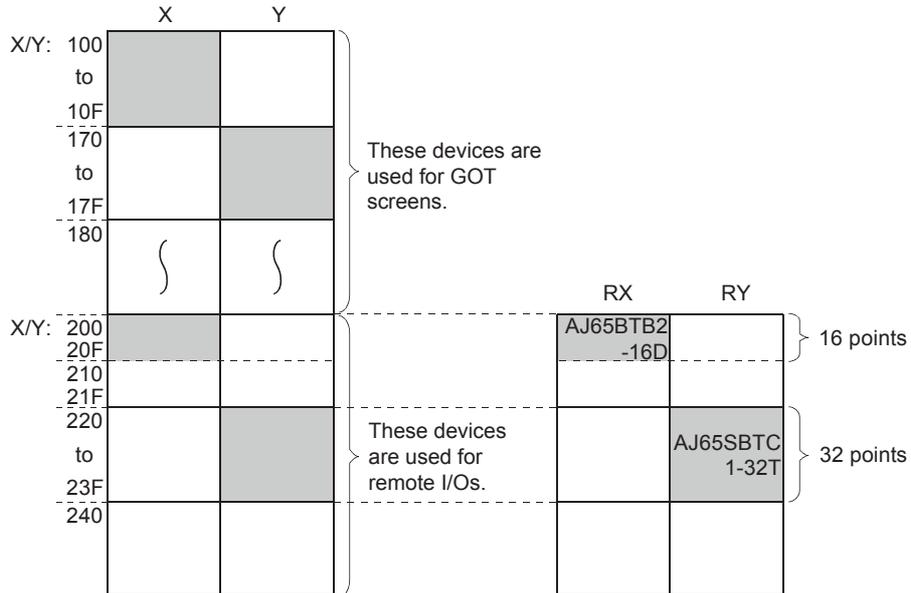
6.3 Parameter Settings

Set parameters of the master station.

After setting, write the parameters to the CPU module.

For how to write parameters, refer to Page 3 - 25 Writing parameters.

6.3.1 Parameter settings (master station)

Set parameters of the master station.

For how to set parameters, refer to Page 3 - 18 Parameter settings (master station).

Operating procedure
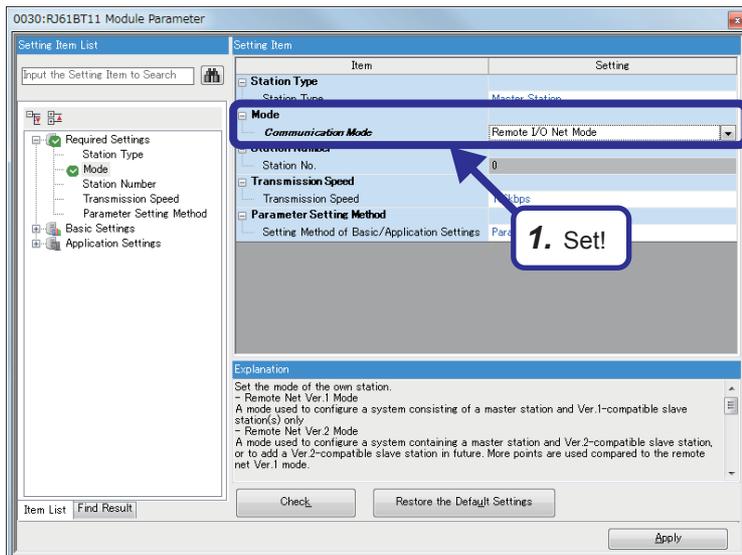
1. After creating a module configuration, set "Communication Mode" to "Remote I/O Net Mode" in the "RJ61BT11 Module Parameter" dialog box.
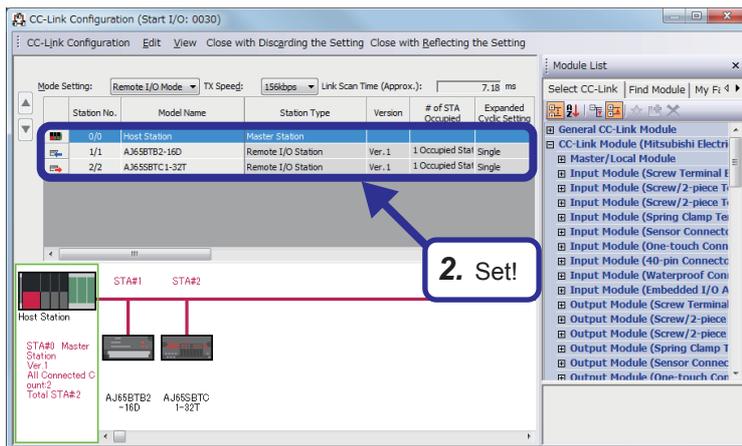
2. Set the CC-Link configuration as shown on the left.

(To the next page)

No.	Link Side					CPU Side				
	Device Name	Points	Start	End		Target	Device Name	Points	Start	End
–	SB	512	00000	001FF	⬌	Specify Device	SB	512	00000	001FF
–	SW	512	00000	001FF	⬌	Specify Device	SW	512	00000	001FF
1	RX	64	00000	0003F	⬌	Specify Device	X	64	00200	0023F
2	RY	64	00000	0003F	⬌	Specify Device	Y	64	00200	0023F
3					⬌					

3. Set!

3. Set the link refresh parameters as shown on the left.

4. Click!

4. Click the [Apply] button to close the "RJ61BT11 Module Parameter" dialog box.

5. After setting parameters, save the project with the file name "EX4".

6.4 Creating a Sequence Program

Refresh device assignment

The following figure shows the refresh relationship among the CPU module, buffer memory of the master station, and remote I/O stations.

Setting sheet

■Station information setting sheet

Station No.	Station type	No. of occupied stations	Reserved/invalid station specification	Intelligent buffer specification (word)		
				Send	Receive	Automatic update
1	Remote I/O station	1	No setting	—	—	—
2	Remote I/O station	1	No setting	—	—	—

■Device assignment table

Station No.	Device							
	RX → (X)		RY ← (Y)		RWw → (D)		RWr ← (D)	
	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side
1	0000 to 000F	00200 to 0020F						
	—	00210 to 0021F						
2			0020 to 002F	00220 to 0022F				
			0030 to 003F	00230 to 0023F				

Sequence program

The following sequence program is the same as that of Exercise 1.

Write this program to the CPU module.

Project name	EX4

```
        X30      X3F      X31     SW80.0                                    ┌─────────┬────┬──────┐
        │/│──────│ │──────│/│──────│/│──────────────────────────────────────┤         │ N0 │ M800 │
(0)                                                                         │   MC    │    │      │
    Module    Module    Own      Data link                                 └─────────┴────┴──────┘
    failure   ready     station  status of
                        data link other
                        status   stations
                                 SM413                                                       Y170
                                 │ │─────────────────────────────────────────────────────────( )
                                 2 second                                               Flash this
                                 clock                                                  device when the
                                                                                       own station
                                                                                       data link is
                                                                                       normally
N0 ── M800                                                                              operating.
   │──┐
      │
        SM400    SW80.0                                                                      Y171
        │ │──────│ │────────────────────────────────────────────────────────────────────────( )
(8)                                                                                    Display a
    Always On Data link                                                                 station
              status of                                                                 No.1 error.
              other
              stations
        SW80.0   X201                                                                        Y176
        │/│──────│ │────────────────────────────────────────────────────────────────────────( )
(11)                                                                                   Turn on this
    Data link                                                                           device when
    status of                                                                           RX1 of the
    other                                                                               station No.1
    stations                                                                            is on.
                                                                                   ┌─────────┬────┐
(14)                                                                               │   MCR   │ N0 │
                                                                                   └─────────┴────┘

        X30      X3F      X31     SW80.1                                    ┌─────────┬────┬──────┐
        │/│──────│ │──────│/│──────│/│──────────────────────────────────────┤   MC    │ N1 │ M801 │
(15)                                                                        └─────────┴────┴──────┘
    Module    Module    Own      Data link
    failure   ready     station  status of
                        data link other
                        status   stations
                                 SM413                                                       Y170
                                 │ │─────────────────────────────────────────────────────────( )
                                 2 second                                               Flash this
                                 clock                                                  device when the
                                                                                       own station
                                                                                       data link is
                                                                                       normally
N1 ── M801                                                                              operating.
   │──┐
        SM400    SW80.1                                                                      Y172
        │ │──────│ │────────────────────────────────────────────────────────────────────────( )
(23)                                                                                   Display a
    Always On Data link                                                                 station
              status of                                                                 No.2 error.
              other
              stations
        SW80.1   X102                                                                        Y222
        │/│──────│ │────────────────────────────────────────────────────────────────────────( )
(26)                                                                                   RY2 of the
    Data link                                                                           station
    status of                                                                           No.2 is on.
    other
    stations
                                                                                   ┌─────────┬────┐
(29)                                                                               │   MCR   │ N1 │
                                                                                   └─────────┴────┘

(30)                                                                                         ─[END]─
```

6.5 Communications in Remote I/O Net Mode

Switch operation of the demonstration machine

❶ Set the RUN/STOP/RESET switch of the CPU module to the RESET position (for approximately one second) to reset the CPU module.

❷ Set the RUN/STOP/RESET switch of the CPU module to the RUN position.

Y170 flashes depending on the own station data link status (Data link normal).

❸ Turn on the switch of the terminal block of the AJ65BTB2-16D. (RX1 turns on.)

Y176 turns on.

❹ Turn on X102.

The LED "Y2" of the AJ65SBTC1-32T turns on.

APPENDICES

Appendix 1 Specifications of CC-Link Cables

Appendix 1.1 Maximum overall cable length

This section describes how a transmission speed and a maximum overall cable length are related when a system is configured with products compatible with CC-Link Ver.1.10 or later and Ver.1.10-compatible CC-Link dedicated cables. For the identification of the CC-Link version, refer to the installation manual issued by the CC-Link Partner Association.
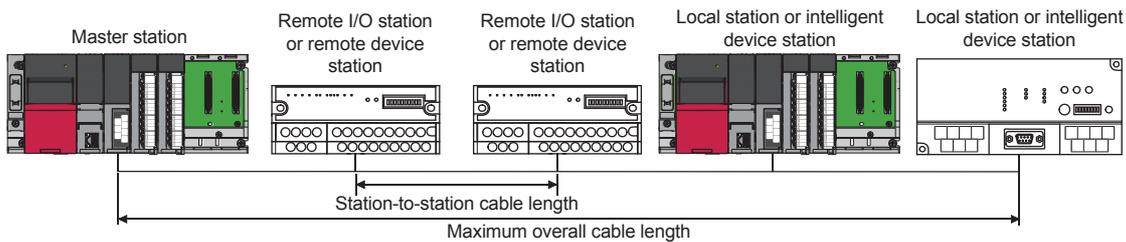
• Ver.1.10-compatible CC-Link dedicated cable (a terminating resistor of 110Ω used)

Transmission speed	Station-to-station cable length	Maximum overall cable length
156kbps	20cm or more	1200m
625kbps		900m
2.5Mbps		400m
5Mbps		160m
10Mbps		100m

Appendix 1.2 Ver.1.10-compatible CC-Link dedicated cables

Use Ver.1.10-compatible CC-Link dedicated cables for the CC-Link system.

If not, the performance of the CC-Link system is not guaranteed.

For the specifications of Ver.1.10 compatible CC-Link dedicated cables and contact information, refer to the following.

Website of CC-Link Association: http://www.cc-link.org/

Point

For details, refer to the CC-Link Cable Wiring Manual issued by CC-Link Partner Association.

A

Appendix 2 Buffer Memory Assignment of RX, RY, RWr, and RWw

Remote input (RX) and remote output (RY)

These buffer memory areas are used when the remote net Ver.1 mode, remote device net Ver.1 mode, or remote I/O net mode is selected.

- In remote net Ver.1 mode, remote device net Ver.1 mode, or remote I/O net mode, data is stored in the remote input (RX) and remote output (RY).

■Remote input (RX)

For the master station, data input from slave stations is stored.

For local stations, data input from the master station is stored.

Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address
1	E0H to E1H	14	FAH to FBH	27	114H to 115H	40	12EH to 12FH	53	148H to 149H
2	E2H to E3H	15	FCH to FDH	28	116H to 117H	41	130H to 131H	54	14AH to 14BH
3	E4H to E5H	16	FEH to FFH	29	118H to 119H	42	132H to 133H	55	14CH to 14DH
4	E6H to E7H	17	100H to 101H	30	11AH to 11BH	43	134H to 135H	56	14EH to 14FH
5	E8H to E9H	18	102H to 103H	31	11CH to 11DH	44	136H to 137H	57	150H to 151H
6	EAH to EBH	19	104H to 105H	32	11EH to 11FH	45	138H to 139H	58	152H to 153H
7	ECH to EDH	20	106H to 107H	33	120H to 121H	46	13AH to 13BH	59	154H to 155H
8	EEH to EFH	21	108H to 109H	34	122H to 123H	47	13CH to 13DH	60	156H to 157H
9	F0H to F1H	22	10AH to 10BH	35	124H to 125H	48	13EH to 13FH	61	158H to 159H
10	F2H to F3H	23	10CH to 10DH	36	126H to 127H	49	140H to 141H	62	15AH to 15BH
11	F4H to F5H	24	10EH to 10FH	37	128H to 129H	50	142H to 143H	63	15CH to 15DH
12	F6H to F7H	25	110H to 111H	38	12AH to 12BH	51	144H to 145H	64	15EH to 15FH
13	F8H to F9H	26	112H to 113H	39	12CH to 12DH	52	146H to 147H	—	—

■Remote output (RY)

For the master station, data output to slave stations is stored.

For local stations, data output to the master station is stored. Data input from slave stations is also stored.

Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address
1	160H to 161H	14	17AH to 17BH	27	194H to 195H	40	1AEH to 1AFH	53	1C8H to 1C9H
2	162H to 163H	15	17CH to 17DH	28	196H to 197H	41	1B0H to 1B1H	54	1CAH to 1CBH
3	164H to 165H	16	17EH to 17FH	29	198H to 199H	42	1B2H to 1B3H	55	1CCH to 1CDH
4	166H to 167H	17	180H to 181H	30	19AH to 19BH	43	1B4H to 1B5H	56	1CEH to 1CFH
5	168H to 169H	18	182H to 183H	31	19CH to 19DH	44	1B6H to 1B7H	57	1D0H to 1D1H
6	16AH to 16BH	19	184H to 185H	32	19EH to 19FH	45	1B8H to 1B9H	58	1D2H to 1D3H
7	16CH to 16DH	20	186H to 187H	33	1A0H to 1A1H	46	1BAH to 1BBH	59	1D4H to 1D5H
8	16EH to 16FH	21	188H to 189H	34	1A2H to 1A3H	47	1BCH to 1BDH	60	1D6H to 1D7H
9	170H to 171H	22	18AH to 18BH	35	1A4H to 1A5H	48	1BEH to 1BFH	61	1D8H to 1D9H
10	172H to 173H	23	18CH to 18DH	36	1A6H to 1A7H	49	1C0H to 1C1H	62	1DAH to 1DBH
11	174H to 175H	24	18EH to 18FH	37	1A8H to 1A9H	50	1C2H to 1C3H	63	1DCH to 1DDH
12	176H to 177H	25	190H to 191H	38	1AAH to 1ABH	51	1C4H to 1C5H	64	1DEH to 1DFH
13	178H to 179H	26	192H to 193H	39	1ACH to 1ADH	52	1C6H to 1C7H	—	—

## Ver.2-compatible remote input (RX) and Ver.2-compatible remote output (RY)

These buffer memory areas are used when the remote net Ver.2 mode or remote device net Ver.2 mode is selected.

In remote net Ver.2 mode, data is stored in the remote input (RX) and remote output (RY) in all slave stations (including Ver.1-compatible slave stations).

For the master station, data input from slave stations is stored.

For local stations, data input from the master station is stored.

■Storage location for each station

The storage locations change depending on the number of occupied stations and extended cyclic settings in slave stations.

The storage locations for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503).

▓ ••• The last two bits of RX/RY cannot be used for communications between the master station and a local station.
(In the example below, RYEE and RYEF cannot be used.)

Remote I/O station (station No.: 1, number of occupied stations: 1, number of remote I/O station points: 16 points)

Remote I/O station (station No.: 2, number of occupied stations: 1, number of remote I/O station points: 32 points)

Local station (station No.: 3, number of occupied stations: 4, extended cyclic setting: double)

Local station (station No.: 7, number of occupied stations: 4, extended cyclic setting: double)

Master station

Address	Remote input (RX)
Station No.1 4000H	RX F to RX 0
Station No.2 4001H	RX 1F to RX 10
4002H	RX 2F to RX 20
4003H	RX 3F to RX 30
4004H	RX 4F to RX 40
Station No.3	⋮
400FH	RX FF to RX F0
4010H	RX 10D to RX 100
4011H	RX 11F to RX 110
4012H	RX 12F to RX 120
Station No.7	⋮
400DH	RX 1DF to RX 1D0
400EH	RX 1EF to RX 1E0
⋮	⋮
41FCH	RX1FCF to RX1FC0
41FDH	RX1FDF to RX1FD0
41FEH	RX1FEF to RX1FE0
41FFH	RX1FFF to RX1FF0

Remote I/O station (No.1): X0F to X00

Remote I/O station (No.2): X1F to X10 / X2F to X20

Local station (No.3) — Remote output (RY)

Remote output (RY)	Address
RY F to RY 0	4200H Station No.1
RY 1F to RY 10	4201H Station No.2
RY 2F to RY 20	4202H
RY 3F to RY 30	4203H
RY 4F to RY 40	4204H
⋮	Station No.3
RY FF to RY F0	420FH
RY 10D to RY 100	4210H
RY 11F to RY 110	4211H
RY 12F to RY 120	4212H
⋮	Station No.7
RY 1DF to RY 1D0	421DH
RY 1EF to RY 1E0	421EH
⋮	⋮
RY1FCF to RY1FC0	43FCH
RY1FDF to RY1FD0	43FDH
RY1FEF to RY1FE0	43FEH
RY1FFF to RY1FF0	43FFH

Local station (No.7) — Remote output (RY)

Remote output (RY)	Address
RY F to RY 0	4200H Station No.1
RY 1F to RY 10	4201H Station No.2
RY 2F to RY 20	4202H
RY 3F to RY 30	4203H
RY 4F to RY 40	4204H
⋮	Station No.3
RY FF to RY F0	420FH
RY 10D to RY 100	4210H
RY 11F to RY 110	4211H
RY 12F to RY 120	4212H
⋮	Station No.7
RY 1DF to RY 1D0	421DH
RY 1EF to RY 1E0	421EH
⋮	⋮
RY1FCF to RY1FC0	43FCH
RY1FDF to RY1FD0	43FDH
RY1FEF to RY1FE0	43FEH
RY1FFF to RY1FF0	43FFH

A

Remote register (RWw) and remote register (RWr)

These buffer memory areas are used when the remote net Ver.1 mode or remote device net Ver.1 mode is selected.

• In remote net Ver.1 mode or remote device net Ver.1 mode, data is stored in the remote register (RWr and RWw).

■Remote register (RWr)

For the master station, data received from slave stations is stored.

For local stations, data received from the master station is stored.

Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address
1	2E0H to 2E3H	14	314H to 317H	27	348H to 34BH	40	37CH to 37FH	53	3B0H to 3B3H
2	2E4H to 2E7H	15	318H to 31BH	28	34CH to 34FH	41	380H to 383H	54	3B4H to 3B7H
3	2E8H to 2EBH	16	31CH to 31FH	29	350H to 353H	42	384H to 387H	55	3B8H to 3BBH
4	2ECH to 2EFH	17	320H to 323H	30	354H to 357H	43	388H to 38BH	56	3BCH to 3BFH
5	2F0H to 2F3H	18	324H to 327H	31	358H to 35BH	44	38CH to 38FH	57	3C0H to 3C3H
6	2F4H to 2F7H	19	328H to 32BH	32	35CH to 35FH	45	390H to 393H	58	3C4H to 3C7H
7	2F8H to 2FBH	20	32CH to 32FH	33	360H to 363H	46	394H to 397H	59	3C8H to 3CBH
8	2FCH to 2FFH	21	330H to 333H	34	364H to 367H	47	398H to 39BH	60	3CCH to 3CFH
9	300H to 303H	22	334H to 337H	35	368H to 36BH	48	39CH to 39FH	61	3D0H to 3D3H
10	304H to 307H	23	338H to 33BH	36	36CH to 36FH	49	3A0H to 3A3H	62	3D4H to 3D7H
11	308H to 30BH	24	33CH to 33FH	37	370H to 373H	50	3A4H to 3A7H	63	3D8H to 3DBH
12	30CH to 30FH	25	340H to 343H	38	374H to 377H	51	3A8H to 3ABH	64	3DCH to 3DFH
13	310H to 313H	26	344H to 347H	39	378H to 37BH	52	3ACH to 3AFH	—	—

■Remote register (RWw)

For the master station, data sent to slave stations is stored.

For local stations, data sent to the master station is stored. Data received from slave stations is also stored.

Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address
1	1E0H to 1E3H	14	214H to 217H	27	248H to 24BH	40	27CH to 27FH	53	2B0H to 2B3H
2	1E4H to 1E7H	15	218H to 21BH	28	24CH to 24FH	41	280H to 283H	54	2B4H to 2B7H
3	1E8H to 1EBH	16	21CH to 21FH	29	250H to 253H	42	284H to 287H	55	2B8H to 2BBH
4	1ECH to 1EFH	17	220H to 223H	30	254H to 257H	43	288H to 28BH	56	2BCH to 2BFH
5	1F0H to 1F3H	18	224H to 227H	31	258H to 25BH	44	28CH to 28FH	57	2C0H to 2C3H
6	1F4H to 1F7H	19	228H to 22BH	32	25CH to 25FH	45	290H to 293H	58	2C4H to 2C7H
7	1F8H to 1FBH	20	22CH to 22FH	33	260H to 263H	46	294H to 297H	59	2C8H to 2CBH
8	1FCH to 1FFH	21	230H to 233H	34	264H to 267H	47	298H to 29BH	60	2CCH to 2CFH
9	200H to 203H	22	234H to 237H	35	268H to 26BH	48	29CH to 29FH	61	2D0H to 2D3H
10	204H to 207H	23	238H to 23BH	36	26CH to 26FH	49	2A0H to 2A3H	62	2D4H to 2D7H
11	208H to 20BH	24	23CH to 23FH	37	270H to 273H	50	2A4H to 2A7H	63	2D8H to 2DBH
12	20CH to 20FH	25	240H to 243H	38	274H to 277H	51	2A8H to 2ABH	64	2DCH to 2DFH
13	210H to 213H	26	244H to 247H	39	278H to 27BH	52	2ACH to 2AFH	—	—

Ver.2-compatible remote register (RWw) and Ver.2-compatible remote register (RWr)

These buffer memory areas are used when the remote net Ver.2 mode or remote device net Ver.2 mode is selected.

In remote net Ver.2 mode or remote device net Ver.2 mode, data is stored in the remote register (RWr/RWw) of all slave stations (including Ver.1-compatible slave stations).

■Storage location for each station

The storage locations change depending on the number of occupied stations and extended cyclic settings in slave stations.

The storage locations for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503).

Ex.

	Master station		Remote device station (station No.: 1, number of occupied stations: 1, extended cyclic setting: single)	Local station (station No.: 2, number of occupied stations: 1, extended cyclic setting: quadruple)	
	Address	Remote register (RWw)	Remote register (RWw)	Remote register (RWr)	Address
For station No.1	4400H	RWw 0	RWw 0	RWr 0	4C00H	For station No.1
	4401H	RWw 1	RWw 1	RWr 1	4C01H
	4402H	RWw 2	RWw 2	RWr 2	4C02H
	4403H	RWw 3	RWw 3	RWr 3	4C03H
For station No.2	4404H	RWw 4		RWr 4	4C04H
	4405H	RWw 5		RWr 5	4C05H
	4406H	RWw 6		RWr 6	4C06H
	4407H	RWw 7		RWr 7	4C07H
	4408H	RWw 8		RWr 8	4C08H
	4409H	RWw 9		RWr 9	4C09H
	440AH	RWw A		RWr A	4C0AH
	440BH	RWw B		RWr B	4C0BH	For station No.2
	440CH	RWw C		RWr C	4C0CH
	440DH	RWw D		RWr D	4C0DH
	440EH	RWw E		RWr E	4C0EH
	440FH	RWw F		RWr F	4C0FH
	4410H	RWw 10		RWr 10	4C10H
	4411H	RWw 11		RWr 11	4C11H
	4412H	RWw 12		RWr 12	4C12H
	4413H	RWw 13		RWr 13	4C13H
	⋮	⋮		⋮	⋮
	4BFCH	RWw 7FC		RWr 7FC	53FCH
	4BFDH	RWw 7FD		RWr 7FD	53FDH
	4BFEH	RWw 7FE		RWr 7FE	53FEH
	4BFFH	RWw 7FF		RWr 7FF	53FFH

A

Link special relay (SB)

This area stores bit (on/off) data indicating the data link status.

Buffer memory addresses 5E0H to 5FFH correspond to link special relay areas SB0000 to SB01FF.

For details on link special relay areas (SB0000 to SB01FF), refer to Appendix 3.

The following table lists the relationship between buffer memory addresses 5E0H to 5FFH and link special relay areas SB0000 to SB01FF.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
5E0H	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
5E1H	1F	1E	1D	1C	1B	1A	19	18	17	16	15	14	13	12	11	10
5E2H	2F	2E	2D	2C	2B	2A	29	28	27	26	25	24	23	22	21	20
5E3H	3F	3E	3D	3C	3B	3A	39	38	37	36	35	34	33	32	31	30
5E4H	4F	4E	4D	4C	4B	4A	49	48	47	46	45	44	43	42	41	40
5E5H	5F	5E	5D	5C	5B	5A	59	58	57	56	55	54	53	52	51	50
5E6H	6F	6E	6D	6C	6B	6A	69	68	67	66	65	64	63	62	61	60
5E7H	7F	7E	7D	7C	7B	7A	79	78	77	76	75	74	73	72	71	70
5E8H	8F	8E	8D	8C	8B	8A	89	88	87	86	85	84	83	82	81	80
5E9H	9F	9E	9D	9C	9B	9A	99	98	97	96	95	94	93	92	91	90
5EAH	AF	AE	AD	AC	AB	AA	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
5EBH	BF	BE	BD	BC	BB	BA	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
5ECH	CF	CE	CD	CC	CB	CA	C9	C8	C7	C6	C5	C4	C3	C2	C1	C0
5EDH	DF	DE	DD	DC	DB	DA	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
5EEH	EF	EE	ED	EC	EB	EA	E9	E8	E7	E6	E5	E4	E3	E2	E1	E0
5EFH	FF	FE	FD	FC	FB	FA	F9	F8	F7	F6	F5	F4	F3	F2	F1	F0
5F0H	10F	10E	10D	10C	10B	10A	109	108	107	106	105	104	103	102	101	100
5F1H	11F	11E	11D	11C	11B	11A	119	118	117	116	115	114	113	112	111	110
5F2H	12F	12E	12D	12C	12B	12A	129	128	127	126	125	124	123	122	121	120
5F3H	13F	13E	13D	13C	13B	13A	139	138	137	136	135	134	133	132	131	130
5F4H	14F	14E	14D	14C	14B	14A	149	148	147	146	145	144	143	142	141	140
5F5H	15F	15E	15D	15C	15B	15A	159	158	157	156	155	154	153	152	151	150
5F6H	16F	16E	16D	16C	16B	16A	169	168	167	166	165	164	163	162	161	160
5F7H	17F	17E	17D	17C	17B	17A	179	178	177	176	175	174	173	172	171	170
5F8H	18F	18E	18D	18C	18B	18A	189	188	187	186	185	184	183	182	181	180
5F9H	19F	19E	19D	19C	19B	19A	199	198	197	196	195	194	193	192	191	190
5FAH	1AF	1AE	1AD	1AC	1AB	1AA	1A9	1A8	1A7	1A6	1A5	1A4	1A3	1A2	1A1	1A0
5FBH	1BF	1BE	1BD	1BC	1BB	1BA	1B9	1B8	1B7	1B6	1B5	1B4	1B3	1B2	1B1	1B0
5FCH	1CF	1CE	1CD	1CC	1CB	1CA	1C9	1C8	1C7	1C6	1C5	1C4	1C3	1C2	1C1	1C0
5FDH	1DF	1DE	1DD	1DC	1DB	1DA	1D9	1D8	1D7	1D6	1D5	1D4	1D3	1D2	1D1	1D0
5FEH	1EF	1EE	1ED	1EC	1EB	1EA	1E9	1E8	1E7	1E6	1E5	1E4	1E3	1E2	1E1	1E0
5FFH	1FF	1FE	1FD	1FC	1FB	1FA	1F9	1F8	1F7	1F6	1F5	1F4	1F3	1F2	1F1	1F0

Link special register (SW)

This area stores word data indicating the data link status.

Buffer memory addresses 600H to 7FFH correspond to link special register areas SW0000 to SW01FF.

For details on link special register areas (SW0000 to 01FF), refer to Appendix 3.

Appendix 3 List of Link Special Relay Areas/Link Special Register Areas/Error Codes

Appendix 3.1 List of link special relay (SB) areas

The link special relay (SB) is turned on/off depending on various factors during data link. Any error status of the data link can be checked by using and monitoring it in the program.

Application of the link special relay (SB)

By using the link special relay (SB), the status of CC-Link system can be checked from HMI (Human Machine Interfaces) as well as the engineering tool.

Refresh of the link special relay (SB)

To use the link special relay (SB), set them in "Link Refresh Settings" in "Basic Settings" so that they are refreshed to the devices or labels of the CPU module.

Ranges turned on/off by users and by the system

The following ranges correspond to when the link special relay (SB) areas are assigned from SB0000 to SB01FF.
- Turned on/off by users: SB0000 to SB001F
- Turned on/off by the system: SB0020 to SB01FF

List of link special relay (SB) areas

The following table lists the link special relay (SB) areas when they are assigned from SB0000 to SB01FF.
When a standby master station is used, refer to the respective columns under "Availability" in the table as explained below.
- When a standby master station is operating as a master station: "Master station" column
- When a standby master station is operating as a standby master station: "Local station" column

Point

Do not turn on or off areas whose numbers are not on the following list. Doing so may cause malfunction of the programmable controller system.

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0000	Data link restart	Restarts the data link that has been stopped by SB0002. Off: Not instructed On: Instructed	○	○	×
SB0001	Refresh instruction at standby master switching	Refreshes cyclic data after data link control is transferred to the standby master station. Off: Not instructed On: Instructed	○	×	×
SB0002	Data link stop	Stops the data link of the own station. Note that if this relay is instructed to the master station, the entire system will stop. Off: Not instructed On: Instructed	○	○	×
SB0003	Refresh instruction when changing parameters by the dedicated instruction	Refreshes cyclic data after parameter setting is changed by the RLPASET instruction. Off: Not instructed (refresh stopped) On: Instructed (refresh started/continued)	○	×	×

A

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0004	Temporary error invalid request	Determines the stations specified by SW0003 to SW0007 as a temporary error invalid station. Off: Not requested On: Requested	○	×	×
SB0005	Temporary error invalid cancel request	Cancels the temporary error invalid station setting configured for the stations specified by SW0003 to SW0007. Off: Not requested On: Requested	○	×	×
SB0007	Master station duplication error cancel request	Clears a master station duplication error. Off: Not instructed On: Instructed	○[*1]	×	×
SB0008	Line test request	Executes a line test to the station specified by SW0008. Off: Not requested On: Requested	○	×	×
SB000B	Transmission speed test request	Executes a transmission speed test. Off: Not requested On: Requested	○[*1]	×	×
SB000C	Forced master switching	Forcibly transfers data link control from the standby master station during data link control to the master station that stands by for system down of the standby master station. Off: Not requested On: Requested	○	×	×
SB000D	Remote device station initialization procedure registration instruction	Performs an initial processing using the information registered by the initialization procedure registration using an engineering tool. While SB000D is on, the remote I/O and remote registers are stopped to be refreshed. Off: Not instructed On: Instructed	○	×	×
SB0020	Module status	Stores the communication status between the master/local module and CPU module. Off: Normal On: Error	○	○	○
SB0040	Data link restart acceptance	Stores whether the data link restart instruction has been accepted. Off: Not accepted On: Accepted	○	○	×
SB0041	Data link restart completion	Stores whether the data link restart instruction has been completed. Off: Not completed On: Started	○	○	×
SB0042	Refresh instruction acceptance status at standby master switching	Stores whether the refresh instruction at standby master switching has been accepted. Off: Not executed On: Accepted	○	×	×
SB0043	Refresh instruction completion status at standby master switching	Stores whether the refresh instruction at standby master switching has been completed. Off: Not executed On: Switched	○	×	×
SB0044	Data link stop acceptance	Stores whether the data link stop instruction has been accepted. Off: Not accepted On: Accepted	○	○	×
SB0045	Data link stop completion	Stores whether the data link stop instruction has been completed. Off: Not completed On: Stopped	○	○	×
SB0046	Forced master switching enable status	Stores whether Forced master switching (SB000C) can be executed. Off:Cannot be executed On: Can be executed	○[*2]	×	×
SB0048	Temporary error invalid acceptance status	Stores whether the remote station temporary error invalid instruction has been accepted. Off: Not executed On: Accepted	○	×	×

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0049	Temporary error invalid completion status	Stores whether the remote station temporary error invalid instruction has been completed. Off: Not executed On: A temporary error invalid station determined	○	×	×
SB004A	Temporary error invalid cancel acceptance status	Stores whether the remote station temporary error invalid cancel instruction has been accepted. Off: Not executed On: Accepted	○	×	×
SB004B	Temporary error invalid cancel completion status	Stores whether the remote station temporary error invalid cancel instruction has been completed. Off: Not executed On: Temporary error invalid station setting canceled	○	×	×
SB004C	Line test acceptance status	Stores whether a line test request has been accepted. Off: Not executed On: Accepted	○	×	×
SB004D	Line test completion status	Stores whether a line test has been completed. Off: Not executed On: Completed	○	×	×
SB0050	Offline test status	Stores whether an offline test is being executed. Off: Not executed On: In process	×	×	○
SB0057	Master station duplication error cancel acceptance	Stores whether a master station duplication error cancel request has been accepted. Off: Not accepted On: Accepted	○	×	×
SB0058	Master station duplication error cancel completion	Stores whether a master station duplication error cancel request has been completed. Off: Not completed On: Completed	○	×	×
SB005A	Master switching request acceptance	Stores whether the standby master station has detected the system down of the master station and has accepted a request of switching from standby master operation to master operation. Off: Not accepted On: Accepted	×	○[2]	×
SB005B	Master switching request completion	Stores whether the standby master station has been switched as a master station. Off: Not completed On: Completed	×	○[2]	×
SB005C	Forced master switching request acceptance	Stores whether a forced master switching request has been accepted. Off: Not accepted On: Accepted	○	×	×
SB005D	Forced master switching request completion	Stores whether a forced master switching request has been completed. Off: Not completed On: Completed	○	○	×
SB005E	Execution status of remote device station initialization procedure	Stores whether the initialization procedure is being performed. Off: Not executed On: In process	○	×	×
SB005F	Completion status of remote device station initialization procedure	Stores whether the initialization procedure has been completed. Off: Not completed On: Completed	○	×	×
SB0060	Mode of own station	Stores the mode setting status of the own station. Off: Online On: Mode other than online	○	○	○
SB0061	Type of own station	Stores the station type of the own station. Off: Master station (station number: 0) On: Local station (station number: 1 to 64)	○	○	×
SB0062	Standby master station setting status of own station	Stores whether the own station has been set as a standby master station. Off: Not set On: Set	○	○	○

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No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0065	Input data status of own data link faulty station	Stores the setting status of "Input Data from Data Link Faulty Station" configured for the own station. Off: Clear On: Hold	○	○	×
SB0066 SB0067	Number of own station occupied stations	Stores the number of occupied stations of the own station. ■1 station occupied • SB0066: OFF • SB0067: OFF ■2 stations occupied • SB0066: OFF • SB0067: ON ■3 stations occupied • SB0066: ON • SB0067: ON ■4 stations occupied • SB0066: ON • SB0067: OFF	○*1	×	×
SB006D	Parameter setting status	Stores whether the parameters have been correctly set. Off: Normal On: Setting incorrect (An error code is stored in SW0068.)	○*1	×	×
SB006E	Operation status of own station	Stores whether data link with other stations is being performed. Off: In process On: Not performed	○	○	×
SB006F	Setting status of block guarantee of cyclic data per station	Stores whether the block guarantee of cyclic data per station has been set to the own station. Off: Not set On: Set	○	○	×
SB0070	Master station information	Stores the data link status. Off: Data link control by the master station On: Data link control by the standby master station	○	○	×
SB0071	Standby master station information	Stores whether a standby master station exists. Off: Absent On: Present	○	○	×
SB0072	Scan mode setting information	Stores the setting status of the scan mode. Off: Link scan is performed asynchronously with a sequence scan. On: Link scan is performed synchronously with a sequence scan.	○	×	×
SB0073	Data link setting when CPU is down	Indicates the data link status specified by the parameter when CPU is down. Off: Data link stopped On: Data link continued	○	○	×
SB0074	Reserved station specification status	Stores whether a reserved station has been specified by the parameter. Off: Not specified On: Specified (The set station number is stored in SW0074 to SW0077.) Depending on the link refresh timing, SB0074 may be updated with the time difference of one sequence scan from the update of Reserved station specification status (SW0074 to SW0077).	○	○	×
SB0075	Error invalid station specification status	Stores whether an error invalid station has been specified using the parameter. Off: Not specified On: Specified (The set station number is stored in SW0078 to SW007B.) Depending on the link refresh timing, SB0075 may be updated with the time difference of one sequence scan from the update of Error invalid station specification status (SW0078 to SW007B).	○	○	×
SB0076	Temporary error invalid station setting information	Stores whether a temporary error invalid station has been set. Off: Not set On: Set (The set station number is stored in SW007C to SW007F.) Depending on the link refresh timing, SB0076 may be updated with the time difference of one sequence scan from the update of Temporary error invalid status (SW007C to SW007F).	○	○	×
SB0077	Parameter receive status	Stores whether parameters have been received from the master station. Off: Received On: Not received	×	○	×

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0079	Master station return specification information	Stores whether "Master Station" or "Master Station (Duplex Function)" has been set in "Station Type" in the module parameter window. Off: Master station On: Master station (duplex function)	○	×	×
SB007A	Standby master station operation history of own station	Stores whether the own station has ever operated as a standby master station. Off: Has no history of operating as a standby master station On: Has a history of operating as a standby master station	○	×	×
SB007B	Master/standby master operation status of own station	Stores whether the own station is operating as a master station or standby master station. Off:The own station is operating as a master station. On:The own station is operating as a standby master station.	○	○	×
SB007C	Slave station refresh/ compulsory clear setting status in case of programmable controller CPU STOP	Stores the parameter setting status of output data in case of CPU STOP. Off: Receives remote output (RY). On: Sends 0 data.	○	○	×
SB0080	Data link status of other stations	Stores the communication status with slave stations. Off: All stations normal On: Faulty station found (The faulty station number is stored in SW0080 to SW0083.) It takes maximum of six seconds for Data link status of other stations (SB0080) to turn on after a slave station connected to the master station or local station becomes faulty.	○	○	×
SB0081	Watchdog timer error status of other stations	Stores whether a watchdog timer error has occurred in other stations. Off: No error On: Error Depending on the link refresh timing, SB0081 may be updated with the time difference of one sequence scan from the update of Watchdog timer error occurrence status of other stations (SW0084 to SW0087).	○	○	×
SB0082	Fuse blown status of other stations	Stores whether a fuse blown error has occurred in other stations. (SW0088 to SW008B) Off: No error On: Error Depending on the link refresh timing, SB0082 may be updated with the time difference of one sequence scan from the update of Fuse blown status of other stations (SW0088 to SW008B).	○	○	×
SB0083	Switch change status of other stations	Detects whether the setting of setting switches of other stations during data link has been changed. Off: No change On: Changed Depending on the link refresh timing, SB0083 may be updated with the time difference of one sequence scan from the update of Switch change status of other stations (SW008C to SW008F).	○	○	×
SB0090	Line status of own station	Stores whether the line to the own station is normally operating. Off: Normal On: Error (disconnected)	×	○	×
SB0094	Transient transmission status	Stores whether a transient transmission error has occurred. Off: No error On: Error	○	○	×
SB0095	Master stations transient transmission status	Stores whether the master station is normally performing transient transmission. Off: Normal On: Error	×	○	×
SB00B4	Standby master station test result	Stores the result of the line test 1. Off: Normal On: Error	○	×	○
SB0160	Remote register use prohibited status	Stores whether the use of remote registers is prohibited. Off: Available On: Use prohibited	○	×	×

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No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0184	Transmission speed test result of standby master station	Stores the result of the transmission speed test to the standby master station. Off: Normal (same transmission speed as the master station) or no response from the module On: Error (different transmission speed from the master station)	○	×	×
SB0185	Transmission speed test acceptance status	Stores whether Transmission speed test request (SB000B) has been accepted. Off: Not accepted On: Accepted	○	×	×
SB0186	Transmission speed test completion status	Stores whether a transmission speed test has been completed. Off: Not completed On: Completed	○	×	×

*1 Available for stations with the station number 0 only.

*2 Available for the standby master station only.

Appendix 3.2 List of link special register (SW) areas

The link special register (SW) stores the information during data link. Error locations and causes can be checked by the using and monitoring the link special register (SW) in programs.

Application of the link special register (SW)

By using the link special register (SW), the status of CC-Link system can be checked from HMI (Human Machine Interfaces) as well as the engineering tool.

Refresh of the link special register (SW)

To use the link special register (SW), set them in "Link Refresh Settings" under "Basic Settings" so that they are refreshed to the devices or labels of the CPU module.

Range where data are stored by users and range where data are stored by the system

The following ranges correspond to when the link special register (SW) areas are assigned from SW0000 to SW01FF.
- Stored by users: SW0000 to SW001F
- Stored by the system: SW0020 to SW01FF

List of link special register (SW) areas

The following table lists the link special register (SW) areas when they are assigned from SW0000 to SW01FF.

When a standby master station is used, refer to the respective columns under "Availability" in the table as explained below.
- When a standby master station is operating as a master station: "Master station" column
- When a standby master station is operating as a standby master station: "Local station" column

> **Point**
>
> Do not write any data to an area whose number is not on the following list. Doing so may cause malfunction of the programmable controller system.

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		**Offline**
			Master station	**Local station**	
SW0003	Multiple temporary error invalid station specification	Selects whether to specify multiple temporary error invalid stations. 00: Multiple stations set in SW0004 to SW0007 specified 01 to 64:A single station specified from 1 to 64 (The number represents the station number to be set as a temporary error invalid station.)	○	×	×
SW0004 to SW0007	Temporary error invalid station specification	Specifies a temporary error invalid station. 0: Temporary error invalid station not specified 1: Temporary error invalid station specified See table below. The stations need not be set by the number of occupied stations. Error invalid stations, reserved stations, station with the end station number, and stations later than that are excepted.	○	×	×
SW0008	Line test station setting	Sets a station number where the line test is executed. 0: Entire system (executed to all stations) 01 to 64:Specified station Default: 0	○	×	×

Table within SW0004 to SW0007 description:

	b15	b14	b13	b12	to	b3	b2	b1	b0
SW0004	16	15	14	13	to	4	3	2	1
SW0005	32	31	30	29	to	20	19	18	17
SW0006	48	47	46	45	to	36	35	34	33
SW0007	64	63	62	61	to	52	51	50	49

1 to 64 in the table indicate station numbers.

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0009	Monitoring time setting	Sets monitoring time when dedicated instructions are used. Default: 10 (seconds) (value = 0) Setting range: 1 to 360 (seconds) If a value outside the range is set, the monitoring time will be 360 seconds. When SW000B is set, the time until a dedicated instruction fails is as follows: (Number of retries + 1) × monitoring time	○	○	×
SW000A	CPU monitoring time setting	Sets the monitoring time of CPU response when the CPU module is accessed through transient transmission. Default: 90 (seconds) (value = 0) Setting range: 1 to 3600 (seconds) If a value outside the range is set, the monitoring time will be 3600 seconds.	○	○	×
SW000B	Dedicated instruction retry count setting	Sets the number of retries of when dedicated instructions are used. Default: 0 (No retry) Setting range: 0 to 7 (time) If a value outside the range is set, the number of times will be 7.	○	○	×
SW0014 to SW0017	Specification of remote device station to be initialized	Specifies a station where an initial processing is performed using the information registered by the initialization procedure registration using an engineering tool. 0: Initial processing not performed 1: Initial processing performed b15 b14 b13 b12 to b3 b2 b1 b0 SW0014 16 15 14 13 to 4 3 2 1 SW0015 32 31 30 29 to 20 19 18 17 SW0016 48 47 46 45 to 36 35 34 33 SW0017 64 63 62 61 to 52 51 50 49 1 to 64 in the table indicate station numbers. The stations need not be set by the number of occupied stations. Error invalid stations, reserved stations, station with the end station number, and stations later than that are excepted.	○	×	×
SW0020	Module status	Stores the communication status between the master/local module and CPU module. 0: Normal Values other than 0:Error code (📖 User's manual for the CPU module used)	○	○	○
SW0041	Data link restart result	Stores whether the data link restart instruction using SB0000 has been normally completed. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	○	×
SW0043	Refresh instruction at standby master switching result	Stores whether the refresh instruction at standby master switching has been normally completed. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW0045	Data link stop result	Stores whether the data link stop instruction using SB0002 has been normally completed. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	○	×
SW0049	Temporary error invalid station specification result	Stores whether the temporary error invalid station specification has been normally completed. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW004B	Temporary error invalid station specification cancel result	Stores whether the temporary error invalid station setting has been normally canceled. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW004D	Line test result	Stores the result of a line test. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0057	Master station duplication error cancel result	Stores whether a master station duplication error cancel request has been normally completed. 0: Normal completion Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW0058	Detailed LED display status	Stores the details of the LED display status. 0: Off 1: On b15 b14 b13 b12 b11 b10 b9 b8 b7 b6 b5 b4 b3 b2 b1 b0 | | | | | | 0 0 | | | | 0 0 0 0 | → LINE (ERROR): A cable is disconnected or the transmission path has been affected by noise. → TIME (ERROR): Responses cannot be received from any station due to the cable being disconnected or the transmission path being affected by noise. → PRM (ERROR): Invalid parameter value → M/S (ERROR): Multiple master stations exist on the same line. → SW (ERROR): Error in switch settings → S MST: The station is operating as a standby master station. → MST: The station is operating as a master station. → ERR.: Error → RUN: The module is operating normally. • The use of b11 is prohibited. • The ERR. LED on the master/local module turns on when a bit among b4 to b8 and b14 is on.	○	○	○
SW0059	Transmission speed setting	Stores the transmission speed setting status. Auto-tracking (b15) is enabled only at local stations. 0: Not set 1: Set b15 b14 b8 b7 b6 b5 b4 b3 b2 b1 b0 | | 0 to 0 | | | | | 0 0 0 | → 10Mbps → 5Mbps → 2.5Mbps → 625kbps → 156kbps → Auto-tracking	○	○	○
SW005B	Transmission speed operation status	Stores the transmission speed operation status. The bit "During auto-tracking" (b15) is enabled only at local stations. 0: Not in operation 1: In operation b15 b14 b8 b7 b6 b5 b4 b3 b2 b1 b0 | | 0 to 0 | | | | | 0 0 0 | → 10Mbps → 5Mbps → 2.5Mbps → 625kbps → 156kbps → During auto-tracking	○	○	○

A

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW005C	Detailed LED display status (2)	Stores the detailed display status of the module LED. 0: Off 1: On b15　b12 b11 b10 b9 b8 b7 b6　b0 Transmission speed setting 156kbps Transmission speed setting 625kbps Transmission speed setting 2.5Mbps Transmission speed setting 5Mbps Transmission speed setting 10Mbps • The use of b0 to b6 is prohibited.	○	○	○
SW005D	Forced master switching instruction result	Stores whether the forced master switching instruction using SB000C has been normally completed. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW005F	Remote device station initialization procedure registration instruction result	Stores whether the initialization procedure registration instruction using SB000D has been normally completed. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW0060	Mode setting status	Stores the mode setting status. 0: Online (remote net mode) 1: Online (remote I/O net mode) 2: Offline 3: Line test 1 4: Line test 2 6: Hardware test C: Online (remote device net mode)	○	○	○
SW0061	Station number of own station	Stores the current own station's station number. 0: Master station 1 to 64:Local station	○	○	○
SW0062	Module operating status	Stores the module operation setting configured using the parameter. b15　b12 b11 b10 b9　b8　b7　b6　b5　b4　b3　b2　b1　b0 Station type 0: Master station/local station 1: Standby master station Master station duplex function 0: Disable 1: Enable Input data from data link faulty station 0: Clear 1: Hold Number of occupied stations 00: 1 station occupied 10: 2 station occupied 11: 3 station occupied 01: 4 station occupied Setting Method of Basic/Application Settings 0: Parameter Editor 1: Program Output mode upon CPU STOPcase of programmable controller CPU STOP 0: Refresh to remote output (RY) 1: Send 0 data to remote output (RY) Extended cyclic setting 00: Single 01: Double 10: Quadruple 11: Octuple Station-based block data assurance 0: Disable 1: Enable	○	○	○
SW0064	Number of retries information	Stores the set number of retries upon an abnormal response. 1 to 7 (time)	○	×	×

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0065	Number of automatic return stations	Stores the set number of automatic return stations in one link scan. 1 to 10 (station)	○	×	×
SW0067	Parameter information	Stores the information of the setting method basic/application settings. 0H: Parameter editor 3H: Program	○	×	○
SW0068	Parameter status of own station	Stores whether the parameters have been correctly set. 0: Normal Values other than 0: Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW0069	Installation status	Stores whether unique station numbers have been assigned for modules and whether parameter settings match with connected module status. 0: Normal Values other than 0: Error code (☞ Page App. - 23 List of error codes) Error details are stored in SW0098 to SW009B and SW009C to SW009F. This item is checked, and the result is stored only at link startup.	○	×	×
SW006D	Maximum link scan time	Stores the maximum link scan time. (unit: 1ms)	○	○	×
SW006E	Current link scan time	Stores the current link scan time. (unit: 1ms)	○	○	×
SW006F	Minimum link scan time	Stores the minimum link scan time. (unit: 1ms)	○	○	×
SW0070	Total number of stations	Stores the end station number set using the parameter. 1 to 64 (station)	○	×	×
SW0071	Maximum communication station number	Stores the maximum station number during data link (station number set using the station number setting switches). 1 to 64 (station) Reserved stations are excepted.	○	×	×
SW0072	Number of connected modules	Stores the number of modules performing data link. Reserved stations are excepted.	○	×	×
SW0073	Standby master station number	Stores the standby master station number. 1 to 64 (station)	○	○	×
SW0074 to SW0077	Reserved station specification status	Stores whether a station has been set as a reserved station. 0: A station other than a reserved station 1: Reserved station |	b15	b14	b13	b12	to	b3	b2	b1	b0 | SW0074	16	15	14	13	to	4	3	2	1 | SW0075	32	31	30	29	to	20	19	18	17 | SW0076	48	47	46	45	to	36	35	34	33 | SW0077	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on. The station with the end station number and stations later than that are excepted.	○	○	×
SW0078 to SW007B	Error invalid station specification status	Stores whether a station has been set as an error invalid station. 0: A station other than an error invalid station 1: Error invalid station |	b15	b14	b13	b12	to	b3	b2	b1	b0 | SW0078	16	15	14	13	to	4	3	2	1 | SW0079	32	31	30	29	to	20	19	18	17 | SW007A	48	47	46	45	to	36	35	34	33 | SW007B	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on. Reserved stations, station with the end station number, and stations later than that are excepted.	○	○	×

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No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW007C to SW007F	Temporary error invalid status	Stores whether a station is in the temporary error invalid status. 0: Normal 1: Temporary error invalid status 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW007C	16	15	14	13	to	4	3	2	1
SW007D	32	31	30	29	to	20	19	18	17
SW007E	48	47	46	45	to	36	35	34	33
SW007F	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. The bits turn on by the number of occupied stations. Error invalid stations, reserved stations, station with the end station number, and stations later than that are excepted.	○	○	×
SW0080 to SW0083	Data link status of other stations	Stores the data link status of each station. 0: Normal 1: Data link error 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW0080	16	15	14	13	to	4	3	2	1
SW0081	32	31	30	29	to	20	19	18	17
SW0082	48	47	46	45	to	36	35	34	33
SW0083	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. The bits turn on by the number of occupied stations. It takes maximum of six seconds for this register to turn on after a slave station connected to the master station or local station becomes faulty. The time until this signal turns on differs depending on the system configuration and error status. Temporary error invalid stations, error invalid stations, reserved stations, station with the end station number, and stations later than that are excepted.	○	○	×
SW0084 to SW0087	Watchdog timer error occurrence status of other stations	Stores whether a watchdog timer error has occurred. 0: No watchdog timer error 1: Watchdog timer error 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW0084	16	15	14	13	to	4	3	2	1
SW0085	32	31	30	29	to	20	19	18	17
SW0086	48	47	46	45	to	36	35	34	33
SW0087	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on. Reserved stations, station with the end station number, and stations later than that are excepted.	○	○	×
SW0088 to SW008B	Fuse blown status of other stations	Stores whether a fuse blown error has occurred. 0: Normal 1: Fuse blown 		b15	b14	b13	b12	to	b3	b2	b1	b0
SW0088	16	15	14	13	to	4	3	2	1
SW0089	32	31	30	29	to	20	19	18	17
SW008A	48	47	46	45	to	36	35	34	33
SW008B	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. The bits turn on by the number of occupied stations. Reserved stations, station with the end station number, and stations later than that are excepted.	○	○	×

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW008C to SW008F	Switch change status of other stations	Stores whether the setting of switches of other stations during data link has been changed. 0: No change 1: Changed 		b15	b14	b13	b12	to	b3	b2	b1	b0
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SW008C	16	15	14	13	to	4	3	2	1
SW008D	32	31	30	29	to	20	19	18	17
SW008E	48	47	46	45	to	36	35	34	33
SW008F	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on. Reserved stations, station with the end station number, and stations later than that are excepted.	○	○	×
SW0090	Line status	Stores the line status. 0: Normal 1: Data link disabled (disconnected)	×	○	×
SW0094 to SW0097	Transient transmission status	Stores whether a transient transmission error has occurred. 0: No transient transmission error 1: Transient transmission error 		b15	b14	b13	b12	to	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---
SW0094	16	15	14	13	to	4	3	2	1
SW0095	32	31	30	29	to	20	19	18	17
SW0096	48	47	46	45	to	36	35	34	33
SW0097	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on. Reserved stations, station with the end station number, and stations later than that are excepted.	○	○	×
SW0098 to SW009B	Station number overlap status	Stores whether station numbers are unique when the start station numbers of modules are different. 0: Normal 1: Station number in use (start station number only) 		b15	b14	b13	b12	to	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---
SW0098	16	15	14	13	to	4	3	2	1
SW0099	32	31	30	29	to	20	19	18	17
SW009A	48	47	46	45	to	36	35	34	33
SW009B	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Reserved stations, station with the end station number, and stations later than that are excepted. Only the bit corresponding to the start station number turns on. This item is checked, and the result is stored only upon data link start and the change of a parameter. For a slave station with the transmission speed auto-tracking setting, whether the station number is already used for other stations may not be detected. When the station number of a station is the same as that of the standby master station, the status cannot be detected.	○	×	×

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW009C to SW009F	Installation/ parameter matching status	Stores the matching statuses such as the matching of CC-Link versions between the parameter settings and the modules on slave stations. ■ The station types do not match. (This mismatch occurs in the following combinations of station types.) 	Installation	Parameter
---	---
Remote device station	Remote I/O station
Intelligent device station	Remote I/O station
	Remote device station	 ■The number of occupied stations do not match (installation > parameter). ■ The extended cyclic settings do not match. ■The remote station versions do not match between the parameter settings and installed modules. 0: Normal 1: Mismatch error 		b15	b14	b13	b12	to	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---
SW009C	16	15	14	13	to	4	3	2	1
SW009D	32	31	30	29	to	20	19	18	17
SW009E	48	47	46	45	to	36	35	34	33
SW009F	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Reserved stations, station with the end station number, and stations later than that are excepted. Only the bit corresponding to the start station number turns on. This item is checked, and the result is stored only upon data link start and the change of a parameter.	○	×	×
SW00B4 to SW00B7	Line test 1 result	Stores the result of the line test 1. 0: Normal 1: Error 		b15	b14	b13	b12	to	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---
SW00B4	16	15	14	13	to	4	3	2	1
SW00B5	32	31	30	29	to	20	19	18	17
SW00B6	48	47	46	45	to	36	35	34	33
SW00B7	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. The bits turn on by the number of occupied stations.	○	×	×
SW00B8	Line test 2 result	Stores the result of a line test. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	×	×
SW0140 to SW0143	Compatible CC-Link Ver. information	Stores a slave station that supports the CC-Link Ver.2 mode. 0: Ver.1-compatible slave station 1: Ver.2-compatible slave station 		b15	b14	b13	b12	to	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---
SW0140	16	15	14	13	to	4	3	2	1
SW0141	32	31	30	29	to	20	19	18	17
SW0142	48	47	46	45	to	36	35	34	33
SW0143	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. The bits turn on by the number of occupied stations. Reserved stations, station with the end station number, and stations later than that are excepted.	○	×	×

No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0144 to SW0147	CC-Link Ver. installation/ parameter matching status	Stores whether a CC-Link version matches between the parameter settings and the modules on slave stations. 0: Normal 1: Mismatch error |	b15	b14	b13	b12	to	b3	b2	b1	b0 | SW0144: 16, 15, 14, 13, to, 4, 3, 2, 1 SW0145: 32, 31, 30, 29, to, 20, 19, 18, 17 SW0146: 48, 47, 46, 45, to, 36, 35, 34, 33 SW0147: 64, 63, 62, 61, to, 52, 51, 50, 49 1 to 64 in the table indicate station numbers. ■Example of a mismatch error Installation / Parameter: Ver.2-compatible remote device station / Ver.1-compatible remote device station Ver.1-compatible remote device station / Ver.2-compatible remote device station The bits corresponding to the start station number and the number of occupied stations turn on. Reserved stations, station with the end station number, and stations later than that are excepted.	○	×	×
SW0148	Parameter mode	Stores the mode set to a system. 0: Remote net Ver.1 mode, Remote device net Ver.1 mode, Remote I/O net mode 2: Remote net Ver.2 mode, Remote device net Ver.2 mode	○	○	×
SW0149	Parameter mode of own station	Stores the mode set to the own station. 0: Remote net Ver.1 mode, Remote device net Ver.1 mode, Remote I/O net mode 2: Remote net Ver.2 mode, Remote device net Ver.2 mode	○	○	×
SW0152	Maximum communication station number	Stores the maximum station number during data link in real time (1 to 64: station number in the station number setting). Reserved stations, error invalid stations, and temporary error invalid stations are excepted.	○	×	×
SW0153	Number of connected modules involved in communication	Stores the number of modules performing data link in real time. Reserved stations, error invalid stations, and temporary error invalid stations are excepted.	○	×	×
SW0160 to SW0163	Remote register use prohibited status	Stores whether the use of remote registers is prohibited. 0: Available 1: Use prohibited |	b15	b14	b13	b12	to	b3	b2	b1	b0 | SW0160: 16, 15, 14, 13, to, 4, 3, 2, 1 SW0161: 32, 31, 30, 29, to, 20, 19, 18, 17 SW0162: 48, 47, 46, 45, to, 36, 35, 34, 33 SW0163: 64, 63, 62, 61, to, 52, 51, 50, 49 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on.	○	×	×

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No.	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0164 to SW0167	Remote device station initialization procedure registration completion status	Stores whether the remote device station initialization procedure registration has been completed. 0: Not completed 1: Completed 		b15	b14	b13	b12	to	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---
SW0164	16	15	14	13	to	4	3	2	1
SW0165	32	31	30	29	to	20	19	18	17
SW0166	48	47	46	45	to	36	35	34	33
SW0167	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on.	○	×	×
SW0183	Transmission speed test result	Stores the result of a transmission speed test. 0: Normal Values other than 0:Error code (☞ Page App. - 23 List of error codes)	○	○	×
SW0184 to SW0187	Transmission speed test result of each station	Stores the result of the transmission speed test for each station. 0: Normal (same transmission speed as the master station) or no response from the module 1: Error (different transmission speed from the master station) 		b15	b14	b13	b12	to	b3	b2	b1	b0
---	---	---	---	---	---	---	---	---	---
SW0184	16	15	14	13	to	4	3	2	1
SW0185	32	31	30	29	to	20	19	18	17
SW0186	48	47	46	45	to	36	35	34	33
SW0187	64	63	62	61	to	52	51	50	49 | 1 to 64 in the table indicate station numbers. Only the bit corresponding to the start station number turns on.	○	×	×

The timing of when data in link special register area (SW) are updated differs depending on the link special register number. The following table lists the update timing.

Link special register	Data update timing	Link special register	Data update timing
SW0041	Updated regardless of the SB status	SW0071	Updated regardless of the SB status (Updated after each station becomes stable.)
SW0045		SW0072	
SW0060	When the SB0060 status is changed	SW0074 to SW0077	When the SB0074 status is changed
SW0061	When the SB0061 status is changed	SW0078 to SW007B	When the SB0075 status is changed
SW0062	Updated regardless of the SB status	SW0080 to SW0083	When the SB0080 status is changed
SW0067		SW0088 to SW008B	Updated regardless of the SB status
SW0068		SW0090	When the SB0090 status is changed
SW0069		SW0098 to SW009B	Updated regardless of the SB status
SW006A		SW009C to SW009	
SW006D		SW00B4 to SW00B7	
SW006E		SW00B8	
SW006F		—	—
SW0070			

Appendix 3.3 List of error codes

This section lists the error codes, error details and causes, and action for the errors occur in the processings for data communication between master/local module and slave stations or caused by processing requests from the CPU module on the own station.

Error code	Error details and causes	Action	Detailed information
1080H	The number of writes to the flash ROM has exceeded 100000. (Number of writes > 100000 times)	Replace the module.	—
1810H	The hardware has failed.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	—
20E0H	The module cannot communicate with the CPU module.	The hardware failure of the CPU module may have been occurred. Please consult your local Mitsubishi representative.	—
24C0H	The hardware has failed.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	Parameter information • I/O No. • Base No. • Slot No. • CPU No.
24C1H	The bus communication has failed.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	Parameter information • I/O No. • Base No. • Slot No. • CPU No.
24C2H	The bus communication has failed.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	Parameter information • I/O No. • Base No. • Slot No. • CPU No.
24C3H	The bus communication has failed.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	Parameter information • I/O No. • Base No. • Slot No. • CPU No.
24C6H	The bus communication has failed.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	—
3C00H	A hardware failure has been detected.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	—
3C02H	A bus error has been detected.	• The possible cause is a malfunction due to noise. Check the wire and cable distances and ground condition of each device, and take measures to reduce noise. • Perform a hardware test. If the error occurs again, the possible cause is a hardware failure of the module. Please consult your local Mitsubishi representative.	—
3C10H	A hardware failure has been detected.	• Take measures to reduce noise. • Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the error module. Please consult your local Mitsubishi representative.	—

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Error code	Error details and causes	Action	Detailed information
3C14H	A bus error has been detected.	Reset the CPU module, and run it again. If the same error code is displayed again, the possible cause is a hardware failure of the error module or CPU module. Please consult your local Mitsubishi representative.	—
B002H	System error	Please consult your local Mitsubishi representative.	—
B101H	System error	Please consult your local Mitsubishi representative.	—
B102H	System error	Please consult your local Mitsubishi representative.	—
B103H	System error	Please consult your local Mitsubishi representative.	—
B104H	System error	Please consult your local Mitsubishi representative.	—
B105H	System error	Please consult your local Mitsubishi representative.	—
B106H	System error	Please consult your local Mitsubishi representative.	—
B109H	System error	Please consult your local Mitsubishi representative.	—
B10AH	System error	Please consult your local Mitsubishi representative.	—
B10CH	System error	Please consult your local Mitsubishi representative.	—
B110H	A line error has occurred.	Check and correct the wiring.	—
B111H	A line error has occurred.	Check and correct the wiring.	—
B112H	A line error has occurred.	Check and correct the wiring.	—
B113H	A line error has occurred. Or a momentary power failure has occurred in the sending station.	Modify the line, or check the power supply module and power supplied to the sending station.	—
B115H	A line error has occurred.	Check and correct the wiring.	—
B116H	A line error has occurred.	Check and correct the wiring.	—
B120H	With the remote device station initialization procedure registration function, the remote device station initialization procedure registration instruction was turned off before all procedures are completed.	Complete all the procedures before turning off the remote device station initialization procedure registration instruction.	—
B122H	System error	Please consult your local Mitsubishi representative.	—
B123H	System error	Please consult your local Mitsubishi representative.	—
B124H	The remote device station initialization procedure registration instruction was turned on in a station other than the master station.	Turn on the remote device station initialization procedure registration instruction in the master station (station No.0).	—
B125H	• The remote device station initialization procedure registration instruction was turned on without setting the remote device station initialization procedure registration. • A bit other than the one corresponding to the start station number was turned on in SW0014 to SW0017 (Specification of remote device station to be initialized) to instruct the remote device station initialization procedure registration.	• Set the remote device station initialization procedure registration before turning on the remote device station initialization procedure registration instruction. • Turn on only the bit corresponding to the start station number in SW0014 to SW0017 (Specification of remote device station to be initialized).	—
B201H	A data link error has occurred in the corresponding station during transient transmission.	Check the communication status of other stations, if a temporary error invalid station is present, or if the corresponding station is stopped.	—
B202H	System error	Please consult your local Mitsubishi representative.	—
B203H	System error	Please consult your local Mitsubishi representative.	—
B204H	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again.	—
B205H	A transient request was issued to a station other than an intelligent device station.	Check the target station.	—
B301H	A line test request was issued during link stop.	Perform a line test while data link is being performed.	—
B302H	The specified station number for a line test request, temporary error invalid request, or temporary error invalid canceling request is greater than the maximum station number that can communicate.	Specify a station number smaller than or equal to the maximum communication station number.	—
B303H	Target station number is not set for temporary error invalid request or temporary error invalid cancellation request.	Set the station number. (SW0003, SW0004 to SW0007)	—
B304H	When a line test was executed, an error has been detected in a remote station, intelligent device station, or standby master station.	Check if the remote station, intelligent device station, or standby master station have been started, and that the cables are not disconnected.	—
B305H	System error	Please consult your local Mitsubishi representative.	—

Error code	Error details and causes	Action	Detailed information
B306H	A station number other than the start station number has been specified in the temporary error invalid request or temporary error invalid canceling request.	Specify the start station for the temporary error invalid request or temporary error invalid cancellation request.	—
B307H	When one of the following requests is issued, a data link error has occurred in all stations. • SB0000 (Data link restart) • SB0002 (Data link stop)	Issue the request again after the data link returns to normal.	—
B308H	A slave station number is not within 1 to 64.	Set the station number for the slave station within 1 to 64.	—
B309H	The station number of the connected module is duplicated (including the number of occupied stations). However, excluding duplication of the start station number.	Check the station number of the module.	—
B30AH	• The station type differs between the mounted modules and parameter settings. • The mode setting is invalid in the master station, local station, or standby master station. • The mode of the master station differs from that of the standby master station.	• Correct the parameter. • Set the parameters of the master station, local station, or standby master station again, and reset the CPU module.	—
B30BH	The module parameter details do not match the installation status.	Correct the installation status or module parameters so that both are matched.	—
B30CH	The master station switching was instructed to a station other than the standby master station.	Specify the standby master station number.	—
B30DH	A request, such as the temporary error invalid station specification, line test request, or data link stop/restart request, was issued before data link is started.	Issue the request after the data link is started.	—
B30EH	Execution of a function that is started using SB, SW and executable only on the master station was attempted on a local station.	Execute the corresponding function from the master station.	—
B30FH	System error	Please consult your local Mitsubishi representative.	—
B310H	SB0000 (Data link restart) was turned on specifying the station that was performing data link.	Turn on SB0000 (Data link restart) specifying the station where data link has been stopped using SB0002 (Data link stop).	—
B311H	SB0002 (Data link stop) was turned on specifying the station where data link had been stopped.	Turn on SB0002 (Data link stop) specifying the station performing data link.	—
B312H	SB000C (Forced master switching) was turned on in a system where no standby master station exists or the standby master station was down.	Start the data link of the standby master station then turn on SB000C (Forced master switching).	—
B313H	SB000C (Forced master switching) was turned on in a system where all stations were faulty.	Start the data link of the standby master station then turn on SB000C (Forced master switching).	—
B314H	SB000C (Forced master switching) was turned on for a station other than the master station.	Turn on SB000C (Forced master switching) in the master station.	—
B315H	While the master station was being switched to the standby master station, SB000C (Forced master switching) was turned on again.	Correct the status of SB000C (Forced master switching).	—
B316H	System error	Please consult your local Mitsubishi representative.	—
B317H	• The RLPASET instruction was executed to a module where parameters had been set using the engineering tool. • The parameter setting was changed without powering off and on the programmable controller system or resetting the CPU module.	Clear parameters for the target module using the engineering tool then set the parameters using the RLPASET instruction.	—
B31AH	The master station duplication error canceling instruction was executed while data link had already been started.	Do not execute the master station duplication error cancellation instruction during data link.	—
B31BH	The transmission speed test was performed during data link.	Turn on SB000B (Transmission speed test request) after turning on SB0002 (Data link stop).	—
B31CH	System error	Please consult your local Mitsubishi representative.	—
B31DH	System error	Please consult your local Mitsubishi representative.	—
B31EH	Logging was started while logs were being deleted.	Delete the logs then start logging.	—
B31FH	Logs were deleted during logging.	Stop the logging then delete the logs.	—
B320H	Logging was executed or logs were deleted in the remote I/O net mode.	Set the remote net mode then start the logging or delete the logs.	—
B321H	System error	Please consult your local Mitsubishi representative.	—

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Error code	Error details and causes	Action	Detailed information
B322H	The logs were deleted during data link with "RAM + Flash ROM" selected.	Terminate the data link then delete the logs.	—
B323H	Although the logs had been set to be deleted with "RAM + Flash ROM" selected, logging was started before deletion of logs was complete.	Delete the logs again with "RAM + Flash ROM" selected.	—
B324H	Storing logs to the flash ROM was attempted when the flash ROM was not ready for storage.	Delete the logs with "RAM + Flash ROM" selected then start logging, or start logging with "RAM" selected.	—
B325H	The cumulative number of times that logs are stored on the flash ROM has exceeded 100000 times.	Start logging with "RAM" selected. To execute logging with "RAM + Flash ROM" selected, replace the module.	—
B326H	System error	Please consult your local Mitsubishi representative.	—
B384H	In the station information parameter, a number other than 1H to 40H is set for a station number (including the number of occupied stations).	Set the number within the range of 1H to 40H.	—
B385H	The total number of occupied stations set in the station information parameter exceeded 64.	Set the value to 64 or less.	—
B386H	In the station information parameter, all the number of occupied stations is set to 0.	Set the value within the range of 1 to 4.	—
B388H	The station type in the station information parameter is out of the range in the remote net Ver.1 mode.	Set a value within 0 to 2 in the remote net Ver.1 mode.	—
B38AH	System error	Please consult your local Mitsubishi representative.	—
B38BH	More than 42 remote device stations are set in the station information parameter.	Set the number of remote device stations to 42 or less. Set the stations to remote device net mode.	—
B38CH	More than 26 intelligent device stations (including local stations) are set in the station information parameter.	Set the number of intelligent device stations to 26 or less.	—
B38DH	In the invalid station specification parameter, a station number other than the start station number of the module or a station number not set in the parameter is set. [Example of when a station number other than the start station number is set] For a module that occupies 4 stations (station No.5 to No.8), a bit corresponding to a station number other than the station No.5 is on.	Set the start station number of the module. Do not set a station number not set in the parameter.	—
B38FH	The total size of the automatic update buffer set in the station information parameter exceeded 4K words.	Set the total size of the automatic update buffer within 4K words.	—
B390H	A value other than 1 to 64 is set in the standby master station specification parameter.	Set the value within the range of 1 to 64.	—
B391H	A value other than 1 to 7 is set in the number of retries parameter.	Set the value within the range of 1 to 7.	—
B392H	A value other than 0 or 1 is set in the parameter of data link setting when CPU is down.	Set 0 or 1.	—
B393H	A value other than 0 or 1 is set in the scan mode setting parameter.	Set 0 or 1.	—
B394H	A value other than 1 to 10 is set in the number of automatic return stations parameter.	Set the value within the range of 1 to 10.	—
B395H	System error	Please consult your local Mitsubishi representative.	—
B396H	The station number is already in use in the station information parameter.	Set a unique number.	—
B397H	The station information parameter setting does not meet the following condition: $(16 \times A) + (54 \times B) + (88 \times C) \leq 2304$ A: The number of remote I/O stations B: The number of remote device stations C: The number of intelligent device stations (including local stations)	Set parameters so that the conditions described in the left are satisfied.	—
B398H	A value other than 1 to 4 is set as the number of occupied stations in the station information parameter.	Set the value within the range of 1 to 4.	—
B399H	A value other than 1 to 64 is set in the number of connected modules parameter.	Set the value within the range of 1 to 64.	—

Error code	Error details and causes	Action	Detailed information
B39AH	The station number set using the station number setting of the standby master station differs from the one set in "Standby master station number" of the module parameter for the master station. Or the station set in "Standby master station number" of the module parameter for the master station is a local station.	Change the parameter for the master station, or change the station number setting of the local station or standby master station. Then reset the CPU module on the local station or standby master station.	—
B39BH	All stations are set as a reserved station.	Correct the reserved station specification.	—
B39CH	• A station type other than an intelligent device station is set as the station type for the station specified in "Standby master station number" of the module parameter for the master station. • The mode setting of the master station differs from that of the standby master station.	• Specify the standby master station as an intelligent device station. • Set the same mode for the master station and the standby master station.	—
B39DH	Zero points are set for a station other than a reserved station.	Set zero points for a reserved station.	—
B39EH	• 8 points or 16 points are set for a station other than a remote I/O station. • 8 points and 16 points are set for the same remote I/O station.	• 8 points and 16 points are set for the same remote I/O station. • Set either 8 points or 16 points for the remote I/O station.	—
B3A0H	The mode setting is invalid in the master station, local station, or standby master station. • The mode of the master station differs from that of the standby master station. • The local station is in the remote net Ver.2 mode, and the master station is in the remote net Ver.1 mode.	Correct the mode setting of the master station, local station, or standby master station again, and reset the CPU module.	—
B3A2H	In the remote I/O net mode, a station other than a remote I/O station is set in the station type parameter using the dedicated instruction.	Set all stations as a remote I/O station.	—
B3A3H	In the remote net Ver.2 mode, the total number of remote points in station information exceeded 8192, the maximum number of points.	Change the number of remote station points set in the station information settings.	—
B3A4H	While the standby master station was operating as a master station by the master station duplex function, the network parameter setting of the faulty master station was changed.	Undo the module parameters of the master station.	—
B3A6H	In the remote device net mode, a station type other than a remote I/O station or remote device station is set in the station type parameter using the dedicated instruction.	Set all stations as a remote device station.	—
B3F1H	System error	Please consult your local Mitsubishi representative.	—
B3F2H	System error	Please consult your local Mitsubishi representative.	—
B3F3H	System error	Please consult your local Mitsubishi representative.	—
B401H	The parameter setting was changed during transient request.	Change the parameters after all transient requests are completed or before the request is issued.	—
B404H	A response is not received from the request destination station within the monitoring time.	Increase the monitoring time value. If the error occurs again, check the modules and cables at the destination.	—
B405H	A transient request was issued to a remote I/O station or a remote device station. Or too many transient requests were sent to the corresponding station.	Set a local station or an intelligent device station as the target station or wait for a while and send the request again. (Transient overload state)	—
B407H	System error	Please consult your local Mitsubishi representative.	—
B409H	System error	Please consult your local Mitsubishi representative.	—
B411H	The number of read/write points in the control data of the dedicated instruction is out of the range.	Set a number of read points or write points within range.	—
B412H	The station number in the control data of the dedicated instruction is out of the range.	Set the station number within range.	—
B413H	Multiple dedicated instructions were executed to the same station.	Review the program.	—
B414H	The value set in the interlock signal storage device of the RIRCV instruction or RISEND instruction is out of range.	Set the interlock signal storage device value within range.	—
B415H	The dedicated instruction which is executable only on the master station was attempted to be executed on a station other than the master station.	Check if the own station type is a master station.	—

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Error code	Error details and causes	Action	Detailed information
B416H	System error	Please consult your local Mitsubishi representative.	—
B417H	System error	Please consult your local Mitsubishi representative.	—
B418H	With the message transmission function, an abnormal data was received.	Set the receivable data size to a value larger than the receive data size.	—
B419H	System error	Please consult your local Mitsubishi representative.	—
B41AH	System error	Please consult your local Mitsubishi representative.	—
B601H	An unsupported request was received.	Check and correct the request data or the target station number.	—
B602H	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again.	—
B603H	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again.	—
B604H	Transient transmission was performed during a line test.	Wait for a while and send the request again.	—
B605H	The transient storage buffer data was failed to be obtained.	Wait for a while and send the request again.	—
B606H	System error	Please consult your local Mitsubishi representative.	—
B607H	The CPU module on the target station is in error.	Check the CPU module of the target station.	—
B608H	Transient transmission was performed to the AJ61BT11 or A1SJ61BT11 in the I/O mode.	Set the target station to intelligent mode.	—
B60CH	System error	Please consult your local Mitsubishi representative.	—
B700H	System error	Please consult your local Mitsubishi representative.	—
B701H	Transient transmission failed.	• Reduce the load placed on the transient transmission and perform the transmission again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
B702H	Transient transmission failed.	• Reduce the load placed on the transient transmission and perform the transmission again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
B703H	Transient transmission failed.	• Reduce the load placed on the transient transmission and perform the transmission again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
B704H	Transient transmission failed.	• Reduce the load placed on the transient transmission and perform the transmission again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
B705H	System error	Please consult your local Mitsubishi representative.	—
B706H	System error	Please consult your local Mitsubishi representative.	—
B771H	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again.	—
B772H	System error	Please consult your local Mitsubishi representative.	—
B773H	System error	Please consult your local Mitsubishi representative.	—
B774H	The target station was not an intelligent device station.	Check if the target station is an intelligent device station.	—
B775H	Unsupported transient data was received.	Check the application on the source that issued the request.	—
B776H	Unsupported transient data was received.	Check the application on the source that issued the request.	—
B777H	Unsupported transient data was received.	Check the application on the source that issued the request.	—
B778H	A response is not received from the request destination.	Check the modules and cables at the request destination.	—
B779H	System error	Please consult your local Mitsubishi representative.	—
B780H	Transient transmission was performed although the target station was set to I/O mode.	Set the target station to intelligent mode.	—
B781H	System error	Please consult your local Mitsubishi representative.	—
B782H	When connection to another station is set, the sending destination station and the sending source station are the same.	Check the station number of the destination or change the setting to connection to the own station.	—

Error code	Error details and causes	Action	Detailed information
B783H	When data larger than 1K was being sent in transient transmission, an error has occurred in the transient storage buffer.	Wait for a while and send the request again.	—
B801H	A non-existing access code or attribute is set.	Set the correct access code or attribute.	—
B802H	A non-existing access code was used.	Use the correct access code.	—
B803H	The number of data points is out of the range.	Set the number of data points within 1 to 960 bytes.	—
B804H	• The attribute definition is invalid. • A transient transmission was performed although the target station does not support transient transmission.	• Correct the attributes definition. • Correct the target station number setting. • Correct the function version of the target local station and software version.	—
B805H	The number of data points is out of the range.	Set a value within 1 to 100 for writing and within 1 to 160 for reading.	—
B807H	• The start device number is out of the range. • The address was not a multiple of 16 when the bit device was accessed.	• Set the start device number within the range. • Set the address in multiples of 16 when the bit device is accessed.	—
B80AH	System error	Please consult your local Mitsubishi representative.	—
B80DH	The set combination (address and number of points) exceeded the processable range.	Set the number of points to be processed within the device range.	—
B80FH	System error	Please consult your local Mitsubishi representative.	—
B810H	System error	Please consult your local Mitsubishi representative.	—
B811H	System error	Please consult your local Mitsubishi representative.	—
B812H	System error	Please consult your local Mitsubishi representative.	—
B814H	The file register capacity is not set.	Set the file register capacity.	—
B815H	Transient transmission was performed although the target station was set to I/O mode.	Set the target station to intelligent mode.	—
B817H	System error	Please consult your local Mitsubishi representative.	—
B821H	System error	Please consult your local Mitsubishi representative.	—
B822H	System error	Please consult your local Mitsubishi representative.	—
B823H	The mode setting of the remote control is not correct.	Correct the mode specification.	—
B824H	System error	Please consult your local Mitsubishi representative.	—
B826H	System error	Please consult your local Mitsubishi representative.	—
B830H	System error	Please consult your local Mitsubishi representative.	—
B903H	A transient request was issued to a station that had not secured a communication buffer.	Secure a communication buffer area using the parameter.	—
B981H	System error	Please consult your local Mitsubishi representative.	—
B982H	System error	Please consult your local Mitsubishi representative.	—
B983H	System error	Please consult your local Mitsubishi representative.	—
B984H	System error	Please consult your local Mitsubishi representative.	—
B985H	System error	Please consult your local Mitsubishi representative.	—
B986H	System error	Please consult your local Mitsubishi representative.	—
B987H	System error	Please consult your local Mitsubishi representative.	—
B988H	An error has been detected in the CPU module.	Check the error of the CPU module and take action using the module diagnostics.	—
	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
B989H	An error has been detected in the CPU module.	Check the error of the CPU module and take action using the module diagnostics.	—
	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
B9FFH	An error has been detected in the CPU module.	Check the error of the CPU module and take action using the module diagnostics.	—
	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA01H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA02H	System error	Please consult your local Mitsubishi representative.	—
BA05H	System error	Please consult your local Mitsubishi representative.	—
BA06H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA07H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA08H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—

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Error code	Error details and causes	Action	Detailed information
BA09H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA0AH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA0BH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA0CH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA0DH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA0EH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA0FH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA10H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA11H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA12H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA13H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA14H	A hardware (communication circuit) failure has been detected.	• Check that the terminating resistor provided with the master/local module is connected between the DA and DB terminals, and execute the hardware test again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
BA15H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA16H	A hardware (communication circuit) failure has been detected.	• Check that the terminating resistor provided with the master/local module is connected between the DA and DB terminals, and execute the hardware test again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
BA17H	A hardware (communication circuit) failure has been detected.	• Check that the terminating resistor provided with the master/local module is connected between the DA and DB terminals, and execute the hardware test again. • If the error occurs again even after taking the above, please consult your local Mitsubishi representative.	—
BA19H	The target station of the line test 2 cannot be communicated.	Check the cables and the target station.	—
BA1BH	A communication failure has occurred in all stations during execution of the line test 1.	Check the cables.	—
BA1FH	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA20H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BA21H	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BB01H	Execution of some of the following was attempted at the same time on the same station (Including the same request). • Remote device station initialization procedure registration function • RISEND or RIRCV instruction • Access from a peripheral to a remote device station	Execute after other processing is completed.	—
BBC1H	System error	Please consult your local Mitsubishi representative.	—
BBC2H	System error	Please consult your local Mitsubishi representative.	—
BBC3H	System error	Please consult your local Mitsubishi representative.	—
BBC5H	• Multiple master stations exist on the same line. • Noise has been detected on the line at power-on.	• Reduce the number of master stations on the same line to one. • When the data link starts by turning on SB0007 (Master station duplication error cancel request), check the line status.	—
BBC7H	System error	Please consult your local Mitsubishi representative.	—
BBC8H	System error	Please consult your local Mitsubishi representative.	—
BBCAH	Multiple standby master stations exist on the same line.	• Reduce the number of standby master stations on the same line to one. • Check the line status.	—
BBCBH	System error	Please consult your local Mitsubishi representative.	—
BBD1H	System error	Please consult your local Mitsubishi representative.	—
BBD3H	System error	Please consult your local Mitsubishi representative.	—
BC01H	A data link error has occurred on all stations during a message transmission.	Issue the request after the data link is started.	—

Error code	Error details and causes	Action	Detailed information
BC02H	System error	Please consult your local Mitsubishi representative.	—
BC03H	The target station specified for the message transmission function is in any of the following status. • No network parameter is set. • The specified station number is not the start station number. • The station is set as a reserved station. • A data link error has occurred (including error on all stations).	Check the parameters or operation on the target station.	—
BC04H	The message transmission was performed to a station other than a remote device station or intelligent device station.	Check the target station.	—
BC05H	The target station number specified for message transmission function is not within 1 to 64.	Check the specified station number.	—
BC06H	The message transmission function was attempted to be executed on a station other than the master station.	Execute the message transmission function on the master station.	—
BC07H	The transmission data size was out of the range when message transmission function was executed.	Set the transmission data size within the range.	—
BC33H	System error	Please consult your local Mitsubishi representative.	—
BC34H	System error	Please consult your local Mitsubishi representative.	—
BC35H	System error	Please consult your local Mitsubishi representative.	—
BC36H	System error	Please consult your local Mitsubishi representative.	—
BC37H	System error	Please consult your local Mitsubishi representative.	—
BC38H	System error	Please consult your local Mitsubishi representative.	—
BC39H	System error	Please consult your local Mitsubishi representative.	—
BC50H	With the message transmission function, an abnormal data was received.	Check the program to see if any prohibited remote output (RY) has not been accessed. If the error occurs again even after checking the above, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC51H	• During execution of message transmission function, a data link error has occurred on the corresponding station. • During execution of message transmission, some parameters were changed. • With the message transmission function, an abnormal data was received.	• Check the operation of the target remote device station. • Stop the data link then change the parameters. • Check the program to see if any prohibited remote output (RY) has not been accessed. If the error occurs again even after checking the above, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC52H	• With the message transmission function, a communication timeout has occurred. • SB0002 (Data link stop) was turned on during message transmission. • With the message transmission function, a stop error in the CPU module was detected.	• Set a larger value in SW0009 (Monitoring time setting) If the error occurs again, check the modules and cables at the destination. • Stop data link after completion of message transmission. • To execute message transmission while there is a stop error in the CPU module, set the data link setting when CPU is down to "Continue Data Link".	—
BC53H	• With the message transmission function, a communication timeout has occurred. • SB0002 (Data link stop) was turned on during message transmission. • With the message transmission function, a stop error in the CPU module was detected.	• Set a larger value in SW0009 (Monitoring time setting) If the error occurs again, check the modules and cables at the destination. • Stop data link after completion of message transmission. • To execute message transmission while there is a stop error in the CPU module, set the data link setting when CPU is down to "Continue Data Link".	—
BC54H	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC55H	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC57H	Multiple peripherals tried to access the same remote device station at the same time.	Execute after other processing is completed.	—

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Error code	Error details and causes	Action	Detailed information
BC58H	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC59H	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC5AH	System error	Please consult your local Mitsubishi representative.	—
BC5BH	With the message transmission function, an abnormal response was received.	Check the operation of the target remote device station.	—
BC5CH	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC5DH	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC5EH	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC5FH	With the message transmission function, an abnormal data was received.	Execute the message transmission function again. If the error occurs again, the possible cause is a failure of a master/local module or remote device station. Please consult your local Mitsubishi representative.	—
BC60H	• The message transmission function was executed simultaneously for five or more remote device stations. • The message transmission function was executed simultaneously for five or more intelligent device stations.	Reduce the number for simultaneous execution to four or less.	—
BC70H	The peripherals sent requests to the remote device station exceeding the number of concurrent execution.	Reduce the number for simultaneous execution to four or less.	—
BC71H	The remote device station access function was attempted to be performed from a station other than the master station.	Execute the function from the master station.	—
BC72H	The remote device station to be accessed from the peripherals is in any of the following. • The station is not set in the network parameter. • The specified station number is not the start station number. • The station is set as a reserved station. • A data link error has occurred (including error on all stations).	Check the parameters or operation on the target station.	—
BC73H	The remote device station to be accessed from the peripherals is a remote I/O station.	Check the station number and station type of the specified target station.	—
BC74H	The specified device (RX, RY, RWw, or RWr) number is out of the valid device range for the connected target station.	Check the parameters and the device range of the target station.	—
BC75H	A data link error has occurred in all stations during access from the peripherals to the remote device station.	Issue the request after the data link is started.	—
BC76H	Time check over has occurred during access from the peripherals to the remote device station.	Increase the time check time in the application of the request source, or check the operation of the target slave station.	—
BC81H	System error	Please consult your local Mitsubishi representative.	—
BC90H	The message transmission result read request was received from the station with an unacceptable target station number.	Correct the target station number at the request source and retry the operation.	—
BC91H	Timeout has occurred in receiving response data of message transmission.	Set a larger value in SW0009 (Monitoring time setting) for execution. If the error occurs again, check the modules and cables at the destination.	—
BD83H	System error	Please consult your local Mitsubishi representative.	—
BD84H	System error	Please consult your local Mitsubishi representative.	—

Error code	Error details and causes	Action	Detailed information
BD85H	An error was detected in the CPU module.	Check the error of the CPU module and take action using the module diagnostics.	—
	A hardware failure has been detected.	Please consult your local Mitsubishi representative.	—
BD86H	System error	Please consult your local Mitsubishi representative.	—
BD87H	System error	Please consult your local Mitsubishi representative.	—
BF11H	System error	Please consult your local Mitsubishi representative.	—
BF12H	System error	Please consult your local Mitsubishi representative.	—
BF13H	System error	Please consult your local Mitsubishi representative.	—
BF14H	System error	Please consult your local Mitsubishi representative.	—
BF15H	System error	Please consult your local Mitsubishi representative.	—
BF16H	System error	Please consult your local Mitsubishi representative.	—
BF17H	System error	Please consult your local Mitsubishi representative.	—
BF18H	System error	Please consult your local Mitsubishi representative.	—
BF19H	System error	Please consult your local Mitsubishi representative.	—
BF1AH	System error	Please consult your local Mitsubishi representative.	—
BF1BH	System error	Please consult your local Mitsubishi representative.	—
BF1CH	System error	Please consult your local Mitsubishi representative.	—
BF20H	System error	Please consult your local Mitsubishi representative.	—
BF30H	System error	Please consult your local Mitsubishi representative.	—
BF31H	System error	Please consult your local Mitsubishi representative.	—
BF32H	System error	Please consult your local Mitsubishi representative.	—
BF33H	System error	Please consult your local Mitsubishi representative.	—
BF34H	System error	Please consult your local Mitsubishi representative.	—
BF35H	System error	Please consult your local Mitsubishi representative.	—
BF36H	System error	Please consult your local Mitsubishi representative.	—
BF37H	System error	Please consult your local Mitsubishi representative.	—
BF38H	An error has been detected in reading the execution result in access from the peripherals to the remote device station.	• Check the application on the source that issued the request. • Check if another peripheral is accessing the remote device station.	—
BF39H	An error has been detected in the request procedure in access from the peripherals to the remote device station.	• Check the application on the source that issued the request. • Check if multiple peripherals are accessing the remote device station. • Check if a value is written in the system area in the buffer memory.	—
BF40H	System error	Please consult your local Mitsubishi representative.	—
BF41H	System error	Please consult your local Mitsubishi representative.	—
BF42H	System error	Please consult your local Mitsubishi representative.	—
BF43H	The station type of the target station for message transmission is neither a remote device station nor intelligent device station.	Correct the target station at the request source and retry the operation.	—
BF44H	System error	Please consult your local Mitsubishi representative.	—
BF50H	System error	Please consult your local Mitsubishi representative.	—
BFFAH	The message transmission function was executed simultaneously for five or more intelligent device stations.	Reduce the number for simultaneous execution to four or less.	—
BFFBH	Too many transient requests were sent from the engineering tool or GOT.	Wait for a while and send the request again.	—

A

Appendix 4 Dedicated Instructions

Dedicated instructions facilitate programming for using intelligent function modules.

A master/local module can perform the following operations by using dedicated instructions.

• Transient transmission to a master station, local station, and intelligent device station
• Module parameter settings for a master station

List of dedicated instructions

For details on dedicated instructions, refer to the following.

📖 MELSEC iQ-R Programming Manual (Instructions, Standard Functions/Function Blocks)

Target station	Instruction	Description
Master station Local station Intelligent device station	RIRD	Reads data of the specified number of points from the buffer memory of the target station or the device in the CPU module on the target station.
	RIWT	Writes data of the specified number of points to the buffer memory of the target station or the device in the CPU module on the target station.
Intelligent device station	RIRCV	Automatically performs a handshake with the specified intelligent device station and reads data from its buffer memory. The instruction can be used for communications with a module supporting a handshake signal such as AJ65BT-R2N.
	RISEND	Automatically performs a handshake with the specified intelligent device station and writes data to its buffer memory. The instruction can be used for communications with a module supporting a handshake signal such as AJ65BT-R2N.
	RIFR	Reads data from the automatic update buffer or random access buffer of the intelligent device station. The instruction can be used for communications with a module having the automatic update buffer such as AJ65BT-R2N.
	RITO	Writes data to the automatic update buffer of the intelligent device station or random access buffer. The instruction can be used for communications with a module having the automatic update buffer such as AJ65BT-R2N.
Remote device station	RDMSG	Reads/writes parameters from/to the remote device station and reads the status of the remote device station. The instruction can be used for communications with a remote device station supporting the message transmission function such as NZ2AW1C2AL.
Master station	RLPASET	Sets network parameters in the master station and starts up the data link.

Appendix 4.1 RIRD (Reading data from the target station)

G(P).RIRD

| RnCPU | RnENCPU | RnPCPU | RnSFCPU (Standard) | RnSFCPU (Safety) ✕ |

This instruction reads data of the specified number of points from the buffer memory of the target station or the device of its CPU module.

Ladder	ST
─┤ ▭ ├─ (U) (s) (d1) (d2)	ENO:=G_RIRD(EN,U,s,d1,d2); ENO:=GP_RIRD(EN,U,s,d1,d2);

FBD/LD
EN   ENO U   d1 s   d2

■Execution condition

Instruction	Execution condition
G.RIRD	┌─┐ (pulse)
GP.RIRD	┌─ (rising edge)

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(s)	Start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(d1)	Start device for storing the read data	—	Device name	ANY16[*1]
(d2)	Device to be turned on one scan upon completion of the instruction (d2)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

*1   When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

Operand	Bit			Word			Double word			Indirect specification	Constant				Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z	LT, LST, LC	LZ		K, H	E	$	(U)
(U)[*1]	—	—	○	—	—	—	—	○	○	—	—	○
(s)	—	—	○[*3]	—	—	—	—	○	—	—	—	—
(d1)	—	—	○[*3]	—	—	—	—	○	—	—	—	—
(d2)	○[*2]	—	○[*4]	—	—	—	—	—	—	—	—	—

*1 Index modification is not available.
*2 FX and FY cannot be used.
*3 FD cannot be used.
*4 T, ST, C, and FD cannot be used.

■Control data

Operand: (s)					
Device	Item	Description		Setting range	Set by
+0	Completion status	The instruction completion status is stored. • 0: Completed successfully • Other than 0: Completed with an error (error code)		—	System
+1	Station number	Specify the station number of the target station.		0 to 64	User
+2	Access/attribute code	Specify the type of the buffer memory or device from which to read data. b15 ••• b8 b7 ••• b0 | Access code | Attribute code |		Refer to "Access/attribute code."	User
+3	Buffer memory address or device number	Specify the start address of the buffer memory or the start device from which to read data.		Refer to the manual of the target station.[*1]	User
+4	Number of read points	Specify the number of read points in units of words.		1 to 480[*2] 1 to 32[*3]	User

*1 When specifying the random access buffer, specify the address with the start of the random access buffer defined as 0.
*2 Specify a value within the capacity of the target station buffer memory area or device.
*3 If data is to be read from a device of the target station CPU module and the CPU module is other than RCPU, QCPU (Q mode), QCPU (A mode), LCPU, QnACPU, or AnUCPU, the setting range is 1 to 32 words.

■Access/attribute code

• When data is read from the buffer memory in the CC-Link module

Contents of buffer memory		Access code	Attribute code
Buffer in intelligent device station		00H	04H
Buffer in master, local, or standby master station	Random access buffer	20H	04H
	Remote input	21H	04H
	Remote output	22H	04H
	Remote register	24H	04H
	Link special relay	63H	04H
	Link special register	64H	04H

• When data is read from a CPU module device

Device category[1]	Name	Device type		Unit	Access code	Attribute code
		Bit	Word			
Input relay	X	○	—	Hexadecimal	01H	05H
Output relay	Y	○	—	Hexadecimal	02H	05H
Internal relay	M	○	—	Decimal	03H	05H
Latch relay	L	○	—	Decimal	83H	05H
Link relay	B	○	—	Hexadecimal	23H	05H
Timer (contact)	T	○	—	Decimal	09H	05H
Timer (coil)	T	○	—	Decimal	0AH	05H
Timer (current value)	T	—	○	Decimal	0CH	05H
Retentive timer (contact)	ST	○	—	Decimal	89H	05H
Retentive timer (coil)	ST	○	—	Decimal	8AH	05H
Retentive timer (current value)	ST	—	○	Decimal	8CH	05H
Counter (contact)	C	○	—	Decimal	11H	05H
Counter (coil)	C	○	—	Decimal	12H	05H
Counter (current value)	C	—	○	Decimal	14H	05H
Data register[2]	D	—	○	Decimal	04H	05H
Link register[2]	W	—	○	Hexadecimal	24H	05H
File register	R	—	○	Decimal	84H	05H
Link special relay	SB	○	—	Hexadecimal	63H	05H
Link special register	SW	—	○	Hexadecimal	64H	05H
Special relay	SM	○	—	Decimal	43H	05H
Special register	SD	—	○	Decimal	44H	05H

[1] Only the above devices can be specified. To read data from a bit device, specify it with 0 or a multiple of 16.
[2] None of D65536 and the subsequent extended data register areas and of W10000 and the subsequent extended link register areas are accepted.

Processing details

- This instruction reads data of the specified number of points from the buffer memory of the target station or the device of its CPU module.
- From the master station, the instruction can be executed for the local station, standby master station, or intelligent device station. From the local station or standby master station, the instruction can be executed for the master station, local station, or standby master station.
- The following figure shows how the G(P).RIRD instruction operates during execution.
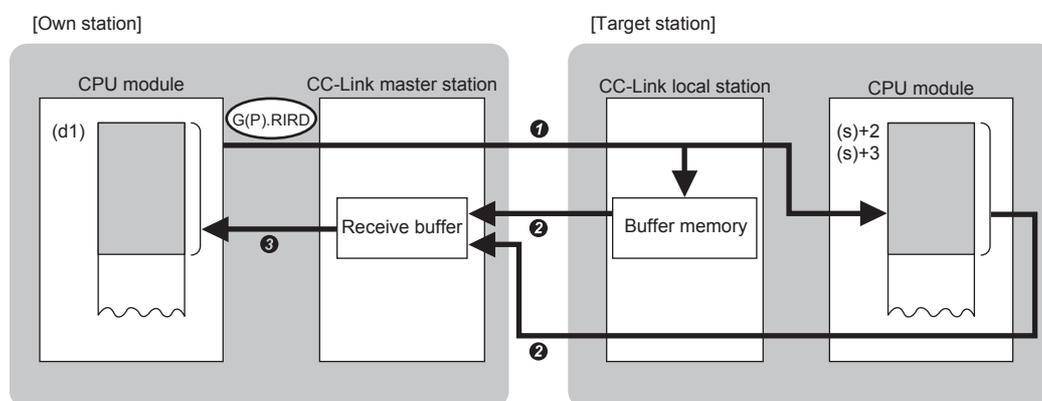
❶ Data is read from the buffer memory area specified by (s)+2 and (s)+3 that is included in the station specified by (s)+1 or from the device of the CPU module.
❷ The read data is stored in the receive buffer of the master station.
❸ The read data is stored in the device specified by (d1) and later, and the device specified by (d2) is turned on.

- Normal/error completion of the G(P).RIRD instruction can be checked with the completion device specified by the setting data (d2) and the completion status indication device (d2)+1.
  - Completion device (d2)
    This device turns on during END processing of the scan that arises upon completion of the G(P).RIRD instruction, and turns off during the next END processing.
  - Completion status indication device (d2)+1
    This device turns on or off depending on the status resulting from completion of the G(P).RIRD instruction.
    When completed successfully: The device remains off.
  - When completed with an error: The device turns on during END processing of the scan that arises upon completion of the G(P).RIRD instruction, and turns off during the next END processing.

Precautions

- The monitoring time and the number of retries can be set with the following link special register (SW) areas.
  - Monitoring time setting (SW0009)
  - Setting of the number of retries for dedicated instruction (SW000B)
- The G(P).RIRD instruction can be concurrently executed for two or more local stations, standby master stations, or intelligent device stations. Two or more dedicated instructions, including those other than this instruction, cannot be concurrently executed for a single station. If the next dedicated instruction is issued before completion of the preceding one that has started, the next one will be ignored. Create the program so that the next dedicated instruction will start after the completion device turns on, because processing of a dedicated instruction takes several scans until its completion.

Operation error

Error code ((s)+0)	Description
4000H to 4FFFH	☐ MELSEC iQ-R CPU Module User's Manual (Application)
B000H to BFFFH	☐ MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

Appendix 4.2 RIWT (Writing data to the target station)

G(P).RIWT

RnCPU RnENCPU RnPCPU RnSFCPU (Standard) RnSFCPU (Safety) ✕

This instruction writes data of the specified number of points to the buffer memory of the target station or the device of its CPU module.

Ladder	ST
⸺□⸺ (U) (s1) (s2) (d) ⸺	ENO:=G_RIWT(EN,U,s1,s2,d); ENO:=GP_RIWT(EN,U,s1,s2,d);

FBD/LD
⸺□⸺ EN   ENO U   d s1 s2
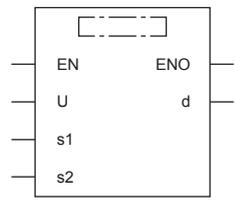
■Execution condition

Instruction	Execution condition
G.RIWT	⎍
GP.RIWT	⌐

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(s1)	Start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(s2)	Start device for storing the data to be written	—	Device name	ANY16[*1]
(d)	Device to be turned on one scan upon completion of the instruction (d)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

*1 When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

Operand	Bit		Word				Double word			Indirect	Constant				Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z	LT, LST, LC	LZ		specification	K, H	E	$	(U)
(U)[1]	—	—	○	—	—	—	—	○		○	—	—	○
(s1)	—	—	○[3]	—	—	—	—	○		—	—	—	—
(s2)	—	—	○[3]	—	—	—	—	○		—	—	—	—
(d)	○[2]	—	○[4]	—	—	—	—	—		—	—	—	—

*1 Index modification is not available.
*2 FX and FY cannot be used.
*3 FD cannot be used.
*4 T, ST, C, and FD cannot be used.

■Control data

Operand: (s1)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	Completion status	The instruction completion status is stored. • 0: Completed successfully • Other than 0: Completed with an error (error code)	—	System
+1	Station number	Specify the station number of the target station.	0 to 64	User
+2	Access/attribute code	Specify the type of the buffer memory or device to which to write data. b15 ••• b8 b7 ••• b0 | Access code | Attribute code |	Refer to "Access/attribute code."	User
+3	Buffer memory address or device number	Specify the start address of the buffer memory or the start device to which to write data.	Refer to the manual of the target station.[1]	User
+4	Number of write points	Specify the number of write points in units of words.	1 to 480[2] 1 to 32[3]	User

*1 When specifying the random access buffer, specify the address with the start of the random access buffer defined as 0.
*2 Specify a value within the capacity of the target station buffer memory area or device.
*3 If data is to be written to a device of the target station CPU module and the CPU module is other than RCPU, QCPU (Q mode), QCPU (A mode), LCPU, QnACPU, or AnUCPU, the setting range is 1 to 32 words.

■Access/attribute code

• When data is written to the buffer memory in the CC-Link module

Contents of buffer memory		Access code	Attribute code
Buffer in intelligent device station		00H	04H
Buffer in master or local station	Random access buffer	20H	04H
	Remote input	21H	04H
	Remote output	22H	04H
	Remote register	24H	04H
	Link special relay	63H	04H
	Link special register	64H	04H

• When data is written to the device of the CPU module

Device category[1]	Name	Device type		Unit	Access code	Attribute code
		Bit	Word			
Input relay	X	○	—	Hexadecimal	01H	05H
Output relay	Y	○	—	Hexadecimal	02H	05H
Internal relay	M	○	—	Decimal	03H	05H
Latch relay	L	○	—	Decimal	83H	05H
Link relay	B	○	—	Hexadecimal	23H	05H
Timer (contact)	T	○	—	Decimal	09H	05H
Timer (coil)	T	○	—	Decimal	0AH	05H
Timer (current value)	T	—	○	Decimal	0CH	05H
Retentive timer (contact)	ST	○	—	Decimal	89H	05H
Retentive timer (coil)	ST	○	—	Decimal	8AH	05H
Retentive timer (current value)	ST	—	○	Decimal	8CH	05H
Counter (contact)	C	○	—	Decimal	11H	05H
Counter (coil)	C	○	—	Decimal	12H	05H
Counter (current value)	C	—	○	Decimal	14H	05H
Data register[2]	D	—	○	Decimal	04H	05H
Link register[2]	W	—	○	Hexadecimal	24H	05H
File register	R	—	○	Decimal	84H	05H
Link special relay	SB	○	—	Hexadecimal	63H	05H
Link special register	SW	—	○	Hexadecimal	64H	05H
Special relay	SM	○	—	Decimal	43H	05H
Special register	SD	—	○	Decimal	44H	05H

*1 Only the above devices can be specified. To write data to a bit device, specify it with 0 or a multiple of 16.
*2 None of D65536 and the subsequent extended data register areas and of W10000 and the subsequent extended link register areas are accepted.

A

Processing details

- This instruction writes data of the specified number of points to the buffer memory of the target station or the device of its CPU module.
- From the master station, the instruction can be executed for the local station, standby master station, or intelligent device station. From the local station or standby master station, the instruction can be executed for the master station, local station, or standby master station.
- The following figure shows how the G(P).RIWT instruction operates during execution.

❶ The data specified by (s2) is stored in the send buffer of the master station.
❷ Data is stored in the buffer memory area specified by (s1)+2 and (s1)+3 that is included in the station specified by (s1)+1 or in the device of the CPU module.
❸ The response indicating the write completion returns from the target station to the master station.
❹ The device specified by (d) is turned on.

- Normal/error completion of the G(P).RIWT instruction can be checked with the completion device specified by the setting data (d) and the completion status indication device (d)+1.

  - Completion device (d)
  This device turns on during END processing of the scan that arises upon completion of the G(P).RIWT instruction, and turns off during the next END processing.
  - Completion status indication device (d)+1
  This device turns on or off depending on the status resulting from completion of the G(P).RIWT instruction.
  When completed successfully: The device remains off.
  When completed with an error: The device turns on during END processing of the scan that arises upon completion of the G(P).RIWT instruction, and turns off during the next END processing.

Precautions

- The monitoring time and the number of retries can be set with the following link special register (SW) areas.
  - Monitoring time setting (SW0009)
  - Setting of the number of retries for dedicated instruction (SW000B)
- The G(P).RIWT can be concurrently executed for two or more local or intelligent device stations. Two or more dedicated instructions, including those other than this instruction, cannot be concurrently executed for a single station. If the next dedicated instruction is issued before completion of the preceding one that has started, the next one will be ignored. Create the program so that the next dedicated instruction will start after the completion device turns on, because processing of a dedicated instruction takes several scans until its completion.

Operation error

Error code ((s1)+0)	Description
4000H to 4FFFH	📖 MELSEC iQ-R CPU Module User's Manual (Application)
B000H to BFFFH	📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

Appendix 4.3 RIRCV (Reading data from the buffer memory of the specified intelligent device station)

G(P).RIRCV

RnCPU	RnENCPU	RnPCPU	RnSFCPU (Standard)	RnSFCPU (Safety) ✕

This instruction automatically performs a handshake with the specified intelligent device station and reads data from its buffer memory. The instruction can be used for communications with a module supporting a handshake signal such as AJ65BT-R2N.

Ladder	ST
⎯⎯[□:□] (U) (s1) (d1) (s2) (d2) ⎯⎯	ENO:=G_RIRCV(EN,U,s1,s2,d1,d2); ENO:=GP_RIRCV(EN,U,s1,s2,d1,d2);

FBD/LD
[□:□] EN   ENO U   d1 s1   d2 s2
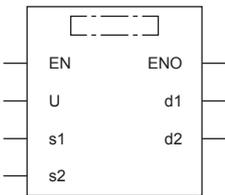
■Execution condition

Instruction	Execution condition
G.RIRCV	⎍
GP.RIRCV	⎍

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(s1)	Start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(d1)	Start device for storing the read data	—	Device name	ANY16[*1]
(s2)	Start device for storing the interlock signal	—	Device name	ANY16[*1]
(d2)	Device to be turned on one scan upon completion of the instruction (d2)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

[*1] When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

Operand	Bit			Word				Double word			Indirect specification	Constant				Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□		T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z		LT, LST, LC	LZ			K, H	E	$		(U)
(U)[*1]	—	—		○	—		—	—		—	○	○		—	—	○
(s1)	—	—		○[*3]	—		—	—		—	○	—		—	—	—
(d1)	—	—		○[*3]	—		—	—		—	○	—		—	—	—
(s2)	—	—		○[*3]	—		—	—		—	○	—		—	—	—
(d2)	○[*2]	—		○[*4]	—		—	—		—	—	—		—	—	—

*1 Index modification is not available.
*2 FX and FY cannot be used.
*3 FD cannot be used.
*4 T, ST, C, and FD cannot be used.

■Control data

Operand: (s1)					
Device	Item	Description		Setting range	Set by
+0	Completion status	The instruction completion status is stored. • 0: Completed successfully • Other than 0: Completed with an error (error code)		—	System
+1	Station number	Specify the station number of the target station.		1 to 64	User
+2	Access/attribute code	Specify 0004H.		0004H	User
+3	Buffer memory address	Specify the start address of the buffer memory area from which to read data.		Refer to the manual of the target station.	User
+4	Number of read points	Specify the number of read points in units of words.		1 to 480[*1]	User

*1 Specify a value within the capacity of the target station buffer memory area.

■Interlock signal

| Operand: (s2)					
Device	Item		Description	Setting range	Set by
+0	b15 ••• b8 b7 ••• b0 0 / RY		RY: Specify the number of the read completion signal (RY) to be used for interlock.[*1]	00H to 7FH	User
+1	b15 ••• b8 b7 ••• b0 0 / RX		RX: Specify the number of the read request signal (RX) to be used for interlock.[*1]	00H to 7FH	User
+2	Dummy		Specify 0.	0	User

*1 For the interlock signals, refer to the following.
　📖 Manual of the intelligent device station from which to read data

Processing details

- This instruction automatically performs a handshake with the specified intelligent device station and reads data from its buffer memory.
- The instruction can be executed, from the master station, for an intelligent device station with a handshake signal (e.g. AJ65BT-R2N).
- The following figure shows how the G(P).RIRCV instruction operates during execution.
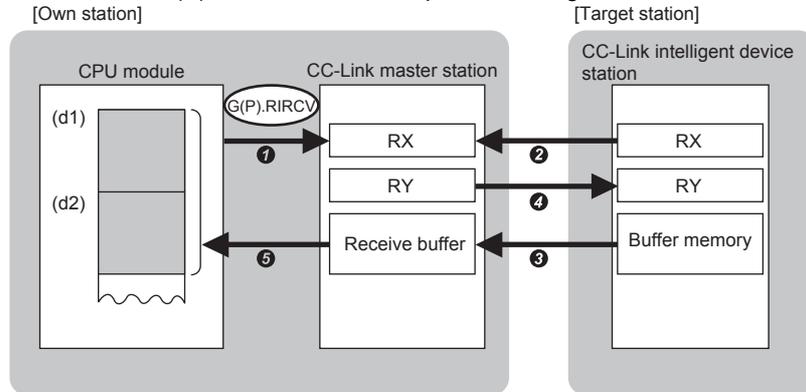
- ❶ A request is issued to read data from the buffer memory address specified by (s1)+3 that is included in the station specified by (s1)+1.
- ❷ The remote input (RX) specified by (s2)+1 that is in the station specified by (s1)+1 is monitored.
- ❸ Turning on the remote input (RX) causes the master station to read the data from the buffer memory of the target station. The read data is stored in the receive buffer of the master station.
- ❹ The master station turns on the remote output (RY) specified by (s2)+0. It turns off the remote output (RY) specified by (s2)+0 by turning on and off the remote input (RX) specified by (s2)+1.
- ❺ The data read from the target station is stored in the device specified by (d1) and later, and the device specified by (d2) is turned on.
- Normal/error completion of the G(P).RIRCV instruction can be checked with the completion device specified by the setting data (d2) and the completion status indication device (d2)+1.
  - Completion device (d2)
    This device turns on during END processing of the scan that arises upon completion of the G(P).RIRCV instruction, and turns off during the next END processing.
  - Completion status indication device (d2)+1
    This device turns on or off depending on the status resulting from completion of the G(P).RIRCV instruction.
    When completed successfully: The device remains off.
    When completed with an error: The device turns on during END processing of the scan that arises upon completion of the G(P).RIRCV instruction, and turns off during the next END processing.

Precautions

- The monitoring time and the number of retries can be set with the following link special register (SW) areas.
  - Monitoring time setting (SW0009)
  - Setting of the number of retries for dedicated instruction (SW000B)
- The G(P).RIRCV instruction can be concurrently executed for two or more intelligent device stations. Two or more dedicated instructions, including those other than this instruction, cannot be concurrently executed for a single station. If the next dedicated instruction is issued before completion of the preceding one that has started, the next one will be ignored. Create the program so that the next dedicated instruction will start after the completion device turns on, because processing of a dedicated instruction takes several scans until its completion.

Operation error

Error code ((s1)+0)	Description
4000H to 4FFFH	📖 MELSEC iQ-R CPU Module User's Manual (Application)
B000H to BFFFH	📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

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Appendix 4.4 RISEND (Writing data to the buffer memory of the specified intelligent device station)

G(P).RISEND

RnCPU RnENCPU RnPCPU RnSFCPU (Standard) RnSFCPU (Safety) ✕

This instruction automatically performs a handshake with the specified intelligent device station and writes data to its buffer memory. The instruction can be used for communications with a module supporting a handshake signal such as AJ65BT-R2N.

Ladder	ST
▢: ▢ (U) (s1) (s2) (s3) (d)	ENO:=G_RISEND(EN,U,s1,s2,s3,d); ENO:=GP_RISEND(EN,U,s1,s2,s3,d);

FBD/LD
▢:▢ EN   ENO U   d s1 s2 s3
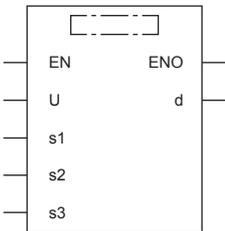
■Execution condition

Instruction	Execution condition
G.RISEND	⎍
GP.RISEND	⎾

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(s1)	Start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(s2)	Start device for storing the data to be written	—	Device name	ANY16[*1]
(s3)	Start device for storing the interlock signal	—	Device name	ANY16[*1]
(d)	Device to be turned on one scan upon completion of the instruction (d)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

[*1] When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

Operand	Bit			Word				Double word			Indirect specification	Constant				Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□		T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z		LT, LST, LC	LZ			K, H	E	$		(U)
(U)[*1]	—	—		○	—	—		—	—		○	○	—	—		○
(s1)	—	—		○[*3]	—	—		—	—		○	—	—	—		—
(s2)	—	—		○[*3]	—	—		—	—		○	—	—	—		—
(s3)	—	—		○[*3]	—	—		—	—		○	—	—	—		—
(d)	○[*2]	—		○[*4]	—	—		—	—		—	—	—	—		—

*1 Index modification is not available.
*2 FX and FY cannot be used.
*3 FD cannot be used.
*4 T, ST, C, and FD cannot be used.

■Control data

Operand: (s1)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	Completion status	The instruction completion status is stored. • 0: Completed successfully • Other than 0: Completed with an error (error code)	—	System
+1	Station number	Specify the station number of the target station.	1 to 64	User
+2	Access/attribute code	Specify 0004H.	0004H	User
+3	Buffer memory address	Specify the start address of the buffer memory to which to write data.	Refer to the manual of the target station.	User
+4	Number of write points	Specify the number of write points in units of words.	1 to 480[*1]	User

*1 Specify a value within the capacity of the target station buffer memory area.

■Interlock signal

Operand: (s3)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	b15 ••• b8 b7 ••• b0 `0` `RY`	RY: Specify the number of the write request signal (RY) to be used for interlock.*1	00H to 7FH	User
+1	b15 ••• b8 b7 ••• b0 `RWr`*1 `RX`	RX: Specify the number of the write completion signal (RX) to be used for interlock.*1	00H to 7FH	User
		RWr: Specify the number of the device (RWr) in which to store the error code. If the error code storage device does not exist, specify FFH.	00H to 0FH, FFH[*2]	User
+2	b15 ••• b0 `Completion mode`	Specifies how the completion signal behaves. • 0: Using Device 1 At completion, the RX signal specified by (s2)+1 turns on. • 1: Using Device 2 For normal completion, the RX signal specified by (s2)+1 turns on. For error completion, both RX and RX+1 turn on simultaneously.	0, 1	User

*1 For the interlock signals, refer to the following.
   📖 Manual of the intelligent device station from which to read data
*2 The error code stored in the error code storage device is the same as the completion status ((s1)+0) of control data.

Processing details

- This instruction automatically performs a handshake with the specified intelligent device station and writes data to its buffer memory.
- The instruction can be executed, from the master station, for an intelligent device station with a handshake signal (e.g. AJ65BT-R2N).
- The following figure shows how the G(P).RISEND instruction operates during execution.
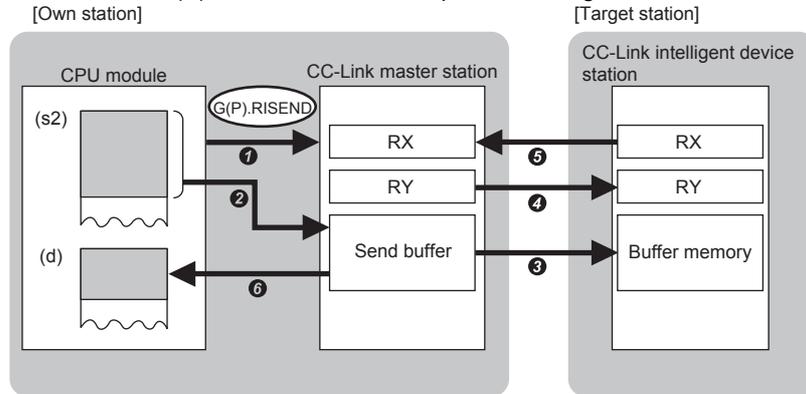
- ❶ A request is issued to write data to the buffer memory address specified by (s1)+3 that is included in the station specified by (s1)+1.
- ❷ The data from the device specified by (s2) and later is stored in the send buffer of the master station.
- ❸ The master station writes the data of the send buffer in the buffer memory of the target station.
- ❹ The master station turns on the remote output (RY) specified by (s3)+0.
- ❺ Upon completion of processing to the remote output (RY), the target station turns on the remote input (RX) specified by (s3)+1. It turns off the remote input (RX) specified by (s3)+1 by turning on and off the remote output (RY) specified by (s3)+1.
- ❻ The device specified by (d) is turned on.
- Normal/error completion of the G(P).RISEND instruction can be checked with the completion device specified by the setting data (d) and the completion status indication device (d)+1.
  - Completion device (d)
    This device turns on during END processing of the scan that arises upon completion of the G(P).RISEND instruction, and turns off during the next END processing.
  - Completion status indication device (d)+1
    This device turns on or off depending on the status resulting from completion of the G(P).RISEND instruction.
    When completed successfully: The device remains off.
    When completed with an error: The device turns on during END processing of the scan that arises upon completion of the G(P).RISEND instruction, and turns off during the next END processing.

Precautions

- The monitoring time and the number of retries can be set with the following link special register (SW) areas.
  - Monitoring time setting (SW0009)
  - Setting of the number of retries for dedicated instruction (SW000B)
- The G(P).RISEND instruction can be concurrently executed for two or more intelligent device stations. Two or more dedicated instructions, including those other than this instruction, cannot be concurrently executed for a single station. If the next dedicated instruction is issued before completion of the preceding one that has started, the next one will be ignored. Create the program so that the next dedicated instruction will start after the completion device turns on, because processing of a dedicated instruction takes several scans until its completion.

Operation error

Error code ((s1)+0)	Description
4000H to 4FFFH	📖 MELSEC iQ-R CPU Module User's Manual (Application)
B000H to BFFFH	📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

Appendix 4.5 RIFR (Reading data from the automatic update buffer)

G(P).RIFR

This instruction reads data from the automatic update buffer or random access buffer. The instruction can be used for communications with a module having the automatic update buffer such as AJ65BT-R2N.

Ladder	ST
▭ (U) (s1) (s2) (d) (n)	ENO:=G_RIFR(,ENU,s1,s2,n,d); ENO:=GP_RIFR(EN,U,s1,s2,n,d);

FBD/LD

```
      ┌─▭─┐
 EN ──┤      ├── ENO
  U ──┤      ├── d
 s1 ──┤      │
 s2 ──┤      │
  n ──┤      │
      └──────┘
```
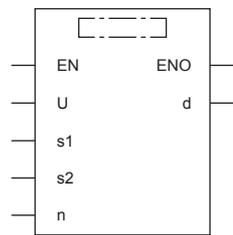
■Execution condition

Instruction	Execution condition
G.RIFR	┌─┐ _┘ └_
GP.RIFR	┌─ _┘

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(s1)	If data is read from the automatic update buffer: Station number of the intelligent device station	1 to 64	16-bit unsigned binary	ANY16
	If data is read from the random access buffer: Specify the random access buffer.	00FFH	16-bit unsigned binary	ANY16
(s2)	Offset value from the start of the random access buffer or automatic update buffer assigned to the target station	0 to parameter set value[1]	16-bit unsigned binary	ANY16
(d)	Start device for storing the read data	—	Device name	ANY16[2]
(n)	Number of read points	1 to 4096	16-bit unsigned binary	ANY16
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

*1   Value that was set in the CC-Link Configuration window of the engineering tool.

*2   When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

| Operand | Bit | | | Word | | | Double word | | | Indirect specification | Constant | | | | Others |
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z		LT, LST, LC	LZ			K, H	E	$		(U)
(U)[*1]	—	—	○	—	—		—	—		○	○	—	—		○
(s1)	○[*2]	—	○[*3]	—	—		—	—		○	○	—	—		—
(s2)	○[*2]	—	○[*3]	—	—		—	—		○	○	—	—		—
(d)	—	—	○[*3]	—	—		—	—		○	—	—	—		—
(n)	○[*2]	—	○[*3]	—	—		—	—		○	○	—	—		—

*1 Index modification is not available.
*2 FX and FY cannot be used.
*3 FD cannot be used.

Processing details

- This instruction reads data from the automatic update buffer or random access buffer of the master station.
- The instruction can be executed, from the master station, for an intelligent device station that performs communications with the automatic update buffer (e.g. AJ65BT-R2N).
- The following figure shows how the G(P).RIFR instruction operates during execution.
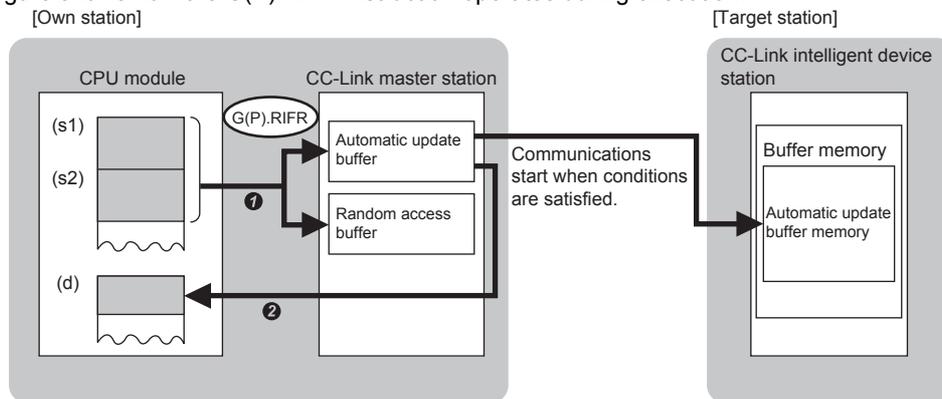
❶ Data is read from the automatic update buffer or random access buffer specified by (s1) and (s2) that is in the master station.
❷ The read data is stored in the device specified by (d) and later.

Precautions

- Assignment of the automatic update buffer can be achieved by CC-Link configuration setting of the module parameters.

Operation error

Error code (SD0)	Description
4000H to 4FFFH	📖 MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 4.6 RITO (Writing data to the automatic update buffer)

G(P).RITO

RnCPU RnENCPU RnPCPU RnSFCPU (Standard) RnSFCPU (Safety) ✗

This instruction writes data to the automatic update buffer or random access buffer. The instruction can be used for communications with a module having the automatic update buffer such as AJ65BT-R2N.

Ladder	ST
─┤ ┌─:─┐ ├ (U) (d1) (d2) (s) (n) ├─	ENO:=G_RITO(EN,U,s,n,d1,d2); ENO:=GP_RITO(EN,U,s,n,d1,d2);

FBD/LD
┌─:─┐ EN   ENO U s n d1 d2
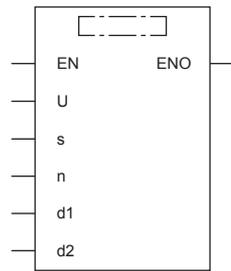
■Execution condition

Instruction	Execution condition
G.RITO	┌─┐
GP.RITO	┌─

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(d1)	If data is written to the automatic update buffer: Station number of the target station	1 to 64	16-bit unsigned binary	ANY16
	If data is written to the random access buffer: Specify the random access buffer.	00FFH	16-bit unsigned binary	ANY16
(d2)	Offset value from the start of the random access buffer or automatic update buffer assigned to the target station	0 to parameter set value[1]	16-bit unsigned binary	ANY16
(s)	Start device for storing the data to be written	—	Device name	ANY16[2]
(n)	Number of write points	1 to 4096	16-bit unsigned binary	ANY16
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

[1] Value that was set in the CC-Link Configuration window of the engineering tool.
[2] When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

Operand	Bit			Word				Double word			Indirect specification	Constant				Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□		T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z		LT, LST, LC	LZ			K, H	E	$		(U)
(U)[*1]	—	—		○	—	—		—	—		○	○	—	—		○
(d1)	○[*2]	—		○[*3]	—	—		—	—		○	○	—	—		—
(d2)	○[*2]	—		○[*3]	—	—		—	—		○	○	—	—		—
(s)	—	—		○[*3]	—	—		—	—		○	—	—	—		—
(n)	○[*2]	—		○[*3]	—	—		—	—		○	○	—	—		—

*1 Index modification is not available.
*2 FX and FY cannot be used.
*3 FD cannot be used.

Processing details

- This instruction writes data to the automatic update buffer or random access buffer of the master station.
- The instruction can be executed, from the master station, for an intelligent device station that performs communications with the automatic update buffer (e.g. AJ65BT-R2N).
- The following figure shows how the G(P).RITO instruction operates during execution.
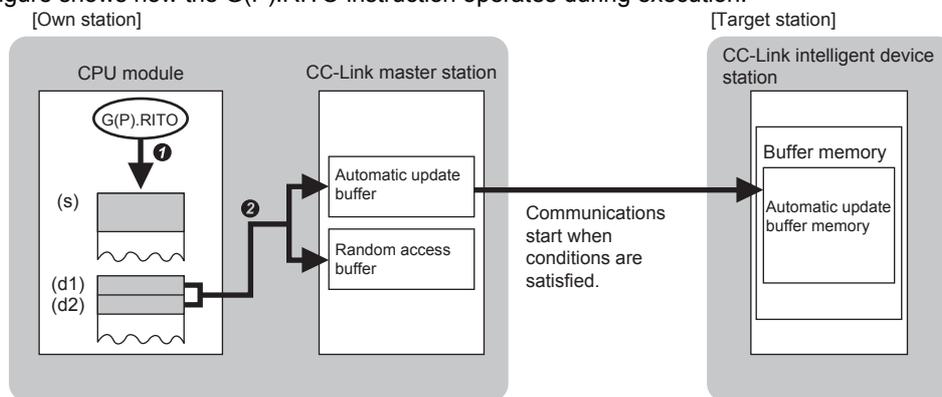
❶ Data is read from the device specified by (s) and later of the master station.
❷ The read data is written to the automatic update buffer or random access buffer specified by (d1) and (d2).

Precautions

- Assignment of the automatic update buffer can be achieved by CC-Link configuration setting of the module parameters.

Operation error

Error code (SD0)	Description
4000H to 4FFFH	📖 MELSEC iQ-R CPU Module User's Manual (Application)

Appendix 4.7 RDMSG (Performing a message transmission to a remote device station)

G(P).RDMSG

RnCPU RnENCPU RnPCPU RnSFCPU (Standard) ~~RnSFCPU (Safety)~~

This instruction reads/writes parameters from/to the remote device station and reads the status of the remote device station. This instruction can be used for communications with a remote device station, for example NZ2AW1C2AL, that supports the message transmission function.

Ladder	ST
⊣[□:□]├ (U) (s1) (s2) (d1) (d2)	ENO:=G_RDMSG(EN,U,s1,s2,d1,d2); ENO:=GP_RDMSG(EN,U,s1,s2,d1,d2);

FBD/LD
┌─ □:□ ─┐ ─ EN   ENO ─ ─ U   d1 ─ ─ s1   d2 ─ ─ s2
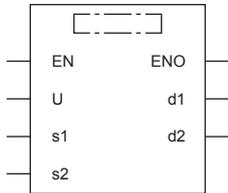
■Execution condition

Instruction	Execution condition
G.RDMSG	⎍
GP.RDMSG	⌐_⎍

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(s1)	Start device where control data is stored	Refer to the control data.	Device name	ANY16[2]
(s2)[1]	Start device for storing the message data to be sent	—	Device name	ANY16[2]
(d1)[1]	Start device for storing the message data received	—	Device name	ANY16
(d2)	Device to be turned on one scan upon completion of the instruction (d2)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

[1] For details on the send data and receive data, refer to the following.

[2] 📖 Manuals for the remote device stations that support the message transmission function

[3] When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

■Applicable devices

Operand	Bit		Word				Double word			Indirect specification	Constant				Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□	T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z	LT, LST, LC	LZ				K, H	E	$	(U)	
(U)[*1]	—	—	○	—	—	—	—	○	○	—	—	○				
(s1)	—	—	○	—	—	—	—	○	—	—	—	—				
(s2)	—	—	○	—	—	—	—	○	—	—	—	—				
(d1)	—	—	○	—	—	—	—	○	—	—	—	—				
(d2)	○	—	○	—	—	—	—	○	—	—	—	—				

*1 Index modification is not available.

■Control data

Operand: (s1)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0	Completion status	The instruction completion status is stored. • 0: Completed successfully • Other than 0: Completed with an error (error code)	—	System
+1	Station number	Specify the station number of the target station.	1 to 64	User
+2	Send data size	Specify the send message data size in bytes.	1 to 255	User
+3	Receivable data size	Specify the maximum size of the device that stores the receive message data in bytes.	0 to 255	User
+4	Receive data size	The receive message data size is stored in bytes.	—	System

Processing details

- This instruction performs a message transmission to a remote device station.
- The instruction can be executed to a remote device station, for example NZ2AW1C2AL, that supports the message transmission function.
- The following figure shows how the G(P).RDMSG instruction operates during execution.
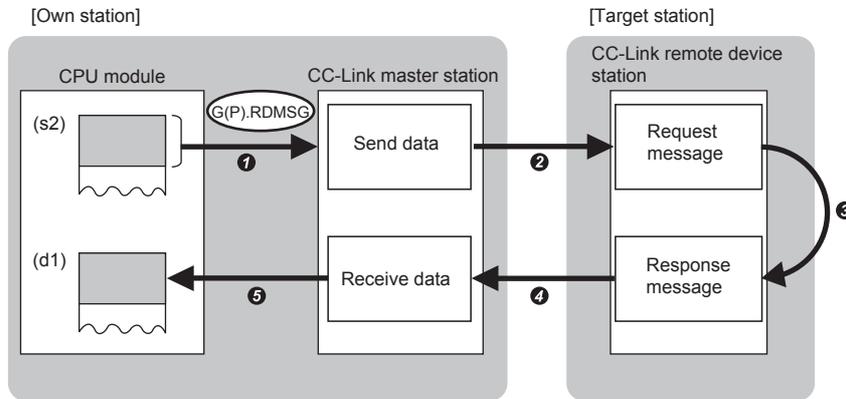
❶ The send data specified by (s2) is stored to the master station for the size specified by (s1)+2.

❷ The master station sends data to the target station specified by (s1)+1.

❸ Processing is performed for the data in the target station specified by (s1)+1.

❹ The master station receives a processing result from the target station specified by (s1)+1.

❺ The master station stores data in the device specified by (d1) and later, and the device specified by (d2) turns on.

- Normal/error completion of the G(P).RDMSG instruction can be checked with the completion device specified by the setting data (d2) and the completion status indication device (d2)+1.
  - Completion device (d2)
    This device turns on during END processing of the scan that arises upon completion of the G(P).RDMSG instruction, and turns off during the next END processing.
  - Completion status indication device (d2)+1
    This device turns on or off depending on the status resulting from completion of the G(P).RDMSG instruction.
    When completed successfully: The device remains off.
    When completed with an error: The device turns on during END processing of the scan that arises upon completion of the G(P).RDMSG instruction, and turns off during the next END processing.

A

■Send data size

When the number of bytes in the send data ((s1)+2) is odd, the lower byte is sent as for the last data.
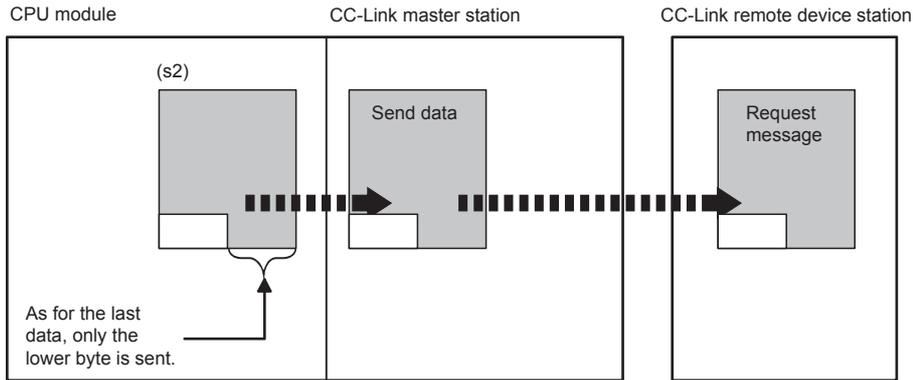
■Receivable data size and receive data size

Set the receivable data size ((s1)+3) so that it satisfies the following.

Receivable data size ((s1)+3) ≥ Receive data size ((s1)+4)
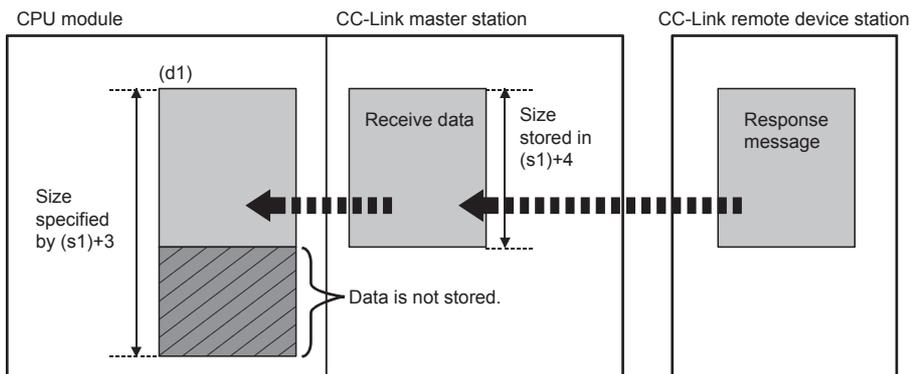
If the receivable data size ((s1)+3) is smaller than the receive data size ((s1)+4), the master station cannot receive data from the remote device station. The G(P).RDMSG instruction completes with an error (error code: B418H).

 • When the number of bytes in the receivable data ((s1)+3) is odd

If the receive data has the same number of bytes, 0 is stored in the upper byte of the last data.
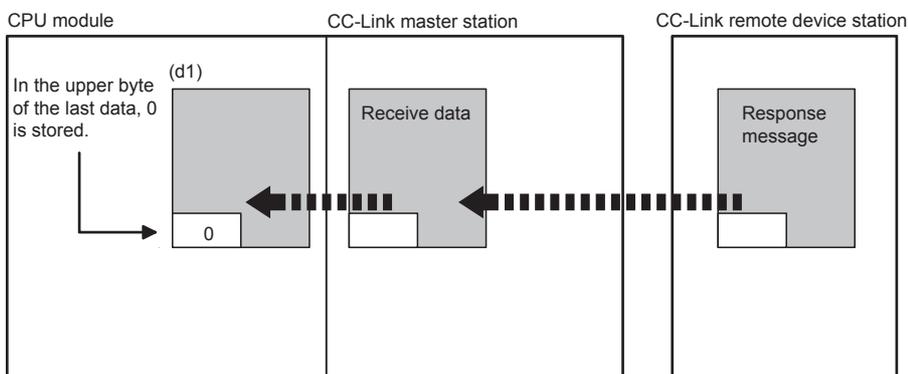
 • When the number of bytes in the receive data ((s1)+4) is odd

The last receive data is stored in the lower byte of the last data storage area in the device memory. In the upper byte of the last data storage area, 0 is stored.
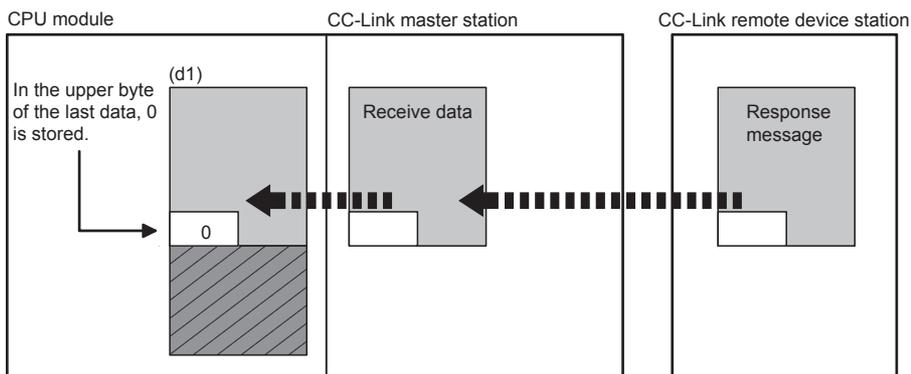
Precautions

- The G(P).RDMSG instruction can be simultaneously executed to two or more remote device stations (up to four stations). Two or more dedicated instructions, including those other than this instruction, cannot be concurrently executed for a single station. If the next dedicated instruction is issued before completion of the preceding one that has started, the instruction will be completed with an error. Create the program so that the next dedicated instruction will start after the completion device turns on, because processing of a dedicated instruction takes several scans until its completion.
- The G(P).RDMSG instruction uses a part or all of remote register that performs cyclic transmissions between the master station and the target station in the system. For programming, refer to the manual for the remote device station targeted. Add SW0160 to SW0163 (Remote register use prohibited status) in a program as an interlock.

Operation error

Error code ((s1)+0)	Description
B000H to BFFFH	📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

Appendix 4.8 RLPASET (Setting network parameters)

G(P).RLPASET

| RnCPU | RnENCPU | RnPCPU | RnSFCPU (Standard) | ~~RnSFCPU (Safety)~~ |

This instruction sets network parameters in the master station and starts up the data link.

Ladder	ST
─┤[ ]├─ (U) (s1) (s2) (s3) (s4) (s5) (d) ─	ENO:=G_RLPASET(EN,U,s1,s2,s3,s4,s5,d); ENO:=GP_RLPASET(EN,U,s1,s2,s3,s4,s5,d);

FBD/LD

```
        ┌─ ─ ─┐
        │     │
      ──│EN ENO│──
      ──│U    d│──
      ──│s1    │
      ──│s2    │
      ──│s3    │
      ──│s4    │
      ──│s5    │
        └─────┘
```
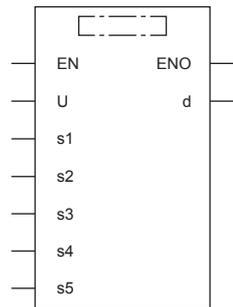
■Execution condition

Instruction	Execution condition
G.RLPASET	┌─┐
GP.RLPASET	─┌

Setting data

■Description, range, data type

Operand	Description	Range	Data type	Data type (label)
(U)	Start I/O number (first three digits in four-digit hexadecimal representation) of a module	00H to FEH	16-bit unsigned binary	ANY16
(s1)	Start device where control data is stored	Refer to the control data.	Device name	ANY16[*1]
(s2)[*2]	Start device containing the slave station setting data	—	Device name	ANY16[*1]
(s3)[*2]	Start device containing the reserved station specification data	—	Device name	ANY16[*1]
(s4)[*2]	Start device containing the error invalid station specification data	—	Device name	ANY16[*1]
(s5)[*2]	Start device containing the automatic update buffer assignment data	—	Device name	ANY16[*1]
(d)	Device to be turned on one scan upon completion of the instruction (d)+1 also turns on when the instruction completes with an error.	—	Bit	ANYBIT_ARRAY (Number of elements: 2)
EN	Execution condition	—	Bit	BOOL
ENO	Execution result	—	Bit	BOOL

[*1] When specifying data with a label, define the array so that an area required for operation can be secured, and specify the array label element.

[*2] If this operand is omitted, specify the dummy device or label.

A

■Applicable devices

Operand	Bit			Word				Double word		Indirect specification	Constant				Others
	X, Y, M, L, SM, F, B, SB, FX, FY	J□\□		T, ST, C, D, W, SD, SW, FD, R, ZR, RD	U□\G□, J□\□, U3E□\(H)G□	Z		LT, LST, LC	LZ		K, H	E	$		(U)
(U)[*1]	—	—		○	—	—		—	—	○	○	—	—		○
(s1)	—	—		○[*3]	—	—		—	—	○	—	—	—		—
(s2)	—	—		○[*3]	—	—		—	—	○	—	—	—		—
(s3)	—	—		○[*3]	—	—		—	—	○	—	—	—		—
(s4)	—	—		○[*3]	—	—		—	—	○	—	—	—		—
(s5)	—	—		○[*3]	—	—		—	—	○	—	—	—		—
(d)	○[*2]	—		○[*4]	—	—		—	—	—	—	—	—		—

*1 Index modification is not available.
*2 FX and FY cannot be used.
*3 FD cannot be used.
*4 T, ST, C, and FD cannot be used.

■Control data

Operand: (s1)					
Device	**Item**	**Description**		**Setting range**	**Set by**
+0	Completion status	The instruction completion status is stored. • 0: Completed successfully • Other than 0: Completed with an error (error code)		—	System
+1	Setting flag	Specify whether the setting data in (s2) to (s5) is valid/invalid. • 0: Invalid[*1] • 1: Valid b15 b14 b13 b12 b11 ••• b4 b3 b2 b1 b0 | 0 | 0 | (6) | (5) | 0 | | 0 | (4) | (3) | (2) | (1) | (1) Slave station setting data (s2) (2) Reserved station specification data (s3) (3) Error invalid station specification data (s4) (4) Automatic update buffer assignment data (s5) (5) Data link faulty station setting • 0: Data in the remote input (RX) is cleared. • 1: Data in the remote input (RX) is held. (6) CPU STOP time output setting • 0: Data is refreshed to the remote output (RY). • 1: Data, 0, is sent to the remote output (RY).		—	User
+2	Total number of connected stations	Specify the number of slave stations to be connected.		1 to 64	User
+3	Number of retries	Specify the number of retries to be performed for a communication error station.		1 to 7	User
+4	Number of automatic return stations	Specify the number of slave stations that can return by one link scan.		1 to 10	User
+5	Data link setting when CPU is down	Specify whether to stop or continue the data link when a stop error occurs in the CPU module. • 0: (Data link stopped) • 1: (Data link continued)		0, 1	User
+6	Scan mode setting	Specify whether the link scan is asynchronous or synchronous with the sequence scan. If it is synchronous, the output transmission delay time will shorten. • 0: (Asynchronous with a sequence scan) • 1: (Synchronous with a sequence scan)		0, 1	User

*1 The default value will be used for any setting data specified as invalid. For the default values, refer to the following.
☞ Page App. - 61 Slave station setting data
☞ Page App. - 61 Reserved station specification data
☞ Page App. - 61 Error invalid station specification data
☞ Page App. - 62 Automatic update buffer assignment data

■Slave station setting data

Operand: (s2)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0 to +63	Station information settings[1]	Specify the station number, the number of occupied stations, and the station type for each slave station. b15 ··· b12 b11 ··· b8 b7 ··· b0 | (3) | (2) | (1) | The default value range is 0101H to 0140H, meaning that the station number is 1 to 64, the number of occupied stations is 1 station occupied, and the station type is Ver.1-compatible remote I/O station.	—	User
		(1) Station number setting 1 to 64	01H to 40H	User
		(2) Number of occupied stations setting • 1H: 1 station occupied • 2H: 2 stations occupied • 3H: 3 stations occupied • 4H: 4 stations occupied	1H to 4H	User
		(3) Station type setting[2] • 0H: Ver.1-compatible remote I/O station • 1H: Ver.1-compatible remote device station • 2H: Ver.1-compatible intelligent device station • 5H: Ver.2-compatible remote device station (single) • 6H: Ver.2-compatible intelligent device station (single) • 8H: Ver.2-compatible remote device station (double) • 9H: Ver.2-compatible intelligent device station (double) • BH: Ver.2-compatible remote device station (quadruple) • CH: Ver.2-compatible intelligent device station (quadruple) • EH: Ver.2-compatible remote device station (octuple) • FH: Ver.2-compatible intelligent device station (octuple)	0H to FH	User

*1 Repeat this setting for the total number of connected stations.
*2 If a local station is specified, specify the intelligent device station.

■Reserved station specification data

Operand: (s3)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0 to +3	Reserved station specification	Specify a reserved station for each station.[1] • 0: Not specified • 1: Specified b15 b14 b13 b12 ··· b3 b2 b1 b0 (s3)+0 |16|15|14|13|···|4|3|2|1| (s3)+1 |32|31|30|29|···|20|19|18|17| (s3)+2 |48|47|46|45|···|36|35|34|33| (s3)+3 |64|63|62|61|···|52|51|50|49| The default value is "0: Not specified" for all stations.	—	User

*1 For two or more stations occupied, specify only the slave station start number.

■Error invalid station specification data

Operand: (s4)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0 to +3	Error invalid station specification	Specify an error invalid station for each station.[1][2] • 0: Not specified • 1: Specified b15 b14 b13 b12 ··· b3 b2 b1 b0 (s4)+0 |16|15|14|13|···|4|3|2|1| (s4)+1 |32|31|30|29|···|20|19|18|17| (s4)+2 |48|47|46|45|···|36|35|34|33| (s4)+3 |64|63|62|61|···|52|51|50|49| The default value is "0: Not specified" for all stations.	—	User

*1 For two or more stations occupied, specify only the slave station start number.
*2 If both the reserved and error invalid stations are specified for the same station, the reserved station specification will take priority.

■Automatic update buffer assignment data

Operand: (s5)				
Device	**Item**	**Description**	**Setting range**	**Set by**
+0 to +77	Automatic update buffer assignment specification	Specify the assigned buffer memory size (words) that is used for the transient transmission with the automatic update buffer that is performed to the local or intelligent device station.[1] • 0: Not specified • 1: Specified (s5)+0 — Dummy ⎤ (s5)+1 — Dummy ⎬ For the 1st module (s5)+2 — Automatic update buffer size ⎦ ⋮ (s5)+75 — Dummy ⎤ (s5)+76 — Dummy ⎬ For the 26th module (s5)+77 — Automatic update buffer size ⎦ The default value is 0080H.	0H (no setting), 0080H to 1000H[2]	User

[1] Beginning at the smallest station number, set the size for the slave stations for which the local or intelligent device station has been set with the slave station setting data ((s2)+0 to (s2)+63).

[2] The automatic update buffer size must be 1000H (4096) words or less in total. For the automatic update buffer size, specify the required size for each intelligent device station.

Processing details

- This instruction sets network parameters in the master station and starts up the data link.
- This instruction can be executed only for the master station.
- The following figure shows how the G(P).RLPASET instruction operates during execution.
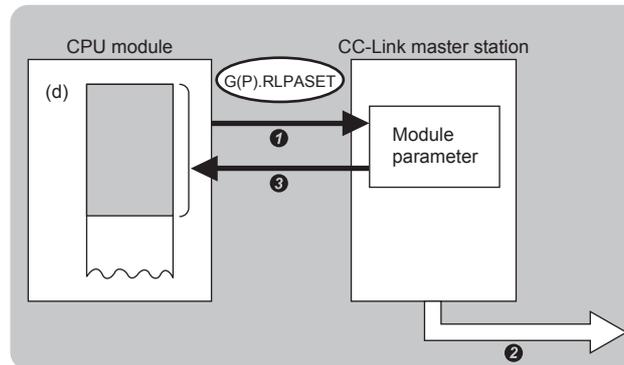
❶ The network parameters specified by (s1) to (s5) are written to the master station.

❷ The data link is started up.

❸ The device specified by (d) is turned on.

- Normal/error completion of the G(P).RLPASET instruction can be checked with the completion device specified by the setting data (d) and the completion status indication device (d)+1.

  - Completion device (d)
    This device turns on during END processing of the scan that arises upon completion of the G(P).RLPASET instruction, and turns off during the next END processing.

  - Completion status indication device (d)+1
    This device turns on or off depending on the status resulting from completion of the G(P).RLPASET instruction.
    When completed successfully: The device remains off.
    When completed with an error: The device turns on during END processing of the scan that arises upon completion of the G(P).RLPASET instruction, and turns off during the next END processing.

- After completion of the G(P).RLPASET instruction, turn on SB0003, a refresh instruction that is used for parameter change with the dedicated instruction, to start the cyclic data refresh.
  - If no stations are faulty

  - If all stations are faulty

Precautions

- Two or more G(P).RLPASET instructions cannot be executed concurrently.
- The G(P).RLPASET instruction is not available in a system containing a standby master station.
- Do not set network parameters using the engineering tool for modules for which network parameters are set using the G(P).RLPASET instruction. If the G(P).RLPASET instruction is executed for a module for which network parameters are set using the engineering tool, the instruction will be terminated with an error and the network parameter settings are not reflected.
- Stop the data link using "Data Link Stop" (SB0002) before executing the G(P).RLPASET instruction.

Operation error

Error code ((s1)+0)	Description
B000H to BFFFH	📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

Appendix 5 Precautions for Creating Programs

Interlock program

When creating a cyclic transmission program, provide an interlock circuit with 'Data link status of other stations' (SW0080 to SW0083).

Ex.

Devices used in the program example

Device	Description
X0	Module failure
X1	Own station data link status
XF	Module ready
SW0080.0	Data link status of other stations (station No.1)
SW0080.1	Data link status of other stations (station No.2)
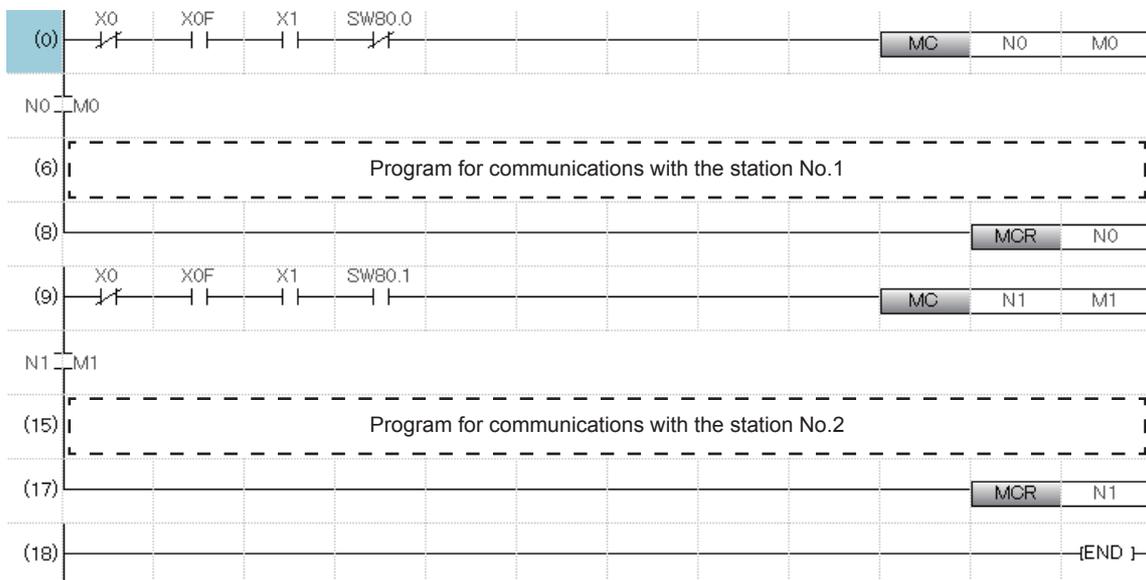
Appendix 6 List of I/O Signals and Remote Register Assignment of the AJ65BT-64AD

List of I/O signals

The AJ65BT-64AD uses 32 inputs and 32 outputs for data communications with the master module.

Signal direction: AJ65BT-64AD → Master module		Signal direction: Master module → AJ65BT-64AD	
Device No.	**Signal name**	**Device No.**	**Signal name**
RXn0	CH1 A/D conversion completed flag	RYn0	Offset/gain value selection
RXn1	CH2 A/D conversion completed flag	RYn1	Voltage/current selection
RXn2	CH3 A/D conversion completed flag	RYn4 ⋮ RY(n+1)7	Use prohibited
RXn3	CH4 A/D conversion completed flag		
RXn4 ⋮ RX(n+1)7	Use prohibited		
RX(n+1)8	Initial data processing request flag	RY(n+1)8	Initial data processing complete flag
RX(n+1)9	Initial data setting complete flag	RY(n+1)9	Initial data setting request flag
RX(n+1)A	Error flag	RY(n+1)A	Error reset request flag
RX(n+1)B	Remote READY	RY(n+1)B ⋮ RY(n+1)F	Use prohibited
RX(n+1)C ⋮ RX(n+1)F	Use prohibited		

n: Address assigned by the master module with the station No. setting

Point

If a "Use prohibited" device is turned on or off in a sequence program, the functions of the AJ65BT-64AD cannot be guaranteed.

A

Remote register assignment

Signal direction	Address	Description	Default
Master → Remote	RWwm	Averaging process setting	0
	RWwm+1	CH1 Time Average/Count Average	0
	RWwm+2	CH2 Time Average/Count Average	
	RWwm+3	CH3 Time Average/Count Average	
	RWwm+4	CH4 Time Average/Count Average	
	RWwm+5	Data format	0
	RWwm+6	A/D conversion enable/disable setting	0
	RWwm+7	Use prohibited	—
Remote → Master	RWrn	CH1 Digital output value	0
	RWrn+1	CH2 Digital output value	
	RWrn+2	CH3 Digital output value	
	RWrn+3	CH4 Digital output value	
	RWrn+4	Error code	0
	RWrn+5	Use prohibited	—
	RWrn+6		
	RWrn+7		

m, n: Address assigned by the master module with the station No. setting

Point

Do not read/write data from/to the use prohibited remote register areas. Otherwise, the functions of the AJ65BT-64AD cannot be guaranteed.

Appendix 7 List of I/O Signals and Remote Register Assignment of the AJ65BT-64DAV

List of I/O signals

The AJ65BT-64DAV uses 32 inputs and 32 outputs for data communications with the master station.

Signal direction: AJ65BT-64DAV → Master station		Signal direction: Master station → AJ65BT-64DAV	
Device No.	**Signal name**	**Device No.**	**Signal name**
RXn0 ⋮ RXnF	Use prohibited	RYn0	CH1 Analog output enable/disable flag
		RYn1	CH2 Analog output enable/disable flag
		RYn2	CH3 Analog output enable/disable flag
		RYn3	CH4 Analog output enable/disable flag
		RYn4	Offset/gain value selection
		RYn5 ⋮ RYnF	Use prohibited
RX(n+1)0 ⋮ RX(n+1)7	Use prohibited	RY(n+1)0 ⋮ RY(n+1)7	Use prohibited
RX(n+1)8	Initial data processing request flag	RY(n+1)8	Initial data processing complete flag
RX(n+1)9	Initial data setting complete flag	RY(n+1)9	Initial data setting request flag
RX(n+1)A	Error flag	RY(n+1)A	Error reset request flag
RX(n+1)B	Remote READY	RY(n+1)B	Use prohibited
RX(n+1)C	Use prohibited	RY(n+1)C	
RX(n+1)D		RY(n+1)D	
RX(n+1)E		RY(n+1)E	
RX(n+1)F		RY(n+1)F	

n: Address assigned by the master station with the station No. setting

Point

If a "Use prohibited" device is turned on or off in a sequence program, the functions of the AJ65BT-64DAV cannot be guaranteed.

A

Remote register assignment

Signal direction	Address	Description	Default
Master → Remote	RWwm	CH1 Digital value setting area	0
	RWwm+1	CH2 Digital value setting area	0
	RWwm+2	CH3 Digital value setting area	0
	RWwm+3	CH4 Digital value setting area	0
	RWwm+4	Analog output enable/disable setting area	0
	RWwm+5	Use prohibited	
	RWwm+6		
	RWwm+7		
Remote → Master	RWrn	CH1 Setting value check code	0
	RWrn+1	CH2 Setting value check code	0
	RWrn+2	CH3 Setting value check code	0
	RWrn+3	CH4 Setting value check code	0
	RWrn+4	Error code	0
	RWrn+5	Use prohibited	
	RWrn+6		
	RWrn+7		

m, n: Address assigned by the master station with the station No. setting

Point

Do not read/write data from/to the use prohibited remote register areas. Otherwise, the functions of the AJ65BT-64DAV cannot be guaranteed.

Appendix 8 List of I/O Signals and Remote Register Assignment of the FR-E520-0.1KN

List of I/O signals

Signal direction: FR-E520-0.1KN → Master		Signal direction: Master → FR-E520-0.1KN	
Device No. (input)	**Signal name**	**Device No. (output)**	**Signal name**
RXn0	Forward running	RYn0	Forward run command (STF)
RXn1	Reverse running	RYn1	Reverse run command (STR)
RXn2	Running (RUN)[2]	RYn2	RH terminal function[1]
RXn3	Up to frequency (SU)	RYn3	RM terminal function[1]
RXn4	Overload (OL)	RYn4	RL terminal function[1]
RXn5	Unused (Reserved for the system)	RYn5	Unused (Reserved for the system)[3]
RXn6	Frequency detection (FU)[2]	RYn6	
RXn7	Fault (ABC)[2]	RYn7	
RXn8	Unused (Reserved for the system)	RYn8	
RXn9		RYn9	Output stop[1]
RXnA		RYnA	Unused (Reserved for the system)[3]
RXnB		RYnB	
RXnC	Monitoring	RYnC	Monitor command
RXnD	Frequency setting completed (RAM)	RYnD	Frequency setting command (RAM)
RXnE	Frequency setting completed (E^{2}PROM)	RYnE	Frequency setting command (E^{2}PROM)
RXnF	Instruction code execution completed	RYnF	Instruction code execution request
RX(n+1)0	Unused (Reserved for the system)	RY(n+1)0	Unused (Reserved for the system)[3]
RX(n+1)1		RY(n+1)1	
RX(n+1)2		RY(n+1)2	
RX(n+1)3		RY(n+1)3	
RX(n+1)4		RY(n+1)4	
RX(n+1)5		RY(n+1)5	
RX(n+1)6		RY(n+1)6	
RX(n+1)7		RY(n+1)7	
RX(n+1)8		RY(n+1)8	
RX(n+1)9		RY(n+1)9	
RX(n+1)A	Error flag	RY(n+1)A	Error reset request flag
RX(n+1)B	Remote READY	RY(n+1)B	Unused (Reserved for the system)[3]
RX(n+1)C	Unused (Reserved for the system)	RY(n+1)C	
RX(n+1)D		RY(n+1)D	
RX(n+1)E		RY(n+1)E	
RX(n+1)F		RY(n+1)F	

n: Address assigned by the master station with the station No. setting

*1 With Pr.180 to Pr.183 (input terminal (remote output) signal function selection), the function of the signal can be changed. (However, for some functions, commands cannot be turned on or off from CC-Link.)
*2 With Pr.190 to Pr.192 (output terminal (remote input) function selection), output contents can be changed.
*3 Unused output signals need to be off (Enter 0.).

Point

If unused (reserved for the system) devices are turned on or off in a sequence program, the functions of the FR-E520-0.1KN cannot be guaranteed.

Remote register assignment

Signal direction	Address	Signal name	Description
Master → Remote	RWwm	Monitor code	Set the monitor code to be referenced. By turning on the RYC signal after setting, the specified monitored data is set to RWrn.
	RWwm+1	Set frequency	Specify the set frequency. At this time, whether it is written to RAM or E^{2}PROM is differentiated by the RYD and RYE signals. After setting the frequency to this register, turn on the RYD or RYE to write the frequency. On completion of frequency write, RXD or RXE turns on in response to the input command.
	RWwm+2	Instruction code	Set the instruction code for execution of operation mode rewrite, Pr. Read/write, error reference, error clear, and others. The corresponding instruction is executed by turning on RYF after completion of register setting. RXF turns on upon completion of instruction execution.
	RWwm+3	Write data	Set the data specified by the above instruction code if required. Turn on RYF after setting the above instruction code and this register. Set zero when the write code is not required.
Remote → Master	RWrn	Monitored value	The monitored value specified by RWwm (monitor code) is set.
	RWrn+1	Output frequency	The present output frequency is always set.
	RWrn+2	Reply code	The reply code corresponding to RWm+2 (instruction code) is set. 0 is set for a normal reply and a value other than 0 is set for a data error.
	RWrn+3	Read data	For a normal reply, the reply data to the instruction specified by the instruction code is set.

m, n: Address assigned by the master station with the station No. setting

Appendix 9 Exercise 5 (Connecting an Inverter)

In this exercise, set parameters for the CC-Link type inverter via CC-Link and operate the system.

Appendix 9.1 System configuration

The following figure shows the system configuration of the demonstration machine for Exercise 5.
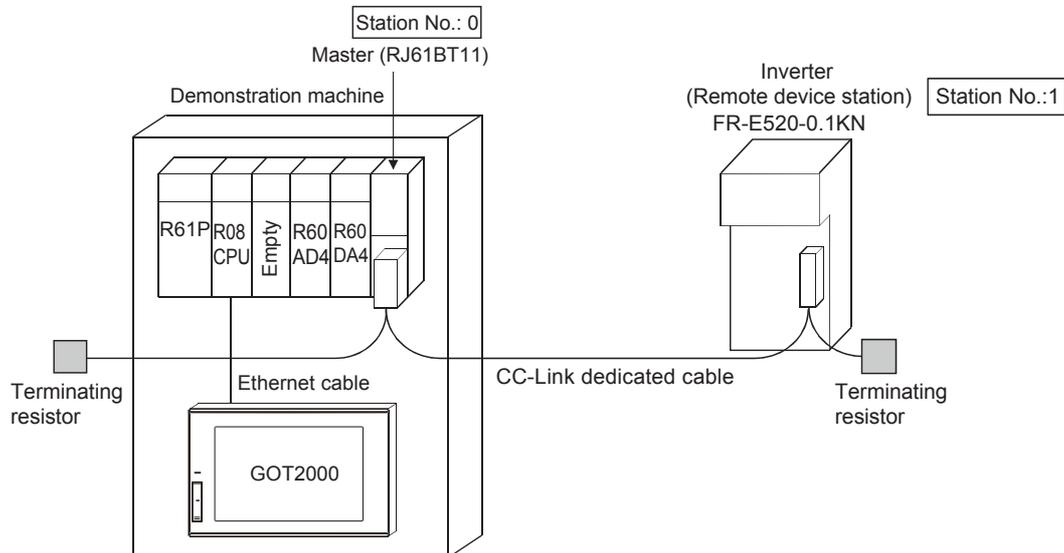
The CC-Link type inverter is handled as a remote device station.

A

Appendix 9.2 Setting and connecting the inverter

This section describes how to set and connect the general-purpose inverter (FR-E520-0.1KN) through CC-Link connection.

Setting the inverter

The following figure shows the settings of the FR-E520-0.1KN.

For details on the functions and specifications, refer to the manual for the inverter used.
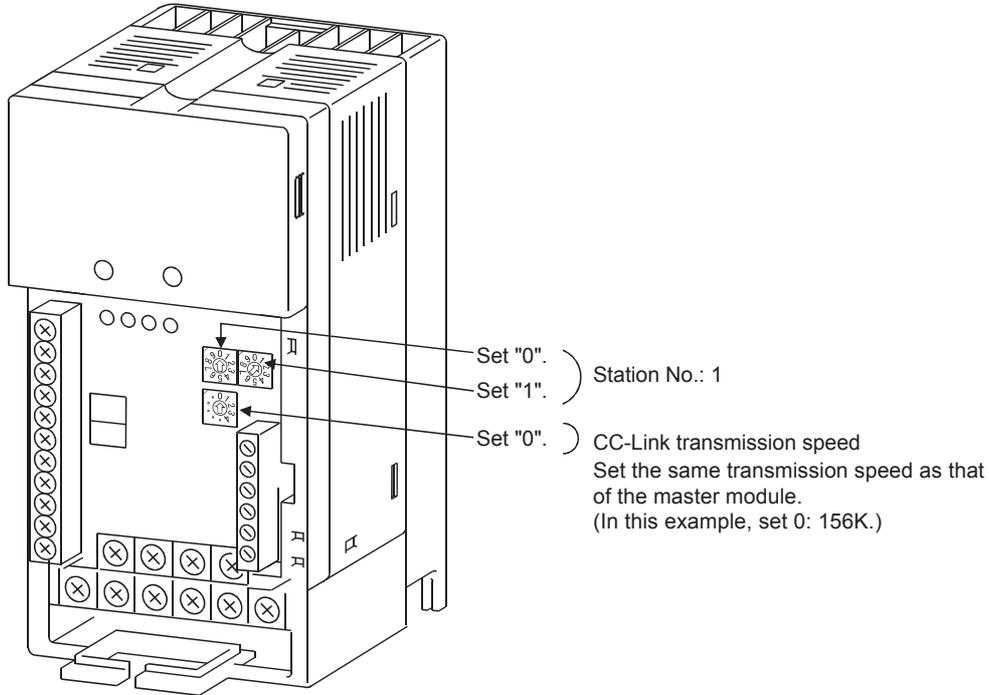
Set "0".
Set "1". } Station No.: 1

Set "0". } CC-Link transmission speed
Set the same transmission speed as that
of the master module.
(In this example, set 0: 156K.)

Connecting the inverter

The following figure shows the connections of CC-Link dedicated cables and terminating resistors.

Use connected wires to the three-phase 200V power supply.

Before connecting CC-Link dedicated cables and wiring the power supply, always shut off the power supply.

Master module (RJ61BT11)
Terminating resistor

NC
NC
SLD
FG
DA
DB
DG

Terminating resistor
Inverter (FR-E520-0.1KN)

DA
DB
DG
SLD
FG

CC-Link dedicated cable
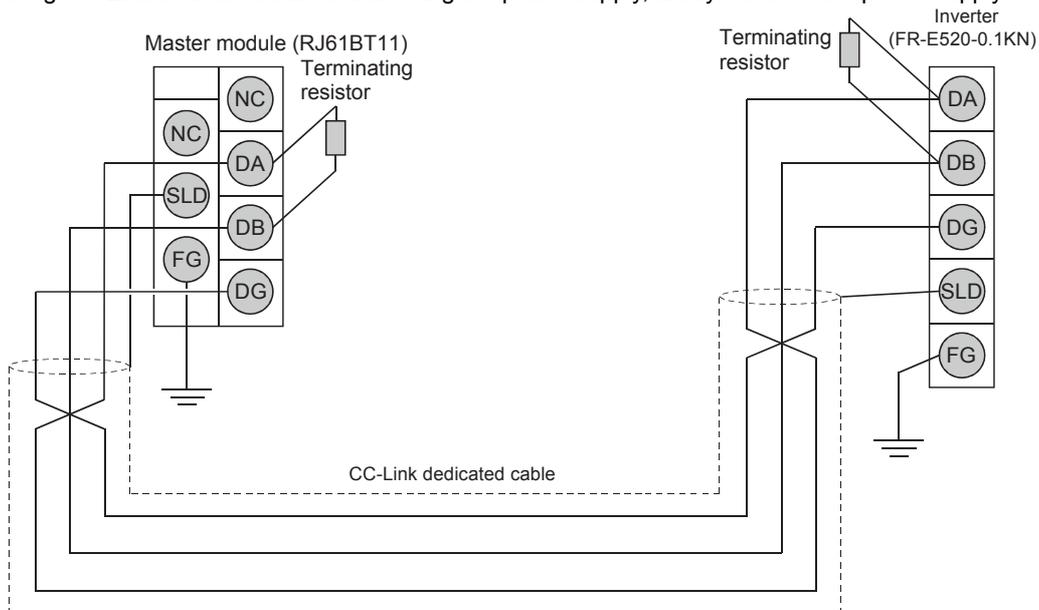
Appendix 9.3 Parameter settings

Set parameters of the master station.

After setting, write the parameters to the CPU module.

For how to write parameters, refer to Page 3 - 25 Writing parameters.

Parameter settings (master station)

Set parameters of the master station.

For how to set parameters, refer to Page 3 - 18 Parameter settings (master station).

Operating procedure
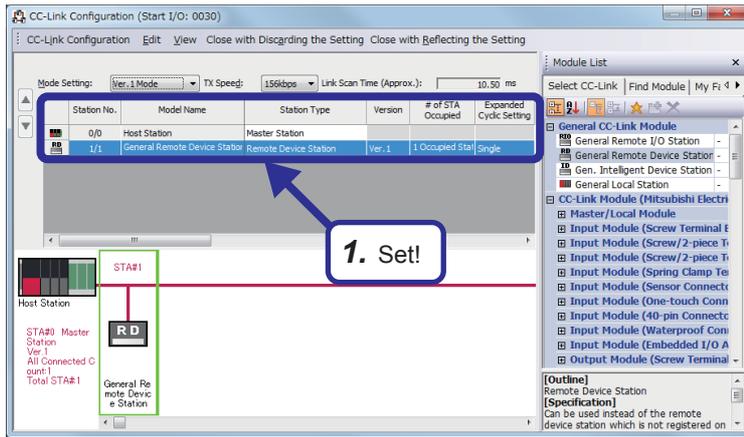
1. In the "CC-Link Configuration" dialog box, drag and drop the following modules from "Module List" to the list of stations or the network map.

"General CC-Link Module"
"General Remote Device Station"

2. Set the link refresh parameters as shown on the left.

(To the next page)

(From the previous page)

3. Click the [Apply] button to close the "RJ61BT11 Module Parameter" dialog box.

Appendix 9.4 Setting parameters of the inverter

Set all the required parameters of the inverter before operation.

The remote output (RY) and remote register (RWw) can be used to set the parameters of the CC-Link type inverter.

The following figure shows the overview of parameter settings via CC-Link.

For the I/O signals and remote register areas of the inverter FR-E500-0.1KN, refer to Page App. - 69 List of I/O Signals and Remote Register Assignment of the FR-E520-0.1KN.

For how to set the parameters with a parameter unit and details on each parameter, refer to the instruction manual for the inverter.
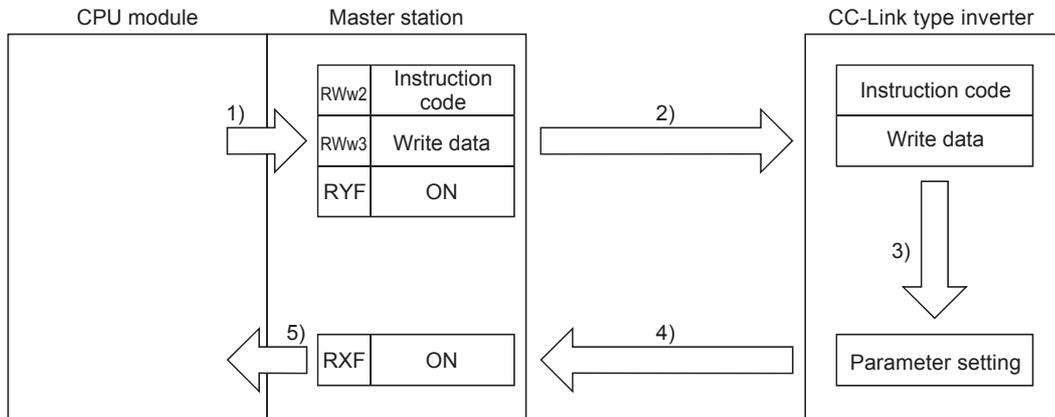
1) Set an instruction code and write data in the remote register with sequence programs and turn on the instruction code execution request signal (RYF).

2) The data is sent to the inverter by the data link.

3) Change the corresponding parameter value according to the instruction code.

4) Turn on the instruction code execution completed signal (RXF) at completion of writing.

5) Check the completion of writing with the instruction code execution completed signal.

*1 The instruction code depends on what needs to be executed by the inverter.
    <Example> Operation mode writing code: FBH
            Pr.4 Multi-speed setting (high speed) writing code: 84H

Appendix 9.5 Creating a sequence program

Refresh device assignment

The following figure shows the refresh relationship among the CPU module, buffer memory of the master station, and remote device stations.

■Remote input (RX) and remote output (RY)
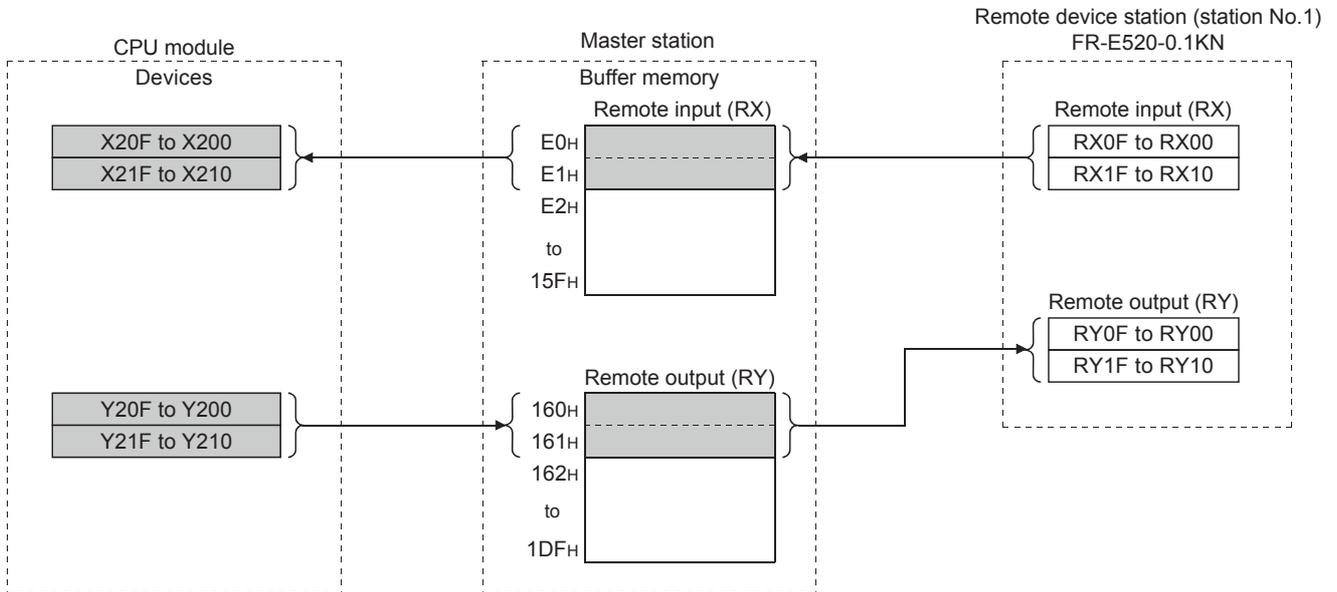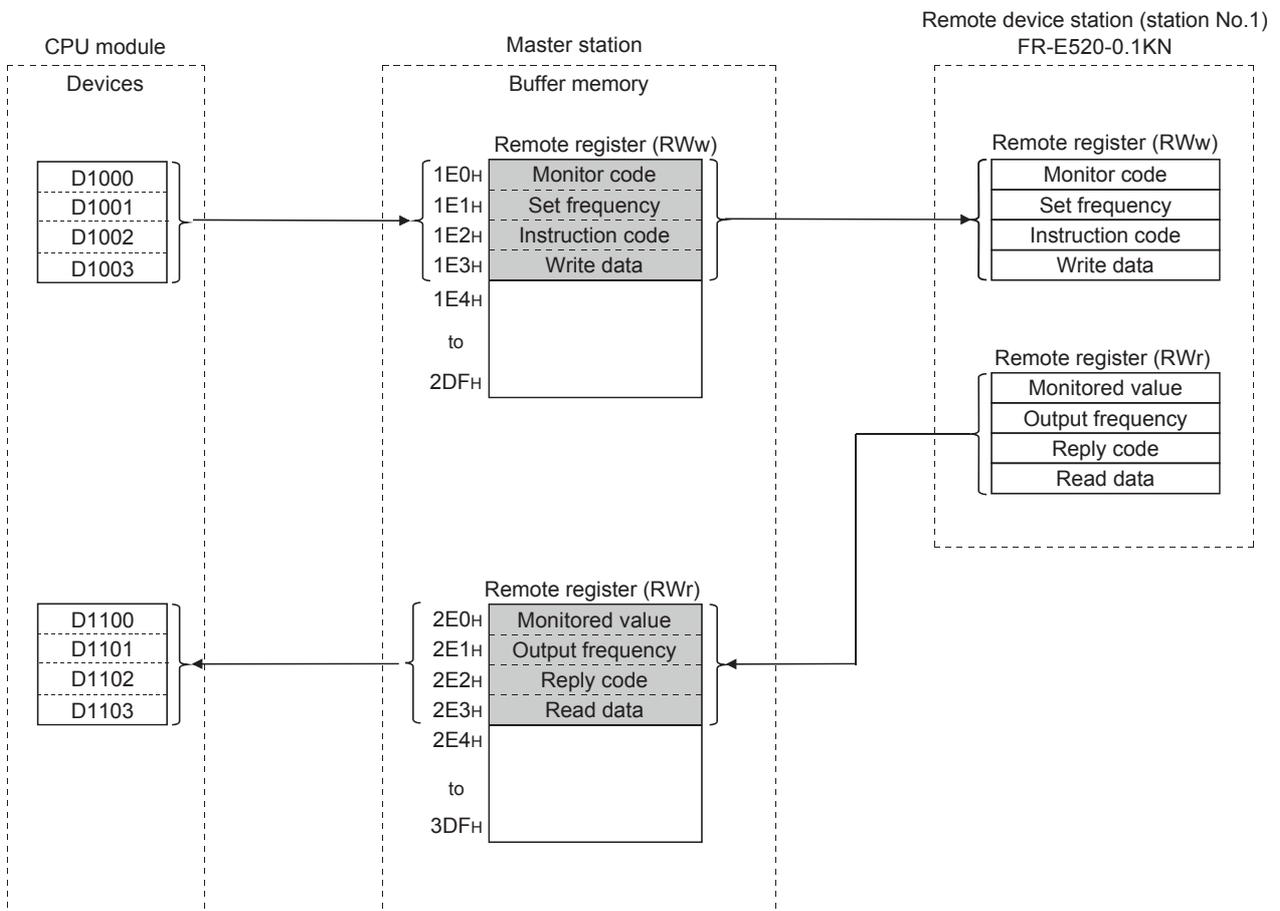
■Remote register (RWw, RWr)

Setting sheet

■Station information setting sheet

Station No.	Station type	No. of occupied stations	Reserved/invalid station specification	Intelligent buffer specification (word)		
				Send	Receive	Automatic update
1	Intelligent device station	1	No setting	—	—	—

■Device assignment table

Station No.	Device							
	RX → (X)		RY ← (Y)		RWw → (D)		RWr ← (D)	
	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side	Remote side	CPU side
1	0000 to 000F	00200 to 0020F	0000 to 000F	00200 to 0020F	0000 to 0003	1000 to 1003	0000 to 0003	1100 to 1103
	0010 to 001F	00210 to 0021F	0010 to 001F	00210 to 0021F				

A

Sequence program

Create the following sequence program and write it to the CPU module.

Project name	EX5

		1	2	3	4	5	6	7	8	9	10	11	12
1	(0)	X30 ⊣/⊢ Module failure	X3F ⊣⊢ Module ready	X31 ⊣⊢ Own station data link status	SW80.0 ⊣/⊢ Data link status of other stations						MC	N0	M800
2						SM413 ⊣⊢ 2 second clock							Y170 ◯ Flash this device when the own station data link is normally operating.
3		N0 — M800											
4	*Check other stations and display output frequency.												
5	(8)	SM400 ⊣⊢ Always On	SW80.0 ⊣⊢ Data link status of other stations										Y171 ◯ Display a station No.1 error.
6											MOV	D1101	D1
7	*Control program												
8	(16)	X21B ⊣⊢ Remote ready	X200 ⊣/⊢ Forward running	X201 ⊣/⊢ Reverse running									M0 ◯
9	(21)	SW80.0 ⊣/⊢ Data link status of other stations	M0 ⊣⊢	M1 ⊣/⊢	M5 ⊣/⊢	Y20F ⊣/⊢ Instruction code execution request	X20F ⊣/⊢ Instruction code execution completed				MOV	H84	D1002 Instruction code
10											MOV	K4000	D1003 Write data
11											SET		Y20F Instruction code execution request
12											SET		M1
13	*Operation mode change												
14	(33)	SW80.0 ⊣/⊢ Data link status of other stations	M0 ⊣⊢	M1 ⊣⊢	M5 ⊣/⊢	Y20F ⊣⊢ Instruction code execution request	X20F ⊣⊢ Instruction code execution completed				RST		Y20F Instruction code execution request
15						Y20F ⊣/⊢ Instruction code execution request	X20F ⊣/⊢ Instruction code execution completed				MOV	H0FB	D1002 Instruction code

	1	2	3	4	5	6	7	8	9	10	11	12
16										MOV	H0	D1003 Write data
17											SET	Y20F Instruction code execution request
18											RST	M1
19											SET	M5
20 (52)	SW80.0 —/— Data link status of other stations	M0 —| |—	M5 —| |—	M10 —/— Initial setting completed flag	Y20F —| |— Instruction code execution request	X20F —| |— Instruction code execution completed					RST	Y20F Instruction code execution request
21				Y20F —/— Instruction code execution request	X20F —/— Instruction code execution completed						SET	M10 Initial setting completed flag
22	*Write the set frequency.											
23 (64)	SW80.0 —/— Data link status of other stations	M0 —| |—	M10 —| |— Initial setting completed flag	M11 —/—	M20 —/—					MOV	K2000	D1001 Set frequency
24											SET	Y20D Frequency setting command (RAM)
25											SET	M11
26 (74)	SW80.0 —/— Data link status of other stations	M11 —| |—	M20 —/—	Y20D —| |— Frequency setting command (RAM)	X20D —| |— Frequency setting completed (RAM)					RST	Y20D Frequency setting command (RAM)
27											RST	M11
28											SET	M20
29	*Forward/reverse run command											
30 (82)	SW80.0 —/— Data link status of other stations	M20 —| |—	X102 —| |— Forward run command	X103 —/— Reverse run command	X201 —/— Reverse running						Y200 —( )— Forward run command (STF)

A

	1	2	3	4	5	6	7	8	9	10	11	12
31			X102 Forward run command	X103 Reverse run command	X200 Forward running							Y201 Reverse run command (STR)

32 *Output stop

	1	2	3	4	5	6	7	8	9	10	11	12
33	(95) X101 Stop command	X202 Running (RUN)	X200 Forward running								SET	Y209 Output stop
34			X201 Reverse running									
35	(102) X202 Running (RUN)	X200 Forward running	X201 Reverse running	Y200 Forward run command (STF)	Y201 Reverse run command (STR)						RST	Y209 Output stop

36 *Multi-speed setting

	1	2	3	4	5	6	7	8	9	10	11	12
37	(108) SW80.0 Data link status of other stations	M20	X104 Multi-speed setting 1	X105 Multi-speed setting 2								Y203 RM terminal function
38			X104 Multi-speed setting 1	X105 Multi-speed setting 2								Y202 RH terminal function
39			X104 Multi-speed setting 1	X105 Multi-speed setting 2								Y204 RL terminal function

40 *Error detection

	1	2	3	4	5	6	7	8	9	10	11	12
41	(123) X21A Error flag										PLS	M40
42	(127) M40									MOV	H74	D1002 Instruction code
43											SET	Y20F Instruction code execution request
44											SET	Y176
45	(132) Y176 Instruction code execution request	Y20F Instruction code execution completed	X20F								RST	Y20F Instruction code execution request

		1	2	3	4	5	6	7	8	9	10	11	12
46												SET	M41
47	*Error reset request												
48	(137)	M41 ⊣ ⊢	X21A ⊣ ⊢ Error flag	X100 ⊣ ⊢ Error reset request								SET	Y21A Error reset request flag
49	(142)	Y21A ⊣ ⊢ Error reset request flag	X21A ⊣/⊢ Error flag									RST	Y21A Error reset request flag
50													RST	Y176
51													RST	M41
52	(147)												MCR	N0
53	(148)													─[END]─

A

Appendix 9.6 Communications with the inverter

Switch operation of the demonstration machine

❶ Set the RUN/STOP/RESET switch of the CPU module to the RESET position (for approximately one second) to reset the CPU module.

❷ Set the RUN/STOP/RESET switch of the CPU module to the RUN position.
Y170 flashes depending on the own station data link status (X0A1) (Data link normal).
Y176 turns on due to an error in the inverter.
(An error occurs in the inverter by resetting the CPU module.)

❸ Turn on X100. (Inverter error reset request)
Y176 turns off. (Station No.1: Normal)

❹ Turn on X102.
Forward run starts at the set frequency (20.00Hz) of E^{2}PROM.
D1 digital display displays "2000" (output frequency).

❺ Turn on X104. (X102 is on, X103 is off, X104 is on, and X105 is off.)
Forward running at the frequency of the initial value of the parameter (multi-speed setting (middle speed)) (30.00Hz)
D1 digital display displays "3000" (output frequency).

❻ Turn on X105. (X102 is on, X103 is off, X104 is on, and X105 is on.)
Forward running at the frequency written in the parameter (multi-speed setting (high speed)) (40.00Hz)
D1 digital display displays "4000" (output frequency).

❼ Turn off X104. (X102 is on, X103 is off, X104 is off, and X105 is on.)
Forward running at the frequency of the initial value of the parameter (multi-speed setting (low speed)) (10.00Hz)

❽ Turn on X101.
The frequency output of the inverter stops.
(The motor coasts to a stop.)
* To decelerate the motor to stop, turn off X102 (Forward run command) and X103 (Reverse run command).

Appendix 10 Standby Master Function

If the master station goes down due to an error in a CPU module, power supply, or others, switching the control to the standby master station (a backup station for the master station) continues data link. This function is used not to stop the entire system even if the master station goes down.

Type

The standby master function can be categorized into three types as listed below.

○: Enabled, ×: Disabled

Function	When the master station goes down, the standby master station continues data link.	When a failed master station becomes normal again, it returns in case of the standby master station going down.	When only a standby master station is started up, it starts data link.	Setting of "Station Type" in the module parameters	
				Master station	Standby master station
Master station switching function	○	×	×*1	Master station	Standby master station
Master station duplex function	○	○	×*1	Master station (duplex function)	Standby master station
Data link startup by standby master station*2	○	○	○	Master station (duplex function)	Master station (duplex function)

*1 A standby master station does not start data link until the master station starts up.
*2 Set the same system for the master station and standby master station (same modules connected, module parameters, and program).

Operation

For the operation of the standby master function, refer to 1 - 3 Page (10) Standby master function.

Setting method

Set the standby master function in the module parameters of the engineering tool.

For details, refer to the following.

📖 MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application)

(1) Setting of the master station

Set "Station Type" in the module parameters.

When the failed master station returns: Master station (duplex function)

When the failed master station does not return: Master station
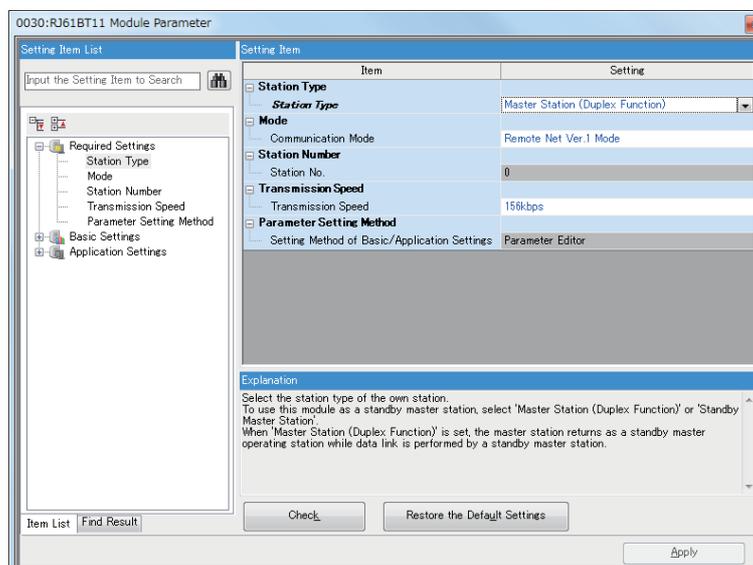
(2) Setting of the standby master station

Set "Station Type" to "Standby Master Station" in the module parameters.

Set "Mode" according to the mode setting of the master station.
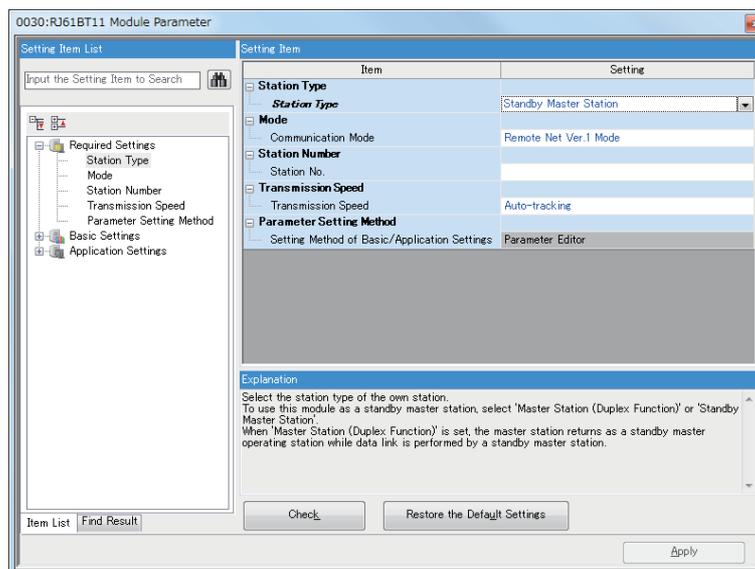
Precautions

(1) The number of standby master stations

One standby master station can be connected in one system.

(2) Data link control of a standby master station

When a master station goes down, data link control is automatically transferred to a standby master station. Note that an instruction to refresh cyclic data is not issued. Use the link special relay (SB) and link special register (SW) to issue a refresh instruction.

After the instruction is issued, information before a master station error is detected is output to each station.

(3) Change in the module parameter settings of the master station

While data link is performed by a standby master station, the module parameter settings of the master station cannot be changed.

(4) Station number setting for a standby master station

If the station number of the standby mater station differs from that set in "Standby master station number" of the module parameter for the master station, an error (error code: B39A) occurs in the standby master station. If an error has occurred, reset the CPU module of the standby master station after changing the module parameter settings of the master station or changing the station number of the standby master station.

(5) If the terminal block of the master station is removed while the master station is controlling data link

If the terminal block of the master station is removed without powering off the master station and reconnected, both of the master station and standby master station will perform master operation because the right of controlling data link is transferred to the standby master station; therefore, communications cannot be normally performed.

By powering off the master station and reconnecting the terminal block and powering on the master station, the master station is reconnected as standby master station operation; therefore, communications can be normally performed.

(6) The status of an LED when data link control is transferred to a standby master station

When the master station goes down and the standby master station starts to take in control of data link, the ERR. LED on the standby master station flashes. The station number of the standby master station is changed from the one set in the module parameters to the station number 0, and the standby master station is regarded that it is not connected. Data link is normally performed.

To prevent this situation, set the standby master station as an error invalid station.

(7) Number of points and range of devices to save data using a program
The points and range of devices where data from a master station (station operating as a master station) to a standby master station (station operating as a standby master station) are saved using a program vary depending on the system.

(8) If an error is detected in the master station in the initial status (before data link is started)
Data link control is not switched to the standby master station and data link is not started. (This applies only to the master station switching function and master station duplex function.)

(9) When the data link startup by standby master station is used
• Parameters and program set in the master station and standby master station
Set the same module parameters and program in the master station and standby master station. If not, the operation is not guaranteed.
• Line test
When the data link startup by standby master station is used, a line test cannot be executed using the mode setting. Use an engineering tool to execute a line test.

(10) Processing that sets the link devices saved at master switching and refresh instruction at standby master switching
After saving the link devices, wait a fixed number of scans and execute the processing that sets the link devices saved at master switching and 'Refresh instruction at standby master switching' (SB0001).
The number of scans for waiting after saving the link devices differs depending on the mode setting. Use the following values.

Mode setting	Number of scans for waiting	Remarks
• Remote net Ver.1 mode • Remote device net Ver.1 mode • Remote I/O net mode	Fixed to 0	—
• Remote net Ver.2 mode • Remote device net Ver.2 mode	(Link scan time ÷ Sequence scan time) (Rounded up to the nearest integer) × 4	• For link scan time, use the maximum value after master switching. • For sequence scan time, use the minimum value after master switching.

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MEMO

Mitsubishi Programmable Controllers Training Manual
CC-Link (for GX Works3)

MODEL	
MODEL CODE	
SH(NA)081676ENG-A (1711) MEE	

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