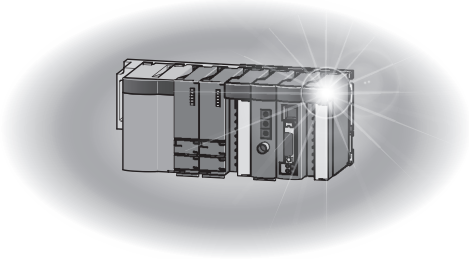
MITSUBISHI ELECTRIC

Mitsubishi Programmable Controller

MELSEC Q series

MELSEC-Q CC-Link System Master/Local Module User's Manual

-QJ61BT11N



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●SAFETY PRECAUTIONS●

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the user's manual for the CPU module used.

In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠WARNING

- For the operating status of each station after a communication failure in the data link, refer to Page 121, Section 7.5 in this manual. Failure to do so may result in an accident due to an incorrect output or malfunction.
- When connecting a peripheral with the CPU module or connecting an external device, such as a personal computer, with an intelligent function module to modify data of a running programmable controller, configure an interlock circuit in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification or operating status change) of a running programmable controller, read the relevant manuals carefully and ensure that the operation is safe before proceeding. Especially, when a remote programmable controller is controlled by an external device, immediate action cannot be taken if a problem occurs in the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.
- Do not write any data to the "system area" of the buffer memory in the intelligent function module. Also, do not use any "use prohibited" signal as an output signal from the CPU module to the intelligent function module. Doing so may cause malfunction of the programmable controller system.

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[Design Precautions]

⚠ WARNING

- To set a refresh device in the network parameter, select the device Y for the remote output (RY) refresh device ("Remote Output (RY)"). If a device other than Y, such as M and L, is selected, the CPU module holds the device status even after its status is changed to STOP. For how to stop data link, refer to Page 320, Section 11.4.5 in this manual.
- If a CC-Link dedicated cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock circuit in the program to ensure that the entire system will always operate safely even if communications fail. Failure to do so may result in an accident due to an incorrect output or malfunction.

[Design Precautions]

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.

[Installation Precautions]

⚠ CAUTION

- Use the programmable controller in an environment that meets the general specifications in the user's manual for the CPU module used. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place. Incorrect mounting may cause malfunction, failure or drop of the module. When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
  Tighten the screws within the specified torque range. Undertightening can cause drop of the screw, short circuit or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction. Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in damage to the product.
- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may result in damage to the product.
- Do not directly touch any conductive parts and electronic components of the module. Doing so can cause malfunction or failure of the module.

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[Wiring Precautions]

⚠ WARNING

- Shut off the external power supply (all phases) used in the system before installation and wiring. Failure to do so may result in electric shock or damage to the product.
- After wiring, attach the included terminal cover to the module before turning it on for operation. Failure to do so may result in electric shock.

[Wiring Precautions]

⚠ CAUTION

- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Tighten the terminal screws within the specified torque range. Undertightening can cause short circuit, fire, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Failure to do so may result in malfunction due to noise.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.
- Use CC-Link dedicated cables for a CC-Link system. If not, the performance of the CC-Link system is not guaranteed. For the maximum station-to-station distance and the overall cable distance, follow the specifications in Page 29, Section 3.2.2 to Page 30, Section 3.2.3. If not, normal data transmission is not guaranteed.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- When disconnecting the cable from the module, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. For the cable connected to the terminal block, loosen the terminal screw. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.

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[Startup and Maintenance Precautions]

⚠ WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal screws or module fixing screws. Failure to do so may result in electric shock or cause the module to fail or malfunction. Undertightening can cause drop of the screw, short circuit or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

[Startup and Maintenance Precautions]

⚠ CAUTION

- Do not disassemble or modify the modules. Doing so may cause failure, malfunction, injury, or a fire.
- Shut off the external power supply (all phases) used in the system before mounting or removing the module. Failure to do so may cause the module to fail or malfunction.
- After the first use of the product, do not mount/remove the module to/from the base unit, and the terminal block to/from the module more than 50 times (IEC 61131-2 compliant) respectively. Exceeding the limit of 50 times may cause malfunction.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.

[Disposal Precautions]

⚠ CAUTION

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

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●CONDITIONS OF USE FOR THE PRODUCT●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

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INTRODUCTION

Thank you for purchasing the Mitsubishi MELSEC-Q series programmable controllers.
This manual describes the operating procedure, system configuration, installation, wiring, settings, functions, programming, and troubleshooting of the QJ61BT11N CC-Link system master/local module (hereafter abbreviated as master/local module).

Before using this product, please read this manual carefully and develop familiarity with the functions and performance of the MELSEC-Q series programmable controller to handle the product correctly.
When applying the program examples introduced in this manual to an actual system, ensure the applicability and confirm that it will not cause system control problems.

Please make sure that the end users read this manual.

Remark

Operating procedures are explained using GX Works2. When using GX Developer, refer to Page 401, Appendix 7.

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- QCPU User's Manual (Hardware Design, Maintenance and Inspection)
- Safety Guidelines (This manual is included with the CPU module or base unit.)

The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

(2) Additional measures

To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

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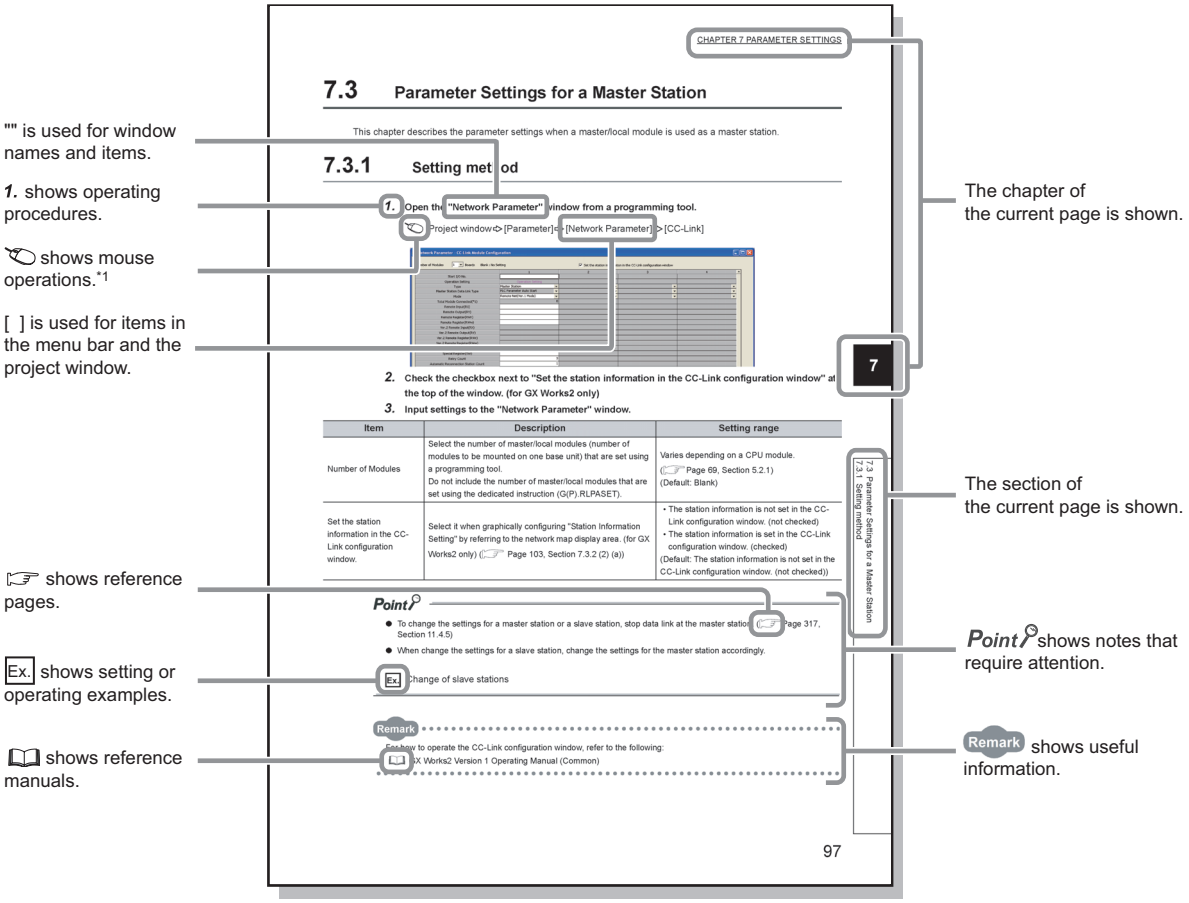
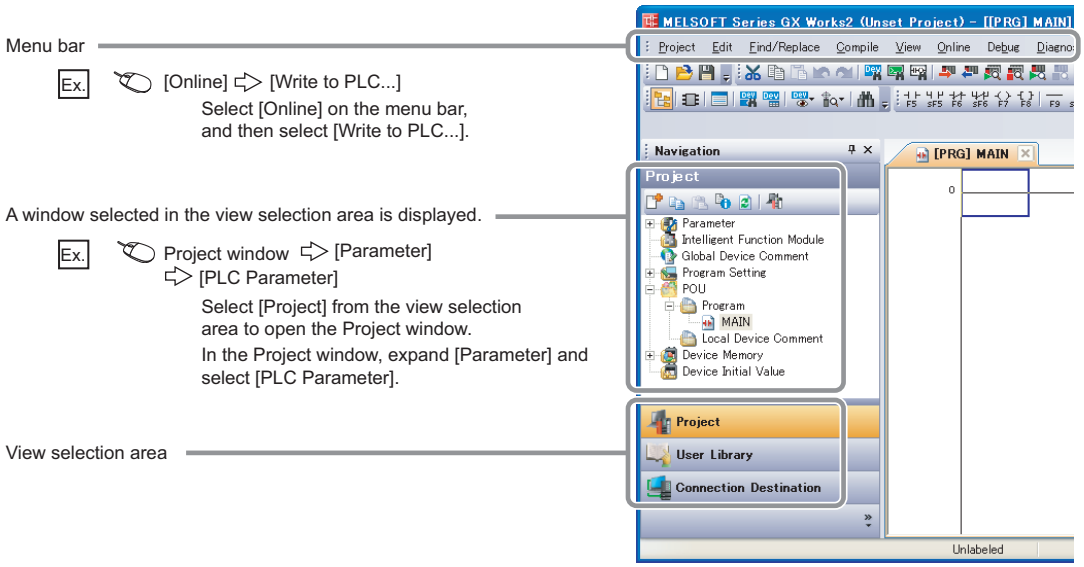
MANUAL PAGE ORGANIZATION

In this manual, pages are organized and the symbols are used as shown below.
The following illustration is for explanation purpose only, and should not be referred to as an actual documentation.



*1 The mouse operation example is provided below.



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TERM

Unless otherwise specified, this manual uses the following terms.

Term	Description
ACPU	A generic term for the following CPU modules: AOJ2HCPU, A1SCPU, A1SHCPU, A1SJCPU-S3, A1SJHCPU, A2SCPU, A2SHCPU, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A1NCPU, A2NCPU, A2NCPU-S1, A3NCPU, A2ACPU, A2ACPU-S1, A3ACPU, A2UCPU, A2UCPU-S1, A3UCPU, and A4UCPU
AJ65BT-R2(N)	A generic term for the CC-Link system RS-232 interface modules: AJ65BT-R2 and AJ65BT-R2N
AnUCPU	A generic term for the A2USCPU, A2USCPU-S1, A2USHCPU-S1, A2UCPU, A2UCPU-S1, A3UCPU, and A4UCPU
CC-Link dedicated cable	A generic term for a Ver.1.10-compatible CC-Link dedicated cable, CC-Link dedicated cable (Ver.1.00-compatible), and CC-Link dedicated high-performance cable (Ver.1.00-compatible)
C Controller module	A generic term for the Q06CCPU-V, Q06CCPU-V-B, Q12DCCPU-V, Q24DHCCPU-V, and Q24DHCCPU-LS
Built-in Ethernet port QCPU	A generic term for the Q03UDVCPU, Q03UDECPU, Q04UDVCPU, Q04UDEHCPU, Q06UDVCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDVCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDVCPU, Q26UDEHCPU, Q50UDEHCPU, and Q100UDEHCPU
QCPU	A generic term for the Basic model QCPU, High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU
QnACPU	A generic term for the following CPU modules: Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q2ACPU, Q2ACPU-S1, Q3ACPU, Q4ACPU, and Q4ARCPU
RAS	The abbreviation for Reliability, Availability, and Serviceability. This term refers to usability of automated equipment.
Remote input (RX)	Bit data input from a slave station to the master station (For some areas in a local station, data are input in the opposite direction.)
Remote output (RY)	Bit data output from the master station to a slave station (For some areas in a local station, data are 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 are input 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 are output in the opposite direction.)
Link special relay (SB)	Bit data that indicates the operating status and data link status of modules on the master and local stations
Link special register (SW)	Word data that indicates the operating status and data link status of modules on the master and local stations
Ver.1-compatible slave station	A slave station that supports the remote net Ver.1 mode
Ver.2-compatible slave station	A slave station that supports the remote net Ver.2 mode
Intelligent device station	A station, such as the AJ65BT-R2(N), 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 MELSEC-Q/L series module that has functions other than input and output, such as an A/D converter module and D/A converter module
Cyclic transmission	A function by which data are periodically exchanged among stations on the same system using link devices (RX, RY, RWw, and RWr)
Data link	A generic term for cyclic transmission and transient transmission
Device	A device (X, Y, M, D, or others) in a CPU module
Transient transmission	A function of communication with another station, which is used when requested by a dedicated instruction or a programming tool
High Performance model QCPU	A generic term for the Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, and Q25HCPU
Buffer memory	The memory of an intelligent function module used to store data (such as setting values and monitored values) for communication with a CPU module
Buffer memory address	An address that indicates the storage location of data assigned to the buffer memory in an intelligent function module
Programming tool	A generic term for GX Works2 and GX Developer
Process CPU	A generic term for the Q02PHCPU, Q06PHCPU, Q12PHCPU, and Q25PHCPU
Basic model QCPU	A generic term for the Q00JCPU, Q00CPU, and Q01CPU
Master/local module	The abbreviation for the QJ61BT11N CC-Link system master/local module
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.
Message transmission	A function to communicate data between a master station and slave stations when the model names of slave stations are read, the data are backed up/restored, or the dedicated instructions are requested

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Term	Description
Universal model QCPU	A generic term for the following CPU modules: Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q03UDVCPU, Q03UDECPU, Q04UDHCPU, Q04UDVCPU, Q04UDEHCPU, Q06UDHCPU, Q06UDVCPU, Q06UDEHCPU, Q10UDHCPU, Q10UDEHCPU, Q13UDHCPU, Q13UDVCPU, Q13UDEHCPU, Q20UDHCPU, Q20UDEHCPU, Q26UDHCPU, Q26UDVCPU, Q26UDEHCPU, Q50UDEHCPU, and Q100UDEHCPU
High-speed Universal model QCPU	A generic term for the Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, and Q26UDVCPU
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, such as the AJ65BTB1-16D and AJ65SBTB1-16D, that exchanges I/O signals (bit data) with another station by cyclic transmission. This station cannot perform transient transmission.
Remote device station	A station, such as the AJ65BT-64AD, AJ65BT-64DAV, and AJ65BT-64DAI, that exchanges I/O signals (bit data) and I/O data (word data) with another station by cyclic transmission. This station cannot perform transient transmission.
Remote net Ver.1 mode	A mode used to configure a CC-Link system consisting of a master station and Ver.1-compatible slave station(s) only
Remote net Ver.2 mode	A mode used to configure a CC-Link system containing a Ver.2-compatible slave station. 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 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 three modes: remote net Ver.1 mode, remote net Ver.2 mode, and remote net additional mode.
Remote net additional mode	A mode used to increase the number of cyclic points by adding a Ver.2-compatible slave station to an existing system consisting of Ver.1-compatible slave stations only. Programs in the remote net Ver.1 mode can be used without change because RX/RY/RWr/RWw data of a Ver.1-compatible slave station are stored in the Ver.1-compatible buffer memory areas.
Remote station	A generic term for a remote I/O station and a remote device station
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.
Local station	A station that performs cyclic transmission and transient transmission with the master station and other local stations. The station is controlled by programs in the CPU module or other equivalent modules on the station.
Disconnection	Processing that stops data link if a data link error occurs
Slave station	A generic term for a remote I/O station, remote device station, local station, intelligent device station, and standby master station
Dedicated instruction	An instruction that simplifies programming for using functions of intelligent function modules
Standby master station	A station that serves as a master station to continue communications if the master station fails
Redundant CPU	A generic term for the Q12PRHCPU and Q25PRHCPU
Return	Processing that restarts data link when a station recovers from an error

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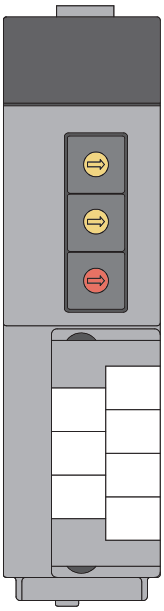
PACKING LIST

The following items are included in the package of this product. Before use, check that all the items are included.

QJ61BT11N



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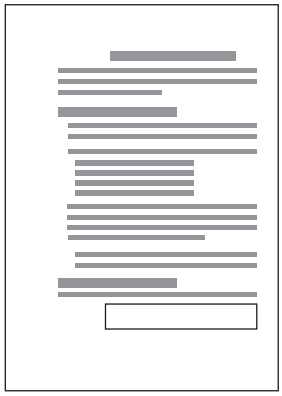
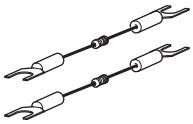
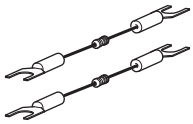


Before Using the Product



Terminating resistor: 110Ω,
1/2W (Brown-Brown-Brown) × 2
(for Ver.1.10-compatible CC-Link dedicated cables or CC-Link dedicated cables (Ver.1.00-compatible))



Terminating resistor: 130Ω,
1/2W (Brown-Orange-Brown)× 2
(for CC-Link dedicated high-performance cables (Ver. 1.00-compatible))

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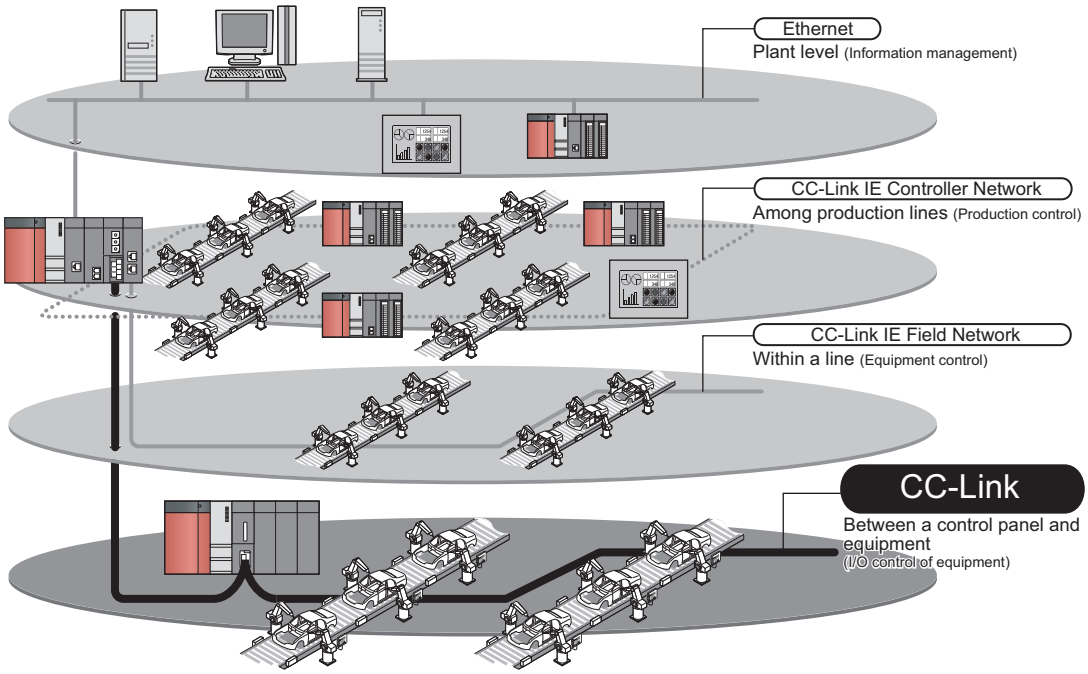
CHAPTER 1 FEATURES

1.1 CC-Link

CC-Link is a system where distributed modules, such as I/O modules and intelligent function modules, are connected using dedicated cables, enabling a CPU module to control the modules.



(1) High-speed communications

On/off information of I/O signals and values can be smoothly exchanged at high speed. This feature allows the configuration of a variety of systems.

(2) System with reduced wiring

Because modules can be distributed in large equipment, such as conveyor lines and machines, a system with reduced wiring can be achieved.

(3) Flexible system design

Various CC-Link devices manufactured by partner vendors are available. Therefore, a system can be flexibly designed according to application.

(4) Configuration of a distributed system

By connecting multiple programmable controllers to a CC-Link system, a simple distributed system can be configured. The multiple programmable controllers can perform data link with remote stations and intelligent device stations and can control distributed devices in a CC-Link system.

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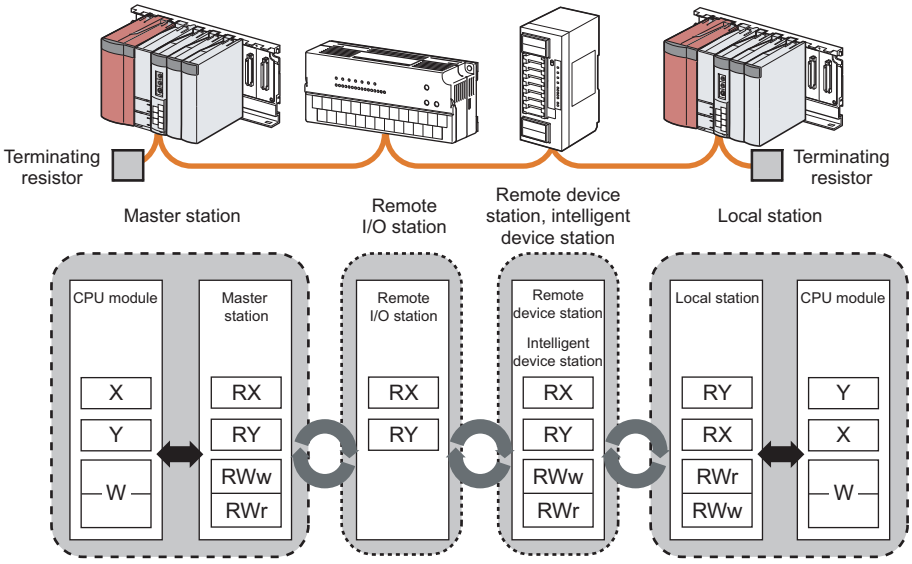
1.2 Master/Local Modules

By using master/local modules, MELSEC-Q series programmable controllers can be connected to a CC-Link system. Remotely-located devices in a CC-Link system can be controlled as if they were on the same base unit as the master/local module.
The module works as a master station or a local station in CC-Link.

(1) Data communications

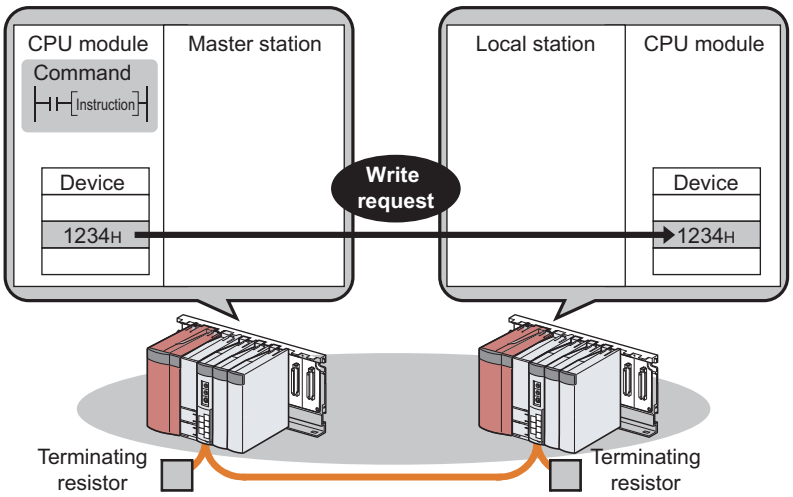
(a) Periodic communications (cyclic transmission)

Master/local modules can periodically exchange data with other stations in a CC-Link system. (☞Page 125, Section 8.1.1)
For example, I/O signals of remotely-located stations in a CC-Link system can be used in the same way as those of the master station.



(b) Non-periodic communications (transient transmission)

Data can be communicated when a request is issued unlike cyclic transmission.
Direct access to buffer memory areas and devices in other stations can be performed in transient transmission. (☞Page 173, CHAPTER 9)



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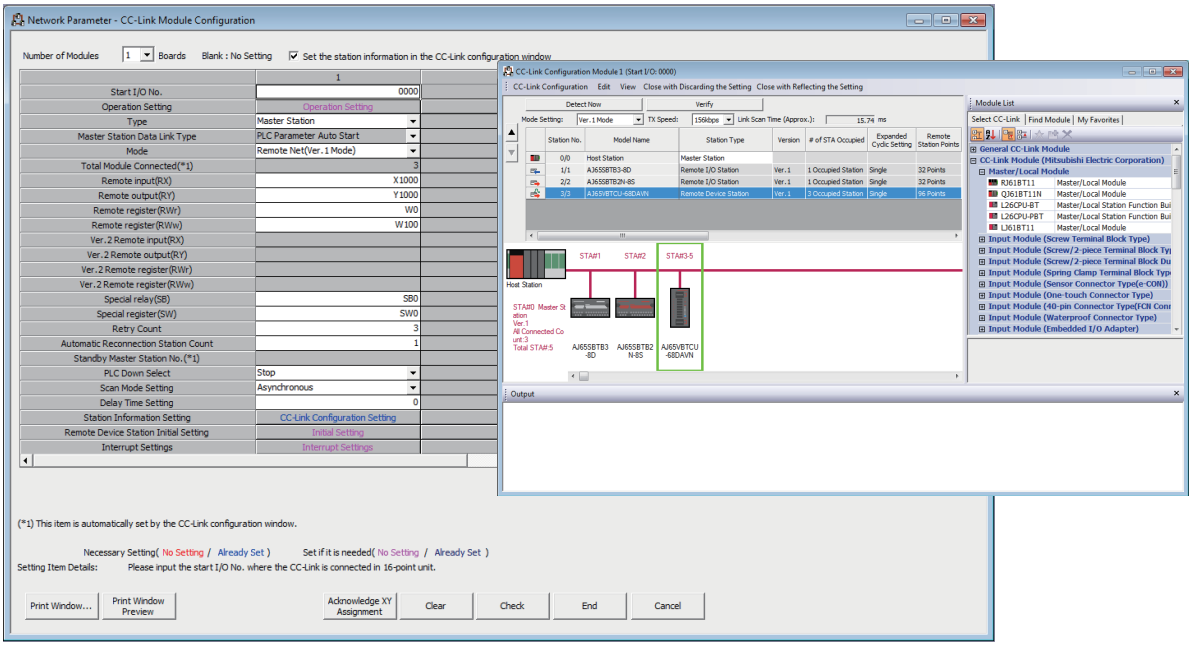
(2) Parameter settings and diagnostics using a programming tool

(a) Parameter settings using a programming tool

Parameters of master/local modules can be set using a programming tool. Therefore, parameter setting programs need not to be created; resulting in reduction in the program amount. (☞Page 93, CHAPTER 7)



Parameters of a master station can be also set using a program. (☞Page 205, Section 9.8)
When parameters are set using a program, parameter settings of the master station can be changed without resetting the CPU module.

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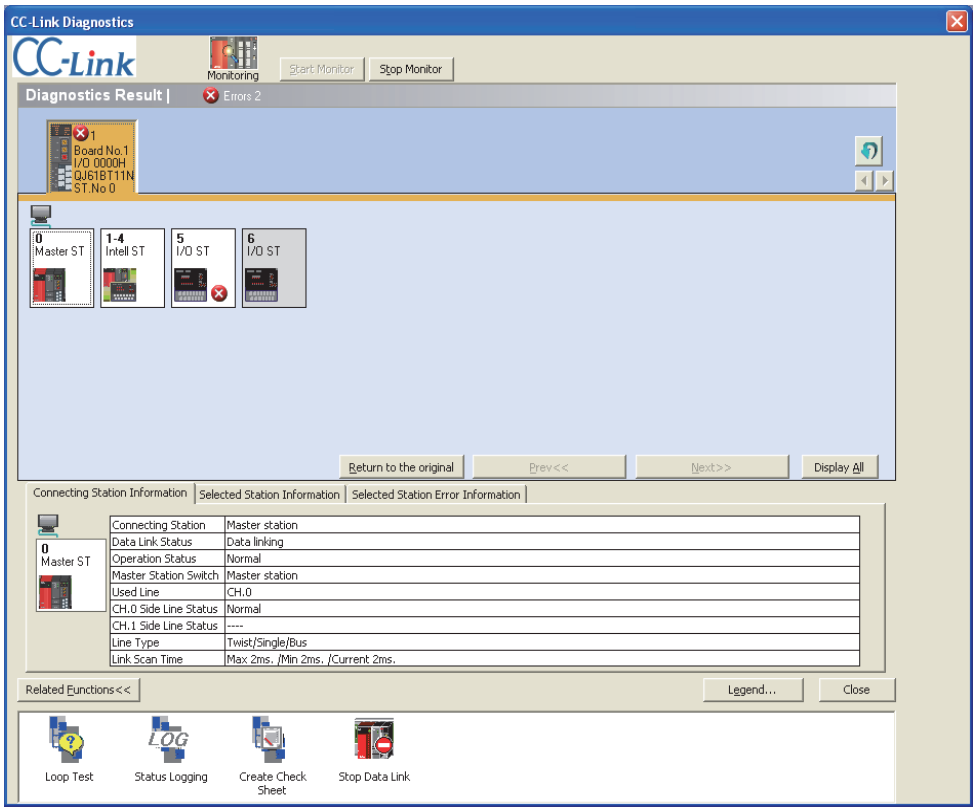
(b) Diagnostics using a programming tool

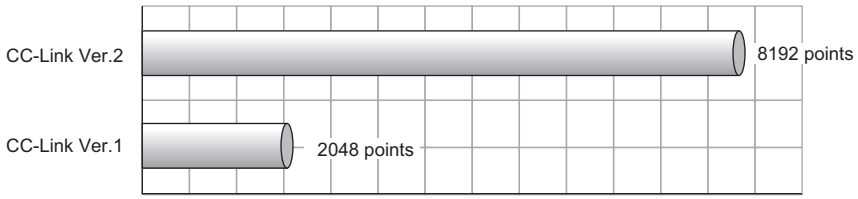
The status of a CC-Link system can be checked using a programming tool. Error locations and error causes are displayed in a programming tool, enabling the user to quickly troubleshoot the problem. (☞ Page 311, Section 11.4)



(3) CC-Link Ver.2-compatible module

Since the master/local module is a CC-Link Ver.2-compatible module, the number of points per system can be increased up to 8192 for RX/RY and the number of words is up to 2048 for RWr/RWw. On a station basis, the number of points can be increased up to 896 for RX/RY and the number of words is 128 for RWr/RWw.
A CC-Link Ver.2-compatible system can be larger than a CC-Link Ver.1-compatible system.

Ex. Maximum number of points of the remote input (RX) and remote output (RY)



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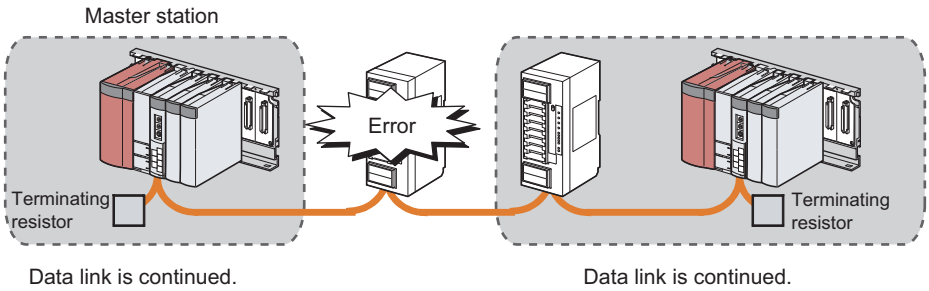
(4) Prevention of a system failure

(a) Continuation of communications upon module error

- Since a bus topology is employed, communications among normal modules continue even if a module goes down due to power-off or other causes.
- The equipped two-piece terminal block is removable, enabling module change during data link.*1

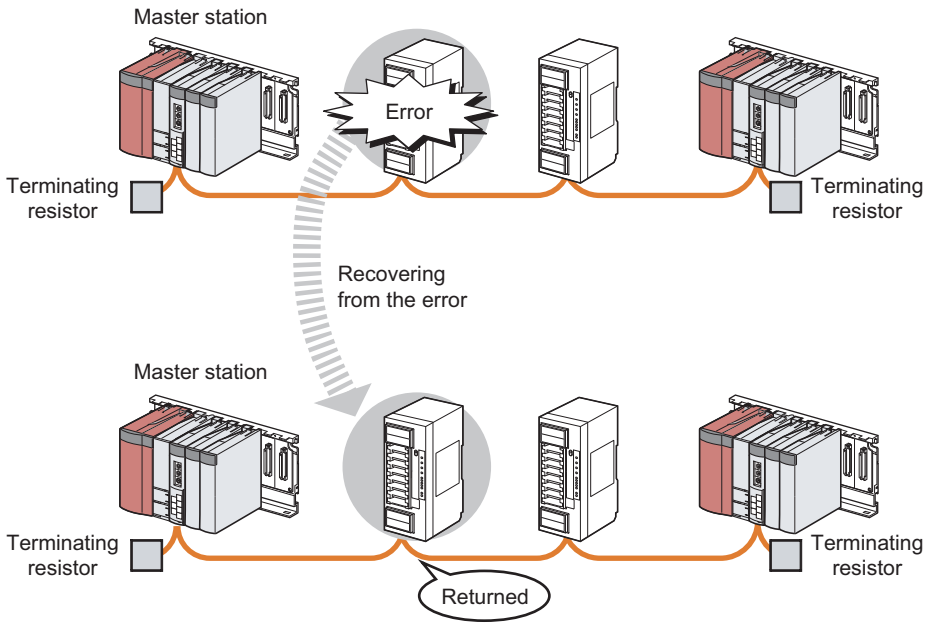
Note that if a cable is disconnected, data link fails among all stations.

*1 Power off the module to be replaced before removal. Check that settings of the module that replaces the currently mounted module are the same as those of the mounted module.



(b) Automatic return when a disconnected station recovers

When the station disconnected from a network due to a data link error recovers, it automatically restarts data link. The time between an error and a return can be shortened.



Point

The master/local module can prevent a system failure by using the following functions as well. (☞ Page 128, Section 8.2 to Page 154, Section 8.3)

- Even if a master station fails, cyclic transmission can be continued by having the standby master station served as a master station.
- When a module is replaced, error detection can be temporarily disabled.

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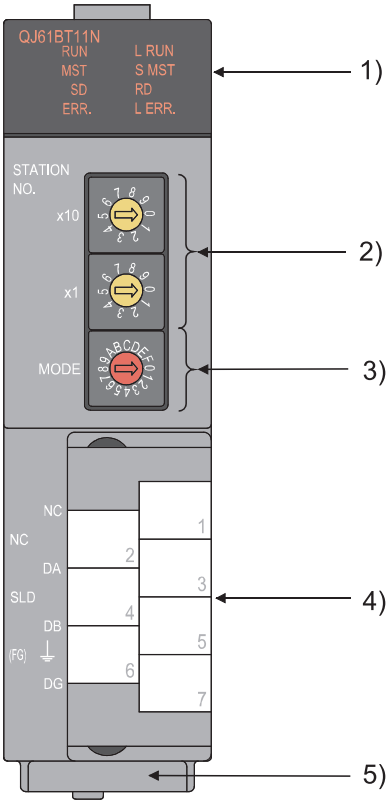
CHAPTER 2 PART NAMES

This chapter describes the part names of the master/local modules.



No.	Name		Application
1)	RUN LED		Indicates the operating status.
		ON	Operating normally
		OFF	A hardware failure or a watchdog timer error has occurred.
	L RUN LED		Indicates the data link status.
		ON	Performing data link
		OFF	Not performing data link
	MST LED		Indicates whether the module is operating as a master station.
		ON	Operating as a master station
		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 status)
		OFF	Operating as a master station or a local station The LED also turns off when a standby master station switches to a master station.
	SD LED		Indicates whether the module is sending data.
		ON	Sending data
		OFF	Not sending data
	RD LED		Indicates whether the module is receiving data.
		ON	Receiving data
		OFF	Not receiving data

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No.	Name		Application
1)	ERR. LED		Indicates the error status of the master/local module. The details of errors can be checked by using the following. • CC-Link diagnostics (☞ Page 311, Section 11.4) • Detailed LED display status (SW0058) (☞ Page 351, Appendix 3.2)
		ON	Any of the following errors has occurred. • The error on all the stations was detected. • The value outside the range is set for the station number setting switches or transmission speed/mode setting switch of the master/local module. • 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 data link faulty station was detected. Or the station number set for a remote station is already in use.
		OFF	Operating normally
	L ERR. LED		Indicates the error status of a data link.
		ON	A data link error has occurred at the host station.
		Flashing at regular intervals	The settings of the switches 2) and 3) were changed when the power was on. (Note that the change of the switch may not be detected at the time of error on all the stations.)
		Flashing at irregular intervals	The communications are unstable due to the following reasons. • A terminating resistor is not connected. • The communications are affected by noise.
		OFF	Operating normally
2)	Station number setting switch		Sets the station number of the master/local module. (Default: 0) Set the station numbers not used for other stations. <Setting range> • Master station: 0 • Local station: 1 to 64 • Standby master station: 1 to 64 If a number other than 0 to 64 is set, the ERR. LED turns on.

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<table>
<tr><th>No.</th><th>Name</th><th>Application</th></tr>
<tr><td>3)</td><td>Transmission speed/mode setting switch</td><td>Sets the transmission speed and mode of the master/local module. (Default: 0)
Set the same value of the transmission speed for all stations.
<table>
<tr><th>Mode</th><th>Transmission speed setting</th><th>Switch number</th></tr>
<tr><td rowspan="5">Online</td><td>Transmission speed: 156kbps</td><td>0</td></tr>
<tr><td>Transmission speed: 625kbps</td><td>1</td></tr>
<tr><td>Transmission speed: 2.5Mbps</td><td>2</td></tr>
<tr><td>Transmission speed: 5Mbps</td><td>3</td></tr>
<tr><td>Transmission speed: 10Mbps</td><td>4</td></tr>
<tr><td rowspan="5">Line test (☞ Page 86, Section 6.5.1)
• When the station number setting switches are set at 0
Line test 1
• When the station number setting switches are set at 1 to 64
Line test 2</td><td>Transmission speed: 156kbps</td><td>5</td></tr>
<tr><td>Transmission speed: 625kbps</td><td>6</td></tr>
<tr><td>Transmission speed: 2.5Mbps</td><td>7</td></tr>
<tr><td>Transmission speed: 5Mbps</td><td>8</td></tr>
<tr><td>Transmission speed: 10Mbps</td><td>9</td></tr>
<tr><td rowspan="5">Hardware test (☞ Page 324, Section 11.5)</td><td>Transmission speed: 156kbps</td><td>A</td></tr>
<tr><td>Transmission speed: 625kbps</td><td>B</td></tr>
<tr><td>Transmission speed: 2.5Mbps</td><td>C</td></tr>
<tr><td>Transmission speed: 5Mbps</td><td>D</td></tr>
<tr><td>Transmission speed: 10Mbps</td><td>E</td></tr>
<tr><td colspan="2">Setting not allowed</td><td>F</td></tr>
</table></td></tr>
<tr><td>4)</td><td>Terminal block</td><td>Used to connect a CC-Link dedicated cable. (☞ Page 77, Section 6.2.2)
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.</td></tr>
<tr><td>5)</td><td>Serial number display</td><td>Indicates the serial number on the rating plate.</td></tr>
</table>

Point

The settings of the station number setting switches and the transmission speed/mode setting switch are enabled by resetting the CPU module or powering off and on the system.

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CHAPTER 3 SPECIFICATIONS

This chapter describes the specifications, functions, I/O signals, buffer memory, remote I/O (RX and RY) and remote register (RWr and RWw) of the master/local module.

3.1 General Specifications

For the general specifications of the master/local module, refer to the following.

User's manual for the CPU module used (hardware design, maintenance and inspection)

3.2 Performance Specifications

<table>
<tr><th colspan="2">Item</th><th>Specifications</th></tr>
<tr><td colspan="2">Transmission speed</td><td>Selected from 156kbps, 625kbps, 2.5Mbps, 5Mbps, and 10Mbps.</td></tr>
<tr><td colspan="2">Maximum number of connected modules (master station)</td><td>64 (Page 27, Section 3.2.1)</td></tr>
<tr><td colspan="2">Number of occupied stations (local station)</td><td>1 to 4 stations (The number of stations can be changed using a programming tool.)</td></tr>
<tr><td rowspan="2">Maximum number of link points per system</td><td>CC-Link Ver.1</td><td>• 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)</td></tr>
<tr><td>CC-Link Ver.2</td><td>• 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)</td></tr>
<tr><td rowspan="2">Number of link points per remote station/local station/intelligent device station/standby master station*1</td><td>CC-Link Ver.1</td><td>• Remote I/O (RX, RY): 32 points (30 points for a local station)
• Remote register (RWw): 4 points (master station → remote device station/local station/intelligent device station/standby master station)
• Remote register (RWr): 4 points (remote device station/local station/intelligent device station/standby master station → master station)</td></tr>
<tr><td>CC-Link Ver.2</td><td>
<table>
<tr><th rowspan="2">Item</th><th colspan="4">Expanded Cyclic Setting</th></tr>
<tr><th>Single</th><th>Double</th><th>Quadruple</th><th>Octuple</th></tr>
<tr><td>Remote I/O (RX, RY)</td><td>32 points (30 points for a local station)</td><td>32 points (30 points for a local station)</td><td>64 points (62 points for a local station)</td><td>128 points (126 points for a local station)</td></tr>
<tr><td>Remote register (RWw)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr>
<tr><td>Remote register (RWr)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr>
</table>
</td></tr>
</table>

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Item	Specifications
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 • CC-Link dedicated cable (Ver.1.00-compatible) • CC-Link dedicated high-performance cable (Ver.1.00-compatible) The cables above cannot be used at the same time. If used, normal data transmission is not guaranteed. In addition, select a terminating resistor to be connected according to the cable type. (☞ Page 76, Section 6.2.1 (3))
Maximum overall cable distance (maximum transmission distance)	Depends on the transmission speed and CC-Link version. (☞ Page 29, Section 3.2.2, Page 30, Section 3.2.3)
RAS function	• Standby master function • Automatic return function • Slave station cutoff function • Error detection using link special relays (SBs) and link special registers (SWs)
Number of occupied I/O points	32 points (I/O assignment: intelli 32 points)
Internal current consumption (5VDC)	0.46A
Weight	0.12kg

*1 In CC-Link Ver.1, increasing the number of occupied stations can increase the number of link points per station.
In CC-Link Ver.2, increasing the number of occupied stations and setting the greater value in the expanded cyclic setting can increase the number of link points per station.
For the points, refer to the following table.

Item			CC-Link Ver.1	CC-Link Ver.2			
				Expanded 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

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Item			CC-Link Ver.1	CC-Link Ver.2			
				Expanded Cyclic Setting			
				Single	Double	Quadruple	Octuple
Number of link points by the number of occupied stations	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

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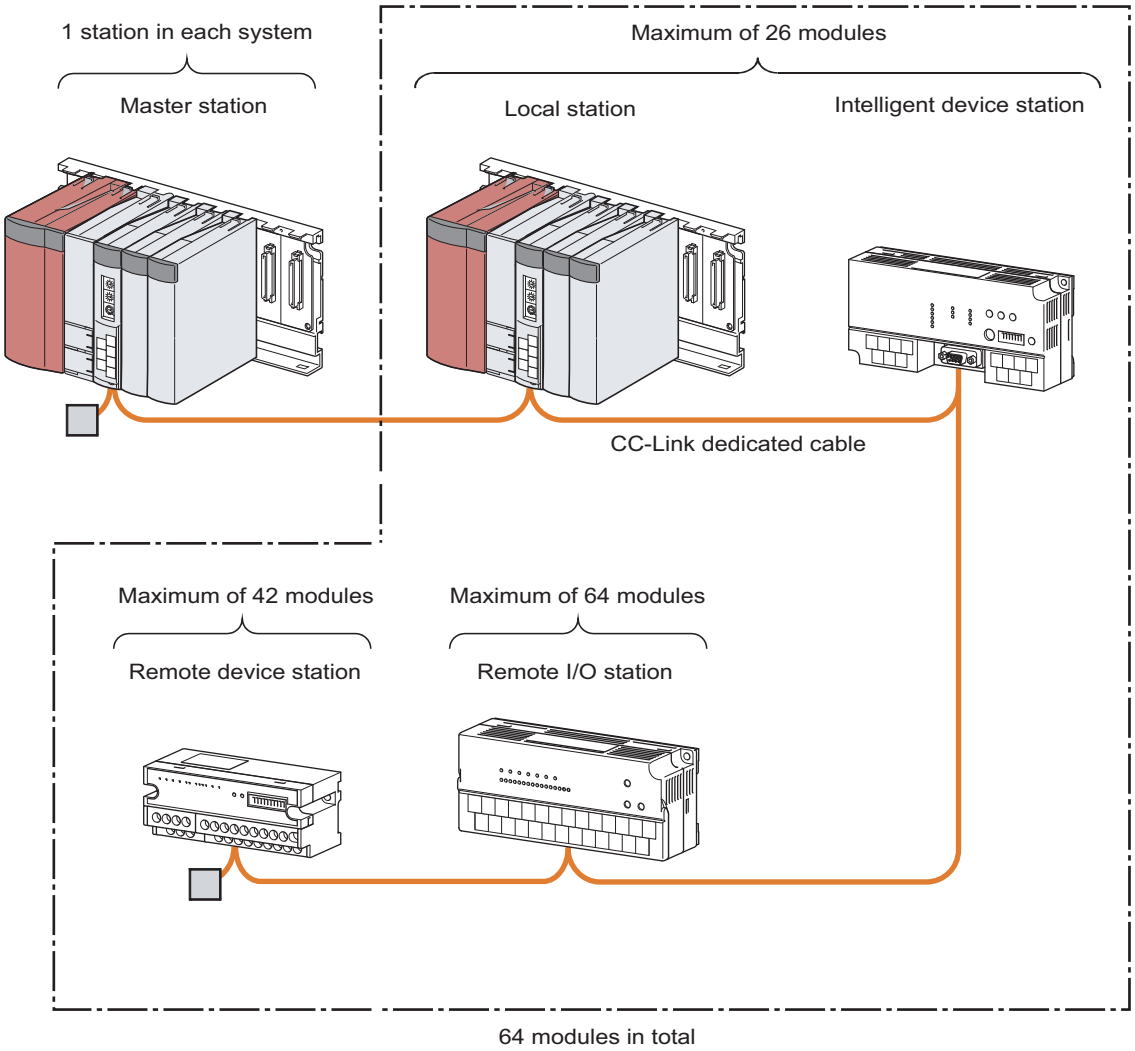
3.2.1 Maximum number of connected modules

A CC-Link system can be configured with the number of modules meeting the following conditions.



(1) Remote net Ver.1 mode

The table below lists the maximum number of connected modules of when a system is configured only with Ver.1-compatible slave stations. For the modes, refer to Page 43, Section 3.6.2.

64 modules of a remote I/O station, remote device station, local station, standby master station, and intelligent device station can be connected in total for one master station. Note, however, that the following conditions must be satisfied.

Item		Number of modules
Condition 1	{(1 × a) + (2 × b) + (3 × c) + (4 × d)} ≤ 64	a: Number of modules occupying one station b: Number of modules occupying two stations c: Number of modules occupying three stations d: Number of modules occupying four stations
Condition 2	{(16 × A)+(54 × B)+(88 × C)} ≤ 2304	A: Number of remote I/O stations ≤ 64 B: Number of remote device stations ≤ 42 C: Number of local stations, standby master stations, and intelligent device stations ≤ 26

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(2) Remote net Ver.2 mode and remote net additional mode

The table below lists the maximum number of connected modules of when a system is configured only with Ver.2-compatible slave stations. For the modes, refer to Page 43, Section 3.6.2.

64 modules of a remote I/O station, remote device station, local station, standby master station, and intelligent device station can be connected in total for one master station. Note, however, that the following conditions must be satisfied.

Item		Number of modules
Condition 1	{(a + a2 + a4+ a8) + (b+ b2 + b4+ b8) × 2 + (c+ c2 + c4 + c8) × 3 + (d + d2 + d4 + d8) × 4} ≤ 64	a: Total number of Ver.1-compatible slave stations occupying one station and Ver.2-compatible slave stations occupying one station with the expanded cyclic setting of "Single" b: Total number of Ver.1-compatible slave stations occupying two stations and Ver.2-compatible slave stations occupying two stations with the expanded cyclic setting of "Single" c: Total number of Ver.1-compatible slave stations occupying three stations and Ver.2-compatible slave stations occupying three stations with the expanded cyclic setting of "Single" d: Total number of Ver.1-compatible slave stations occupying four stations and Ver.2-compatible slave stations occupying four stations with the expanded cyclic setting of "Single" a2: Number of Ver.2-compatible slave stations occupying one station with the expanded cyclic setting of "Double" b2: Number of Ver.2-compatible slave stations occupying two stations with the expanded cyclic setting of "Double" c2: Number of Ver.2-compatible slave stations occupying three stations with the expanded cyclic setting of "Double" d2: Number of Ver.2-compatible slave stations occupying four stations with the expanded cyclic setting of "Double" a4: Number of Ver.2-compatible slave stations occupying one station with the expanded cyclic setting of "Quadruple" b4: Number of Ver.2-compatible slave stations occupying two stations with the expanded cyclic setting of "Quadruple" c4: Number of Ver.2-compatible slave stations occupying three stations with the expanded cyclic setting of "Quadruple" d4: Number of Ver.2-compatible slave stations occupying four stations with the expanded cyclic setting of "Quadruple" a8: Number of Ver.2-compatible slave stations occupying one station with the expanded cyclic setting of "Octuple" b8: Number of Ver.2-compatible slave stations occupying two stations with the expanded cyclic setting of "Octuple" c8: Number of Ver.2-compatible slave stations occupying three stations with the expanded cyclic setting of "Octuple" d8: Number of Ver.2-compatible slave stations occupying four stations with the expanded cyclic setting of "Octuple"
Condition 2	[{(a × 32) + (a2 × 32) + a4 × 64) + (a8 × 128)} + {(b × 64) + (b2 × 96) + (b4 × 192) + (b8 × 384)} + {(c × 96) + (c2 × 160) + (c4 × 320) + (c8 × 640)} + {(d × 128) + (d2 × 224) + (d4 × 448) + (d8 × 896)}] ≤ 8192	
Condition 3	[{(a × 4) + (a2 × 8) + (a4 × 16) + (a8 × 32)} + {(b × 8) + (b2 × 16) + (b4 × 32) + (b8 × 64)} + {(c × 12) + (c2 × 24) + (c4 × 48) + (c8 × 96)}+{(d × 16)+(d2 × 32)+(d4 × 64) + (d8 × 128)}] ≤ 2048	
Condition 4	{(16 × A) + (54 × B) + (88 × C)} ≤ 2304	A: Number of remote I/O stations ≤ 64 B: Number of remote device stations ≤ 42 C: Number of local stations, standby master stations, and intelligent device stations ≤ 26

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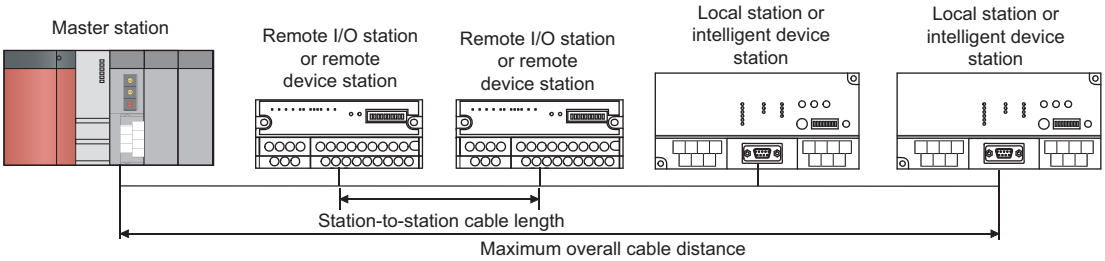
3.2.2 Maximum overall cable distance (CC-Link Ver.1.10)

This section describes how transmission speed and a cable length are related when a system is configured with products of CC-Link Ver.1.10 or later and Ver.1.10-compatible CC-Link dedicated cables. Configure a CC-Link system that satisfies the following conditions.



- Ver.1.10-compatible CC-Link dedicated cable (a terminating resistor of 110Ω used)

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

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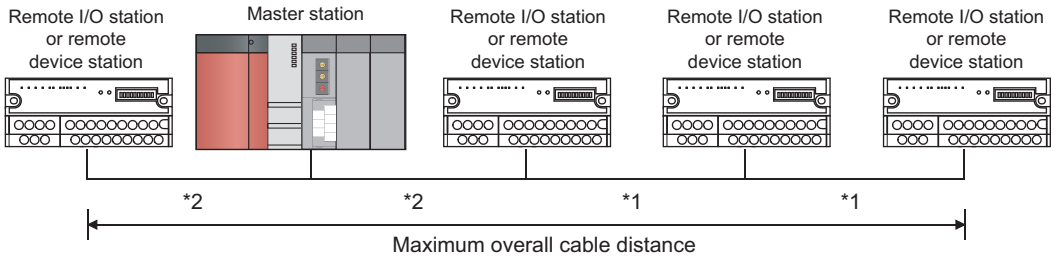
3.2.3 Maximum overall cable distance (CC-Link Ver.1.00)

Configure a CC-Link system where the transmission speed and the cable length satisfy the following conditions.

(1) When a system is configured with a remote I/O station and remote device station only



- CC-Link dedicated cable (Ver.1.00-compatible) (a terminating resistor of 110Ω used)

Transmission speed	Station-to-station cable length		Maximum overall cable distance
	*1	*2	
156kbps	30cm or longer	1m or longer	1200m
625kbps			600m
2.5Mbps			200m
5Mbps	Between 30cm and 59cm*3		110m
	60cm or longer		150m
10Mbps	Between 30cm and 59cm*3		50m
	Between 60cm and 99cm*3		80m
	1m or longer		100m

- CC-Link dedicated high-performance cable (Ver.1.00-compatible) (a terminating resistor of 130Ω used)

Transmission speed		Station-to-station cable length		Maximum overall cable distance
		*1	*2	
156kbps		30cm or longer	1m or longer	1200m
625kbps				900m
2.5Mbps				400m
5Mbps				160m
10Mbps	Number of connected stations: 1 to 32			100m
	Number of connected stations: 33 to 48	Between 30cm and 39cm*3		80m
		40cm or longer		100m
	Number of connected stations: 49 to 64	Between 30cm and 39cm*3		20m
		Between 40cm and 69cm*3		30m
		70cm or longer		100m

*1 This is a station-to-station cable length between remote I/O stations or remote device stations.
*2 This is a station-to-station cable length between a master station and a station one before/after the master station.
*3 When this range is applied for one section, the maximum overall cable distance is the shortest station-to-station cable length.

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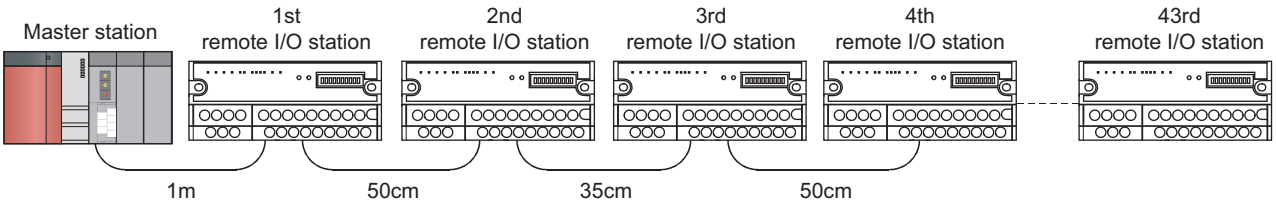
Ex. When 43 stations of remote I/O stations and remote device stations are connected using a CC-Link dedicated high-performance cable (Ver.1.00-compatible)
(Transmission speed: 10Mbps)
Because the cable length between the second station and the third station is 35cm, the maximum overall cable distance is 80m.



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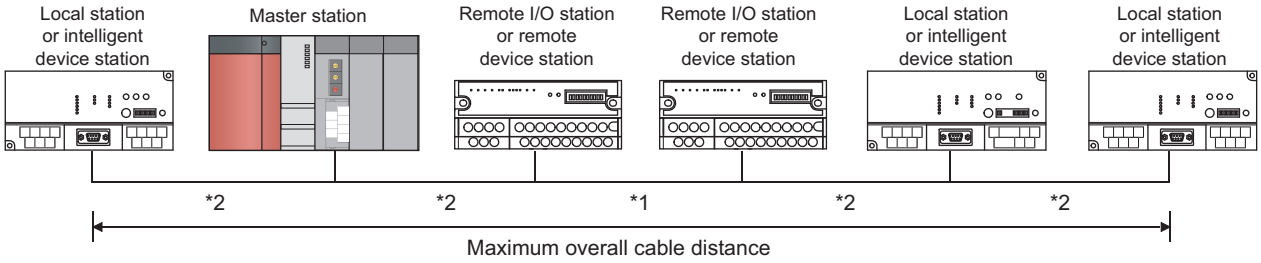
(2) When a system is configured with remote I/O stations, remote device stations, local stations, and intelligent devices stations



- CC-Link dedicated cable (Ver.1.00-compatible) (a terminating resistor of 110Ω used)

Transmission speed	Station-to-station cable length		Maximum overall cable distance
	*1	*2	
156kbps	30cm or longer	2m or longer	1200m
625kbps			600m
2.5Mbps			200m
5Mbps	Between 30cm and 59cm*3		110m
	60cm or longer		150m
10Mbps	Between 30cm and 59cm*3		50m
	Between 60cm and 99cm*3		80m
	1m or longer		100m

- CC-Link dedicated high-performance cable (Ver.1.00-compatible) (a terminating resistor of 130Ω used)

Transmission speed	Station-to-station cable length		Maximum overall cable distance
	*1	*2	
156kbps	30cm or longer	2m or longer	1200m
625kbps			600m
2.5Mbps			200m
5Mbps	Between 30cm and 59cm*3		110m
	60cm or longer		150m
10Mbps	Between 70cm and 99cm*3		50m
	1m or longer		80m

*1 This is a station-to-station cable length between remote I/O stations or remote device stations.

*2 This is a station-to-station cable length between a master station and a station one before/after the master station, a local station and a station one before/after the local station, or an intelligent device station and a station one before/after the intelligent device station.

*3 When this range is applied for one section, the maximum overall cable distance is the shortest station-to-station cable length.

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3.2.4 CC-Link dedicated cables

In a CC-Link system, use CC-Link dedicated cables. If cables other than CC-Link dedicated cables are used, the performance of the CC-Link system is not guaranteed.

For the specifications of CC-Link dedicated cables and contact information, refer to the following.
Website of CC-Link Partner Association: www.cc-link.org

Remark

Refer to the CC-Link Cable Wiring Manual published by CC-Link Partner Association.

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3.3 List of Functions

(1) Cyclic transmission

Function		Description	Reference
Communications with other stations		Communications can be performed with other stations using remote I/O (RX, RY) and remote registers (RWr, RWw). Access to remote slave stations can be performed in the same way as access to a module mounted on the same base unit is performed.	Page 41, Section 3.6.1 Page 125, Section 8.1.1
	Remote net Ver.1 mode	The mode can be selected according to the CC-Link system configuration. There is a mode such as the one to add a Ver.2-compatible slave station to a system with a Ver.1-compatible slave station.	Page 46, Section 3.6.3
	Remote net Ver.2 mode		Page 48, Section 3.6.4
	Remote net additional mode		Page 51, Section 3.6.5
	Remote I/O net mode		Page 55, Section 3.6.6
Auto refresh		Data can be automatically transferred between RX, RY, RWr, RWw, SB, and SW in a master/local module and a device in a CPU module. Accessing a device in a CPU module on a program enables access to RX, RY, RWr, RWw, SB, and SW.	Page 97, Section 7.3.2 Page 115, Section 7.4.2
Scan synchronization		Whether to synchronize the link scan with the sequence scan of a CPU module or not can be selected. Selecting the asynchronous setting shortens input transmission delay time. Selecting the synchronous setting shortens output transmission delay time.	Page 163, Section 8.3.5
Cyclic data assurance		This function prevents read/write data from being separated between new and old data.	-
	Block data assurance per station	This function prevents read/write data per station from being separated between new and old data depending on the auto refresh timing. Because the setting is configured only on a programming tool, a program to prevent data separation is not required.	Page 150, Section 8.2.6 (1)
	32-bit data integrity assurance	This function prevents read/write data in 32-bit increments from being separated between new and old data.	Page 153, Section 8.2.6 (2)
Data link stop/restart		Data link of the host station can be stopped or restarted using a programming tool or SB/SW. This function is used when data link should be temporarily stopped for maintenance or other reasons.	Page 169, Section 8.3.8 Page 320, Section 11.4.5
Remote I/O station points setting		When the master station is in the remote net Ver.2 mode, the refresh points with a remote I/O station can be selected from 8 points, 16 points, and 32 points. Changing the number of points can save the areas of the refresh device in a CPU module. (In modes other than the remote net Ver.2 mode, only 32 points per station can be selected.)	Page 170, Section 8.3.9

(2) Transient transmission

Function	Description	Reference
Communications using a dedicated instruction	Communications can be performed with other stations at any timing. Unlike cyclic transmission, direct access to buffer memory areas in other stations can be performed. This function is used to access data that is updated infrequently.	Page 127, Section 8.1.2 Page 173, CHAPTER 9

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(3) RAS function

Function	Description	Reference
Slave station cutoff function	Data link can be continued in a normal station by disconnecting a slave station that cannot perform data link due to reasons such as power-off. (No parameter setting is required.) Using this function prevents the entire system from going down when one station goes down.	Page 128, Section 8.2.1
Automatic return function	When a slave station that has been disconnected from data link due to reasons such as power-off returns to the normal status, data link is automatically restarted. The time between an error and a return can be shortened.	Page 128, Section 8.2.1
Setting of the data link status upon an error in the programmable controller CPU of the master station	Whether to stop or continue data link when a stop error occurs in the CPU module of a master station can be selected.	Page 130, Section 8.2.2
Setting of the status of the input data from a data link faulty station	Whether to clear or hold data input from a data link faulty station can be selected. How data should be handled can be selected according to the system used.	Page 131, Section 8.2.3
Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP	Whether to refresh or compulsorily clear remote output (RY) when the switch on a CPU module is set to STOP can be selected. How data should be handled can be selected according to the system used.	Page 133, Section 8.2.4
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.	Page 135, Section 8.2.5
Master station duplication error canceling function	Even if a master station duplication error has been detected, the error can be cleared without resetting the CPU module or powering off and on the system.	Page 172, Section 8.3.10

(4) Diagnostics function

Function	Description	Reference
Line test	Whether a CC-Link dedicated cable is properly connected and data link can be performed with slave stations can be checked.	Page 86, Section 6.5.1
Transmission speed test	Whether the transmission speed setting of a slave station is the same as that of the master station can be checked. The station number of the slave station having a different transmission speed setting can be also checked; therefore, corrective actions upon a transmission error can be easily taken.	Page 90, Section 6.5.2
CC-Link diagnostics	The status of a CC-Link system can be checked using a programming tool. Unlike link special relays (SBs) and link special registers (SWs), the system status can be checked on a graphical window; therefore, corrective actions can be easily taken.	Page 311, Section 11.4
Hardware test	The hardware in the master/local module can be checked.	Page 324, Section 11.5

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(5) Other functions

Function	Description	Reference
Remote device station initialization procedure registration function	The initial setting of a remote device station that was performed on a program can be registered in advance using a programmable controller and can be saved by turning on the link special relay (SB). A program for the initial setting is not required.	Page 154, Section 8.3.1
Event issuance for the interrupt program	A request for the interrupt to a CPU module is issued when the conditions that have been set using a programming tool are satisfied, and the interrupt program can be executed. This function is used to stop the control and execute an interrupt program upon an error or for other purposes.	Page 158, Section 8.3.2
Automatic CC-Link startup	Data link can be performed by powering on the master/local module. This function is used to check the operation of when a system is configured.	Page 159, Section 8.3.3
Reserved station function	Slave stations that are not actually connected (but will be connected in future) are not detected as "Data Link Faulty Station" in the master station and local station. By setting slave stations that will be connected in future as reserved stations, slave stations can be added without a program change because the RX/RY/RWr/RWw assignment is not changed. In addition, the number of points of a slave station that has been set as a reserved station can be set as zero points.	Page 162, Section 8.3.4
Error invalid station setting function	Even if a data link error occurs in a slave station, the station is not detected as a faulty station in the master station and local station. This function is used when a slave station is powered off as a matter of the system configuration or for other purposes.	Page 167, Section 8.3.6
Temporary error invalid station setting function	Even if a data link error occurs in a slave station, the station is not detected as a faulty station in the master station and local station. This setting can be configured even during data link, unlike the error invalid station setting function. This function is used to exchange slave stations during data link for maintenance or for other purposes.	Page 168, Section 8.3.7
Automatic detection of connected devices	The time of setting parameters can be reduced by automatically reading information of slave stations.	Page 102, Section 7.3.2 (2)
	The model names of slave stations can be read.	iQ Sensor Solution Reference Manual
Data backup/restoration	The setting data of the slave station is backed up into the SD memory card of the CPU module on the master station. The setting data backed up on the SD memory card of the CPU module on the master station is restored into the slave module.	iQ Sensor Solution Reference Manual

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3.4 List of I/O signals

This section lists the I/O signals for a CPU module.
The device X is an input signal from a master/local module to a CPU module. The device Y is an output signal from a CPU module to a master/local module.
"n" in the table below represents the start I/O number of the master/local module.

Ex. When the start I/O number of the master/local module is 0030:
Xn0 to X(n + 1)F → X30 to X4F
Yn0 to Y(n + 1)F → Y30 to Y4F

Signal direction: Master/local module → CPU module		Signal direction: CPU module → Master/local module	
Input No.	**Signal name**	**Output No.**	**Signal name**
Xn0	Module error	Yn0	Use prohibited
Xn1	Host data link status	Yn1	
Xn2	Use prohibited	Yn2	
Xn3	Other station data link status	Yn3	
Xn4	Use prohibited	Yn4	
Xn5		Yn5	
Xn6		Yn6	
Xn7		Yn7	
Xn8		Yn8	
Xn9		Yn9	
XnA		YnA	
XnB		YnB	
XnC		YnC	
XnD		YnD	
XnE		YnE	
XnF	Module ready	YnF	
X(n+1)0	Use prohibited	Y(n+1)0	
X(n+1)1		Y(n+1)1	
X(n+1)2		Y(n+1)2	
X(n+1)3		Y(n+1)3	
X(n+1)4		Y(n+1)4	
X(n+1)5		Y(n+1)5	
X(n+1)6		Y(n+1)6	
X(n+1)7		Y(n+1)7	
X(n+1)8		Y(n+1)8	
X(n+1)9		Y(n+1)9	
X(n+1)A		Y(n+1)A	
X(n+1)B		Y(n+1)B	
X(n+1)D		Y(n+1)D	
X(n+1)D		Y(n+1)D	
X(n+1)E		Y(n+1)E	
X(n+1)F		Y(n+1)F	

Point

- Do not turn on the “Use prohibited” signals of the I/O signals for the CPU module.
  Doing so may cause a malfunction in the programmable controller system.

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3.5 List of Buffer Memory Areas

Buffer memory is memory to transmit data between a master/local module and a CPU module.
Data can be read from or written to buffer memory areas by setting the parameters of a programming tool or using dedicated instructions.
Resetting the CPU module or powering off and on the system returns data in buffer memory areas to default.

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

○: Can be used, –: Cannot be used

Address		Name	Description	Read/write	Availability		Reference
Hexadecimal	Decimal				Master station	Local station	
0 to DF_H	0 to 223	Parameter information area	Stores parameter settings.	Read only	○ (Not available when a standby master station is controlling the system)	–	Page 328, Appendix 2 (1)
$E0_H$ to $15F_H$	224 to 351	Remote input (RX)*1	(Master station) Stores the status of the data input from slave stations.	Read only	○	–	Page 331, Appendix 2 (2)
			(Local station) Stores the status of the data input from the master station.		–	○	
160_H to $1DF_H$	352 to 479	Remote output (RY)*1	(Master station) Stores the status of the data output to slave stations.	Write only	○	–	Page 331, Appendix 2 (2)
			(Local station) Stores the status of the data output to the master station. Stores the status of the data output to slave stations. Data received from other slave stations are also stored.	Read/ write	–	○	
$1E0_H$ to $2DF_H$	480 to 735	Remote register (RWw)*1 • Master station: For data sending • Local station: For data sending/ receiving	(Master station) Stores the send data to slave stations.	Write only	○	–	Page 333, Appendix 2 (3)
			(Local station) Stores the send data to the master station and other salve stations. Data received from other slave stations are also stored.	Read/ write	–	○	

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Address		Name	Description	Read/write	Availability		Reference
Hexadecimal	Decimal				Master station	Local station	
$2E0_H$ to $3DF_H$	736 to 991	Remote register (RWr)*1 • Master station: For data receiving • Local station: For data receiving	(Master station) Stores the data received from slave stations.	Read only	○	-	Page 333, Appendix 2 (3)
			(Local station) Stores the data received from the master station.		-	○	
$3E0_H$ to $5DF_H$	992 to 1503	Slave station offset, size information	Stores the offset and size of RX/RY/RWw/RWr in each slave station.	Read only	○	○	Page 335, Appendix 2 (4)
$5E0_H$ to $5FF_H$	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.)	○	○	Page 338, Appendix 2 (5)
600_H to $7FF_H$	1536 to 2047	Link special register (SW)	Stores the data link status.				Page 339, Appendix 2 (6)
800_H to $9FF_H$	2048 to 2559	System area	-	-	-	-	-
$A00_H$ to FFF_H	2560 to 4095	Random access buffer	Stores any data and is used for transient transmission.	Read/ write	○	○	Page 339, Appendix 2 (7)
1000_H to $1FFF_H$	4096 to 8191	Communication buffer	Stores sending/receiving data and control data when transient transmission (communications using a communication buffer) is performed with a local station, standby master station, and intelligent device station.	Read/ write	○	○	Page 339, Appendix 2 (8)
2000_H to $2FFF_H$	8192 to 12287	Automatic update buffer	Stores data automatically updated when transient transmission (communications using the automatic update buffer) is performed with an AJ65BT-R2(N).	Read/ write	○	-	Page 340, Appendix 2 (9)
3000_H to $3FFF_H$	12288 to 16383	System area	-	-	-	-	-
4000_H to $41FF_H$	16384 to 16895	Ver.2-compatible remote input (RX)*2	(Master station) Stores the status of the data input from slave stations.	Read only	○	-	Page 341, Appendix 2 (10)
			(Local station) Stores the status of the data input from the master station.		-	○	

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Address		Name	Description	Read/write	Availability		Reference
Hexadecimal	Decimal				Master station	Local station	
4200_H to $43FF_H$	16896 to 17407	Ver.2-compatible remote output (RY)*2	(Master station) Stores the status of the data output to slave stations.	Write only	○	-	Page 341, Appendix 2 (10)
			(Local station) Stores the status of the data output to the master station. Data received from other slave stations are also stored.	Read/ write	-	○	
4400_H to $4BFF_H$	17408 to 19455	Ver.2-compatible remote register (RWw)*2 • Master station: For data sending • Local station: For data sending/ receiving	(Master station) Stores the send data to slave stations.	Write only	○	-	Page 342, Appendix 2 (11)
			(Local station) Stores the send data to the master station and other salve stations. Data received from other slave stations are also stored.	Read/ write	-	○	
$4C00_H$ to $53FF_H$	19456 to 21503	Ver.2-compatible remote register (RWr)*2 • Master station: For data receiving • Local station: For data receiving	(Master station) Stores the data received from slave stations.	Read only	○	-	Page 342, Appendix 2 (11)
			(Local station) Stores the data received from the master station.		-	○	
5400_H to $7FFF_H$	21504 to 32767	System area	-	-	-	-	-

*1 This buffer memory area is used when the remote net Ver.1 mode and remote net additional mode are selected.
*2 This buffer memory area is used when the remote net Ver.2 mode and remote net additional mode are selected.

Point

Do not write data to "System area".
Doing so may cause malfunction in the programmable controller system.

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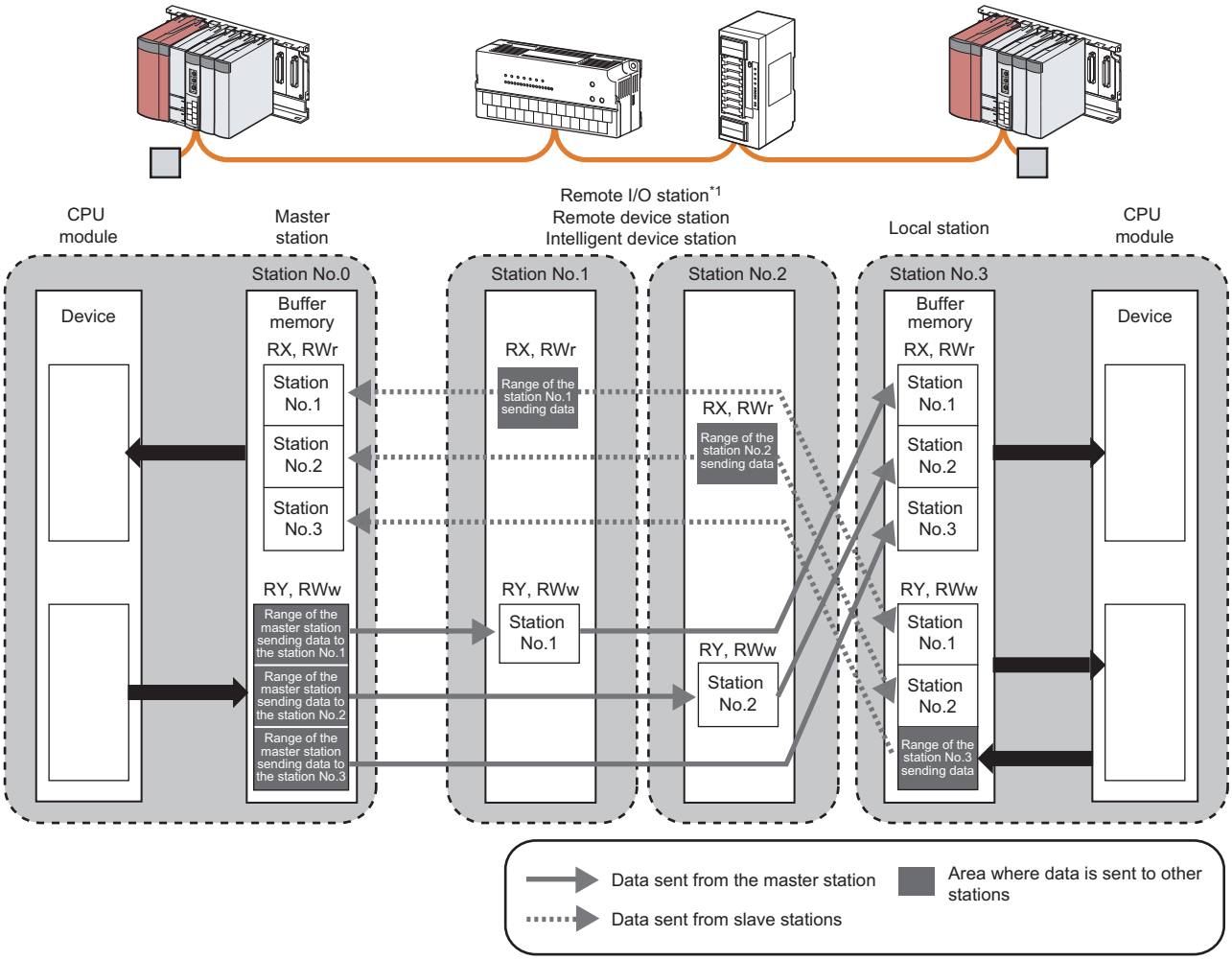
3.6 Assignment and Modes

For a master/local module, the mode can be selected according to the system used. For example, there is a mode to configure a new system or a mode to add a Ver.2-compatible slave station to a Ver.1-compatible slave station. Depending on the mode, the addresses of buffer memory areas to store RX, RY, RWr, and RWw vary.

3.6.1 Assignment

In CC-Link, communications are performed between the master station and slave stations using RX, RY, RWr, and RWw. Data in RX, RY, RWr, and RWw of the master/local module are stored in the buffer memory.
This section describes the assignment using an example of data input and output of the master station and local station.



*1 RWr and RWw are not used for a remote I/O station. Note, however, that buffer memory areas are occupied depending on the mode of the master/local module. (☞ Page 46, Section 3.6.3 to Page 55, Section 3.6.6)

Point

- Buffer memory (RX, RY, RWr, and RWw) addresses differ depending on the mode of the master/local module. (☞ Page 46, Section 3.6.3 to Page 55, Section 3.6.6)
- In a local station, data in RX and RWr of other slave stations are stored into RY and RWw, and data in RY and RWw of other stations are stored into RX and RWr. (Areas where data is input and output are reversed.)

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(1) Input and output of the master station

Data can be input to and output from all slave stations. Areas are assigned in the order of station number.

(a) Data input to the master station

Data in RX and RWr of all slave stations are stored into RX and RWr of the master station.
In a local station, however, data in RY and RWw of a local station are stored into RX and RWr of the master station.

(b) Data output from the master station

Data stored in RY and RWw of the master station are output to RY and RWw of all slave stations.
In a local station, however, data are stored into RX and RWr.

(2) Input and output of a local station

Data can be input from all slave stations. Data can be output from a local station only to the master station.
Areas are assigned in the order of station number.

(a) Data input to a local station

Data in RY and RWw of other stations are stored into RX and RWr of a local station.
Data in RX and RWr of other slave stations are stored into RY and RWw of local stations.

(b) Data output from a local station

Data stored in RY and RWw (the area in the host station for data sending) are stored into RX and RWr of the master station.

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3.6.2 Modes

This section describes the modes of a master/local module.

(1) List of modes

Select the mode according to the system used.

Mode	Application	Connectable slave station	Reference
Remote net Ver.1 mode	• To configure a new system (only with Ver.1-compatible slave stations)	Ver.1-compatible slave station	Page 46, Section 3.6.3
Remote net Ver.2 mode	• To configure a system including a Ver.2-compatible slave station • More points are used compared to the remote net Ver.1 mode.	Ver.1-compatible slave station and Ver.2-compatible slave station	Page 48, Section 3.6.4
Remote net additional mode	• To add a Ver.2-compatible slave station to an existing Ver.1 system (using the program of the Ver.1 system)		Page 51, Section 3.6.5
Remote I/O net mode*1	• To configure a system only with remote I/O stations	Remote I/O station	Page 55, Section 3.6.6

*1 This mode cannot be selected for a local station.

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(a) Combination of the modes of a master/local module

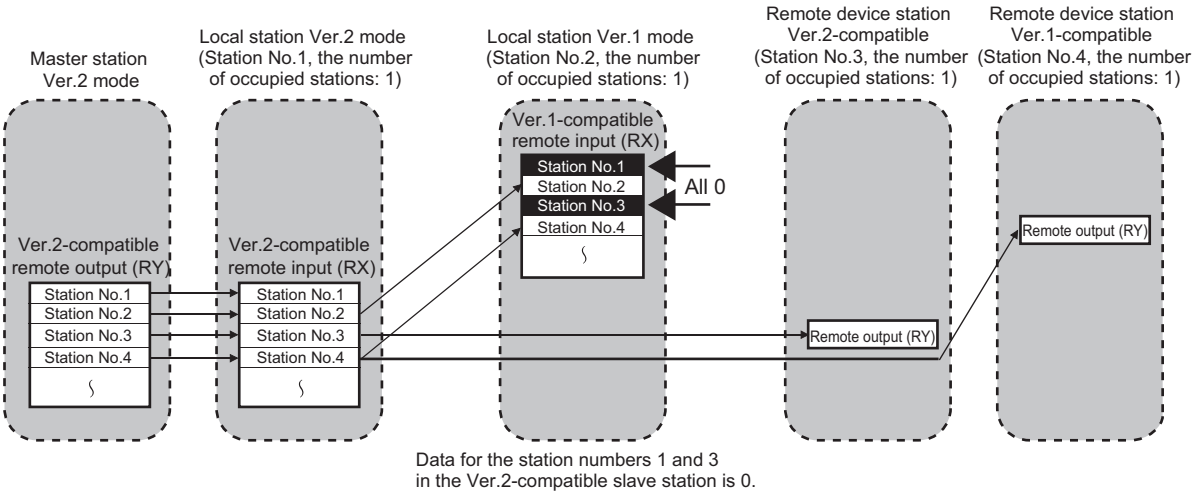
The table below lists the combination of the modes of the master station and local station in a master/local module.

○: Data link can be performed. ×: Data link cannot be performed.

Mode of the master station	Mode of a local station*1		
	Remote net Ver.1 mode	Remote net Ver.2 mode	Remote net additional mode
Remote net Ver.1 mode	○	×	
Remote net Ver.2 mode	○*2	○	×
Remote net additional mode	○*2	○	○

*1 In a standby master station, data link can be performed only when the mode is the same as that of the master station.

*2 Although a local station in the remote net Ver.1 mode cannot perform data link with a Ver.2-compatible slave station, the status of the Ver.2-compatible slave station is stored in Other station data link status (SW0080 to SW0083) for the local station as well as that for the master station. (When the master station is normally performing data link with the Ver.2-compatible slave station, Other station data link status (SW0080 to SW0083) for the local station indicates "0: Normal".) Note that cyclic data in the Ver.2-compatible slave station will become "0" in the local station in the remote net Ver.1 mode. Transient transmission cannot be performed due to an error such as a timeout error.



(b) Differences in functions between the modes of a master/local module

The following table lists differences in functions between the modes of a master/local module.

Item	Mode of a master/local module		
	Remote net Ver.1 mode, remote I/O net mode	Remote net Ver.2 mode	Remote net additional mode
Storage area for RX/RY/RWr/RWw	Ver.1 compatible area	Ver.2 compatible area	Ver.1 compatible station: Ver.1-compatible area Ver.2 compatible station: Ver.2-compatible area
RWr/RWw of remote I/O stations	4 points per station*1	0 point (RWr and RWw move over forward.)	4 points per station
Zero points setting for a reserved station	Not available	Available	Not available
Remote I/O station points setting	Not available	Available	Not available

*1 RWr and RWw are not used for the remote I/O net mode.

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(2) How to set the mode

Set the mode using the network parameter. (☞Page 97, Section 7.3.2, Page 115, Section 7.4.2, Page 213, Section 9.8.1)

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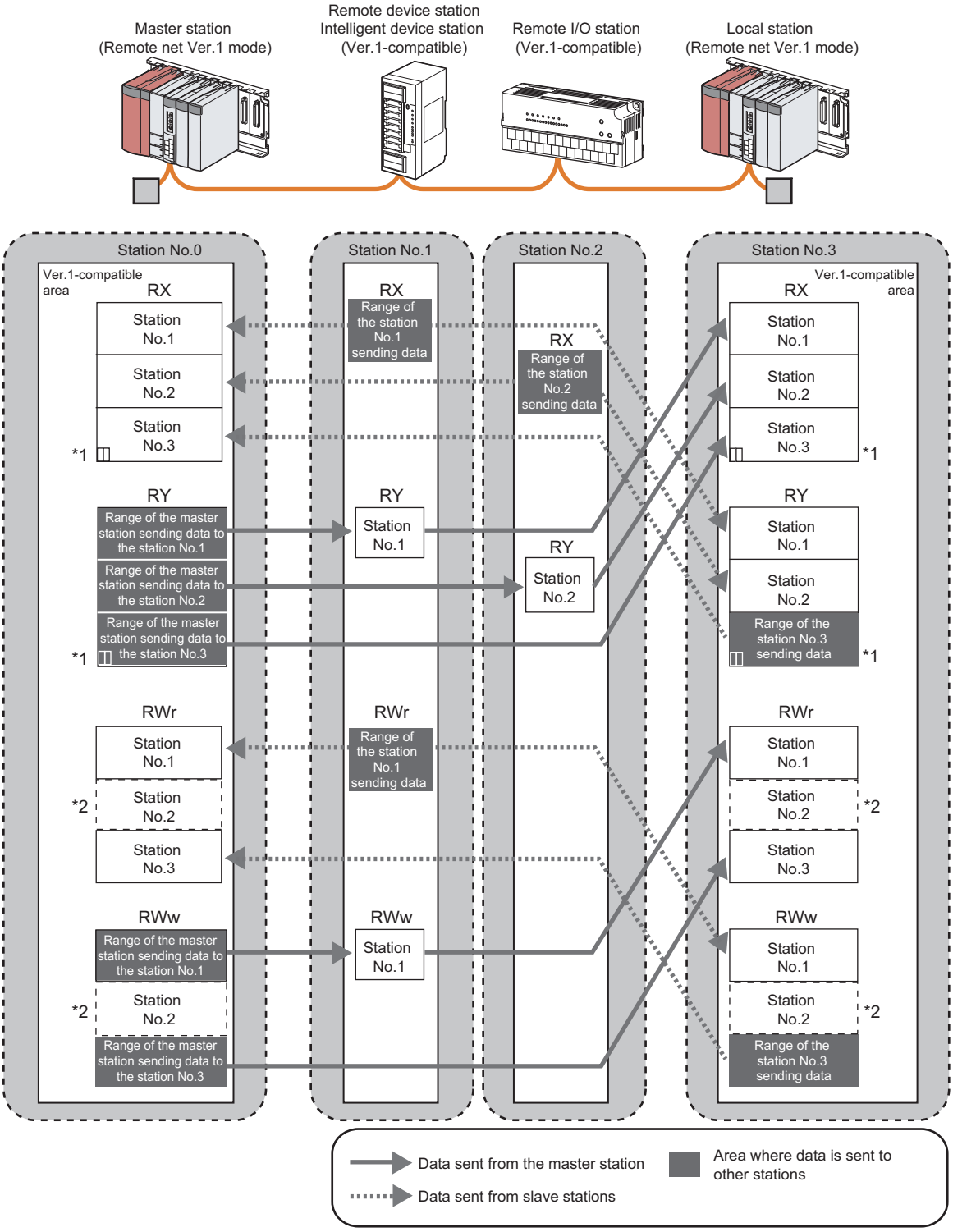
3.6.3 Remote net Ver.1 mode

This mode is selected when a new CC-Link system is configured. When the system includes a Ver.2-compatible slave station, select the remote net Ver.2 mode. (☞ Page 48, Section 3.6.4)



*1 The last two bits in RX and RY cannot be used for communications between a master station and a local station.

*2 A remote I/O station does not have RWr or RWw. However, areas in RWr and RWw of the master station and a local station are occupied for the number of points of a remote I/O station. When areas in RWr and RWw should not be occupied, use the remote net Ver.2 mode. (☞ Page 48, Section 3.6.4)

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(1) Points per module and per system

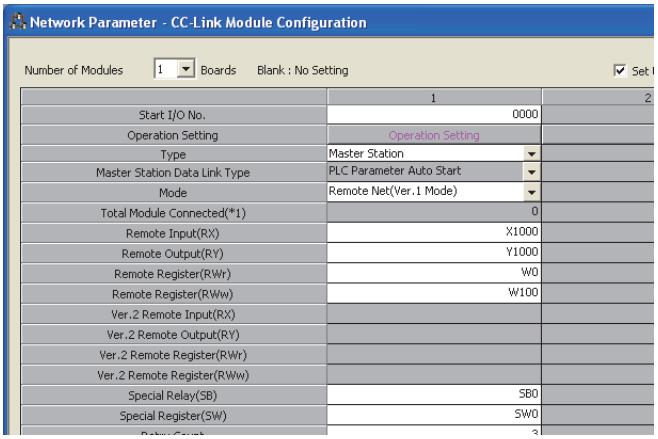
For the points, refer to the table of the performance specifications. (☞Page 24, Section 3.2)
In CC-Link, increasing the number of occupied stations can increase the number of points per module. The number of occupied stations is set for each slave station. (☞Page 102, Section 7.3.2 (2), Page 118, Section 7.4.2 (1))

Item	Description
Number of Occupied Stations	The number of points is increased by increasing the station numbers occupied per module. Note that the number of slave stations that can be connected to a CC-Link system is decreased because one module occupies the station numbers for multiple modules.

(2) Data transfer between RX, RY, RWr, and RWw and a device in a CPU module

(a) Automatic transfer by parameter settings using a programming tool

Setting a refresh device using the network parameter can automatically transfer data between RX, RY, RWr, and RWw in a master/local module and a device in a CPU module. (☞Page 97, Section 7.3.2, Page 115, Section 7.4.2)



(b) Transfer using a program

Using an intelligent function module device (Un\G□) and FROM/TO instructions transfers data between the buffer memory areas in a master/local module and a device in a CPU module. Use this function to use a different refresh device for each station or for other purposes.

Address		Item	Reference
Hexadecimal	Decimal		
$E0_H$ to $15F_H$	224 to 351	Remote input (RX)	Page 331, Appendix 2 (2)
160_H to $1DF_H$	352 to 479	Remote output (RY)	
$1E0_H$ to $2DF_H$	480 to 735	Remote register (RWw)	Page 333, Appendix 2 (3)
$2E0_H$ to $3DF_H$	736 to 991	Remote register (RWr)	

(3) Storage locations of RX, RY, RWr, and RWw

Areas are assigned by 32 points in the order of station number to the remote input (RX) and remote output (RY). To the remote register (RWr and RWw), areas are assigned by four points in the order of station number.
(☞Page 331, Appendix 2 (2), Page 333, Appendix 2 (3))

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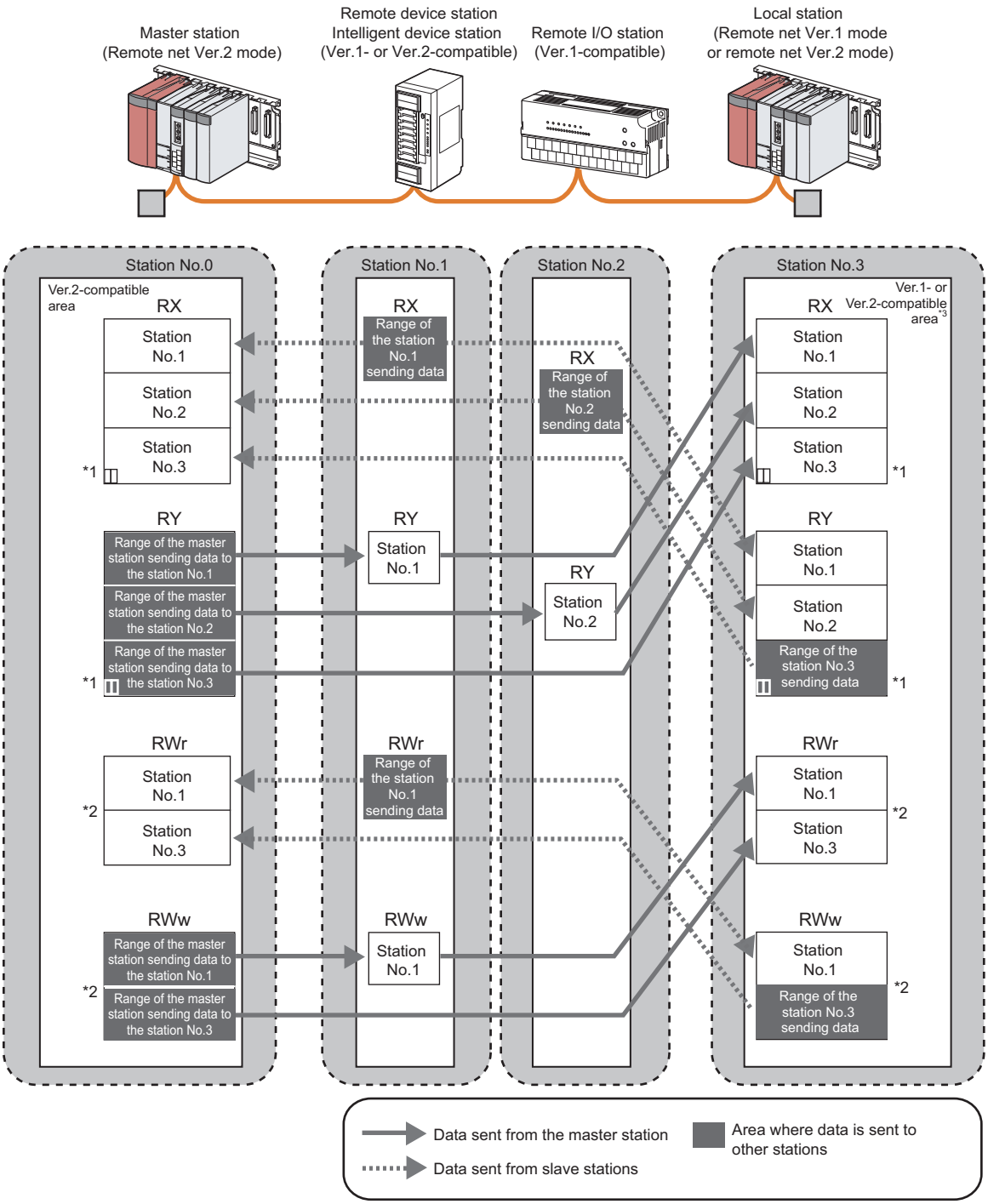
3.6.4 Remote net Ver.2 mode

This mode is selected when a new CC-Link system including a Ver.2-compatible slave station is configured.

More points can be used compared to the remote net Ver.1 mode. (☞Page 24, Section 3.2)



*1 The last two bits in RX and RY cannot be used for communications between a master station and a local station.

*2 In the master station and a local station, 0 points are assigned to RWr and RWw in a remote I/O station. (Buffer memory areas move over.)
Note that buffer memory areas for RWr and RWw in a local station do not move over when the local station is in the remote net Ver.1 mode.

*3 When a local station is in the remote net Ver.1 mode, data are stored in the Ver.1-compatible area. When a local station is in the remote net Ver.2 mode, data are stored in the Ver.2-compatible area.

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(1) Points per module and per system

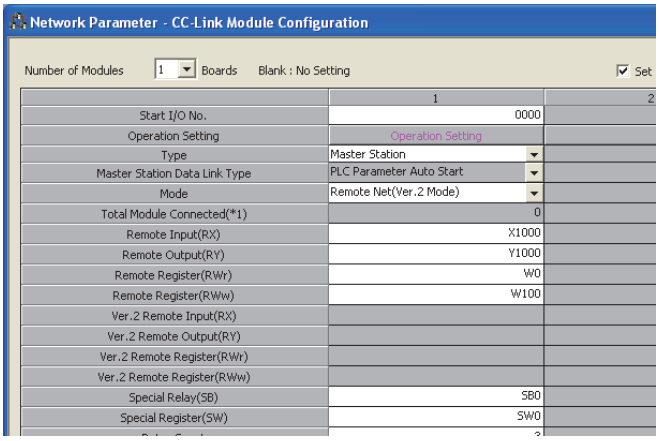
For the points, refer to the table of the performance specifications. (☞Page 24, Section 3.2)
In CC-Link, increasing the number of occupied stations and expanded cyclic setting can increase points per module. Set the number of occupied stations and expanded cyclic setting for each slave station. (☞Page 102, Section 7.3.2 (2), Page 118, Section 7.4.2 (1))

Item	Description
Number of Occupied Stations	The number of points is increased by increasing the station numbers occupied per module. Note that the number of slave stations that can be connected to a CC-Link system is decreased because one module occupies the station numbers for multiple modules.
Expanded Cyclic Setting (CC-Link Ver.2 only)	The station numbers occupied by one module are not changed, and only the number of points is increased. Unlike "Number of Occupied Stations", the number of slave stations connected to a CC-Link system is not decreased. Note, however, that the transmission delay time is extended compared to that of when the number of points is increased in "Number of Occupied Stations".

(2) Data transfer between RX, RY, RWr, and RWw and a device in a CPU module

(a) Automatic transfer by parameter settings using a programming tool

Setting a refresh device using the network parameter can automatically transfer data between RX, RY, RWr, and RWw in a master/local module and a device in a CPU module. (☞Page 97, Section 7.3.2, Page 115, Section 7.4.2)



(b) Transfer using a program

Using an intelligent function module device (Un\G□) and FROM/TO instructions transfers data between the buffer memory areas in a master/local module and a device in a CPU module. Use this function to use a different refresh device for each station or for other purposes.

Address		Item	Reference
Hexadecimal	Decimal		
4000_H to $41FF_H$	16384 to 16895	Ver.2-compatible remote input (RX)	Page 341, Appendix 2 (10)
4200_H to $43FF_H$	16896 to 17407	Ver.2-compatible remote output (RY)	
4400_H to $4BFF_H$	17408 to 19455	Ver.2-compatible remote register (RWw)	Page 342, Appendix 2 (11)
$4C00_H$ to $53FF_H$	19456 to 21503	Ver.2-compatible remote register (RWr)	

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(3) Storage locations of RX, RY, RWr, and RWw

The storage locations change depending on the number of occupied stations and expanded cyclic setting in slave stations. The storage locations for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))

Point

- Local station
  Data stored in RX, RY, RWr, and RWw in the local station side are stored in a remote net Ver.1 mode area when the master station is in the remote net Ver.2 mode and the local station is in the remote net Ver.1 mode. (☞ Page 47, Section 3.6.3 (2))
  Four points are occupied per station for RWr and RWr in a remote I/O station. (Buffer memory areas do not move over.)

(4) Precautions

(a) When changed from the remote net Ver.1 mode

In the remote net Ver.2 mode, zero points are assigned to RWr and RWw in a remote I/O station. (Buffer memory areas move over.)
The assignment of the station numbers for stations after the remote I/O station changes; therefore, change the program if required.

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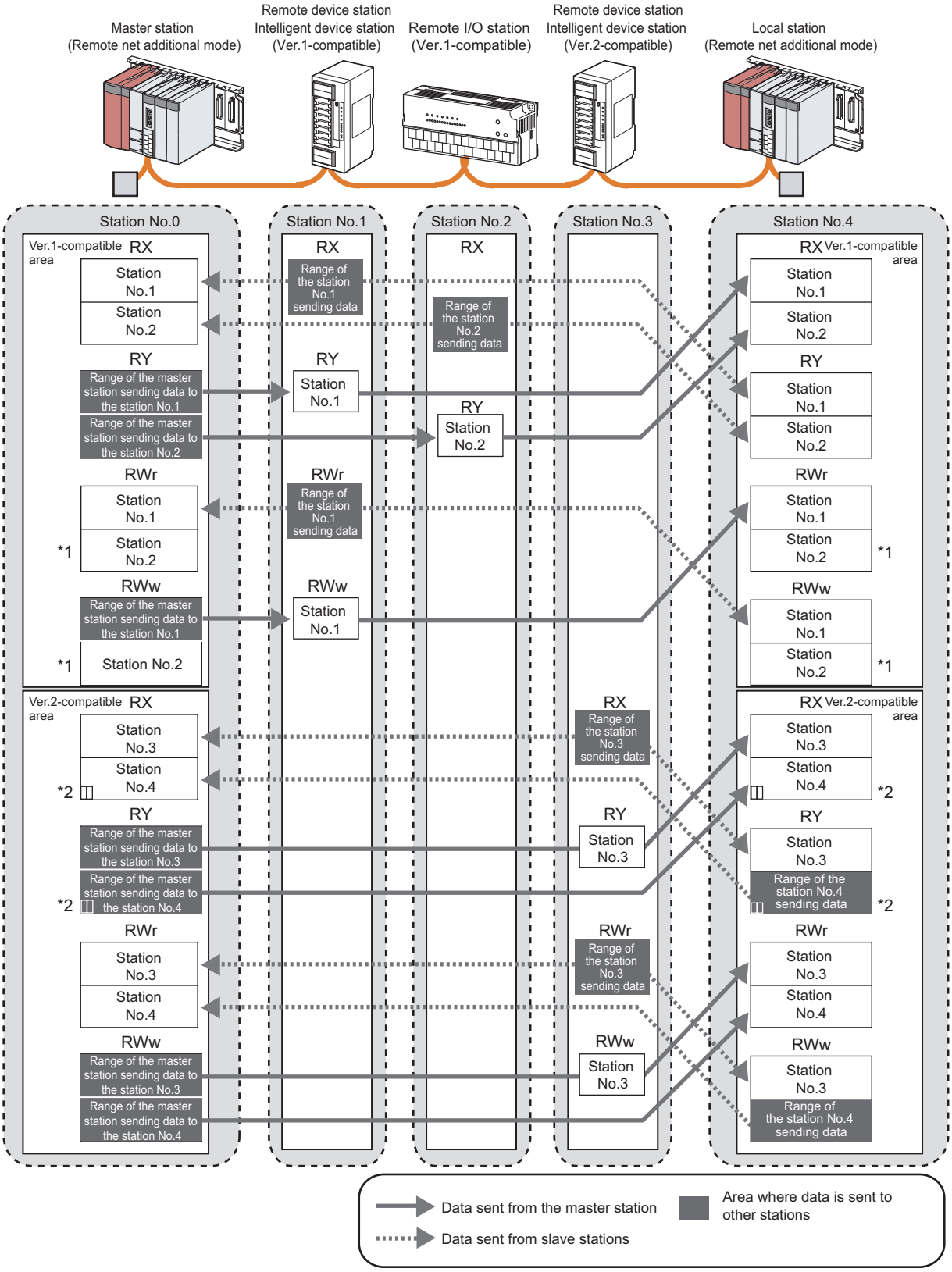
3.6.5 Remote net additional mode

This mode is selected when a Ver.2-compatible slave station is added to an existing Ver.1 system and cyclic points are expanded. Unlike the remote net Ver.2 mode, RX, RY, RWr, and RWw in a Ver.1-compatible slave station are stored into buffer memory for the Ver.1 (same buffer memory addresses); therefore, a program in the remote net Ver.1 mode can be used.



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*1 Areas in RWr and RWw are occupied for the number of points of the remote I/O station in the master station and local station. When areas in RWr and RWw should not be occupied, use the remote net Ver.2 mode. (☞ Page 48, Section 3.6.4)

*2 The last two bits in RX and RY cannot be used for communications between a master station and a local station.

Point

- The assignment of RX, RY, RWr, and RWw in a Ver.1-compatible slave station is the same as that in the remote net Ver.1 mode; therefore, a program that has been used in the remote net Ver.1 mode can be used.
  - Buffer memory addresses where RX, RY, RWr, and RWw are stored are Ver.1-compatible areas.
  - A remote I/O station does not have RWr or RWw. However, areas in RWr and RWw of the master station and a local station are occupied for the number of points of a remote I/O station.
- In the remote net additional mode, add a Ver.2-compatible slave station (including a local station in the remote net additional mode) to a station number after a Ver.1-compatible slave station. When there is a possibility to add a Ver.1-compatible slave station in future, set a reserved station at the end of the Ver.1-compatible slave station.
  To add a station number of a Ver.2-compatible slave station between station numbers of a Ver.1-compatible slave station, use the remote net Ver.2 mode.
- In a system where a standby master station is used, changing the mode to the remote net Ver.2 mode is recommended. In the remote net additional mode, the storage locations of RX, RY, RWr, and RWw differ between a Ver.1-compatible slave station and a Ver.2-compatible slave station; therefore, changing a program for a standby master station is required.

(1) Points per module and per system

For the points, refer to the table of the performance specifications. (☞ Page 24, Section 3.2)
In CC-Link, increasing the number of occupied stations and setting the greater value in the expanded cyclic setting can increase the number of points. Set the number of occupied stations and expanded cyclic setting for each slave station. (☞ Page 102, Section 7.3.2 (2), Page 118, Section 7.4.2 (1))

Item	Description
Number of Occupied Stations	The number of points is increased by increasing the station numbers occupied per module. Note that the number of slave stations that can be connected to a CC-Link system is decreased because one module occupies the station numbers for multiple modules.
Expanded Cyclic Setting (CC-Link Ver.2 only)	The station numbers occupied by one module are not changed, and only the number of points is increased. Unlike "Number of Occupied Stations", the number of slave stations connected to a CC-Link system is not decreased. Note, however, that the transmission delay time is extended compared to that of when the number of points is increased in "Number of Occupied Stations".

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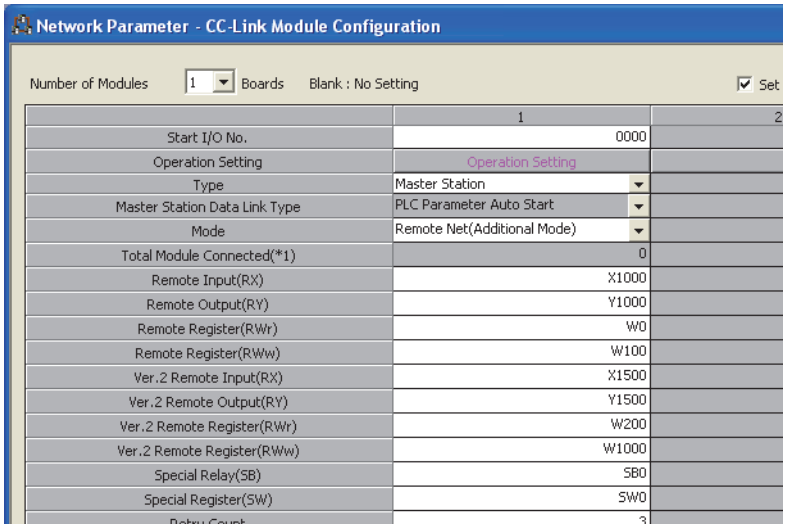
(2) Data transfer between RX, RY, RWr, and RWw and a device in a CPU module

In the remote net additional mode, data of a Ver.1-compatible slave station are stored into a Ver.1-compatible area, and data of a Ver.2-compatible slave station are stored into a Ver.2-compatible area.

(a) Automatic transfer by parameter settings using a programming tool

Setting a refresh device using the network parameter can automatically transfer data between RX, RY, RWr, and RWw in a master/local module and a device in a CPU module. (☞Page 97, Section 7.3.2, Page 115, Section 7.4.2)



(b) Transfer using a program

Using an intelligent function module device (Un\G□) and FROM/TO instructions transfers data between the buffer memory areas in a master/local module and a device in a CPU module. Use this function to use a different refresh device for each station or for other purposes.

- Ver.1-compatible area

Address		Item	Reference
Hexadecimal	Decimal		
$E0_H$ to $15F_H$	224 to 351	Remote input (RX)	Page 331, Appendix 2 (2)
160_H to $1DF_H$	352 to 479	Remote output (RY)	
$1E0_H$ to $2DF_H$	480 to 735	Remote register (RWw)	Page 333, Appendix 2 (3)
$2E0_H$ to $3DF_H$	736 to 991	Remote register (RWr)	

- Ver.2-compatible area

Address		Item	Reference
Hexadecimal	Decimal		
4000_H to $41FF_H$	16384 to 16895	Ver.2-compatible remote input (RX)	Page 341, Appendix 2 (10)
4200_H to $43FF_H$	16896 to 17407	Ver.2-compatible remote output (RY)	
4400_H to $4BFF_H$	17408 to 19455	Ver.2-compatible remote register (RWw)	Page 342, Appendix 2 (11)
$4C00_H$ to $53FF_H$	19456 to 21503	Ver.2-compatible remote register (RWr)	

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(3) Storage locations of RX, RY, RWr, and RWw

The storage locations change depending on the number of occupied stations and expanded cyclic setting in slave stations. The storage locations for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))

(4) Precautions

(a) To use the remote net additional mode for a local station

Set the master station to the remote net additional mode.

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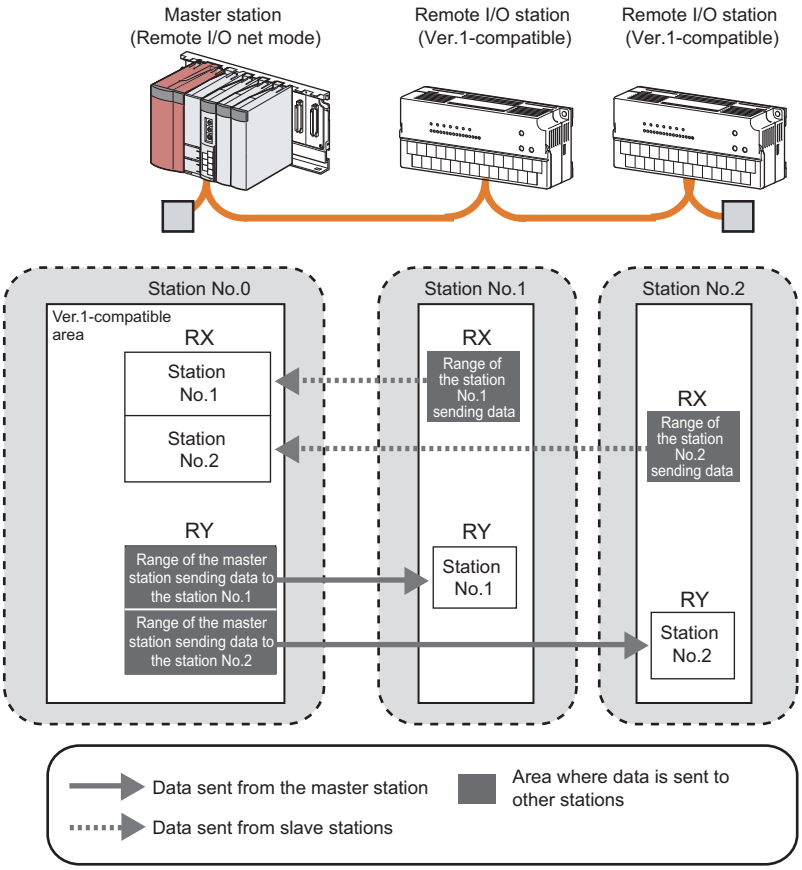
3.6.6 Remote I/O net mode

This mode is selected when slave stations are remote I/O stations only. Compared to other modes, transmission delay time of cyclic transmission can be shortened. In addition, the master/local module can operate with less setting.



The table below lists the differences of link scan time from other modes. (Rough indication)

(When transmission speed is 10Mbps)

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

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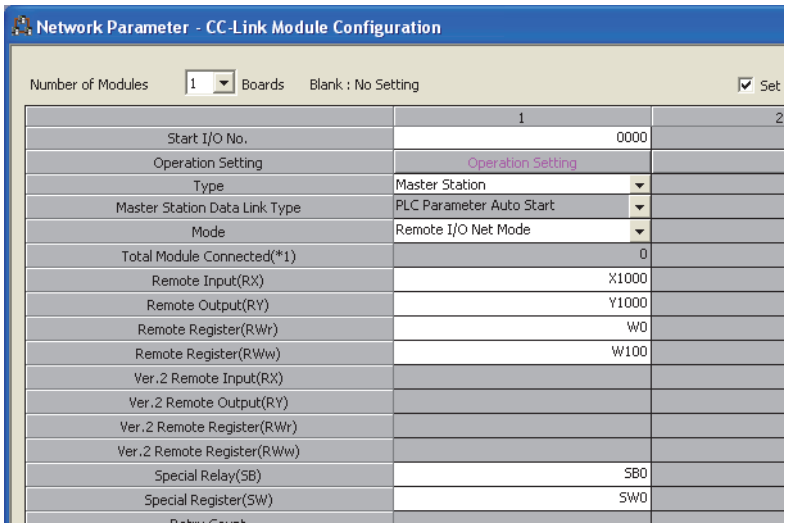
(1) Points per module and per system

For the points, refer to the table of the performance specifications. (☞Page 24, Section 3.2)

(2) Data transfer between RX, RY, RWr, and RWw and a device in a CPU module

(a) Automatic transfer by parameter settings using a programming tool

Setting a refresh device using the network parameter can automatically transfer data between RX, RY, RWr, and RWw in a master/local module and a device in a CPU module. (☞Page 97, Section 7.3.2)



(b) Transfer using a program

Using an intelligent function module device (Un\G□) and FROM/TO instructions transfers data between the buffer memory areas in a master/local module and a device in a CPU module. Use this function to use a different refresh device for each station or for other purposes.

Address		Item	Reference
Hexadecimal	Decimal		
$E0_H$ to $15F_H$	224 to 351	Remote input (RX)	Page 331, Appendix 2 (2)
160_H to $1DF_H$	352 to 479	Remote output (RY)	

(3) Storage locations of RX, RY, RWr, and RWw

Areas are assigned by 32 points in the order of station number to the remote input (RX) and remote output (RY). (☞Page 331, Appendix 2 (2))

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CHAPTER 4 PROCEDURE BEFORE THE OPERATION

This chapter describes the procedure to be taken before operating a master/local module.

Check column

☐ **System planning**

Plan the system configuration and device assignment.

☞ Page 41, Section 3.6

▼

☐ **Mounting**

Mount the master/local module on the base unit. Connect the slave station to the control panel and machine.

☞ Page 75, Section 6.1

▼

☐ **Wiring**

Connect the modules with a CC-Link dedicated cable. Connect terminating resistors to the modules located at both ends.

☞ Page 76, Section 6.2

▼

☐ **Items to check before powering on the module**

- Check the module installation status.
- Check the input power supply voltage.
- Check that the switch on the CPU module is set to STOP.
- Check that the switch on the CPU module is not set to RESET.

☐ **Switch setting**

Use the switches on the master/local module to set the station number, transmission speed, and mode.
Set the station number and transmission speed for the slave station as well.

☞ Page 21, CHAPTER 2
Page 82, Section 6.3
Page 85, Section 6.4

▼

To the next page

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☐ **Powering on the system**

Power on the system.

▼

☐ **Parameter setting**

Set the parameters on the master/local module.*1
Write the parameter settings to the CPU module.
Reset the CPU module or power off and on the system.

☞ Page 93, CHAPTER 7

▼

☐ **Checking operation with the LED display**

When data link is performed normally, the L RUN LED is turned on, and the ERR. LED is turned off.

▼

☐ **Programming**

Create a control program.
Write the program to the CPU module. Reset the CPU module or power off and on the system.

☞ Page 228, CHAPTER 10

*1 The parameters can be set using dedicated instructions. (☞ Page 205, Section 9.8)

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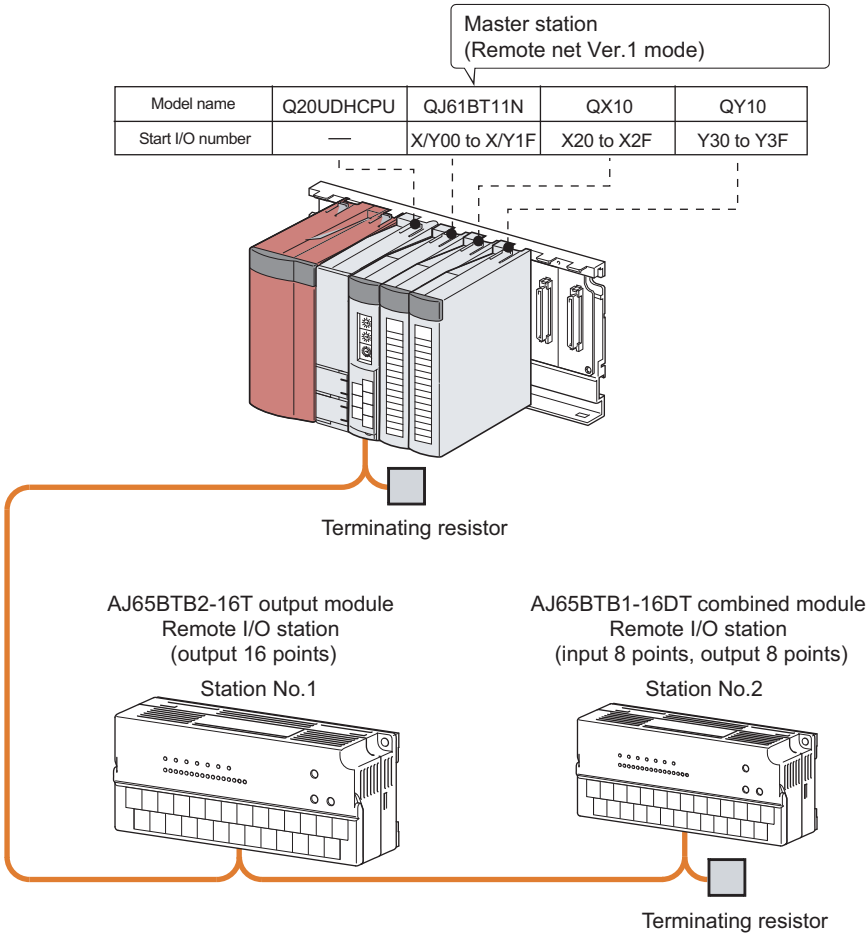
4.1 Operation Example

This section describes an example of the operation until starting up the system using the procedure described in Page 57, CHAPTER 4.

1. Design a system configuration.

The following system is used for explanation purpose.



Model name	Q20UDHCPU	QJ61BT11N	QX10	QY10
Start I/O number	—	X/Y00 to X/Y1F	X20 to X2F	Y30 to Y3F

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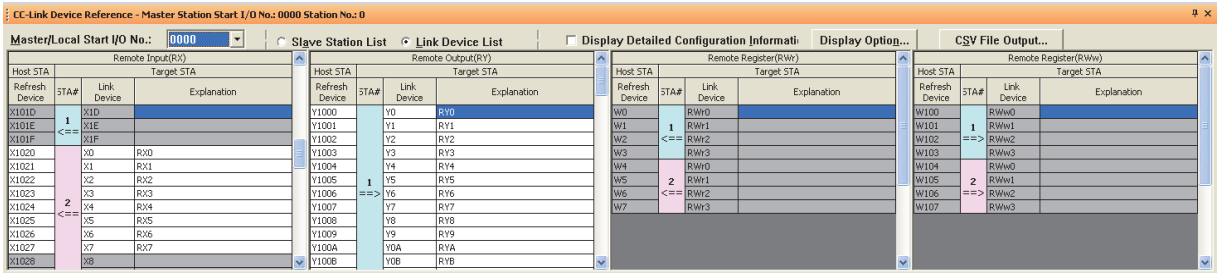
2. Plan the device assignment.

Point

The status of a device assignment can be checked on GX Works2 by setting information of a slave station on the CC-Link configuration window on GX Works2. (☞ Page 102, Section 7.3.2 (2) (a))

[View] ⇨ [Docking Window] ⇨ [Device Reference]

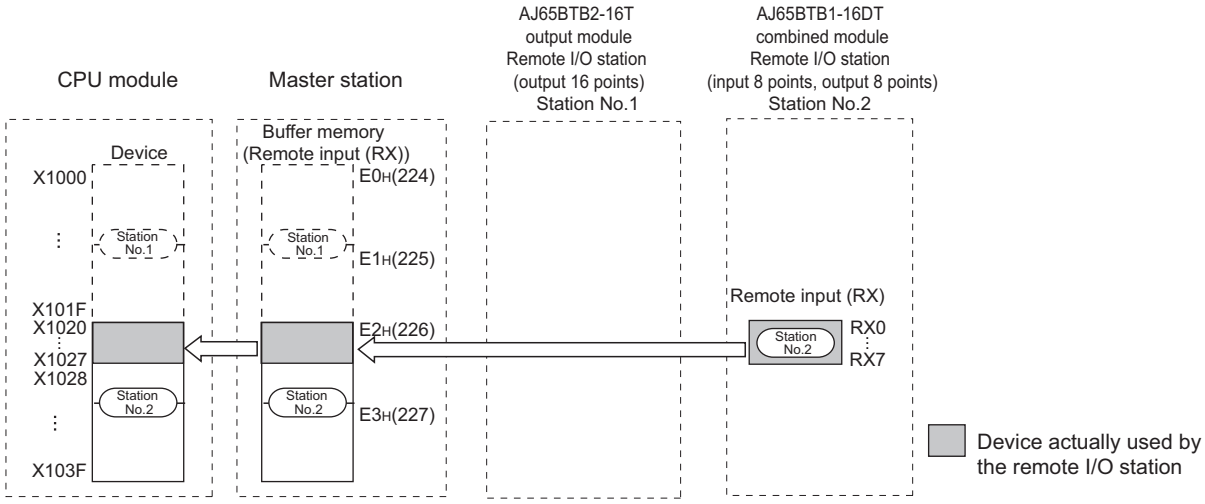


- Remote input (RX)

  Plan the assignment using the assignment sheet on Page 407, Appendix 8.1 (1).

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)
	Hexadecimal	Decimal			
X1000 to X100F	$E0_H$	224	1	AJ65BTB2-16T	to
X1010 to X101F	$E1_H$	225			to
X1020 to X102F*1	$E2_H$	226	2	AJ65BTB1-16DT	RX0 to RXF*1
X103 to X103F	$E3_H$	227			to

*1 In the AJ65BTB1-16DT, the first eight points are used for input, and the last eight points are used for output. RX0 to RX7 are used for input in the AJ65BTB1-16DT. In a CPU module, X1020 to X1027 are actually used.



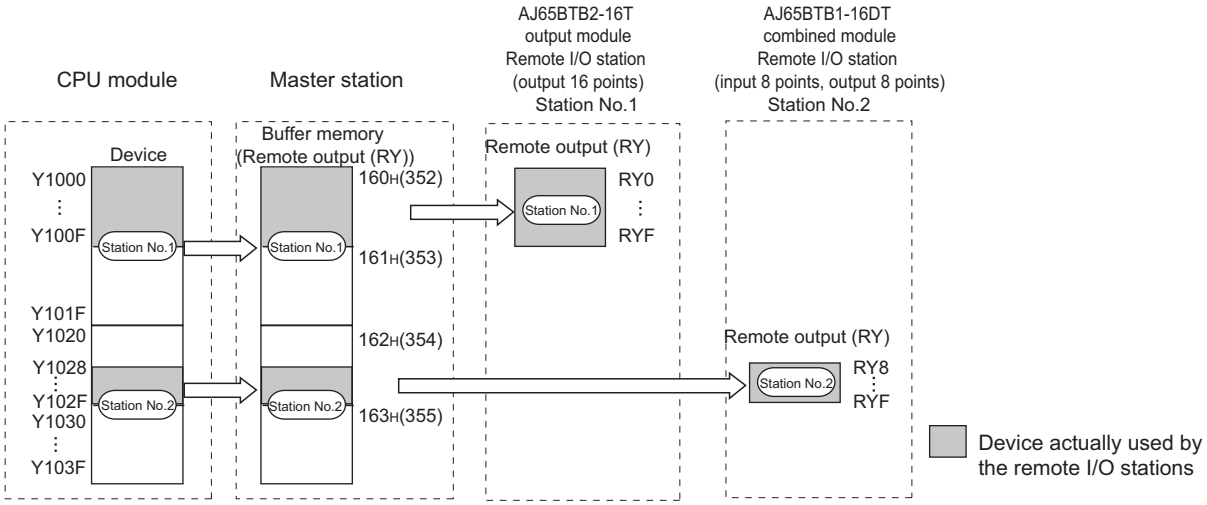
Downloaded from Arrow.com.

- Remote output (RY)

  Plan the assignment using the assignment sheet on Page 407, Appendix 8.1 (1).

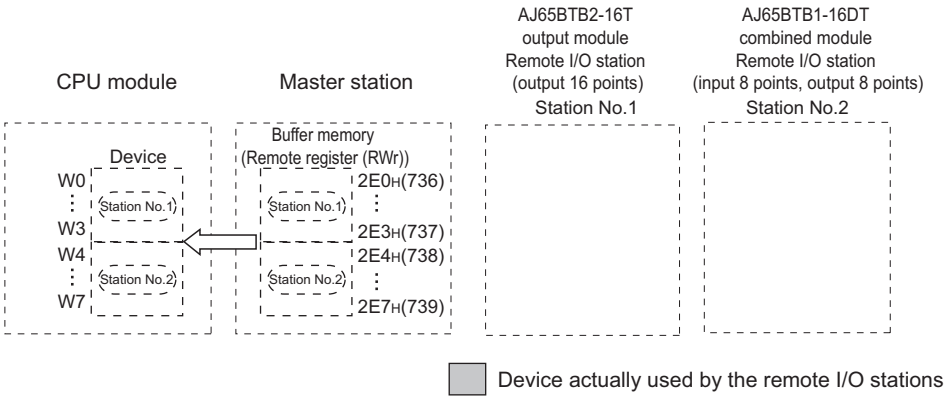
CPU module	Master station		Slave station		
Device	Buffer memory address		Station No.	Module name	Remote I/O (RX/RY)
	Hexadecimal	Decimal			
Y1000 to Y100F	160_H	352	1	AJ65BTB2-16T	RY0 to RYF
Y1010 to Y101F	161_H	353			to
Y1020 to Y102F	162_H	354	2	AJ65BTB1-16DT	RY0 to RYF*1
Y1030 to Y103F	163_H	355			to

*1 In the AJ65BTB1-16DT, the first eight points are used for input, and the last eight points are used for output. RY8 to RYF are used for output in the AJ65BTB1-16DT. In a CPU module, Y1028 to Y102F are actually used.



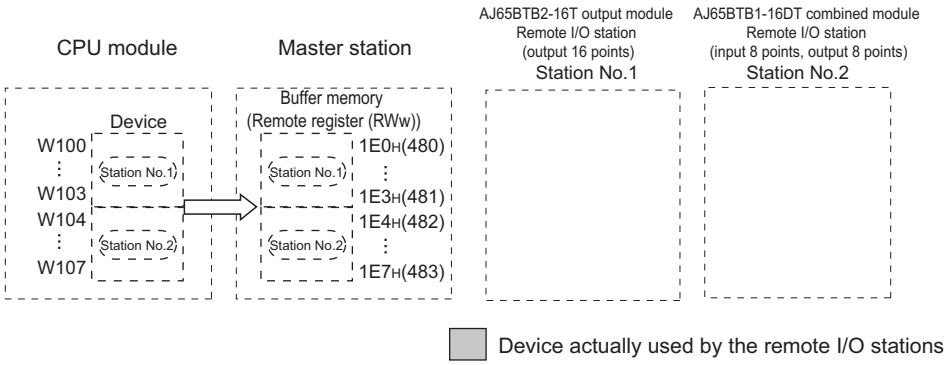
- Remote register (RWr)

  Because an AJ65BTB2-16T and AJ65BTB1-16DT are remote I/O stations, the remote register (RWr) is not used. Note, however, that four points (equivalent to the points for one station) are occupied in the master/local module because the system is in the remote net Ver.1 mode.



Downloaded from Arrow.com.

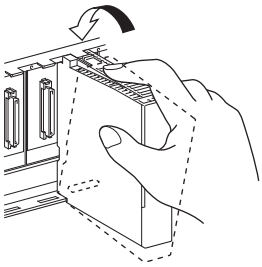
- Remote register (RWw)
  Because an AJ65BTB2-16T and AJ65BTB1-16DT are remote I/O stations, the remote register (RWw) is not used. Note, however, that four points (equivalent to the points for one station) are occupied in the master/local module because the system is in the remote net Ver.1 mode.



Point

Using the remote net Ver.2 mode can reduce the number of devices by assigning zero points to RWr and RWw in a remote I/O station. (☞ Page 48, Section 3.6.4)

3. Mount the master/local module on a base unit. (☞ Page 75, Section 6.1)



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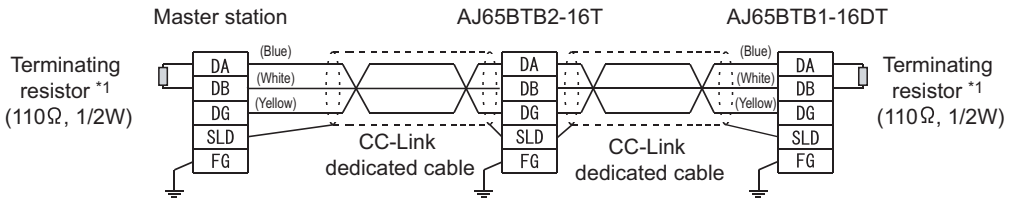
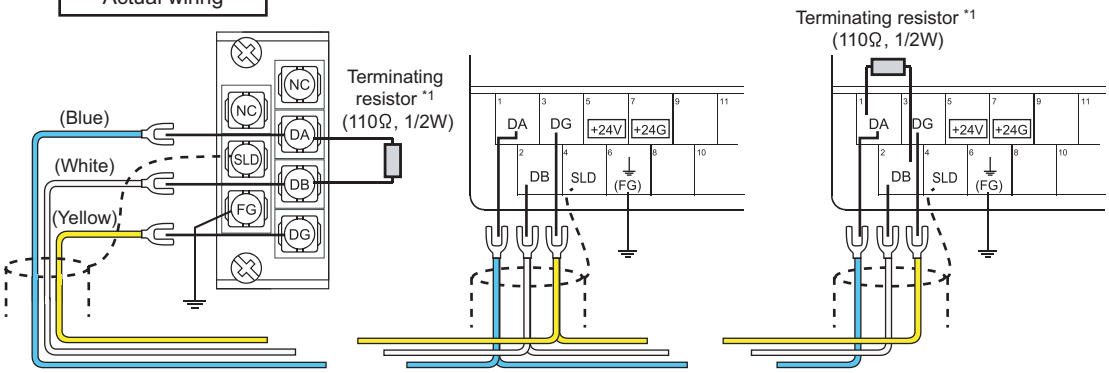
4. Connect a CC-Link dedicated cable to each module. Connect terminating resistors to the modules at both ends. (☞ Page 76, Section 6.2)

Wiring diagram



Actual wiring



*1 When a Ver.1.10-compatible CC-Link dedicated cable or CC-Link dedicated cable (Ver.1.00-compatible) is used, connect 110Ω 1/2W (Brown-Brown-Brown) terminating resistors.
When a CC-Link dedicated high-performance cable (Ver.1.00-compatible) is used, connect 130Ω 1/2W (Brown-Orange-Brown) terminating resistors.

After connecting the terminating resistors, check the following:

- If the modules are properly connected
- Voltage of the input power supply
- If the switch on the CPU module is set at STOP
- If the switch on the CPU module is not set at RESET

Point

Use terminating resistors supplied with the modules.

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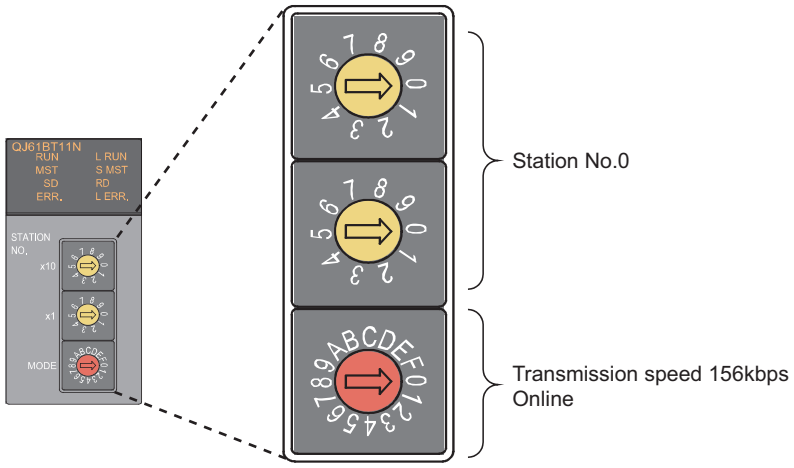
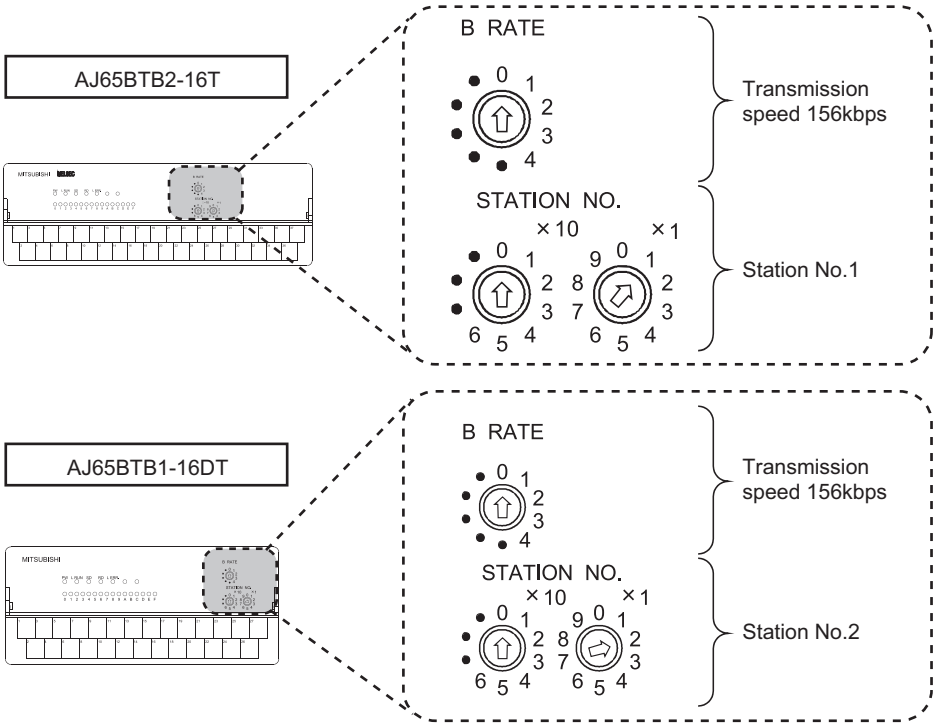
5. **Set the station number and transmission speed using the switches on the master/local module.**
(☞ Page 21, CHAPTER 2)
The transmission speed should be 156kbps.



6. **Set the station number and transmission speed using the switches on the AJ65BTB2-16T and AJ65BTB1-16DT.**



Point

- Set the station numbers not used for other modules. Pay extra attention when a module with the number of occupied stations of two or more is connected. (☞ Page 82, Section 6.3)
- Set the same transmission speed on all the connected modules. (☞ Page 85, Section 6.4)

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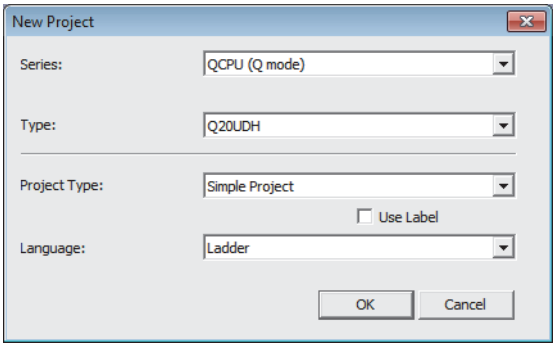
7. Power on the system.

8. Set the parameters on the master station using a programming tool.

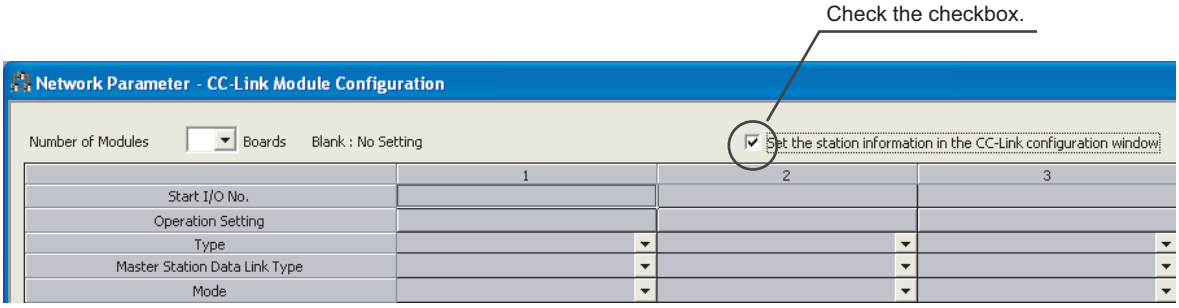
Create a project on a programming tool.
Select "QCPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

[Project] ⇨ [New]

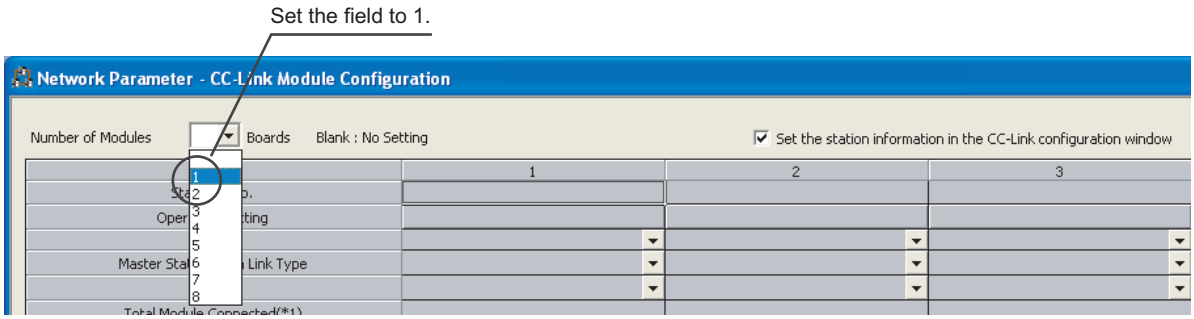


9. Open the "Network Parameter" window and check the checkbox next to "Set the station information in the CC-Link configuration window.". (On GX Works2 only)

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]



10. Select 1 for "Number of Modules".



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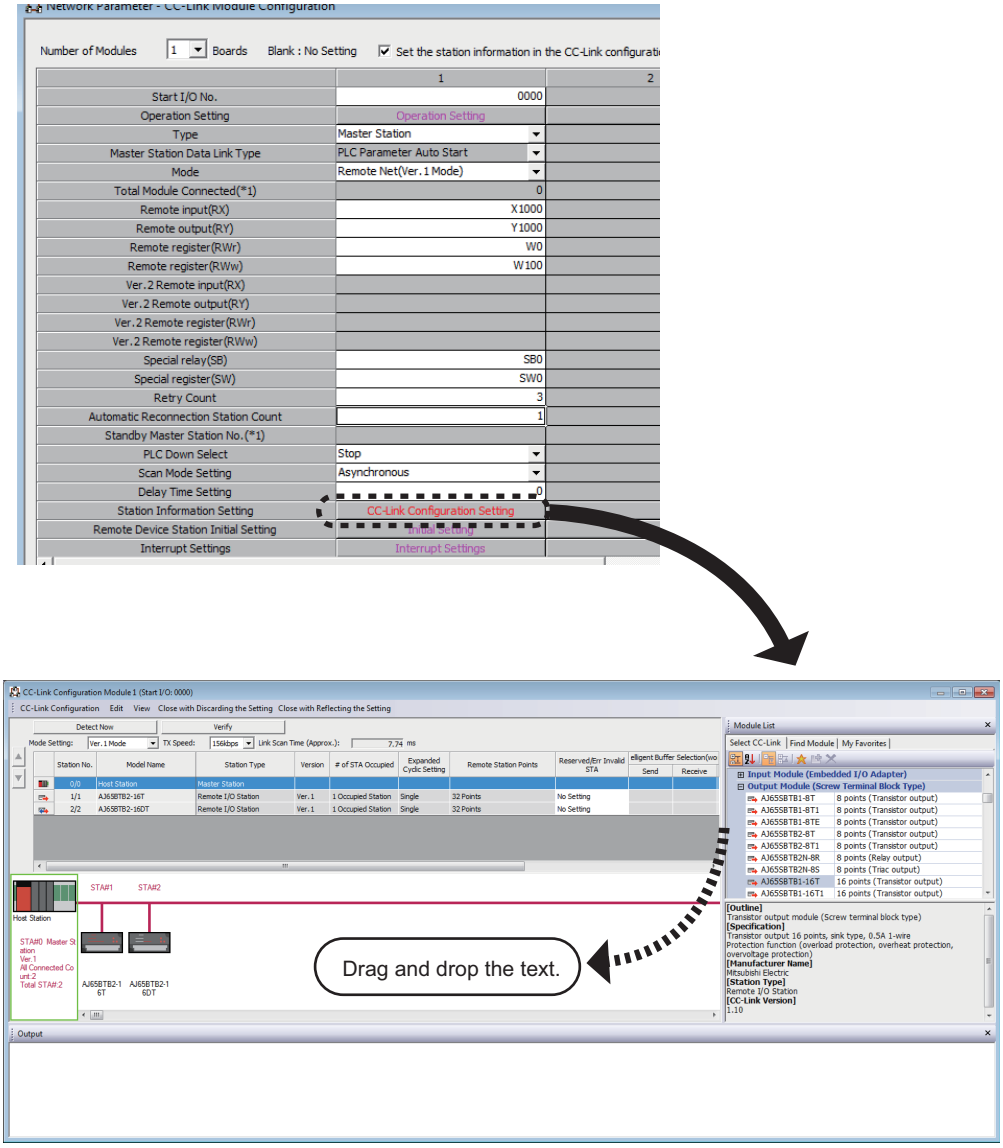
11. Configure the settings as follows.

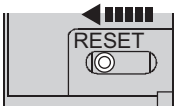
When using GX Developer, refer to the section "When the checkbox next to 'Set the station information in the CC-Link configuration window.' is not checked". (☞ Page 106, Section 7.3.2 (2) (b))



12. Write the set parameters to the CPU module. Then reset the CPU module or power off and on the system.

Data link is started.

[Online] ⇨ [Write to PLC]



or power off → on

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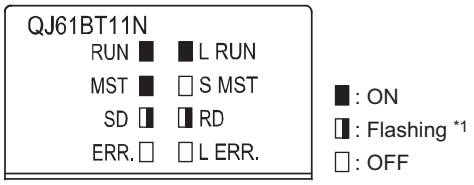
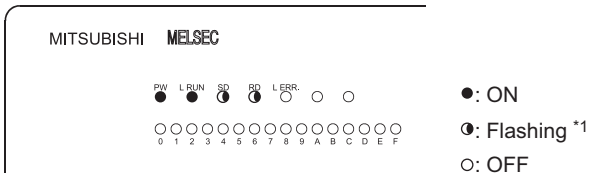
13. Check that the LEDs are in the following status.

If the LEDs are not in the following status, follow the steps 1 to 11 again.

Master station



AJ65BTB2-16T, AJ65BTB1-16DT



*1 The LED may look dimly lit or off depending on the communication status.

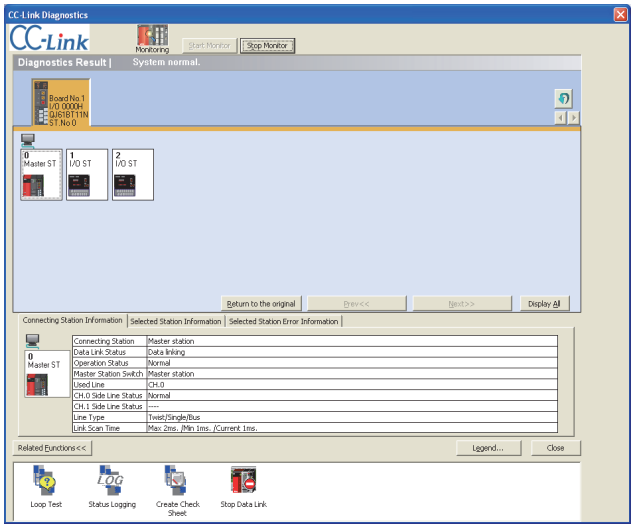
Point

- If the LEDs on the CPU module are in the following states, refer to the manual for the CPU module used and follow the troubleshooting instructions. (User's manual for the CPU module used (hardware design, maintenance and inspection))
  - The MODE LED is off.
  - The ERR. LED is on or flashing.

14. Check the connection status of each module on the CC-Link diagnostics. (Page 311, Section 11.4)

When the window is as follows, the connection status is normal.

[Diagnostics] ⇨ [CC-Link Diagnostics]



Point

The data link status of each module can be also checked using Other station data link status (SW0080 to SW0083).

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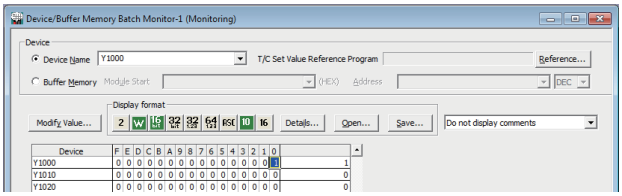
15. Check whether data link is being performed normally.

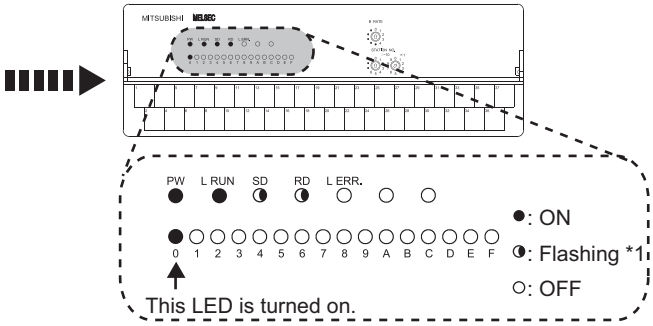
Turning on Y1000 of the master station on "Device/Buffer Memory Batch" on the programming tool turns on RY0 (Y0) of the AJ65BTB2-16T (station number 1).
Turning on X0 of the AJ65BTB1-16DT (station number 2) turns on X1020 of the master station.

[Online] ⇨ [Monitor] ⇨ [Device/Buffer Memory Batch]

Turn on Y1000 in the master station.



RY0 in the AJ65BTB2-16T is turned on.



*1 The LED may look dimly lit or off depending on the communication status.

Point

- If the operation above does not turn on the output (Y) of the slave station or the input (X) of the master station, check the RX, RY, RWr, and RWw assignment of the module using Slave station offset, size information (Un\G992 to Un\G1503).
- Before turning on or off the output using a device test, ensure the safety of the external device. Failure to do so may break the external device or cause an accident.

16. When the connection status is normal, create a control program. (☞ Page 228, CHAPTER 10)

Write the program to the CPU module. Then reset the CPU module or power off and on the system.

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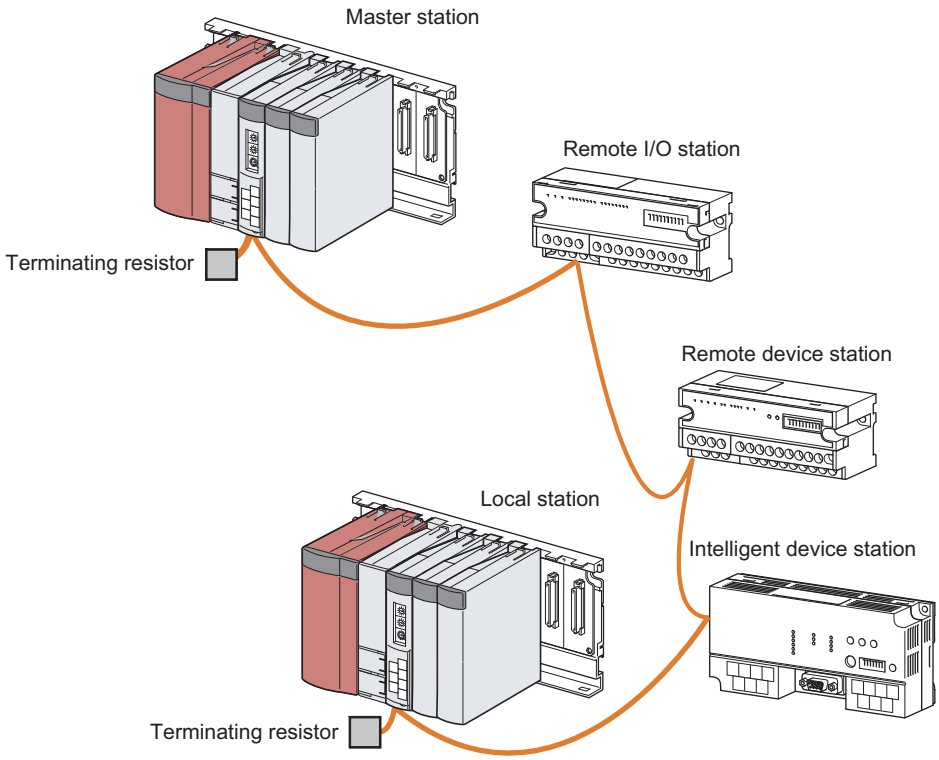
CHAPTER 5 SYSTEM CONFIGURATION

5.1 CC-Link System Configuration

A CC-Link system is configured with a master station, remote I/O station, remote device station, intelligent device station, and local station.



The CC-Link version and the number of slave stations that can be connected vary depending on the mode of the master/local module. (☞Page 27, Section 3.2.1, Page 43, Section 3.6.2)
Master/local modules of other series can be also used in a CC-Link system.

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5.2 Configuration of the System Where a Master/Local Module is Mounted

This section describes the MELSEC-Q series system where a master/local module is mounted.

5.2.1 Connectable modules and the number of connectable modules

(1) Connecting a master/local module to a CPU module

For the CPU modules, the number of modules, and base units applicable to the master/local module, refer to the user's manual for the CPU module used.

Note the following when the master/local module is used with a CPU module.

- Some restrictions apply to the version of a CPU module depending on the functions of the master/local module used. Check the version of the CPU module in the appendix of this manual. (☞Page 397, Appendix 6)
- Depending on the combination with other modules or the number of mounted modules, power supply capacity may be insufficient. Pay attention to the power supply capacity before mounting modules, and if the power supply capacity is insufficient, change the combination of the modules.
- Mount a module within the number of I/O points for the CPU module. If the number of slots is within the available range, the module can be mounted on any slot.

Remark

When using a C Controller module, refer to the user's manual for the C Controller module.

(2) Connecting a master/local module in a MELSECNET/H remote I/O station

For the MELSECNET/H remote I/O station, the number of modules, and base units applicable to the master/local module, refer to the following.

📖 Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)

Note the following when the master/local module is used with the MELSECNET/H remote I/O station.

- Some restrictions apply to the version of a MELSECNET/H remote I/O station depending on the functions of the master/local module used. Check the version of the MELSECNET/H remote I/O station in the appendix of this manual. (☞Page 397, Appendix 6)

(3) Using a multiple CPU system

Before using a master/local module in a multiple CPU system, refer to the following.

📖 Manual for the CPU module used (multiple CPU system)

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5.2.2 Applicable programming tools

The following two programming tools support a master/local module.

- GX Works2
- GX Developer

The version of a programming tool that can be used varies depending on the CPU module used. For the applicable versions, refer to the following.

User's manual for the CPU module used (hardware design, maintenance and inspection)

Some restrictions apply to the version of a programming tool depending on the functions of the master/local module used. Refer to "Upgrading the Functions of a Master/Local Module" in this manual. (Page 397, Appendix 6)

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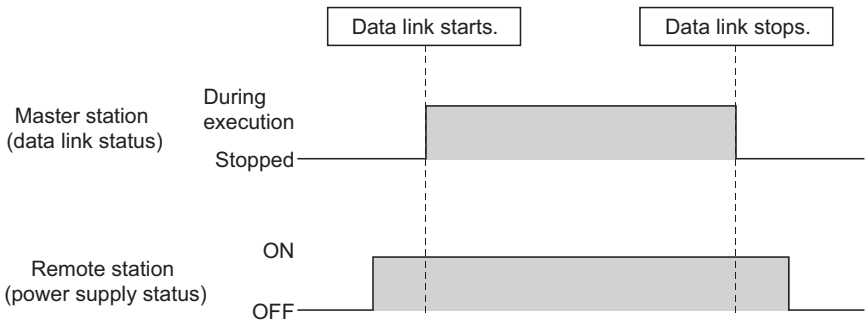
5.3 Precautions for the System Configuration

(1) When using the remote station

This section describes notes to be paid attention upon system design to prevent an incorrect input from a remote station.

(a) When turning on and off the power

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

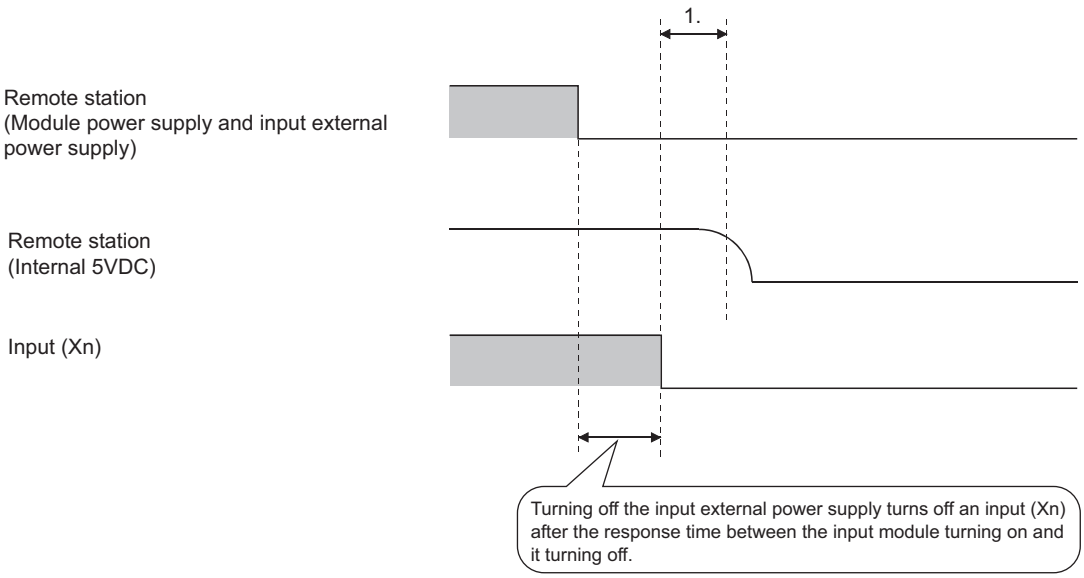


(b) Upon a momentary power failure of a remote station

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

- **Cause of an incorrect input due to a momentary power failure**

  The hardware of a remote station internally converts the power supply of a module (24VDC) into 5VDC. If a momentary power failure occurs in a remote station, the time until the 5VDC power supply in the remote station turns off becomes greater than the response time after an input module turns on and off; therefore, refreshing data within the time as shown in 1. below causes an incorrect input.



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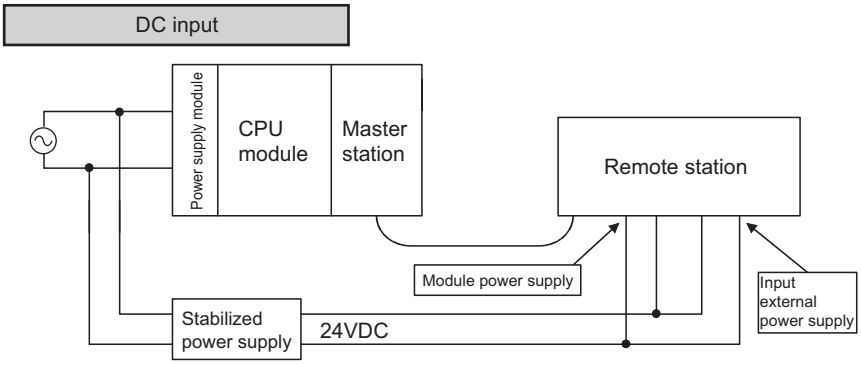
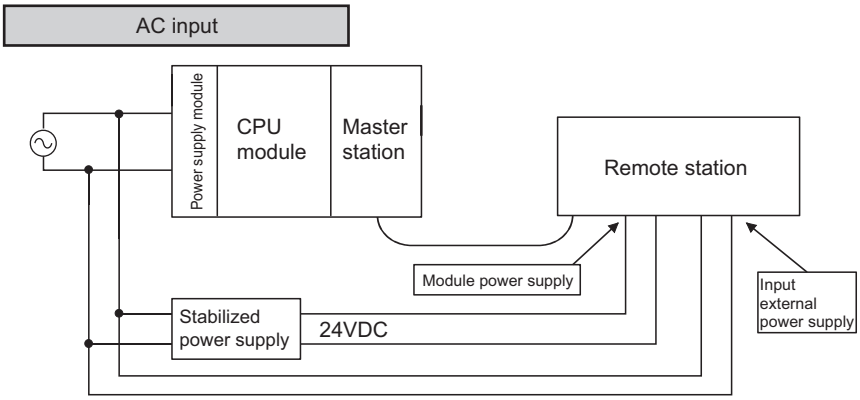
- **Countermeasure against an incorrect input**

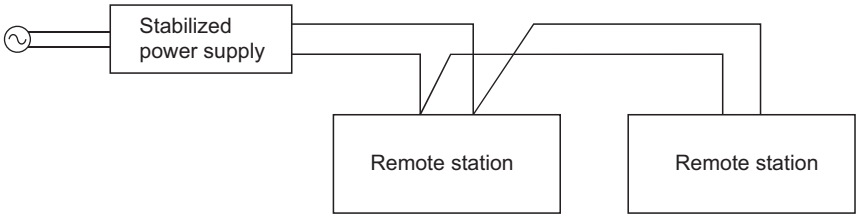
  Supply power to the power supply module, stabilized power supply, and AC input external power supply from the same power supply.





Remark

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.



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(2) Access to a station with the station number 64

(a) Access from other stations using a programming tool and GOT

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

(b) Access to other stations using a CC-Link system master/local interface board

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

(3) When using a master/local module in a MELSECNET/H remote I/O station

In a MELSECNET/H remote I/O station, an event issuance for the interrupt program and dedicated instructions cannot be used.

(4) When using a master/local module in a redundant system

For the precautions, refer to the following.

QnPRHCPU User's Manual (Redundant System)

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CHAPTER 6 INSTALLATION AND WIRING

6.1 Installing the Module

(1) How to install the module

The precautions when a master/local module is handled from the time it is unpacked until it is installed are described on this page. For more details on the module installation, refer to the following.

User's manual for the CPU module used (hardware design, maintenance and inspection)

(2) Handling precautions

The following are the precautions for when a master/local module is handled.

- Do not drop or apply strong shock to the module case and terminal block since it is made from resin.
- Do not remove the printed-circuit board of each module from its case. Doing so may cause a failure in the module.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.
- Solderless terminals with insulation sleeves cannot be used for the terminal block. It is recommended to cover the connecting sections of the solderless terminals with a marking tube or insulation tube.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.
- To mount the module on the base unit, fully insert the module fixing latch into the fixing hole in the base unit and press the module using the hole as a fulcrum. Incorrect mounting may cause malfunction, failure or drop of the module.
- Tighten screws such as module fixing screws and terminal screws within the torque ranges listed below.

Screw type	Tightening torque range
Module fixing screw (M3 screw)*1	0.36 to 0.48 N•m
Terminal block screw (M3 screw)	0.42 to 0.58 N•m
Terminal block mounting screw (M3.5 screw)	0.66 to 0.89 N•m

*1 The module can be easily fixed on the base unit using the hook at the top of the module. Note, however, that it is recommended to secure the module with module fixing screws under vibration.

- Before installing or removing the terminal block, power off the applicable station. If the terminal block is installed or removed without turning off the power, normal data transmission is not guaranteed.
- Before removing the terminating resistors to change the CC-Link system, power off the system. If the terminating resistors are removed or mounted without turning off the power, normal data transmission is not guaranteed.

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6.2 Wiring

This section describes how to connect a CC-Link dedicated cable to the master/local module.

6.2.1 Preparation before wiring

Before wiring, check the cables and terminating resistors to be used.

(1) Cables that can be used

The following cables can be used:

- Ver.1.10-compatible CC-Link dedicated cable
- CC-Link dedicated cable (Ver.1.00-compatible)
- CC-Link dedicated high-performance cable (Ver.1.00-compatible)

These cables cannot be used together. If used, normal data transmission is not guaranteed.

(2) The order of connecting the cables

The cables do not have to be connected in the order of station number.

(3) Terminating resistors to be used

Connect the terminating resistors included with the modules at both ends of the modules in the CC-Link system. The terminating resistors to be used vary depending on the cable.

Cable type	Terminating resistor to be used
Ver.1.10-compatible CC-Link dedicated cable	110Ω 1/2W (Brown-Brown-Brown)
CC-Link dedicated cable (Ver.1.00-compatible)	
CC-Link dedicated high-performance cable (Ver.1.00-compatible)	130Ω 1/2W (Brown-Orange-Brown)

When the A(1S)J61BT11/A(1S)J61QBT11 is used as a master station in a T-branch system configuration, the terminating resistors included with the master/local module cannot be used. (☞Page 79, Section 6.2.3 (1))

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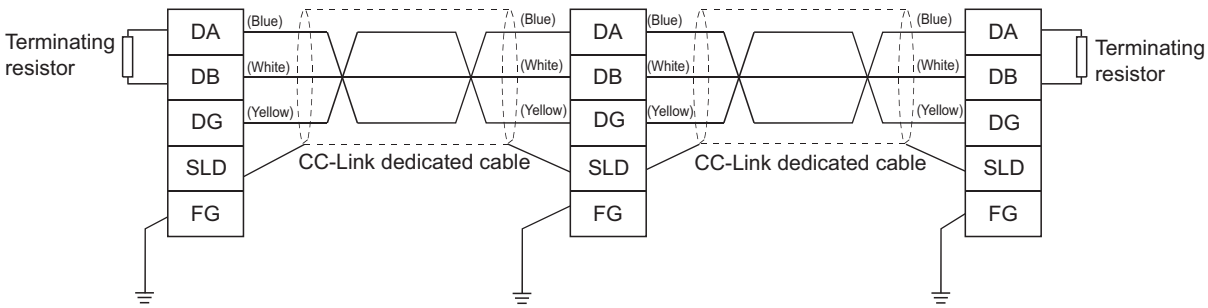
6.2.2 Wiring procedure

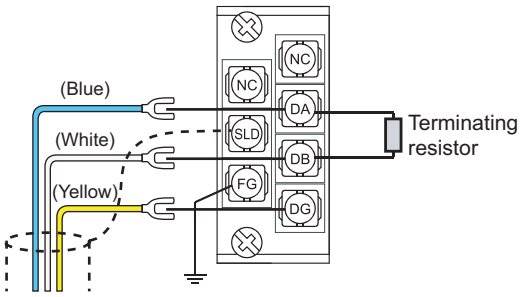
Connect a CC-Link dedicated cable to the terminal block of the master/local module.

(1) Wiring procedure

(a) Wiring diagram



(b) Actual wiring diagram



Point

- Connect the terminating resistors between the DA and DB terminals.
- Connect the shielded cables of a CC-Link dedicated cable to the SLD terminal through the FG terminal. Then ground the cables at both ends with a ground resistance of 100Ω or less. The SLD and FG terminals are connected inside.
- No restrictions apply to the connection order of a master/local module. (The cables need not be connected in the order of station number.)
- The star topology cannot be used. Note, however, that the T-branch connection can be used. (☞ Page 79, Section 6.2.3)

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(2) Terminal block of the master/local module

(a) Solderless terminal

Use a solderless terminal and wire specified in the following table. Tighten a solderless terminal within the specified torque range. Use a UL-listed solderless terminal and a tool recommended by the manufacturer of the solderless terminal for processing.
Solderless terminals with sleeves cannot be used.

Solderless terminal		Wire			
Model name	Tightening torque range	Diameter	Type	Material	Temperature rating
1.25-3	0.42 to 0.58N•m	22 to 16AWG	Stranded	Copper	60°C or higher

(b) Screws and tightening torque

The table below lists the screws of the terminal block and the tightening torque.

Screw type	Tightening torque range
Terminal block screw (M3 screw)	0.42 to 0.58N•m
Terminal block mounting screw (M3.5 screw)	0.66 to 0.89N•m

(3) Wiring check

Connect the master station with the slave station. Check whether the slave station is turned on and off by turning on and off the device of the master station. (☞ Page 59, Section 4.1)

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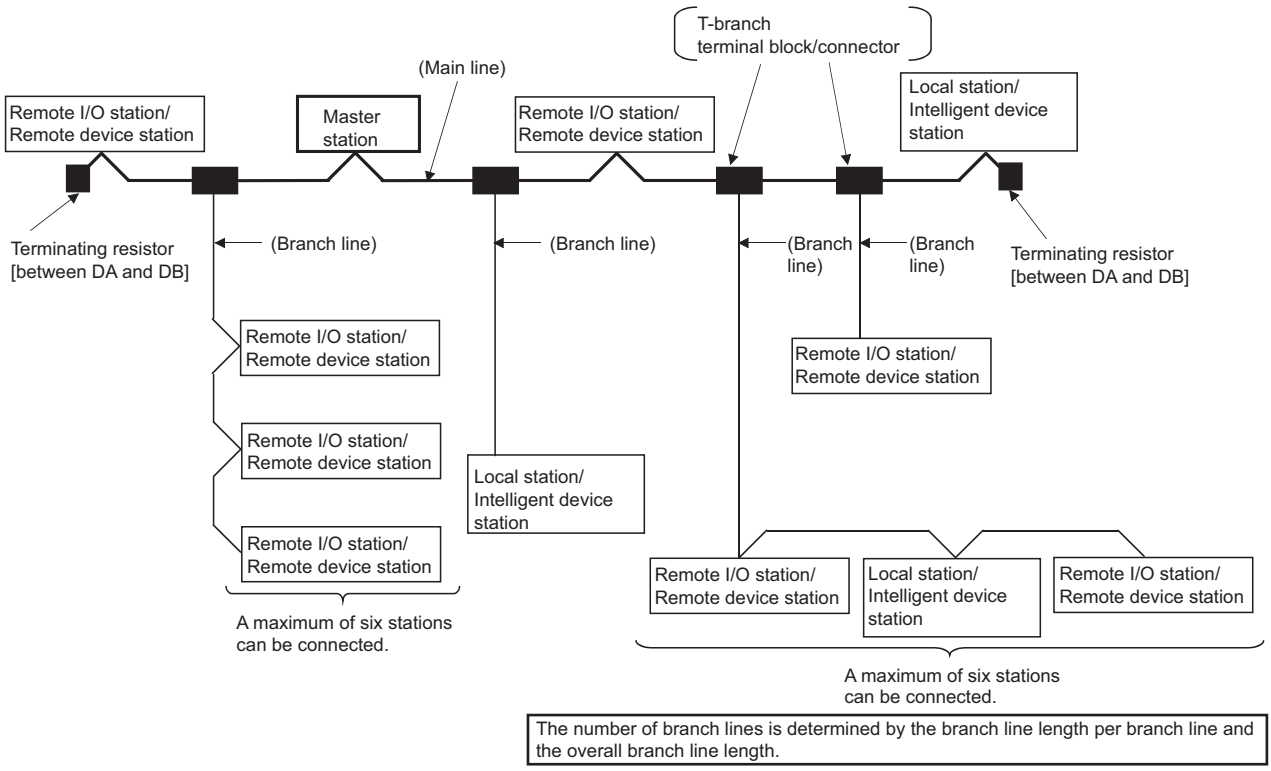
6.2.3 T-branch connection

This section describes how to connect CC-Link dedicated cables in T-branch.

(1) T-branch system configuration

The following is a system configuration in T-branch.

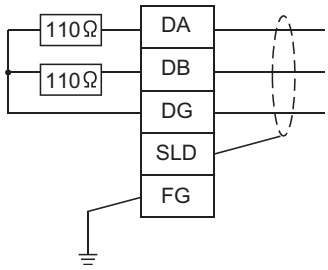


(a) Precautions

When the following modules are the master stations, change the procedure of connecting terminating resistors.

- AJ61BT11: Hardware version C or earlier
- AJ61QBT11: Hardware version C or earlier
- A1SJ61BT11: Hardware version D or earlier
- A1SJ61QBT11: Hardware version D or earlier

Connect the terminating resistors between DA and DB and between DA and DG. Use the following terminating resistors and do not use the terminating resistors included with the module.



110Ω ±5%, 1/2W × 4 pieces
(Connection between DA and DG and between DB and DG): Connect a terminating resistor to each module at both ends of the main line.

[Terminating resistor model name]

Ex. ERDS1TJ111: Manufactured by Panasonic Corporation

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(2) Communication specifications for a T-branch connection

The following table lists the communication specifications upon T-branch connection.

For those not listed below, refer to the performance specifications. (☞ Page 24, Section 3.2)

Item	Specifications		Remark
Transmission speed	625kbps	156kbps	10M, 5M, and 2.5Mbps cannot be used.
Maximum length of the main line	100m	500m	A cable length between terminating resistors. The length (branch line length) of a T-branch cable is not included.
Maximum length of the branch line	8m		A total cable length for each branch
Overall branch line length	50m	200m	A total length of all branch cables
Maximum number of connected modules on the branch line	6 modules per branch		The total number of connected modules depends on the CC-Link specifications.
Connection cable	• Ver.1.10-compatible CC-Link dedicated cable • CC-Link dedicated cable (Ver.1.00-compatible)		• Ver.1.10-compatible CC-Link dedicated cables manufactured by different companies can be used together. • CC-Link dedicated cables (Ver.1.00-compatible) manufactured by different companies cannot be used together. • CC-Link dedicated high-performance cables (Ver.1.00-compatible) cannot be used.
T-branch terminal block/connector	• Terminal block A commercially available terminal block • Connector An FA connector conforming to NECA4202 and IEC947-5-2 or equivalent product is recommended. (NECA: Nippon Electric Control Equipment Industries Association)		Do not remove the jacket of the cables on the branch line, if possible.

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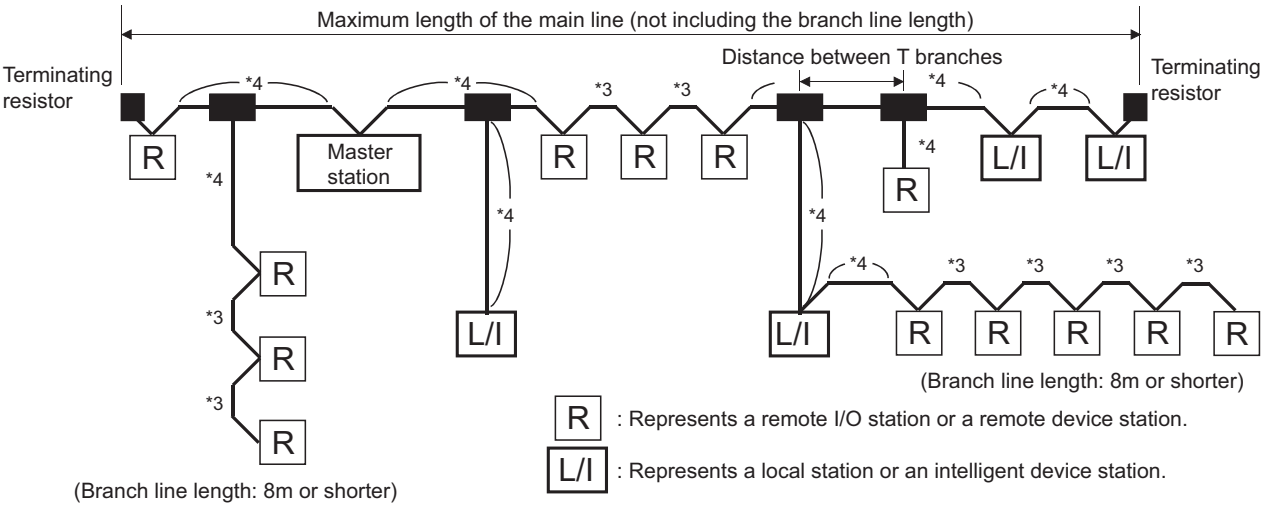
Item	Specifications	Remark
Maximum length of the main line, distance between T-branches, and station-to-station cable length	Ver.1.10-compatible CC-Link dedicated cable, CC-Link dedicated cable (Ver.1.00-compatible) (terminating resistors of 110Ω used)	

Transmission speed	Maximum length of the main line	Distance between T-branches	Cable length between remote I/O stations or remote device stations*3	Cable length between a master/local station and the station one before/after the master/local station or an intelligent device station and the station before/after the intelligent device station*3
625kbps	100m	No restriction	30cm or longer	1m or longer*1/2m or longer*2
156kbps	500m			

*1 This applies to a system configured with a remote I/O station and remote device station only.
*2 This applies to a system configuration including a local station and intelligent device station.
*3,*4 Refer to the following figure.



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6.3 Station Number Setting

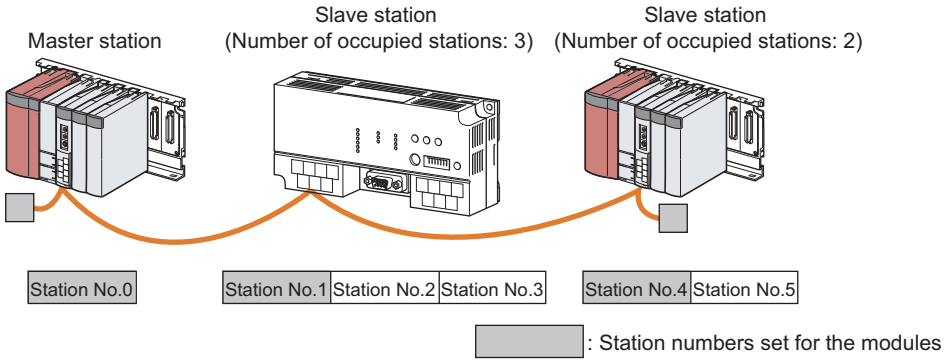
This section describes how to set the station numbers for CC-Link and a master/local module.

(1) Station number setting for CC-Link

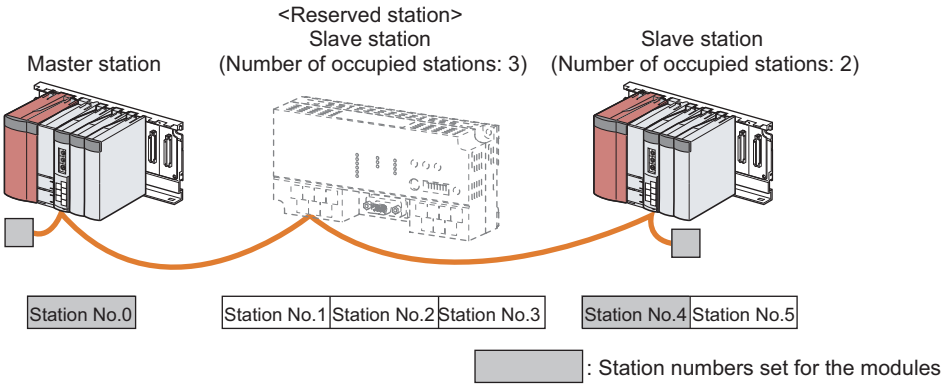
For CC-Link, follow the rules below to set the station numbers.

- Set the station numbers not used for other stations. If a station number already in use is set, an error occurs.
- Set consecutive station numbers for stations in the same system.
  To set empty station numbers for future use, set the stations as reserved stations. Setting the stations as reserved stations prevents the stations from being detected as a faulty station. Set reserved stations in the master station using the network parameter of a programming tool. (☞ Page 102, Section 7.3.2 (2), Page 162, Section 8.3.4)
- When the number of occupied stations in a module is two or more, set the start station number.

Ex. Station number setting in modules when the number of occupied stations is two or more



Ex. Setting the station numbers 1 to 3 (number of occupied stations: 3) as reserved stations



Point

- If an empty station number is set without setting a reserved station, the station is detected as a faulty station in Other station data link status (SW0080 to SW0083).
- The station numbers need to be consecutive, but wiring does not need to be performed in the order of station number.

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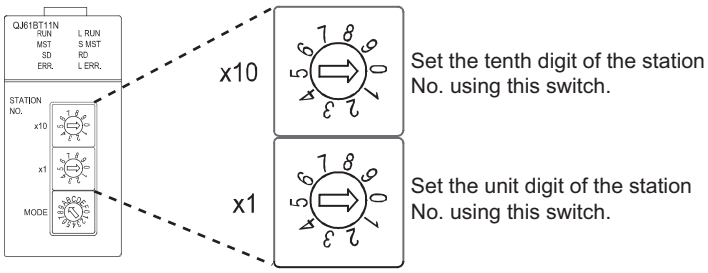
(2) How to set the station number in the master/local module

1. Set the station number using the station number setting switches on the master/local module.
(☞ Page 21, CHAPTER 2)



2. Resetting the CPU module or powering off and on the system reflects the set station number.

3. If the ERR. LED is on or flashing, check if the station number is not used for other stations.

ERR. LED	Description
ON	The station number 0 is already in use. Check the station number of the station connected again. Switch setting status (SB006A) turns on, and the error code is stored in Switch setting status (SW006A).
Flashing	One of the station numbers 1 to 64 is already in use. Check the station number of the station connected again. Whether the station number is already in use can be checked in Loading status (SW0069) and Station number overlap status (SW0098 to SW009B). Even if the station number is in use, data link is performed with a normal station.

Point

Correct the station number already in use. Resetting the CPU module or powering off and on the system clears error information stored in a link special register (SW) or others.

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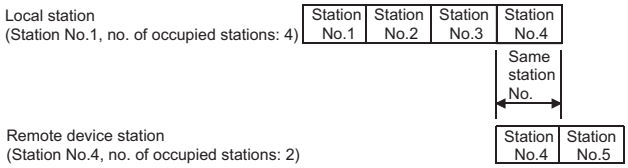
(3) Precautions

(a) Detecting overlapped station numbers of the master/local module

An overlapped station number is detected in a master/local module if a station number other than a start number is in use.

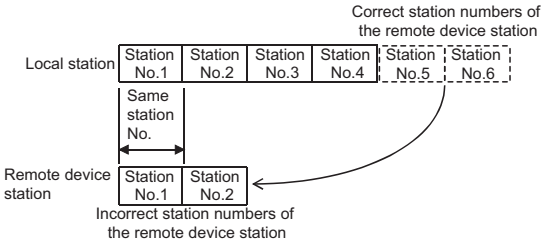


If a start station number is in use, it is not detected. (The station number 0 of the master station is detected if it is in use.)

Check whether the station number of the station where a data link error has occurred is not already used for other stations using Other station data link status (SW0080 to SW0083).

Ex. A local station (station number 1 with the number of occupied stations of 4) and a remote device station (station number 1 with the number of occupied stations of 2)

In the following case, the overlapped station number is not detected.



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6.4 Transmission Speed Setting

This section describes the transmission speed setting in CC-Link.

(1) Conditions for transmission speed

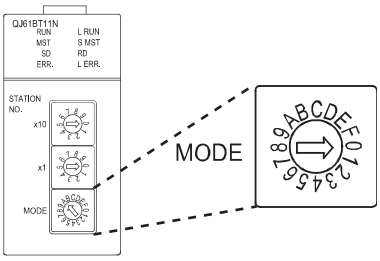
- Set the same transmission speed in all the stations in the CC-Link system. Data link cannot be performed with a slave station where the different transmission speed from the master station is set.
- The transmission speed that can be set varies depending on the overall distance. (☞ Page 29, Section 3.2.2, Page 30, Section 3.2.3)

Point

Whether the transmission speed of the slave station is the same as that of the master station can be checked by executing a transmission speed test. (☞ Page 90, Section 6.5.2)

(2) How to set the transmission speed

1. Set the transmission speed using the transmission speed/mode setting switch on the master/local module.



Mode	Transmission speed setting	Switch number
Online	Transmission speed: 156kbps	0
	Transmission speed: 625kbps	1
	Transmission speed: 2.5Mbps	2
	Transmission speed: 5Mbps	3
	Transmission speed: 10Mbps	4
Line test (☞ Page 86, Section 6.5.1) • When the station number setting switch is set at 0 Line test 1 • When the station number setting switch is set at 1 to 64 Line test 2	Transmission speed: 156kbps	5
	Transmission speed: 625kbps	6
	Transmission speed: 2.5Mbps	7
	Transmission speed: 5Mbps	8
	Transmission speed: 10Mbps	9
Hardware test (☞ Page 324, Section 11.5)	Transmission speed: 156kbps	A
	Transmission speed: 625kbps	B
	Transmission speed: 2.5Mbps	C
	Transmission speed: 5Mbps	D
	Transmission speed: 10Mbps	E
Setting not allowed		F

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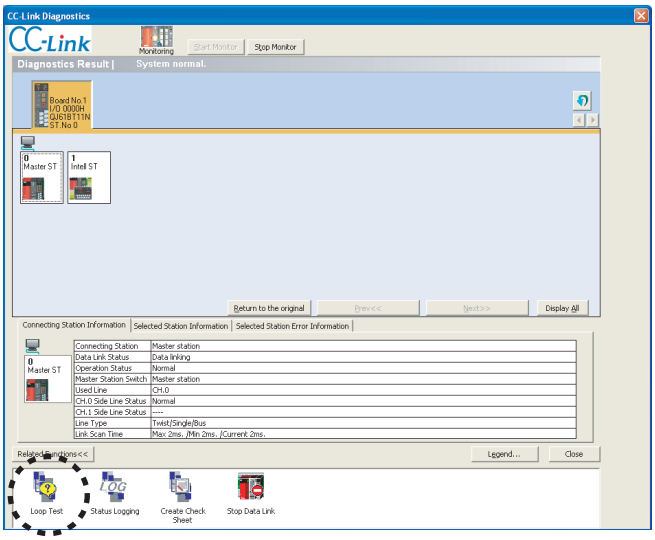
6.5 Test After Wiring

6.5.1 Line test

Whether a CC-Link dedicated cable is properly connected and data link can be performed with slave stations can be checked.
A line test is executed in the master station.

(1) Using a programming tool



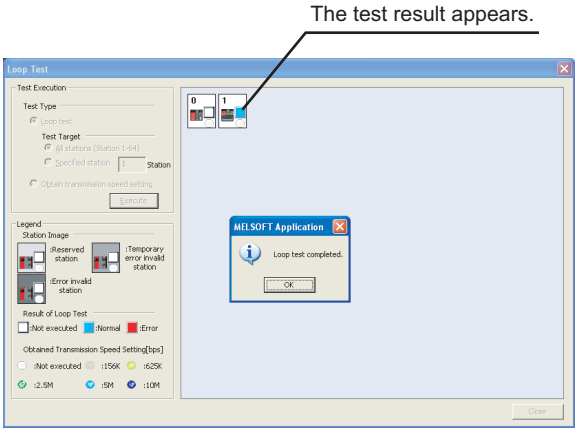
Double-click the icon.

1. Open the CC-Link diagnostics window on a programming tool.

[Diagnostics] ⇨ [CC-Link Diagnostics]

2. Double-click "Loop Test" on the bottom left corner of the window.

If "Loop Test" is not displayed, click the Related Functions>> button on the bottom left corner of the window.



3. Select "Loop Test" under "Test Type".

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

- Selecting "All stations (Station 1-64)" executes a test on all the connected stations.
- Selecting "Specified station" executes a test on a specified station. Set the start station number when the number of occupied stations is two or more.

5. Clicking the Execute button executes the line test.

- Do not write data to the buffer memory areas (buffer memory addresses: $5E0_H$ and 608_H) during line test.
- Do not execute a line test using a program or other peripherals at the same time. The line test may not be normally executed.

After the line test is completed, the result is displayed on the right side of the window.

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(2) Using the transmission speed/mode setting switch on the master/local module

There are two types of line tests: line test 1 and line test 2. First, a line test 1 is executed. If the line test 1 is abnormally ended, a line test 2 is executed.

Item	Description
Line test 1	To check the status of communications with all the modules connected. If the test is abnormally ended, the faulty station is identified in a line test 2.
Line test 2	To check the status of communications with a specific slave station

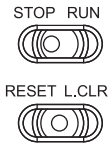
Point

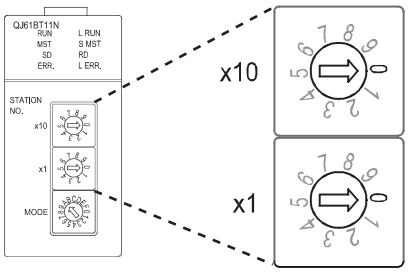
- A line test can be executed when a CC-Link dedicated cable is connected and the station number and transmission speed are set in a slave station. No parameter setting is required in the master/local module.
  However, to execute a line test 2 for a standby master station, the parameter setting is required in the standby master station.
- When the data link start function is used, execute a line test using a programming tool. (Page 86, Section 6.5.1 (1))

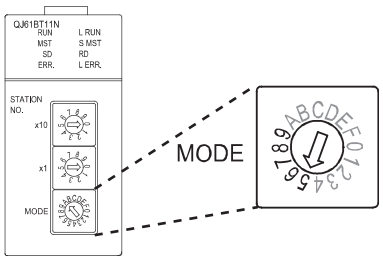
(a) Line test 1

Example Universal model QCPU

Example High Performance model QCPU







1. Before the line test 1, check the following:
- If the switch on the CPU module is set at STOP
- If the switch on the CPU module is not set at RESET
- If all the stations are connected with CC-Link dedicated cables

2. Set the station number setting switches on the master station to 0.

3. Set the transmission speed/mode setting switch on the master station from 5 to 9.
When setting the switch from 5 to 9, set the same transmission speed as that of during system operation.
(Page 21, CHAPTER 2)

4. Reset the CPU module or power off and on the system.

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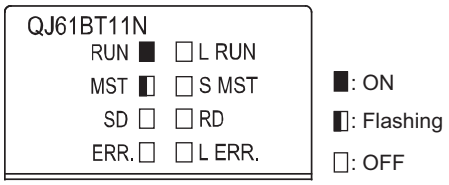
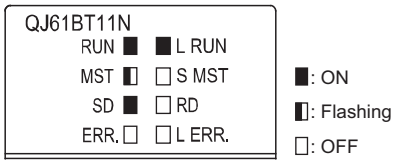
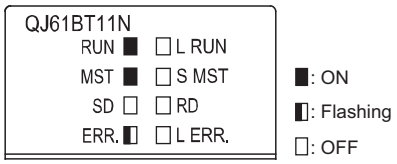


5. **The line test 1 is started. During the test, the MST LED on the master station flashes.**

When the test is completed



When the test is not completed (error on all the stations)



6. After the line test 1 is completed, the L RUN LED or MST LED on the master station turns on.

- When the test is completed
  L RUN LED: ON
  MST LED: Flashing
  The station number where data link was performed with the slave station is stored in Line test 1 result (SW00B4 to SW00B7).
- For a standby master station, use Standby master station test result (SB00B4).
- When the test is not completed (error on all the stations)
  MST LED: ON
  ERR. LED: Flashing
  The error code is stored into Line test result (SW00B8).
  (☞ Page 293, Section 11.3.2)

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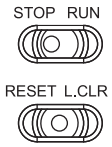
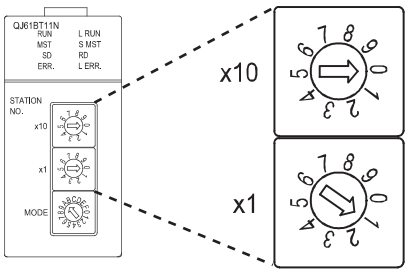
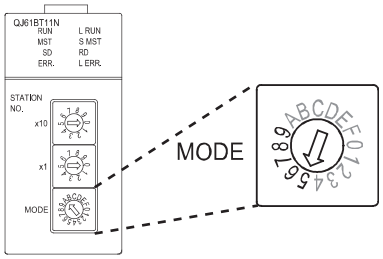
(b) Line test 2

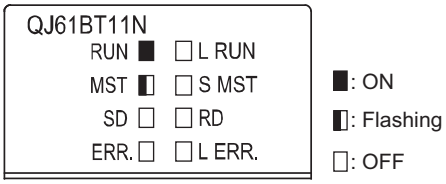
Example Universal model QCPU

Example High Performance model QCPU

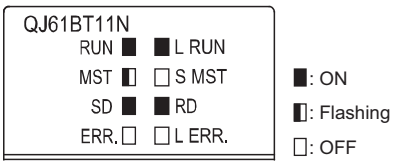




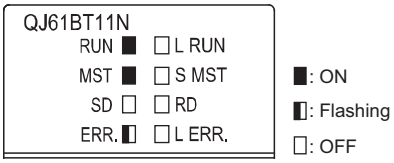




When the test is completed



When the test is not completed (error on all the stations)



1. Before the line test 2, check the following:

- If the switch on the CPU module is set at STOP
- If the switch on the CPU module is not set at RESET
- If all the stations are connected with CC-Link dedicated cables

2. Set the station number setting switches on the master station to the station number of the slave station where the test is executed.

Set the start station number when the number of occupied stations is two or more.

3. Set the transmission speed/mode setting switch on the master station from 5 to 9.

When setting the switch from 5 to 9, set the same transmission speed as that of during system operation.

(☞ Page 21, CHAPTER 2)

4. Reset the CPU module or power off and on the system.

5. The line test 2 is started. During the test, the MST LED on the master station flashes.

6. After the line test 2 is completed, the L RUN LED or MST LED on the master station turns on.

- When the test is completed
  L RUN LED: ON
  MST LED: Flashing
- When the test is not completed
  MST LED: ON
  ERR. LED: Flashing
  The error code is stored into Line test result (SW00B8).
  (☞ Page 293, Section 11.3.2)

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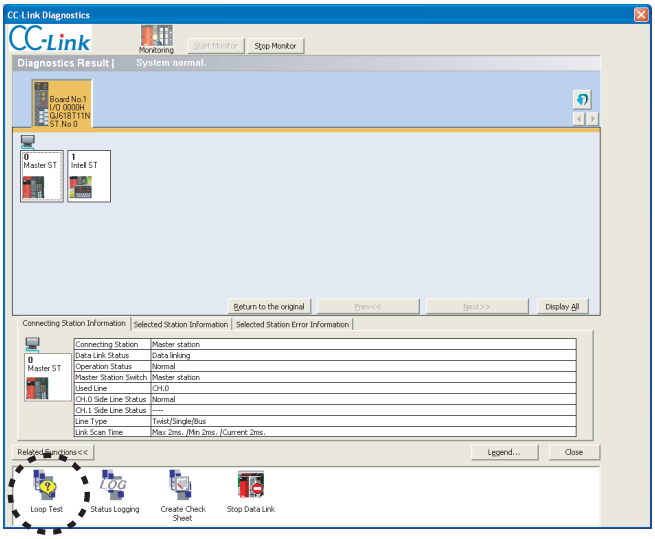
6.5.2 Transmission speed test

Whether the transmission speed setting of a slave station is the same as that of the master station can be checked. The station number of the slave station having a different transmission speed setting can be also checked; therefore, corrective action upon a transmission error can be easily taken.

Point

Before using this function, check the versions of the master/local module and programming tool. (☞ Page 399, Appendix 6 (2))

(1) Using a programming tool (GX Works2 only)



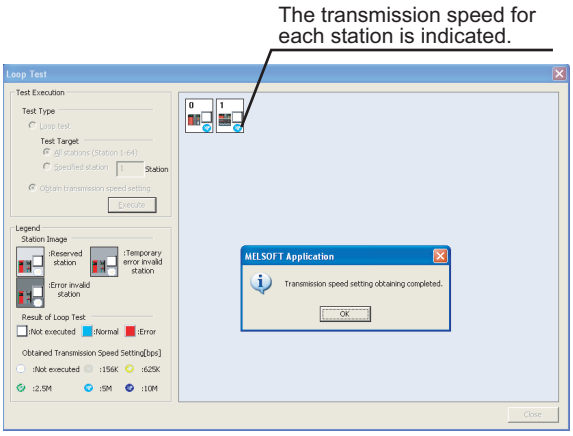
Double-click the icon.

1. Open the CC-Link diagnostics window on GX Works2.

[Diagnostics] ⇨ [CC-Link Diagnostics]

2. Double-click "Loop Test" on the bottom left corner of the window.

If "Loop Test" is not displayed, click the Related Functions>> button on the bottom left corner of the window.



3. Select "Obtain transmission speed setting" under "Test Type".

4. Clicking the Execute button executes the transmission speed test.

- Do not write data to the buffer memory areas (buffer memory addresses: $5E0_H$, $5E4_H$, $5F8_H$, 641_H, 645_H, and 783_H to 787_H).
- Do not obtain the transmission speed setting using GX Works 2 and a program or other peripherals at the same time. The transmission speed setting may not be obtained normally.
- In addition, do not obtain the transmission speed setting using GX Works 2 and the check sheet creating wizard at the same time.

After the transmission speed test is completed, the transmission speed of each station is displayed on the right side of the window.

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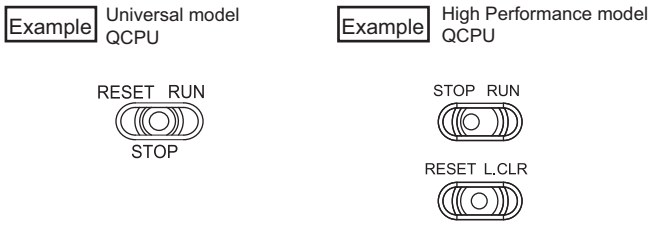
(2) Using link special relays (SBs) and link special registers (SWs)

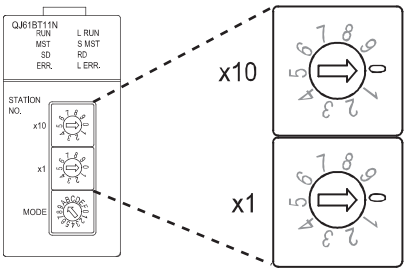
A transmission speed test is performed in the master station.

1. Before the transmission speed test, check the following:

- If the switch on the CPU module is set at STOP
- If the switch on the CPU module is not set at RESET
- If all the stations are connected with CC-Link dedicated cables

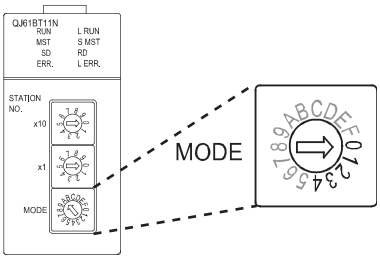


2. Set the station number setting switches on the master station to 0.



3. Set the transmission speed/mode setting switch on the master station from 0 to 4.

When setting the switch from 0 to 4, set the same transmission speed as that of during system operation. (☞Page 21, CHAPTER 2)



4. Reset the CPU module or power off and on the system.

5. Turn on Data link stop (SB0002) to stop data link.

6. Turn on Transmission speed test request (SB000B) to start a transmission speed test.

When the transmission speed test is started, Transmission speed test accept status (SB0185) turns on. The transmission speed test is completed in about 10 seconds.

7. When the transmission speed test is completed, Transmission speed test completion status (SB0186) turns on.

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8. **The test result is stored in Transmission speed test result (SW0183).**

0: Normally completed

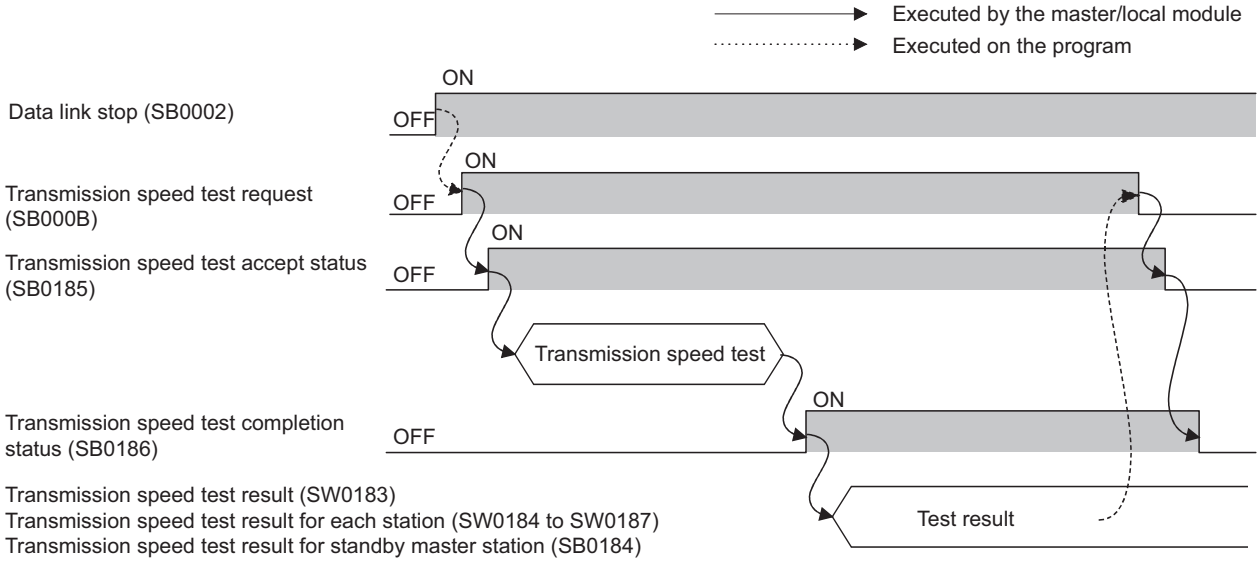
Values other than 0: Error code

Whether the transmission speed setting of the slave station is the same as that of the master station can be checked using the following link special relay (SB) and link special registers (SWs).

- For a slave station (excluding a standby master station)
  Transmission speed test result for each station (SW0184 to SW0187)
- For a standby master station
  Transmission speed test result for standby master station (SB0184)

9. **After checking the test result, turn off Transmission speed test request (SB000B).**

(3) Timing chart of the link special relays (SBs) and link special registers (SWs) used in a transmission speed test



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CHAPTER 7 PARAMETER SETTINGS

For CC-Link, set parameters both for a master station and a slave station.
For a master station, set the information about a slave station to be connected to a CC-Link system.
For a slave station, set the station number of the slave station. (Manual for the slave station used)

This chapter describes how to set the parameters for a master/local module.

7.1 Parameter Setting Method

Parameters for a master/local module can be set by using a programming tool or a dedicated instruction. Select the setting method depending on the application.

Item	Application	Reference
Parameter settings by using a programming tool	Use a programming tool for the following cases. • To set parameters on a window in a simply way, without creating program • To transfer data automatically from RX, RY, RWr, RWw, SB, and SW in a master/local module to a device in a CPU module	Page 96, Section 7.3 Page 114, Section 7.4
Parameter settings by using the dedicated instruction (G(P).RLPASET instruction)	Use the dedicated instruction for the following cases. • To connect nine or more master/local modules to one programmable controller system • To change the parameter settings while a CPU module is set to RUN	Page 205, Section 9.8

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7.2 Parameter Setting List

This section lists the parameter setting items for a master/local module and whether the settings are required for each station.

○: The setting is required. △: The setting is required as the occasion demands. ×: The setting is not required.

Item		Necessity of a setting		Remark
		Master station	Local station, standby master station	
Number of Modules		○	○	–
Start I/O No.		○	○	–
Operation Setting	Parameter Name	△	△	–
	Data Link Faulty Station Setting	△	△	
	Case of CPU STOP Setting	△	△	
	Auto Detect Setting of the Connected Device	△	×	Set it only when "Remote Net(Ver.1 Mode)", "Remote Net(Ver.2 Mode)", or "Remote Net(Additional Mode)" is set to "Mode".
	Number of Occupied Stations	×	○	
	Expanded Cyclic Setting	×	○	Set it only when "Remote Net(Ver.2 Mode)" or "Remote Net(Additional Mode)" is set to "Mode".
	Block Data Assurance per Station	△	△	–
Type		○	○	It is automatically input when "Station Type" is set in the CC-Link configuration window.
Master Station Data Link Type		×	×	–
Mode		○	○	It is automatically input when "Mode" is set in the CC-Link configuration window.
Total Module Connected		○	×	It is automatically input when the station information is set in the CC-Link configuration window.
Remote Input(RX)		△	△	–
Remote Output(RY)		△	△	
Remote Register(RWr)		△	△	
Remote Register(RWw)		△	△	
Ver.2 Remote Input(RX)		△	△	Set it only when "Remote Net(Additional Mode)" is set to "Mode".
Ver.2 Remote Output(RY)		△	△	
Ver.2 Remote Register(RWr)		△	△	
Ver.2 Remote Register(RWw)		△	△	
Special Relay(SB)		△	△	–
Special Register(SW)		△	△	
Retry Count		○	×	The settings are not required when "Remote I/O Net Mode" is set to "Mode".
Automatic Reconnection Station Count		○	×	

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Item	Necessity of a setting		Remark
	Master station	Local station, standby master station	
Standby Master Station No.	△	×	• It is automatically input when the standby master station is set in the CC-Link configuration window. • The setting is not required when "Remote I/O Net Mode" is set to "Mode".
PLC Down Select	○	×	–
Scan Mode Setting	○	×	
Delay Time Setting	○	×	The settings are not required when "Remote I/O Net Mode" is set to "Mode".
Station Information Setting	○	×	
Set the station information in the CC-Link configuration window.	△	×	Select it when graphically configuring "Station Information Setting" by referring to the network map display area. (for GX Works2 only)
Remote Device Station Initial Setting	△	×	The setting is not required when "Remote I/O Net Mode" is set to "Mode".
Interrupt Settings	△	△	–

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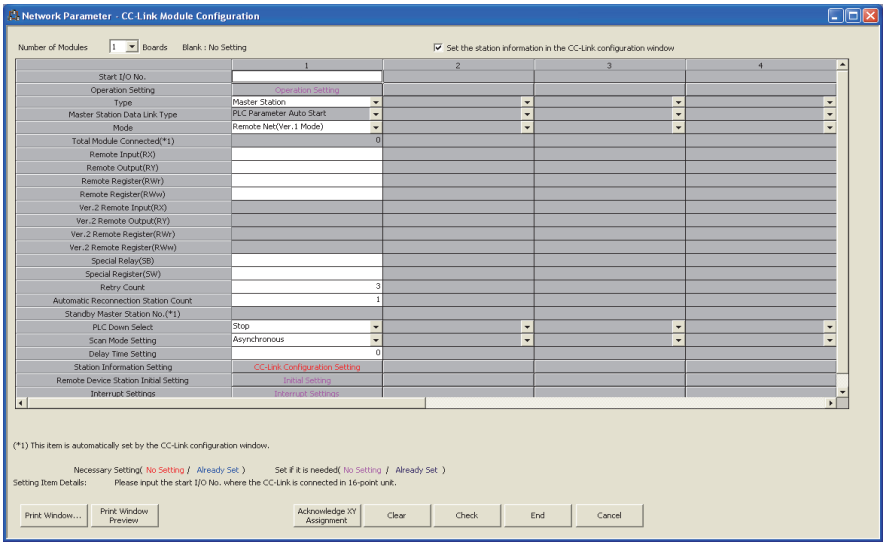
7.3 Parameter Settings for a Master Station

This chapter describes the parameter settings when a master/local module is used as a master station.

7.3.1 Setting method

1. Open the "Network Parameter" window from a programming tool.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]



2. Check the checkbox next to "Set the station information in the CC-Link configuration window" at the top of the window. (for GX Works2 only)

3. Input settings to the "Network Parameter" window. (☞ Page 97, Section 7.3.2)

4. Click the [End] button.

5. Write the settings to the CPU module using the programming tool.

[Online] ⇨ [Write to PLC]

6. The settings are reflected by resetting the CPU module or powering off and on the system. When the reflection is completed, data link is automatically started at master/local modules.

Point

- To change the settings for a master station or a slave station, stop data link at the master station. (☞ Page 320, Section 11.4.5)
- When change the settings for a slave station, change the settings for the master station accordingly.

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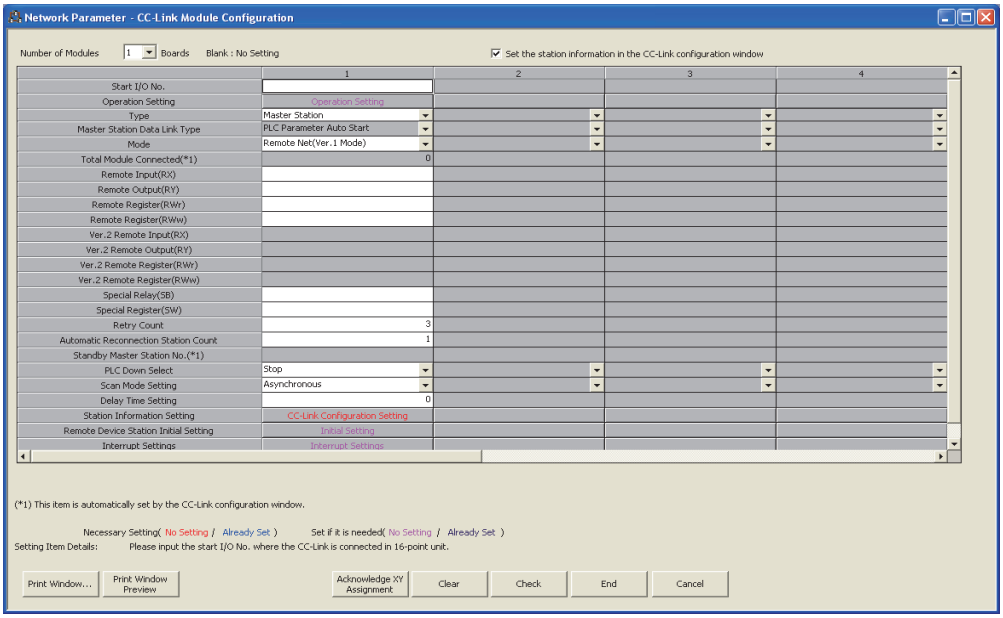
7.3.2 Setting details



Item	Description	Setting range
Number of Modules	Select the number of master/local modules (number of modules to be mounted on one base unit) that are set using a programming tool. Do not include the number of master/local modules that are set using the dedicated instruction (G(P).RLPASET).	Varies depending on a CPU module. (☞ User's manual for the CPU module used) (Default: Blank)
Set the station information in the CC-Link configuration window	Select it when graphically configuring "Station Information Setting" by referring to the network map display area. (for GX Works2 only) (☞ Page 102, Section 7.3.2 (2) (a))	• The station information is not set in the CC-Link configuration window. (not checked) • The station information is set in the CC-Link configuration window. (checked) (Default: The station information is not set in the CC-Link configuration window. (not checked))
Start I/O No.	Set the start I/O number of a master/local module in units of 16 points.	Within the range of I/O points of the CPU module (Default: Blank)
Operation Setting	Set the operations to be performed at an error or when the switch on a CPU module is set to STOP. (☞ Page 101, Section 7.3.2 (1))	–

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<table>
<tr><th>Item</th><th>Description</th><th>Setting range</th></tr>
<tr><td>Type</td><td>Select "Master Station".
To configure the system that switches the control to the standby master station if the master station goes down, set as follows.
(☞ Page 135, Section 8.2.5)
<table>
<tr><th>Operation</th><th>Setting</th></tr>
<tr><td>When a failed master station becomes normal again, it does not return as a standby master station.</td><td>Master Station</td></tr>
<tr><td>• When a failed master station becomes normal again, it returns as a standby master station.
• When only the standby master station is started up, it starts data link as a master station.</td><td>Master Station(Duplex Function)</td></tr>
</table></td><td>• Master Station
• Master Station(Duplex Function)
• Master station (Extension Base)*2
(Default: Master Station)</td></tr>
<tr><td>Master Station Data Link Type</td><td>"PLC Parameter Auto Start" is displayed. (The setting is not required.)</td><td>-</td></tr>
<tr><td>Mode</td><td>Select the mode of a master/local module. (☞ Page 43, Section 3.6.2 to Page 55, Section 3.6.6)
If the mode is selected in the CC-Link configuration window for the station information setting, the mode selected in the CC-Link configuration window is automatically set.</td><td>• Remote Net(Ver.1 Mode)
• Remote Net(Ver.2 Mode)
• Remote Net(Additional Mode)
• Remote I/O Net Mode
• Offline
(Default: Remote Net(Ver.1 Mode))</td></tr>
<tr><td>Total Module Connected</td><td>Set the number of modules to be connected to a slave station. (including a reserved station)
If "Set the station information in the CC-Link configuration window" is checked, the setting is automatically input by configuring "Station Information Setting".</td><td>1 to 64 (Default: 64)</td></tr>
</table>

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Item	Description	Setting range
Remote Input(RX)	Set the start device where RX, RY, RWr, and RWw are transferred. By setting these items, RX, RY, RWr, and RWw can be automatically transferred to a device in a CPU module without using a program. (1) Number of refresh points All points for the station number 1 to last station number are automatically assigned. (☞ Page 46, Section 3.6.3 to Page 55, Section 3.6.6) To use a different refresh device for each station, transfer the device individually using a program (Un\G□ or FROM/TO instructions). The points for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4)) (2) Buffer memory areas of the refresh sources (☞ Page 47, Section 3.6.3 (2),Page 50, Section 3.6.4 (3), Page 56, Section 3.6.6 (3)) • When "Remote Net(Ver.1 Mode)", "Remote Net(Additional Mode)", or "Remote I/O Net Mode" is set to "Mode" Data in Ver.1-compatible area are transferred to a CPU module. • When "Remote Net(Ver.2 Mode)" is set to "Mode" Data in Ver.2-compatible area are transferred to a CPU module. (3) Overlaps with other devices Set the devices without overlaps with the following. • Refresh parameters of modules on the network • I/O numbers used for I/O modules and an intelligent function module • Auto refresh settings of an intelligent function module • Auto refresh using a multiple CPU shared memory (4) To set X or Y to a refresh device Set a number later than the I/O numbers used for I/O modules and an intelligent function module. (5) Refresh timing Data are refreshed in the END process of a CPU module.	Blank or the following range • Device X, M, L, B, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device number Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Remote Output(RY)		Blank or the following range • Device*1 Y, M, L, B, T, C, ST, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device number Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Remote Register(RWr)		Blank or the following range • Device M, L, B, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device number Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Remote Register(RWw)		Blank or the following range • Device M, L, B, T, C, ST, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device number Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Ver.2 Remote Input(RX)	When "Remote Net(Additional Mode)" is set to "Mode", set the start device where RX, RY, RWr, and RWw (Ver.2-compatible area) of a master/local module are transferred. (1) Number of refresh points All points for the start station number to last station number of a Ver.2-compatible slave station are automatically assigned. (☞ Page 54, Section 3.6.5 (3)) To use a different refresh device for each station, transfer the device individually using a program (Un\G□ or FROM/TO instructions). The points for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4)) The other contents are same as those for "Remote Input(RX)" described the above.	Same as "Remote Input(RX)"
Ver.2 Remote Output(RY)		Same as "Remote Output(RY)"
Ver.2 Remote Register(RWr)		Same as "Remote Register(RWr)"
Ver.2 Remote Register(RWw)		Same as "Remote Register(RWw)"

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Item	Description	Setting range
Special Relay(SB)	Set the start device where SB and SW are transferred. SB and SW can be automatically transferred to a device in a CPU module without using a program.	Blank or the following range • Device M, L, B, D, W, R, SB, or ZR (M, B, D, W, and SB for a MELSECNET/H remote I/O station) • Device number Within the device range of the CPU module or MELSECNET/H remote I/O station • (Default: Blank)
Special Register(SW)		Blank or the following range • Device M, L, B, D, W, R, SW, or ZR (M, B, D, W, and SW for a MELSECNET/H remote I/O station) • Device number Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Retry Count	Set the number of retries when a communication failure occurs.	1 to 7 (Default: 3)
Automatic Reconnection Station Count	Set the number of slave stations that return to the system operation by a single link scan after the stations are disconnected due to a communication failure. Setting a larger number extends link scan time of when the station returns.	1 to 10 (Default: 1)
Standby Master Station No.	Set the station number for the standby master station. Set the number of the station that controls a CC-Link system instead of the master station if a master station goes down. (☞ Page 135, Section 8.2.5)	• Blank • 1 to 64 (Default: Blank)
PLC Down Select	Select whether to stop or continue data link if a stop error occurs in a CPU module. (☞ Page 130, Section 8.2.2)	• Stop • Continue (Default: Stop)
Scan Mode Setting	Whether to synchronize the link scan with the sequence scan of a CPU module or not can be selected. (☞ Page 163, Section 8.3.5) • Asynchronous A link scan does not synchronize with a sequence scan. Input transmission delay time is shortened. • Synchronous A link scan synchronizes with a sequence scan. (The sequence scan and link scan start simultaneously.) Output transmission delay time is shortened. Because of the synchronization, extended sequence scan time increases link scan time.	• Asynchronous • Synchronous (Default: Asynchronous)
Delay Time Setting	Set 0.	0
Station Information Setting	Set information about a slave station connected to the master station. (☞ Page 102, Section 7.3.2 (2))	–
Remote Device Station Initial Setting	Set the procedure for the initial settings when registering the initial settings of a remote device station using a programming tool. (☞ Page 108, Section 7.3.2 (3))	–
Interrupt Settings	Set the conditions used to issue a request for the interrupt to a CPU module. (☞ Page 111, Section 7.3.2 (4))	–

*1 The operations when the switch on a CPU module is set to STOP vary depending on whether Y or the devices other than Y is set to "Remote Output(RY)". (☞ Page 133, Section 8.2.4)

*2 The ranges can be set only for the Redundant CPU.

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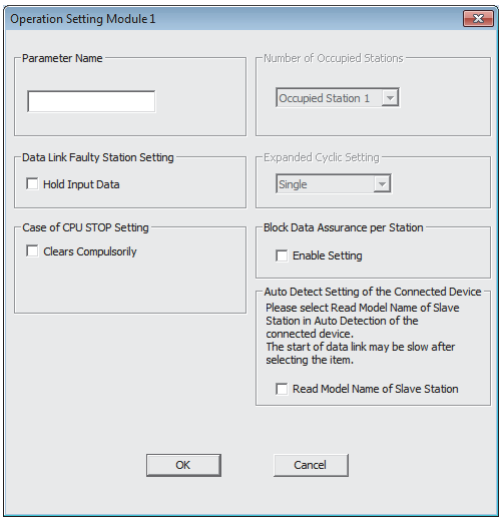
(1) Operation Setting

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Operation Setting button



Item	Description	Setting range
Parameter Name	Set the name of the setting if needed. This item is displayed when the setting details of the network parameters are printed using a programming tool.	Eight characters
Data Link Faulty Station Setting	Select whether to clear or hold data input from a data link faulty station. (☞ Page 121, Section 7.5, Page 131, Section 8.2.3)	• Clear input data (not checked) • Hold input data (checked) (Default: Clear input data (not checked))
Case of CPU STOP Setting	Select whether to refresh or clear compulsorily output (sending) data to a slave station when the switch on a CPU module is set to STOP. (☞ Page 121, Section 7.5, Page 133, Section 8.2.4)	• Refresh (not checked) • Clear compulsorily (checked) (Default: Refresh (not checked))
Auto Detect Setting of the Connected Device	Select whether or not to read the model name of slave stations with the connected device autodetection function. To read the model name of the slave stations with the connected device auto-detection function, refer to the following. • 📖 iQ Sensor Solution Reference Manual	• Do not to read the model name of the slave stations (not checked) • Read the model name of the slave stations (checked) (Default: Do not to read the model name of the slave station (not checked)
Number of Occupied stations	The settings are not required when a master/local module is used as a master station.	–
Expanded Cyclic Setting		
Block Data Assurance per Station	Select whether to assure the integrity of cyclic data for each slave station. (☞ Page 150, Section 8.2.6 (1))	• Disable setting (not checked) • Enable setting (checked) (Default: Disable setting (not checked))

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(2) Station Information Setting

(a) When the checkbox next to "Set the station information in the CC-Link configuration window" is checked

There are two ways to set the parameters.

- Set the parameters by automatically detecting the system configuration; and
- Select modules in "Module List" and drag and drop them to "List of stations".

Remark

For how to operate the CC-Link configuration window, refer to the following:

GX Works2 Version 1 Operating Manual (Common)

[Set the parameters by automatically detecting of the system configuration]

The time of setting parameters can be reduced by automatically reading information of slave stations connected to the master/local module.

The following lists how to set parameters by automatically detecting the system configuration.

1. Check if the station number of slave stations is correctly set.

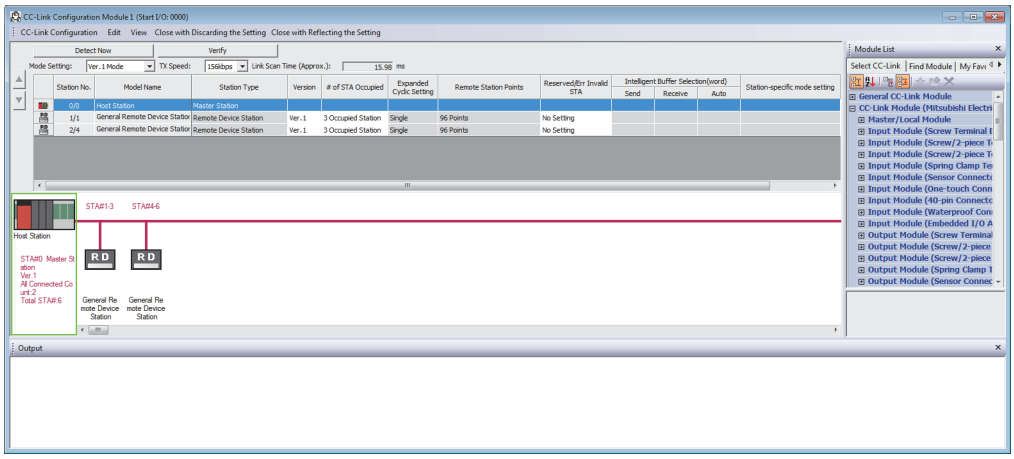
2. Turn on the slave stations first, and turn on a master station.

3. Open the CC-Link configuration window.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ CC-Link Configuration Setting button.

4. Information of the system configuration obtained from the master/local module is reflected to the CC-Link configuration window.

[CC-Link Configuration] ⇨ [Online] ⇨ [Detect Now]



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The following items are automatically reflected to the CC-Link Configuration window:

- Station No.
- Station Type*1
- Version
- # of STA Occupied Stations
- Expanded Cyclic Setting

*1 When slave stations are used as local stations, the stations are displayed as intelligent device stations. Change the station type if necessary.

5. When a standby master station exists in the system configuration, the standby master station is set to the last station number. Change the number corresponding to the actual system configuration.

6. When the setting is completed, close the CC-Link configuration window.

[CC-Link Configuration] ⇨ **[Close with Reflecting the Setting]**

Point

- When the station number is empty, the following items are displayed as:
  - Station Type: Remote I/O Station
  - Version: Ver.1
  - Number of Occupied Stations: Occupied Station 1
  - Expanded Cyclic Setting: Single
  - Remote Station Points: 32Points
  - Reserve/Invalid Station Select: Reserved
- The automatic detection of connected devices cannot be executed on the station that has switched from a standby master station to a master station.
  To execute the automatic detection of connected devices, follow the procedure below:
  1. Turn off a master station and standby master station.
  2. Turn on the standby master station, then turn on the master station.
  3. Execute the automatic detection of connected devices.
- To execute the automatic detection of connected devices after a system has been changed (for example, addition or modification of stations), turn on the slave stations then the master station.

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[Select modules in "Module List" and drag and drop them to "List of stations"]

1. Open the CC-Link configuration window.

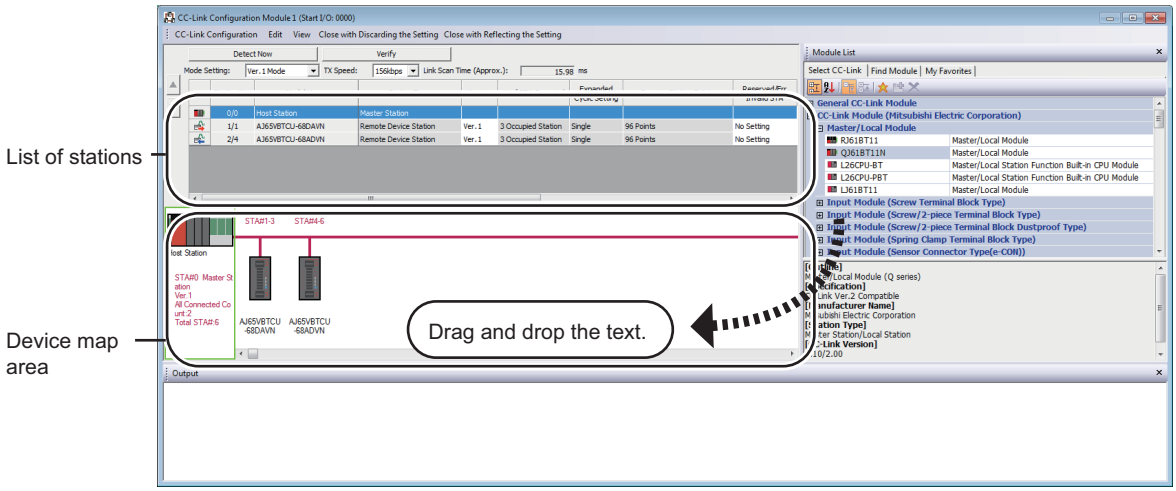
Project window ➪ [Parameter] ➪ [Network Parameter] ➪ [CC-Link] ➪ CC-Link Configuration Setting button

2. Select modules in "Module List" and drag and drop them to "List of stations".

Slave stations are added to "List of stations". The added modules are displayed in the device map area as well.

3. When completing the setting, close the CC-Link configuration window.

[CC-Link Configuration] ➪ [Close with Reflecting the Setting]



Item	Description	Setting range
Mode Setting	Select the mode of a master station. (☞ Page 43, Section 3.6.2 to Page 55, Section 3.6.6)	• Ver.1 Mode • Ver.2 Mode • Addition Mode • Remote I/O Mode (Default: Ver.1 Mode)
TX Speed	Select the transmission speed of a master station. Note that this setting is used only to display "Link Scan Time (Approx.)". For the transmission speed of a master/local module, set it with a transmission speed/mode setting switch on the module. (☞ Page 21, CHAPTER 2)	• 156kbps • 625kbps • 2.5Mbps • 5Mbps • 10Mbps (Default: 156kbps)
Link Scan Time (Approx.)	The estimate value of link scan time is displayed.	–
Station No.	• For a master station 0/0 is displayed. • For a slave station The order of the slave station is displayed before the slash. The start station number of the slave station is displayed after the slash.	–
Model Name	The model name of the module is displayed. If the module information cannot be found, "Module without profile" is displayed.	–
Station Type	Select the station type. Set the station type of the slave station actually connected.	Varies depending on the module that was set.

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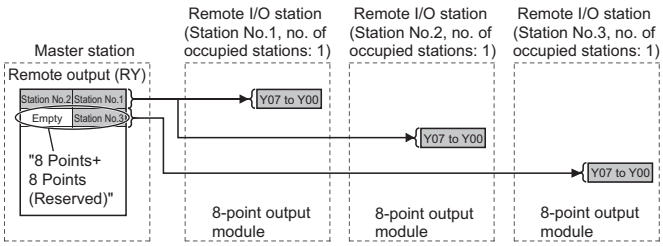
Item	Description	Setting range
Version	Select CC-Link version of the slave station. Select the mode of the master/local module if the slave station is a master/local module.(☞ Page 43, Section 3.6.2, Page 51, Section 3.6.5) Select the same CC-Link version as the version of the slave station actually connected. If not, data link cannot be performed.	Varies depending on the module that was set.
# of STA Occupied	Select the number of occupied stations of the slave station.	Varies depending on the module that was set.
Expanded Cyclic Setting	Select the expanded cyclic setting for the slave station. The setting can be selected only when "Ver.2" or "Add" is set to "Version".	Varies depending on the module that was set.
Remote Station Points	The number of points of remote I/O (RX, RY) occupied by the slave station is displayed. The number of points can be changed for a remote I/O station when "Ver.2 Mode" is set to "Mode Setting". Changing the number of points can save the areas of a refresh device in a CPU module.(☞ Page 170, Section 8.3.9) When setting eight points to the remote I/O stations, set them to even numbers of the stations consecutively. When setting eight points to odd numbers of the remote I/O stations, set "8 Points+8 Points(Reserved)" to the last of consecutive remote I/O stations.  	• 0 Point (Reserved Station) • 8 Points • 8 Points+8 Points(Reserved) • 16 Points • 32 Points (Default: Varies depending on the number of occupied stations)
Reserved/Err Invalid STA	Select whether to set the slave station as a reserved station or an error invalid station. (☞ Page 162, Section 8.3.4, Page 167, Section 8.3.6)	• No Setting • Reserved Station • Error Invalid Station (Default: No Setting)
Intelligent Buffer Size(word)	Set the size of buffer memory used to perform transient transmission with dedicated instructions. This setting can be configured only for a local station, intelligent device station, and standby master station.	–
Send	Set the size of send buffer to send data using the G(P).RIWT instruction.	0, 64 to 4096 Note that the total buffer size of "Send" and "Receive" for all slave stations must be 4096 or less. (Default: 64)
Receive	Set the size of receive buffer to receive data using the G(P).RIRD instruction.	
Auto	Set the size of automatic update buffer to communicate with an intelligent device station using automatic update buffer. Set the size required for each intelligent device station.	0, 128 to 4096 Note that the total buffer size of "Auto" for all slave stations must be 4096 or less. (Default: 128)
Station-specific mode setting	Set the station-specific mode for the slave station. This setting can be configured only when the slave station supports the station-specific mode.	Varies depending on the module that was set.

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Item	Description	Setting range
Module List	The list of slave stations is displayed. Information about slave stations can be set to the master station by drag and drop of the items from "Module List" to "List of stations".	–
Select CC-Link	The list of CC-Link modules is displayed. Select modules from "General CC-Link Module" if they are not in the list.	
Find Module	Search modules by the station type or model name. The modules displayed in "Find Result" can be moved to "List of stations" by drag and drop.	
My Favorites	The modules registered in "My Favorites" are displayed. To register modules in "My Favorites", perform any of the following. • Right-click on the module listed in "Select CC-Link". • Right-click on the module displayed in "Find Result" of "Find Module".	
Output	Error details are displayed if settings are not configured properly.	–

(b) When the checkbox next to "Set the station information in the CC-Link configuration window" is not checked

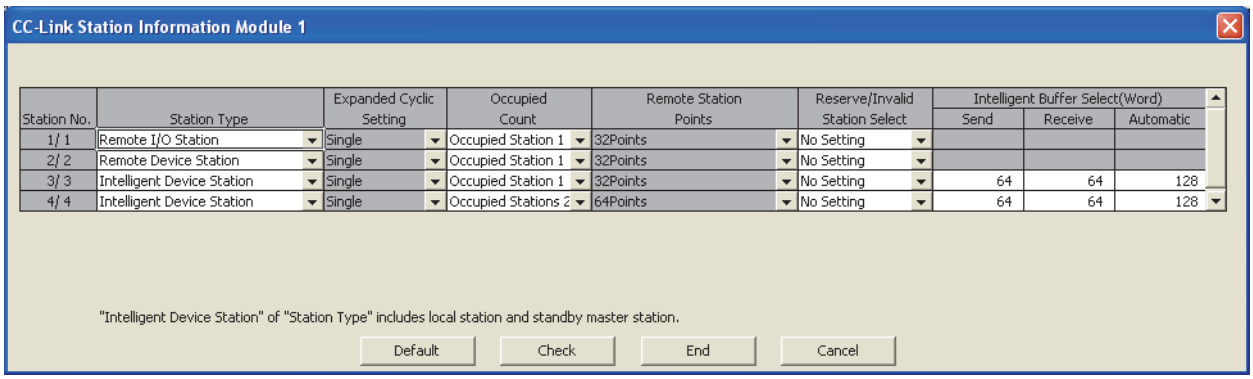
1. Set "Mode" and "Total Module Connected" in the "Network Parameter" window and open "CC-Link Station Information" window.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Station Information button

2. Input setting values.

3. When completing the setting, close the "CC-Link Station Information" window.

End button



Item	Description	Setting range
Station No.	The order of the slave station is displayed before the slash. The start station number of the slave station is displayed after the slash.	–
Station Type	Select the station type of the slave station. Set the same type of the slave station actually connected. Select "Intelligent Device Station" for a local station or standby master station.	Varies depending on the mode set to "Mode".
Expanded Cyclic Setting	Select the expanded cyclic setting for the slave station. The setting can be selected only when "Ver.2 Remote Device Station" or "Ver.2 Intelligent Device Station" is set to "Station Type".	• Single • Double • Quadruple • Octuple (Default: Single)

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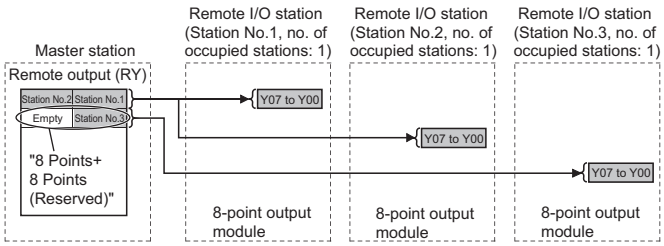
Item	Description	Setting range
Occupied Count	Select the number of occupied stations of the slave station.	• No Setting • Occupied Station 1 • Occupied Station 2 • Occupied Station 3 • Occupied Station 4 (Default: Occupied Station 1)
Remote Station Points	The number of points of remote I/O (RX, RY) occupied by the slave station is displayed. The number of points can be changed for a remote I/O station when "Remote Net(Ver.2 Mode)" is set to "Mode Setting". Changing the number of points can save the areas of a refresh device in a CPU module. (☞ Page 170, Section 8.3.9) When setting eight points to the remote I/O stations, set them to even numbers of the stations consecutively. When setting eight points to odd numbers of the remote I/O stations, set "8 Points+8 Points(Reserved) to the last of consecutive remote I/O stations.  	• 0 Points(Reserved Station) • 8 Points • 8 Points+8 Points(Reserved) • 16 Points • 32 Points (Default: Varies depending on the "Number of Occupied Stations".)
Reserve/Invalid Station Select	Select whether to set the slave station as a reserved station or an error invalid station. (☞ Page 162, Section 8.3.4, Page 167, Section 8.3.6)	• No Setting • Reserved Station • Invalid Station (Default: No Setting)
Intelligent Buffer Select(Word)	Set the size of buffer memory used to perform transient transmission with dedicated instructions. This setting can be configured only for an intelligent device station.	–
Send	Set the size of send buffer to send data using the G(P).RIWT instruction.	0, 64 to 4096 Note that the total buffer size of "Send" and "Receive" for all slave stations must be 4096 or less. (Default: 64)
Receive	Set the size of receive buffer to receive data using the G(P).RIRD instruction.	
Automatic	Set the size of automatic update buffer to communicate with an intelligent device station using automatic update buffer. Set the size required for each intelligent device station.	0, 128 to 4096 Note that the total buffer size of "Automatic" for all slave stations must be 4096 or less. (Default: 128)

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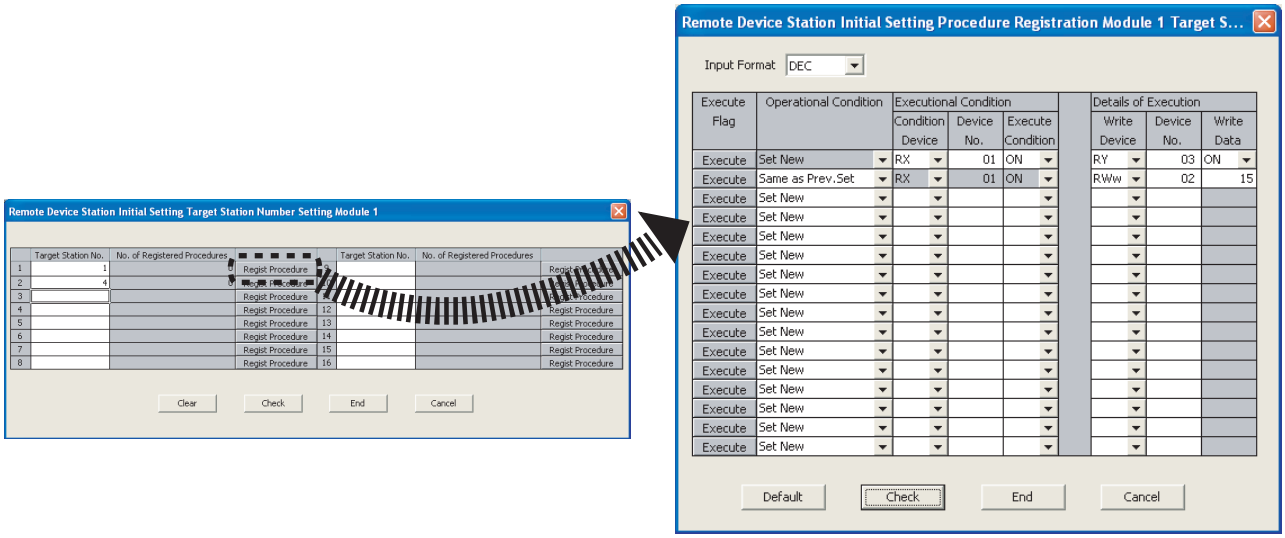
(3) Remote Device Station Initial Setting

Register the initial settings using a programming tool, and reflect them to a remote device station using Remote device station initialization procedure registration instruction (SB000D).

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Initial Setting button

1. **To "Target Station No.", set the station number of the remote device station where the initial settings are configured.**
   Set the start station number instead if the number of occupied stations is two or more.
2. **Click the Regist Procedure button.**
3. **Register the procedure for the initial settings in the "Remote Device Station Initial Setting Procedure Registration" window.**
4. **Click the End button and close the setting window.**



- "Remote Device Station Initial Setting Target Station Number Setting" window

Item	Description	Setting range
Target Station No.	Set the station number of the station where the initial settings are configured.	1 to 64 (Default: Blank)
No. of Registered Procedures	The number of the procedures registered using the Regist Procedure button is displayed.	–
Regist Procedure	"Remote Device Station Initial Setting Procedure Registration" is displayed by clicking it.	–

- "Remote Device Station Initial Setting Procedure Registration" window

Item	Description	Setting range
Input Format	Select the input format of "Write Data".	• DEC • HEX (Default: DEC)

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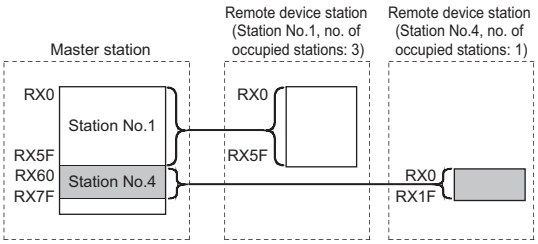
Item	Description	Setting range
Execute Flag	Select whether to actually execute the registered procedure or not. Click it to change the setting. Set "Only Set" to use the setting only as a reference when inputting similar setting items.	• Execute • Only Set (Default: Execute)
Operational Condition	Select whether to newly set the condition for the initial settings or use the same condition as the above line.	• Set New • Same as Prev. Set (Default: Set New)
Executional Condition	Set the condition to execute the initial settings.	-
Condition Device	Select the device to execute the initial settings.	• RX • SB (Default: Blank)
Device No.	Set the device number of the device set to "Condition Device". Set 0 to the first device number for each station. Ex. For instance, 0 to 1F can be set to the device number for the station number 4 as shown below.  	• For RX: 0 to $37F_H$ • For SB: 0 to FF_H (Default: Blank)
Execute Condition	Select whether to execute the initial settings with ON of the condition device or with OFF of the condition device.	• ON • OFF (Default: Blank)

5. When completing the initial settings, write the settings to the CPU module using a programming tool.

[Online] ⇨ [Write to PLC]

6. The settings are reflected by resetting the CPU module or powering off and on the system.

7. Start the initial settings by turning on Remote device station initialization procedure registration instruction (SB000D).

While the initial settings are being executed, Execution status of remote device station initialization procedure (SB005E) is on.

Also the execution procedure number and the target station number for the procedure registration are stored in Remote device station initialization procedure registration execution individual information (SW0110 to SW011F).

8. When the initial settings are completed for all the set stations, Completion status of remote device station initialization procedure (SB005F) is turned on.

Also the execution results are stored in Remote device station initialization procedure registration instruction result (SW005F).

The data stored in Remote device station initialization procedure registration execution individual information (SW0110 to SW011F) become FF^{**}_H. ("**" indicates the target station number for the initial settings.)

9. Turn off Remote device station initialization procedure registration instruction (SB000D).

Remote device station initialization procedure registration instruction result (SW005F) and Remote device station initialization procedure registration execution individual information (SW0110 to SW011F) are cleared.

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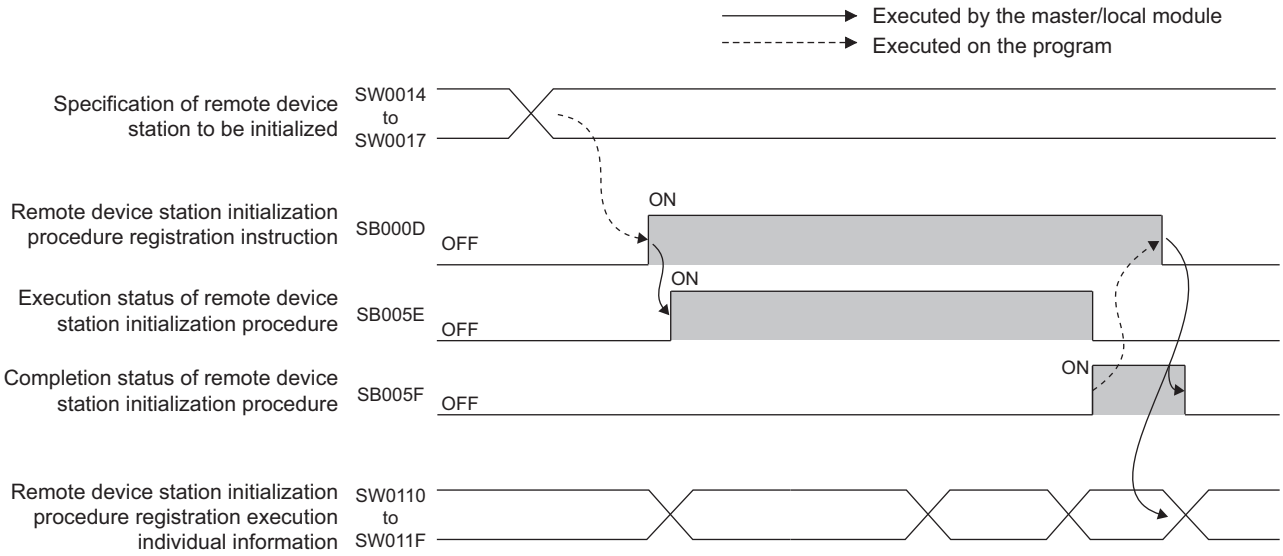
The following figure shows the operations of a link special relay (SB) and link special register (SW) when the remote device station initialization procedure registration is performed.



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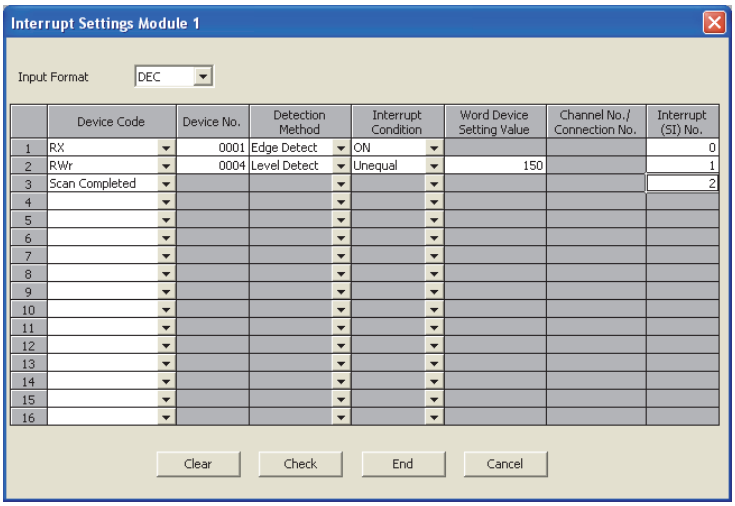
(4) Interrupt Settings

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Interrupt Settings button

1. In "Interrupt Settings" window, set the conditions on which a master/local module issues the interrupt to a CPU module.

2. Click the End button and close the setting window.



Item	Description	Setting range
Input Format	Select the input format of "Word Device Setting Value".	• DEC • HEX (Default: DEC)
Device Code	Set the device for the interrupt condition.	Refer to the following table.
Device No.		
Detection Method	Select the timing of the interrupt detection for the device set to "Device Code" and "Device No.".	
Interrupt Condition		
Word Device Setting Value	Set the word device value for the interrupt condition if RWr or SW is set to "Device Code".	
Channel No./Connection No.	The setting is not required for a master/local module.	
Interrupt (SI) No.	Set the interrupt (SI) No. used for the interrupt pointer setting of the PLC parameter. The interrupt (SI) No. is the control number on the master/local module side to issue a request for the interrupt from a master/local module to a CPU module. (This is not the device used for an actual program.)	

Point

Only one interrupt condition can be set for one interrupt program.

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(Setting range)

If the interrupt condition is established upon the completion of a link scan, the interrupt is issued. If "Scan Completed" is set to "Device Code", the interrupt is issued without condition upon the completion of a link scan.

Device Code	Device No.	Detection Method	Interrupt Condition	Word Device Setting Value	Channel No./ Connection No.	Interrupt (SI) No.
RX	0 to $1FFF_H$	Edge Detect + ON: Interrupt at rise Edge Detect + OFF: Interrupt at fall Level Detect + ON: Interrupt at ON Level Detect + OFF: Interrupt at OFF		–	–	0 to 15
SB	0 to $01FF_H$					
RY	0 to $1FFF_H$					
RWr	0 to $07FF_H$	Edge Detect + Equal: Interrupt when the value is matched (first time only) Edge Detect + Unequal: Interrupt when the value is not matched (first time only) Level Detect + Equal: Interrupt when the value is matched Level Detect + Unequal: Interrupt when the value is not matched		0 to 65535 (0_H to $FFFF_H$)		
SW	0 to $01FF_H$					
Scan Completed	–					

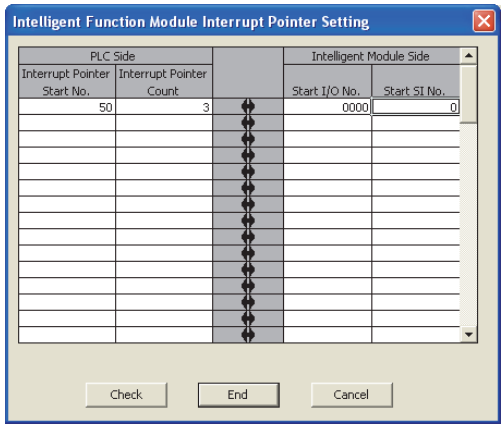
3. When completing the interrupt settings, open the "Intelligent Function Module Interrupt Pointer Setting" window of the PLC parameter.

Relate "Interrupt (SI) No." of a master/local module set in the "Interrupt Settings" window to the interrupt pointer of a CPU module.

Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "PLC System" tab ⇨ Interrupt Pointer Setting button

4. Input settings to the "Intelligent Function Module Interrupt Pointer Setting" window.

5. Click the End button and close the setting window.



Item		Description	Setting range
PLC Side	Interrupt Pointer Start No.	Set the start number (I□□) of the interrupt pointer.	50 to 255 (Default: Blank)
	Interrupt Pointer Count	Set the number of the interrupt conditions set in the "Interrupt Settings" window of Network Parameter.	1 to 16 (Default: Blank)
Intelligent Module Side	Start I/O No.	Set the start I/O number of the master/local module.	Within the range of I/O points of the CPU module (Default: Blank)
	Start SI No.	Set the start number of the SI No. set to "Interrupt (SI) No." in the "Interrupt Settings" window of Network Parameter.	0 to 15 (Default: Blank)

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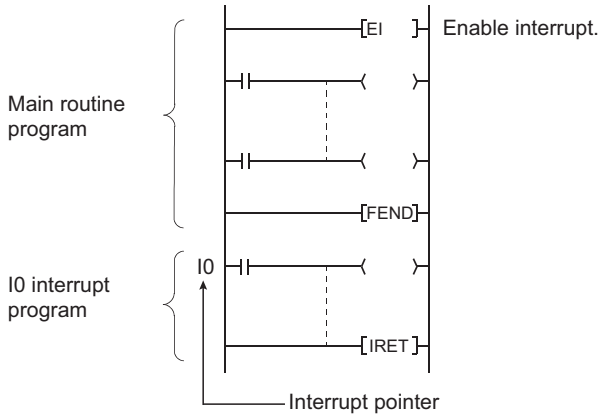
(a) Precautions

- When interrupt conditions are always established with "Level Detect" being set to "Detection Method"
  Because the interrupt process is performed for each link scan, if the sequence scan time is much longer than the link scan time, a watchdog timer error may occur in the CPU module due to the prolonged sequence scan. To avoid this, check the conditions using program and do not use the interrupt settings.

- Before executing an interrupt program
  Execute the EI instruction in the main routine program and enable the interrupt. (User's manual for the CPU module used (function explanation, program fundamentals))

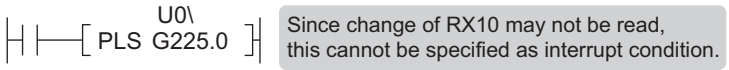


- When multiple interrupts occur simultaneously
  The operation may delay.

- When a master/local module is in test mode or offline mode
  The interrupt to the CPU module can be performed when a master/local module is in online mode. The interrupt cannot be performed when a master/local module is in test mode or offline mode.

- Executing an interrupt program at rise or fall of the specified device
  Do not execute an interrupt program by using the rise (using the PLS instruction) or fall (using the PLF instruction) of the specified device because the device change may not be recognized.

Ex. A request for the interrupt is issued by turning on RX10.



- When the interrupt cannot be performed
  If the changing time of the device used for the interrupt condition is shorter than the transmission delay time, the device change cannot be detected.

- When using data for an interrupt program
  When an interrupt program is being executed, RX/RY/RWr/RWw are not auto refreshed to the device of a CPU module. Therefore, directly access to the buffer memory of a master/local module by using Intelligent function module device (Un\G□).

- When data link is faulty, a request for the interrupt to a CPU module is not issued.

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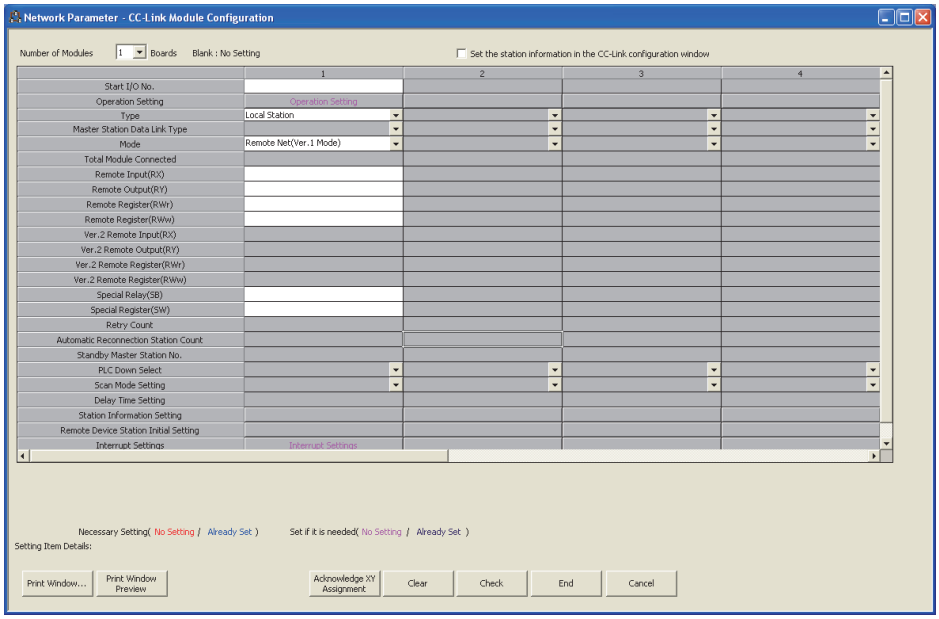
7.4 Parameter Settings for a Local Station and Standby Master Station

This section describes the parameter settings when a master/local module is used as a local station or standby master station.

7.4.1 Setting method

1. Open the "Network Parameter" window from a programming tool.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]



2. Input settings to the "Network Parameter" window. (☞ Page 115, Section 7.4.2)

3. Click the End **button.**

4. Write the settings to the CPU module using the programming tool.

[Online] ⇨ [Write to PLC]

5. The settings are reflected by resetting the CPU module or powering off and on the system. When the reflection is completed, data link is automatically started at master/local modules.

Point

- When change the settings for a local station or standby master station, change the settings for the master station accordingly.

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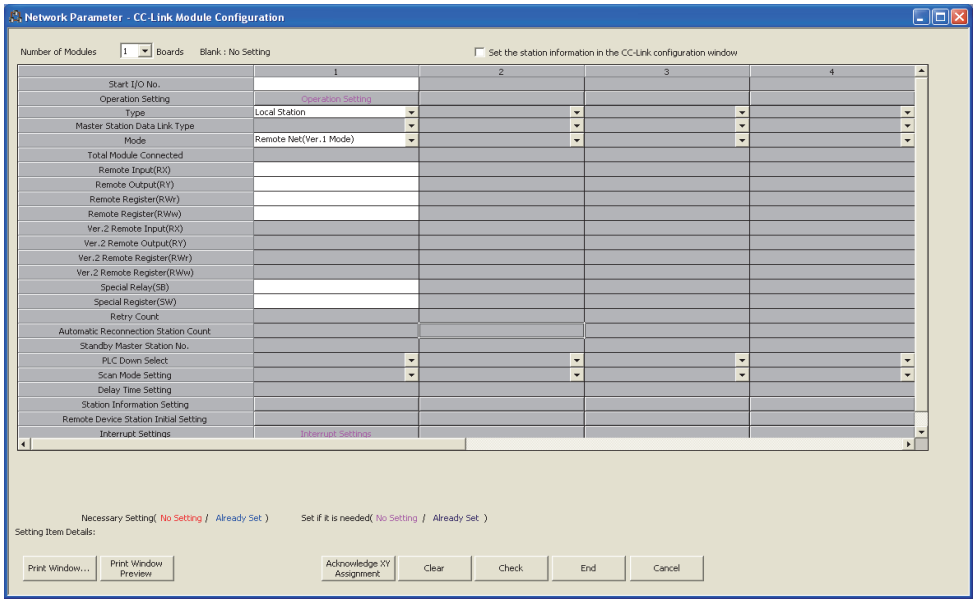
7.4.2 Setting details



Item	Description	Setting range
Number of Modules	Select the number of master/local modules (number of modules to be mounted on one base unit). Do not include the number of master/local modules that are set using the dedicated instruction (G(P).RLPASET).	Varies depending on a CPU module. (☞ User's manual for the CPU module used) (Default: Blank)
Set the station information in the CC-Link configuration window.	Checking this item is not necessary for a local station or standby master station.	–
Start I/O No.	Set the start I/O number of a master/local module in units of 16 points.	Within the range of I/O points of the CPU module (Default: Blank)
Operation Setting	Set the operations to be performed at an error or when the switch on a CPU module is set to STOP. (☞ Page 118, Section 7.4.2 (1))	–
Type	Select "Local Station" to use a master/local module as a local station. Select any of the following to use a master/local module as a standby master station. (☞ Page 135, Section 8.2.5)) Operation: When only the standby master station is started up, it starts data link as a master station. — Setting: Master Station(Duplex Function)*1 Operation: Other than the above — Setting: Standby Master Station *1 When select "Master Station(Duplex Function)", set the same settings as the master station for other items. (☞ Page 97, Section 7.3.2)	• Local Station • Standby Master Station • Master Station(Duplex Function) (Default: Master Station)
Master Station Data Link Type	The setting is not required when a master/local module is used as a local station or standby master station.	–

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Item	Description	Setting range
Mode	Set the mode for a master/local module. (☞ Page 43, Section 3.6.2 to Page 51, Section 3.6.5) Set the same mode as a master station to use a master/local module as a standby master station.	• Remote Net(Ver.1 Mode) • Remote Net(Ver.2 Mode) • Remote Net(Additional Mode) • Offline (Default: Remote Net(Ver.1 Mode))
Total Module Connected	The setting is not required when a master/local module is used as a local station or standby master station. (Except when "Master Station(Duplex Function)" is selected for "Type")	–
Remote Input(RX)	Set the start device where RX, RY, RWr, and RWw are transferred. By setting these items, RX, RY, RWr, and RWw can be automatically transferred to a device in a CPU module without using a program. (1) Number of refresh points All points for the station number 1 to last station number are automatically assigned. (☞ Page 46, Section 3.6.3 to Page 55, Section 3.6.6) To use a different refresh device for each station, transfer the device individually using a program (Un\G□ or FROM/TO instructions). The points for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4)) (2) Buffer memory areas of the refresh sources (☞ Page 47, Section 3.6.3 (2), Page 50, Section 3.6.4 (3), Page 56, Section 3.6.6 (3)) • When "Remote Net(Ver.1 Mode)" or "Remote Net(Additional Mode)" is set to "Mode" Data in Ver.1-compatible area are transferred to a CPU module. • When "Remote Net(Ver.2 Mode)" is set to "Mode" Data in Ver.2-compatible area are transferred to a CPU module. (3) Overlaps with other devices Set the devices without overlaps with the following. • Refresh parameters of modules on the network • I/O numbers used for I/O modules and an intelligent function module • Auto refresh settings of an intelligent function module • Auto refresh using a multiple CPU shared memory (4) To set X or Y to a refresh device Set a number later than the I/O numbers used for I/O modules and an intelligent function module. (5) Refresh timing Data are refreshed in the END process of a CPU module.	Blank or the following range • Device X, M, L, B, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device No. Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Remote Output(RY)		Blank or the following range • Device*1 Y, M, L, B, T, C, ST, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device No. Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Remote Register(RWr)		Blank or the following range • Device M, L, B, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device No. Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Remote Register(RWw)		Blank or the following range • Device M, L, B, T, C, ST, D, W, R, or ZR (M, B, D, and W for a MELSECNET/H remote I/O station) • Device No. Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)

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Item	Description	Setting range
Ver.2 Remote Input(RX)	When "Remote Net(Additional Mode)" is set to "Mode", set the start device where RX, RY, RWr, and RWw (Ver.2-compatible area) of a master/local module are transferred. (1) Number of refresh points All points for the start station number to last station number of a Ver.2-compatible slave station are automatically assigned. (☞ Page 51, Section 3.6.5) To use a different refresh device for each station, transfer the device individually using a program (Un\G□ or FROM/TO instructions). The points for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4)) The other contents are same as those for "Remote Input(RX)" described the above.	Same as "Remote Input(RX)"
Ver.2 Remote Output(RY)		Same as "Remote Output(RY)"
Ver.2 Remote Register(RWr)		Same as "Remote Register(RWr)"
Ver.2 Remote Register(RWw)		Same as "Remote Register(RWw)"
Special Relay(SB)	Set the start device where SB and SW are transferred. By setting these items, SB and SW can be automatically transferred to a device in a CPU module without using a program.	Blank or the following range • Device M, L, B, D, W, R, SB, or ZR (M, B, D, W, and SB for a MELSECNET/H remote I/O station) • Device No. Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Special Register(SW)		Blank or the following range • Device M, L, B, D, W, R, SW, or ZR (M, B, D, W, and SW for a MELSECNET/H remote I/O station) • Device No. Within the device range of the CPU module or MELSECNET/H remote I/O station (Default: Blank)
Retry Count	The settings are not required when a master/local module is used as a local station or standby master station. (Except when "Master Station(Duplex Function)" is selected for "Type")	–
Automatic Reconnection Station Count		
Standby Master Station No.		
PLC Down Select		
Scan Mode Setting		
Delay Time Setting		
Station Information Setting		
Remote Device Station Initial Setting		
Interrupt Settings	Set the conditions used to issue a request for the interrupt to a CPU module. (☞ Page 119, Section 7.4.2 (2))	–

*1 The operations when the switch on a CPU module is set to STOP vary depending on whether Y or the devices other than Y is set to "Remote Output(RY)". (☞ Page 133, Section 8.2.4)

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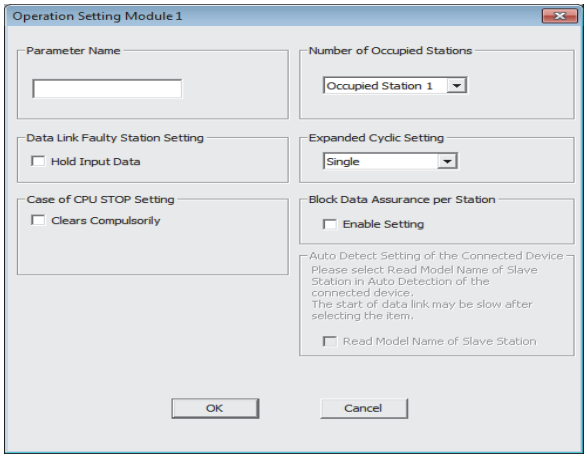
(1) Operation setting

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Operation Setting button



Item	Description	Setting range
Parameter Name	Set the name of the setting if needed. This item is displayed when the setting details of the network parameters are printed using a programming tool.	Eight characters (Default: Blank)
Data Link Faulty Station Setting	Select whether to clear or hold data input from a data link faulty station. (☞ Page 121, Section 7.5, Page 131, Section 8.2.3)	• Clear input data (not checked) • Hold input data (checked) (Default: Clear input data (not checked))
Case of CPU STOP Setting	Select whether to refresh or clear compulsorily output (sending) data to a master station when the switch on a CPU module is set to STOP. (☞ Page 121, Section 7.5, Page 133, Section 8.2.4)	• Refresh (not checked) • Clear compulsorily (checked) (Default: Refresh (not checked))
	The settings are not required when the master/local module is used as a local station or standby master station.	–
Number of Occupied Stations	Select the number of occupied stations for a master/local module. Select it only when "Local Station" or "Standby Master Station" is set to "Type".	• Occupied Station 1 • Occupied Station 2 • Occupied Station 3 • Occupied Station 4 (Default: Occupied Station 1)
Expanded Cyclic Setting	Select the expanded cyclic setting for a master/local module. Select the setting only for the following cases. • When "Remote Net(Ver.2 Mode)" or "Remote Net(Additional Mode)" is set to "Mode" • When "Local Station" or "Standby Master Station" is set to "Type"	• Single • Double • Quadruple • Octuple (Default: Single)
Block Data Assurance per Station	Select whether to assure the integrity of cyclic data for each slave station. (☞ Page 150, Section 8.2.6 (1))	• Disable setting (not checked) • Enable setting (checked) (Default: Disable setting (not checked))

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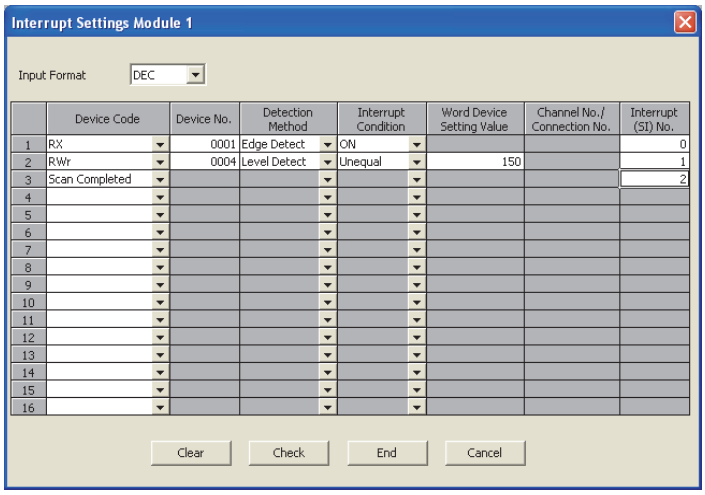
(2) Interrupt Settings

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Interrupt Settings button

1. In "Interrupt Settings" window, set the conditions on which a master/local module issues the interrupt to a CPU module.

2. Click the End button and close the setting window.



Item	Description	Setting range
Input Format	Select the input format of "Word Device Setting Value".	• DEC • HEX (Default: DEC)
Device Code	Set the device for the interrupt condition.	Refer to the following table.
Device No.		
Detection Method	Select the timing of the interrupt detection for the device set to "Device Code" and "Device No.".	
Interrupt Condition		
Word Device Setting Value	Set the word device value for the interrupt condition if RWr or SW is set to "Device Code".	
Channel No./Connection No.	The setting is not required for a master/local module.	
Interrupt (SI) No.	Set the interrupt (SI) No. used for the interrupt pointer setting of the PLC parameter. The interrupt (SI) No. is the control number on the master/local module side to issue a request for the interrupt from a master/local module to a CPU module. (This is not the device used for an actual program.)	

Point

Only one interrupt condition can be set for one interrupt program.

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(Setting range)

If the interrupt condition is established upon the completion of a link scan, the interrupt is issued. If "Scan Completed" is set to "Device Code", the interrupt is issued without condition upon the completion of a link scan.

Device Code	Device No.	Detection Method	Interrupt Condition	Word Device Setting Value	Channel No./ Connection No.	Interrupt (SI) No.
RX	0 to $1FFF_H$	Edge Detect + ON: Interrupt at rise Edge Detect + OFF: Interrupt at fall Level Detect + ON: Interrupt at ON Level Detect + OFF: Interrupt at OFF		–	–	0 to 15
SB	0 to $01FF_H$					
RY	0 to $1FFF_H$					
RWr	0 to $07FF_H$	Edge Detect + Equal: Interrupt when the value is matched (first time only) Edge Detect + Unequal: Interrupt when the value is not matched (first time only) Level Detect + Equal: Interrupt when the value is matched Level Detect + Unequal: Interrupt when the value is not matched		0 to 65535 (0_H to $FFFF_H$)		
SW	0 to $01FF_H$					
Scan Completed	–					

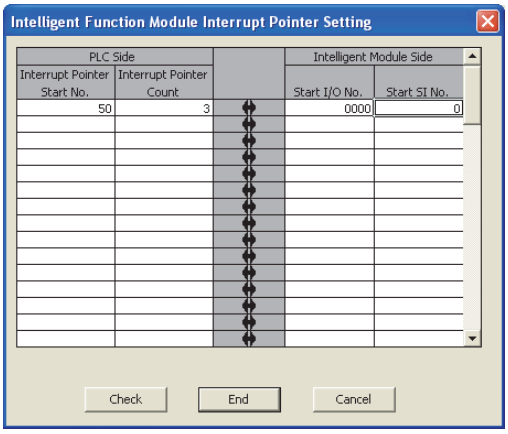
3. When completing the interrupt settings, open the "Intelligent Function Module Interrupt Pointer Setting" window of the PLC parameter.

Relate "Interrupt (SI) No." of a master/local module set in the "Interrupt Settings" window to the interrupt pointer of a CPU module.

Project window ➪ [Parameter] ➪ [PLC Parameter] ➪ "PLC System" tab ➪ Interrupt Pointer Setting button

4. Input settings to the "Intelligent Function Module Interrupt Pointer Setting" window.

5. Click the End button and close the setting window.



Item		Description	Setting range
PLC Side	Interrupt Pointer Start No.	Set the start number (I□□) of the interrupt pointer.	50 to 255 (Default: Blank)
	Interrupt Pointer Count	Set the number of the interrupt conditions set in the "Interrupt Settings" window of Network Parameter.	1 to 16 (Default: Blank)
Intelligent Module Side	Start I/O No.	Set the start I/O number of the master/local module.	Within the range of I/O points of the CPU module (Default: Blank)
	Start SI No.	Set the start number of the SI No. set to "Interrupt (SI) No." in the "Interrupt Settings" window of Network Parameter.	0 to 15 (Default: Blank)

(a) Precautions

The precautions are same as those for the parameter settings for a master station. (☞ Page 113, Section 7.3.2 (4) (a))

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7.5 Status Difference Between a Master Station and a Slave Station at an Error

The station status at an error varies depending on the combination of "PLC Down Select" of Network Parameter, "Data Link Faulty Station Setting" and "Case of CPU STOP Setting" in the "Operation Setting" window. When configuring the settings, consider the station status at errors listed below.

(1) Status of a master station, standby master station (when operating as a master station), and remote I/O station

Data link status			Master station, standby master station (operating as a master station)				Remote I/O station	
			Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)	Input	Output
When the programmable controller CPU of the master station is set to STOP at an error (data link continued)			Continue	*1	Continue	Hold	Continue	*1
When the programmable controller CPU of the local station is set to STOP at an error (data link continued)			*2	Continue	Continue	Continue	Continue	Continue
When data link for the entire system is stopped	"Data Link Faulty Station Setting" of a programming tool (for master station setting)	Clear	Clear	Indefinite	Indefinite	Hold	By external signals	All points off
		Hold	Hold					
When a communication failure (such as power off) occurs in a remote I/O station	"Data Link Faulty Station Setting" of a programming tool (for master station setting)	Clear	Clears the receive area from the remote I/O station having a communication failure.	Continue	Continues operation of areas other than the remote I/O station.	Continues operation of areas other than the remote I/O station.	By external signals	All points off
		Hold	Holds the receive area from the remote I/O station having a communication failure.					
When a communication failure (such as power off) occurs in a remote device station	"Data Link Faulty Station Setting" of a programming tool (for master station setting)	Clear	Clears the receive area from the remote device station having a communication failure.	Continue	Continue	Holds the receive area from the remote device station having a communication failure.	Continue (Not affected by the communication status of the remote device station.)	Continue (Not affected by the communication status of the remote device station.)
		Hold	Holds the receive area from the remote device station having a communication failure.					

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<table>
<tr><th colspan="3" rowspan="2">Data link status</th><th colspan="4">Master station, standby master station (operating as a master station)</th><th colspan="2">Remote I/O station</th></tr>
<tr><th>Remote input (RX)</th><th>Remote output (RY)</th><th>Remote register (RWw)</th><th>Remote register (RWr)</th><th>Input</th><th>Output</th></tr>
<tr><td rowspan="2">When a communication failure (such as power off) occurs in a local station</td><td rowspan="2">"Data Link Faulty Station Setting" of a programming tool (for master station setting)</td><td>Clear</td><td>Clears the receive area from the local station having a communication failure.</td><td rowspan="2">Continue</td><td rowspan="2">Continue</td><td rowspan="2">Holds the receive area from the local station having a communication failure.</td><td rowspan="2">Continue (Not affected by the communication status of the local station.)</td><td rowspan="2">Continue (Not affected by the communication status of the local station.)</td></tr>
<tr><td>Hold</td><td>Holds the receive area from the local station having a communication failure.</td></tr>
</table>

*1 If parameter settings have been configured using dedicated instructions, the data is held.
If parameter settings have been configured using a programming tool, the data is cleared when Y is set to the refresh device of the remote output (RY). The data is held or cleared according to the parameter settings when the device other than Y is set.

*2 When Y is set to the refresh device of the remote output (RY) in the local station that has stopped, only the receive area from the stopped local station is cleared. The data is held or cleared according to the parameter settings when the device other than Y is set.
The operations continue for the receive areas from other stations.

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(2) Status of a remote device station, intelligent device station, local station, and standby master station (when operating as a local station)

Data link status			Remote device station, intelligent device station				Local station, standby master station (operating as a local station)			
			Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)	Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)
When the programmable controller CPU of the master station is set to STOP at an error (data link continued)			Continue	*1	Continue	Continue	Clear	Continue	Continue	Continue
When the programmable controller CPU of the local station is set to STOP at an error (data link continued)			Continue	Continue	Continue	Continue	Continue	*2	Continue	Continue
When data link for the entire system is stopped	"Data Link Faulty Station Setting" of a programming tool (for local station setting)	Clear	Indefinite	All points off	Indefinite	Indefinite	Clear	Clears the receive areas from other stations.	Holds the receive areas from other stations.	Hold
		Hold					Hold	Holds the receive areas from other stations.		
When a communication failure (such as power off) occurs in a remote I/O station	"Data Link Faulty Station Setting" of a programming tool (for local station setting)	Clear	Continue	Continue	Continue	Continue	Continue	Clears the receive area from the remote I/O station having a communication failure.	Continue	Continue
		Hold						Holds the receive area from the remote I/O station having a communication failure.		
When a communication failure (such as power off) occurs in a remote device station	"Data Link Faulty Station Setting" of a programming tool (for local station setting)	Clear	Indefinite	Indefinite	Indefinite	Indefinite	Continue	Clears the receive area from the remote device station having a communication failure.	Holds the receive area from the remote device station having a communication failure.	Continue
		Hold						Holds the receive area from the remote device station having a communication failure.		
When a communication failure (such as power off) occurs in a local station	"Data Link Faulty Station Setting" of a programming tool (for local station setting)	Clear	Continue	Continue	Continue	Continue	Continue	Clears the receive area from the local station having a communication failure.	Holds the receive area from the local station having a communication failure.	Continue
		Hold						Holds the receive area from the local station having a communication failure.		

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*1 If parameter settings have been configured using dedicated instructions, the data is held.
If parameter settings have been configured using a programming tool, the data is cleared when Y is set to the refresh device of the remote output (RY). The data is held or cleared according to the parameter settings when the device other than Y is set.

*2 When Y is set to the refresh device of the remote output (RY) in the local station that has stopped, only the remote output (RY) in the stopped local station is cleared. The data is held or cleared according to the parameter settings when the device other than Y is set.
Data link is continued for the other local stations.

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CHAPTER 8 FUNCTIONS

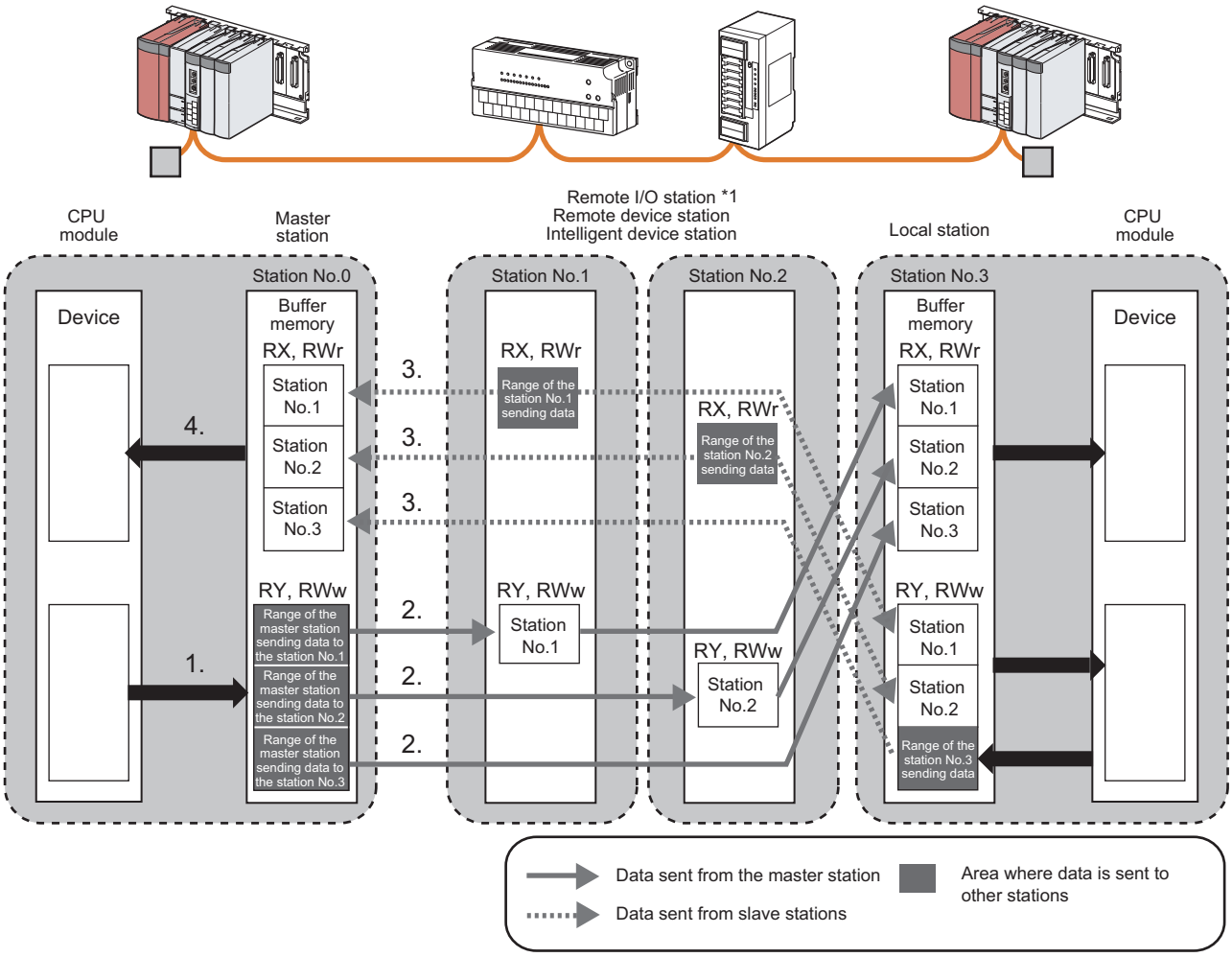
8.1 Basic Applications of the Functions

8.1.1 Periodic communications (cyclic transmission)

A master/local module communicates with other stations periodically using RX, RY, RWr, and RWw. For example, controlling the input and output in the CPU module of a master station controls the input and output in a slave station.

(1) Overview of communications

In CC-Link, communications are performed between the master station and slave stations using RX, RY, RWr, and RWw. Data in RX, RY, RWr, and RWw of the master/local module are stored in the buffer memory.
For assignment and a flow of input/output data, refer to Page 41, Section 3.6.



*1 RWr and RWw are not used for a remote I/O station. Note, however, that buffer memory areas are occupied depending on the mode of the master/local module. (☞ Page 46, Section 3.6.3, Page 55, Section 3.6.6)

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(2) How to start communications

Power on the slave station, then master station to start data link.

When the parameter settings are reflected, the master/local module starts data link automatically.

- When the settings are configured using a programming tool, resetting the CPU module or powering off and on the system reflects the settings.
- When the settings are configured using dedicated instructions, executing the dedicated instructions reflects the settings.

Note that the master station sends data only to a station where data link has been started. The master station does not send data to a station where data link is not being performed.

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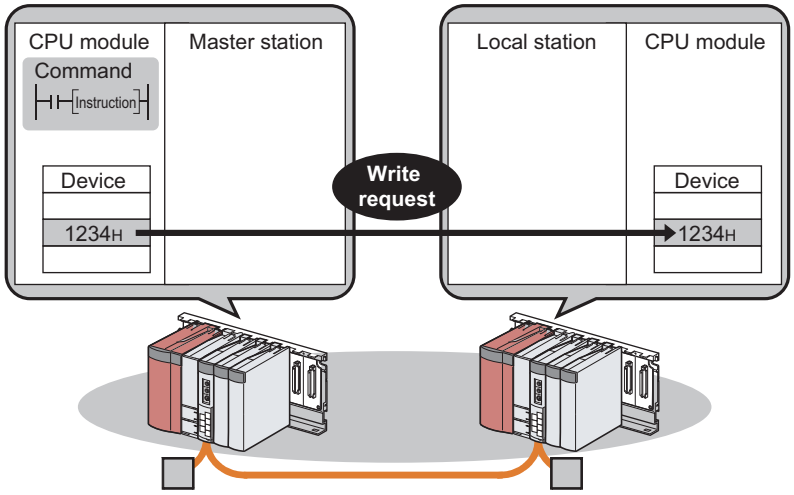
8.1.2 Non-periodic communications (transient transmission)

In transient transmission, data can be communicated when a request is issued unlike periodic communications (cyclic transmission). Direct access to the buffer memory and device in other stations can be performed in transient transmission.



(1) Communication method

The dedicated instructions of the master/local module are used for communications. (☞Page 173, CHAPTER 9)

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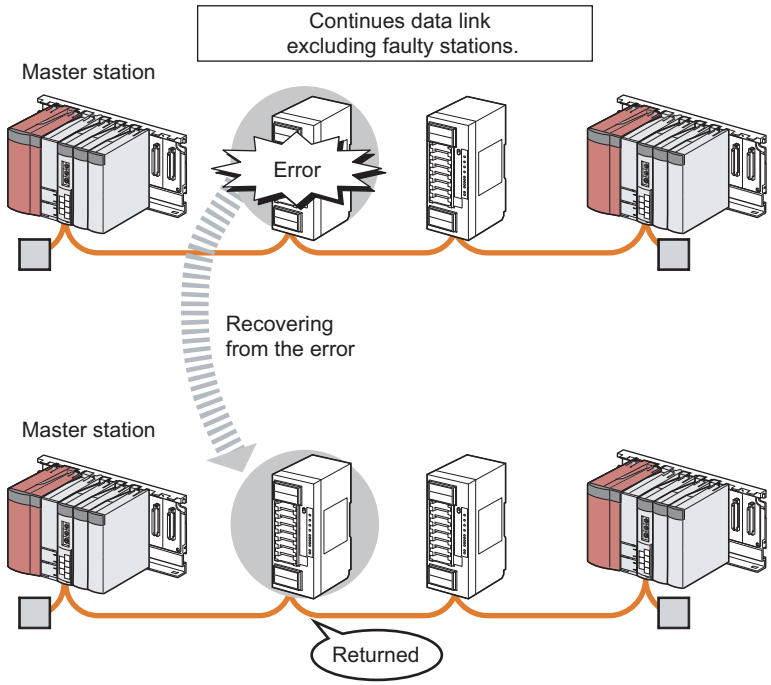
8.2 Improving the System Reliability

This section describes how to improve the CC-Link system reliability using the functions.

8.2.1 Slave station cut-off and automatic return

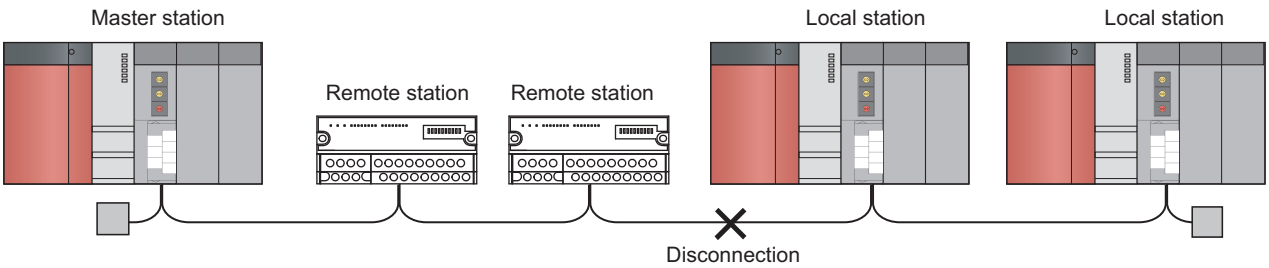
The slave-station cut-off function disconnects a slave station that cannot perform data link due to reasons such as power-off to continue the data link in a normal station.
The automatic return function allows data link to be automatically performed again when the slave station that has been disconnected from data link returns to the normal state.

Using these functions prevents the entire system from going down when one station goes down. Because no process is required for a return, time between an error and a return can be shortened.



Point

If a cable is disconnected, data link cannot be performed because the terminating resistors are also disconnected. (The ERR. LED turns on.)



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(1) Setting method

(a) Setting the slave station cut-off function

No setting is required in the master/local module.

(b) Setting the automatic return function

Set the number of slave stations that can be returned per link scan in "Automatic Reconnection Station Count" of the network parameter. (☞ Page 97, Section 7.3.2)

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8.2.2 Setting of the data link status upon an error in the programmable controller CPU of the master station

If a stop error occurs in the CPU module of the master station, whether to stop or continue data link can be selected. (☞ Page 121, Section 7.5)

Point

When a standby master station is set, the standby master station starts to take in control without data link of the master station continued even if the setting of the data link status is set to "Continue". (Use of the standby master function is prioritized.)

(1) Setting method

Select whether to stop or continue data link in "PLC Down Select" of the network parameter. (☞ Page 97, Section 7.3.2)

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8.2.3 Setting of the status of the input data from a data link faulty station

Whether to clear or hold data input from a data link faulty station can be selected. How the input data should be handled can be selected according to the system used. (☞ Page 121, Section 7.5)

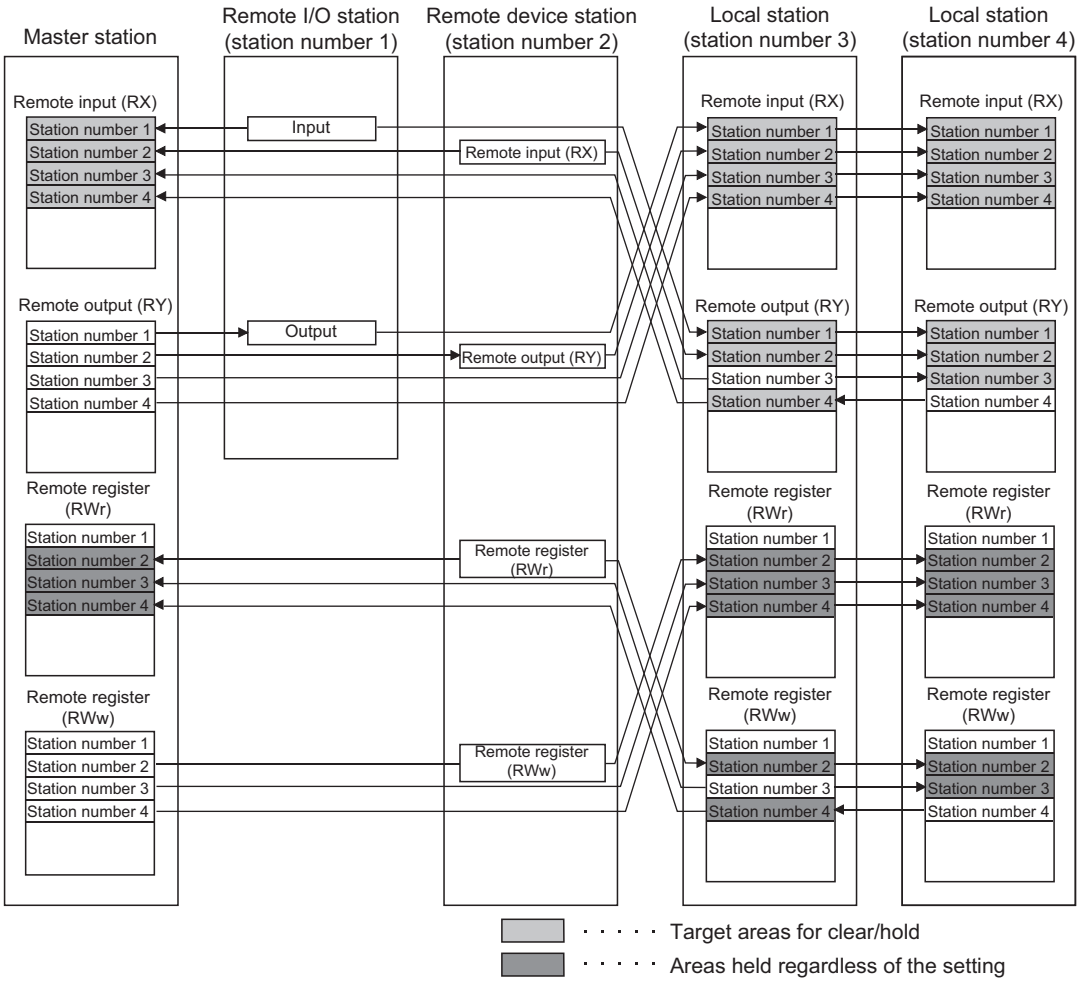
(1) Applicable input (receiving) data

Bit input data from other stations are cleared or held according to the setting.

- Remote input (RX) of the master station
- Remote input (RX) of local stations
- Remote output (RY) of local stations

Word input data from other stations are held regardless of setting.

- Remote register (RWr) of the master station
- Remote register (RWr) of local stations
- Remote register (RWw) of local stations



Point

If a data link error occurs in a station set as an error invalid station, input data (remote input (RX)) from that station is held regardless of the setting.

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(2) Setting method

Select whether to clear or hold input data in "Data Link Faulty Station Setting" under "Operation Setting" of the network parameter.

(☞ Page 101, Section 7.3.2 (1) , Page 118, Section 7.4.2 (1))

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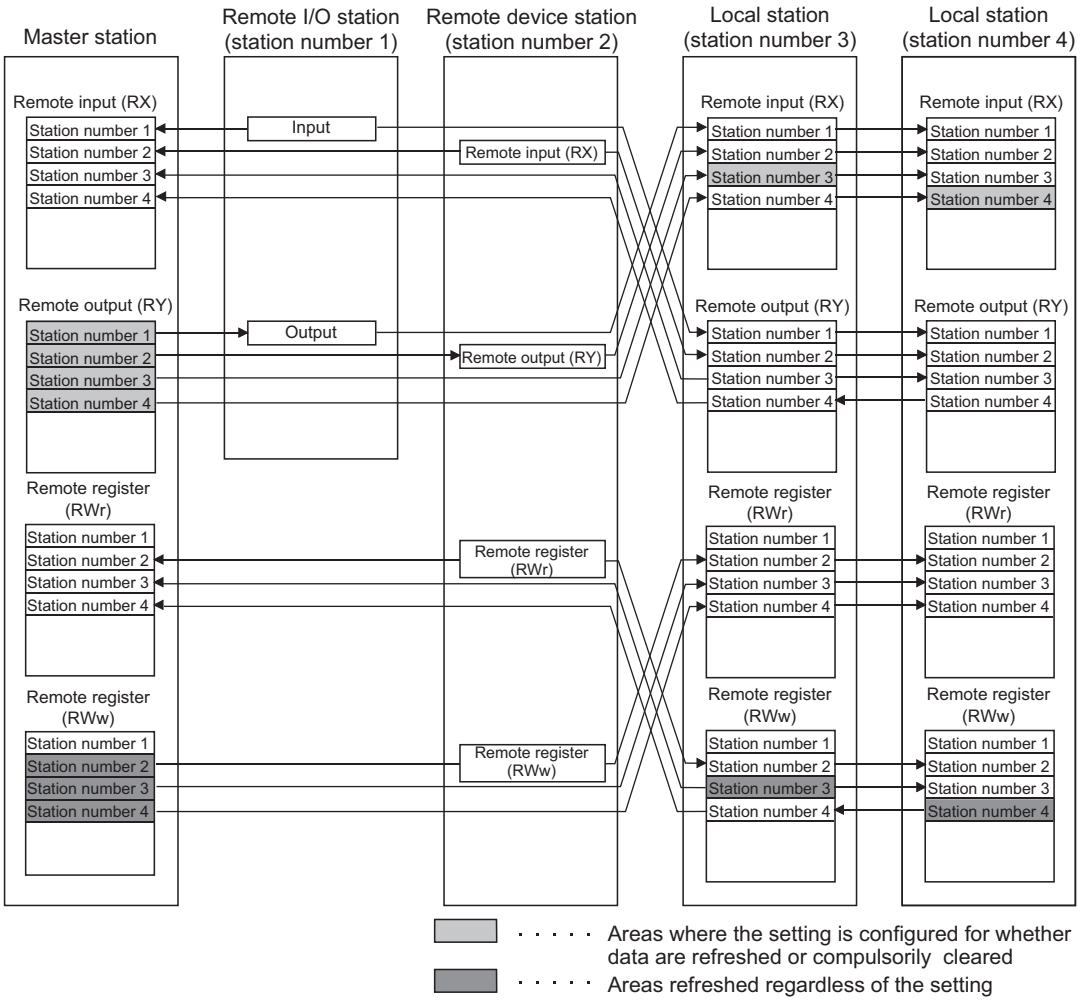
8.2.4 Refreshing/compulsorily clearing a slave station when the switch on a programmable controller CPU is set to STOP

Whether to refresh or compulsorily clear remote output (RY) when the switch on a CPU module is set to STOP can be selected. How the remote output (RY) should be handled can be selected according to the system used. (☞ Page 121, Section 7.5)

(1) Applicable output (sending) data

The following figure shows applicable data.



Only remote output (RY) is refreshed or compulsorily cleared according to the setting.
Remote input (RX) and remote register (RWr/RWw) are refreshed even if the switches on the CPU modules in the master station and local stations are set to STOP, regardless of the setting.

Point

- If the switch on a CPU module is set to STOP with "Clears Compulsorily" set, a compulsory output to a slave station cannot be performed on a programming tool (by using a device test or other methods).
- The setting is enabled even if RY is refreshed using an intelligent function module device (Un\G□) or TO instructions.

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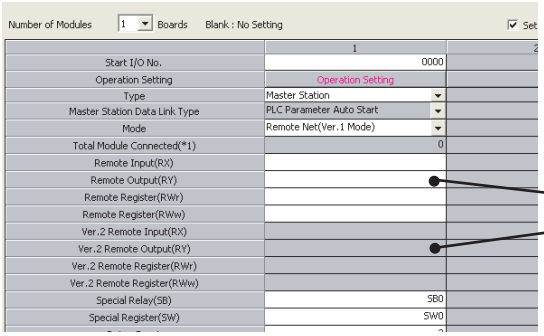
(2) Device to be set in the refresh device setting

Whether remote output (RY) is refreshed or compulsorily cleared varies in the refresh device setting of the network parameter as described below:

- When Y is set, remote output (RY) is compulsorily cleared regardless of the parameter setting.
- When a device other than Y, such as M and L, is selected, remote output (RY) is refreshed or compulsorily cleared according to the setting.



When Y is selected, remote output (RY) is compulsorily cleared regardless of parameter setting.

(3) Setting method

Select whether to refresh or clear output (sending) data to a slave station in "Case of CPU STOP Setting" under "Operation Setting" of the network parameter. (☞ Page 101, Section 7.3.2 (1), Page 118, Section 7.4.2 (1))

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8.2.5 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.

(1) Types of the standby master function

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 operates as a master station to continue data link.	When a failed master station becomes normal again, it return as a standby master station.	When only a standby master station is started up, it starts data link as a master station.
Master station switching function	○	×	×*1
Master station duplex function	○	○	×*1
Data link start function using a standby master station*2*3	○	○	○

*1 A standby master station does not start data link until the master station starts up.

*2 Configure the same system for the master station and standby master station (same modules connected, parameters, and program).

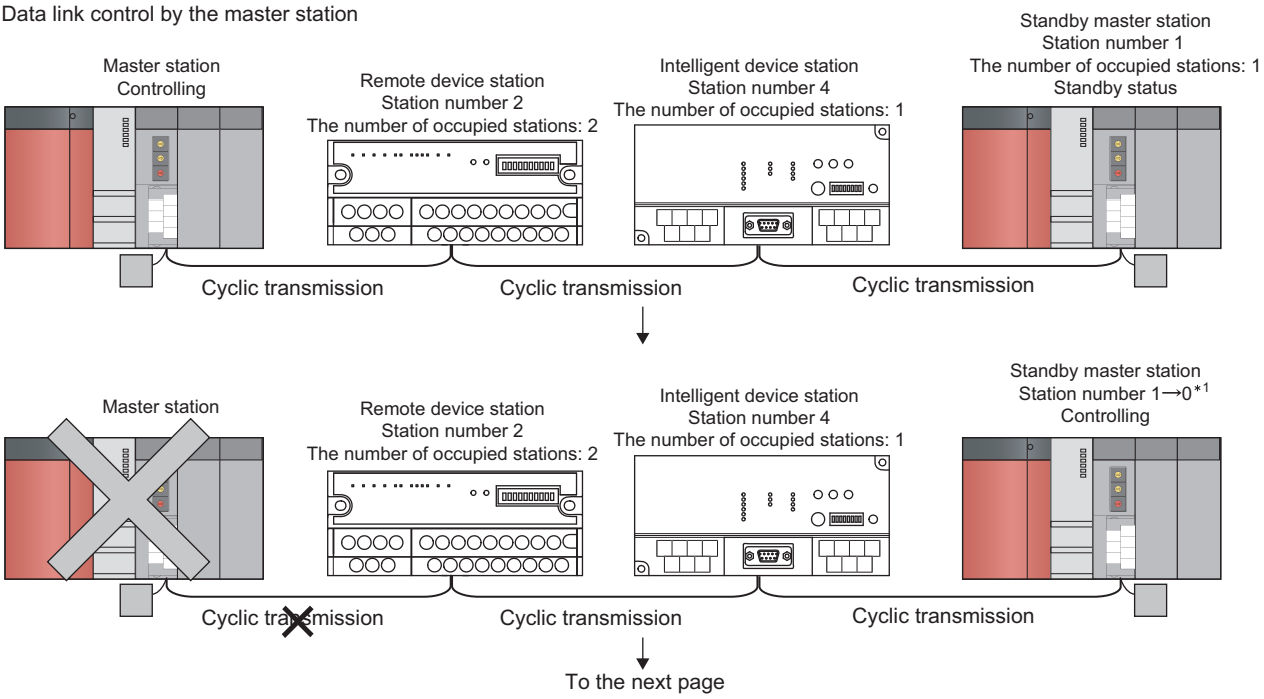
*3 Before using this function, check the version of the master/local module. (☞ Page 399, Appendix 6 (2))

(2) Operation of the standby master function

The following are the operations of the master station and standby master station of when the master station goes down. The following figure shows the operation until a failed master station goes back to normal after the standby master station starts to operate as a master station and data link is continued.

Controlling: Controlling the data link of the CC-Link system
Standby status: Standing by in case the station controlling the data link of the CC-Link system becomes faulty.

Data link control by the master station



*1 When the master station goes down and the standby master station starts to take in control of data link, the station number of the standby master station becomes 0.

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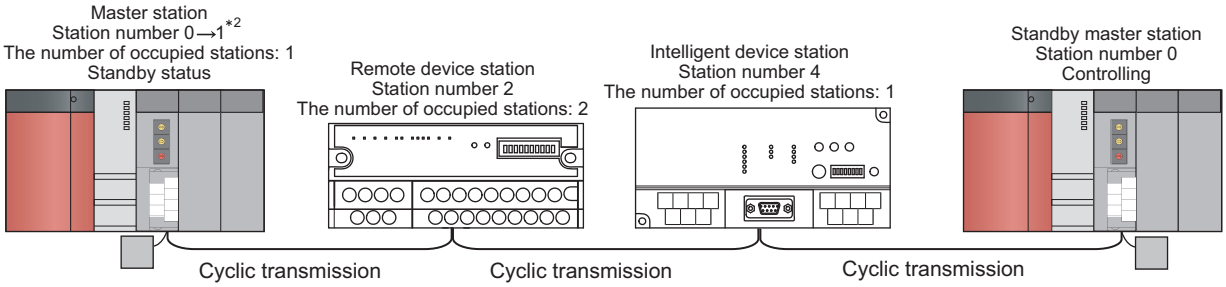
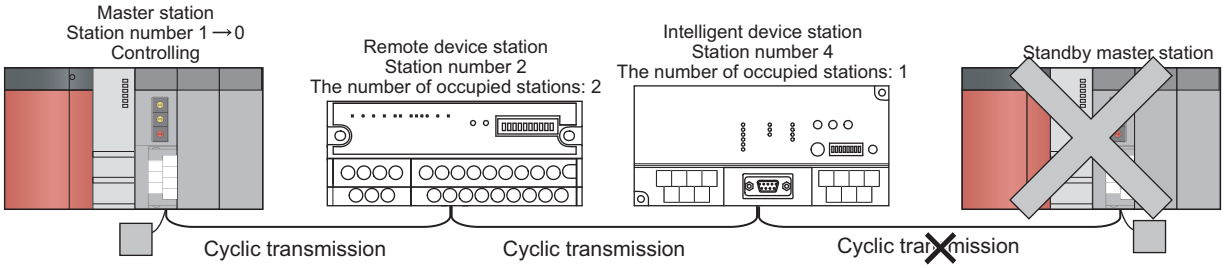
Continued from the previous page

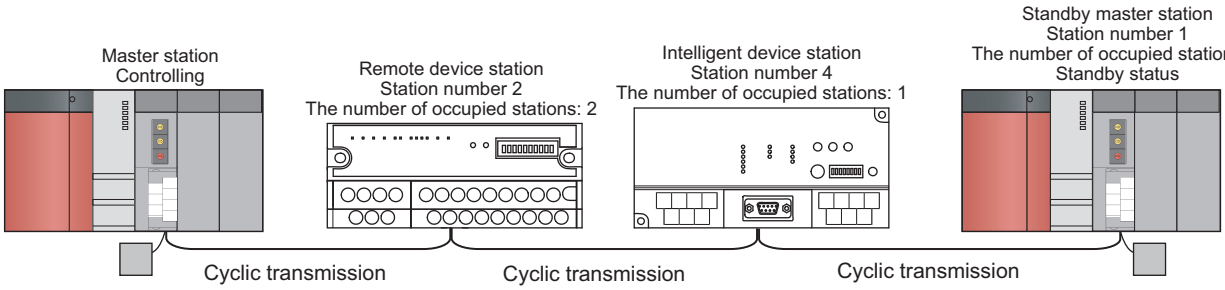
The master station in the normal state returns to the system operation. → The master station is on standby in case of the standby master station failure.



An error has occurred in the standby master station. → Data link is controlled by the master station.



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



*2 When the master station returns as a standby master station, the station number of the master station becomes the number set in "Standby Master Station No." of the network parameter.

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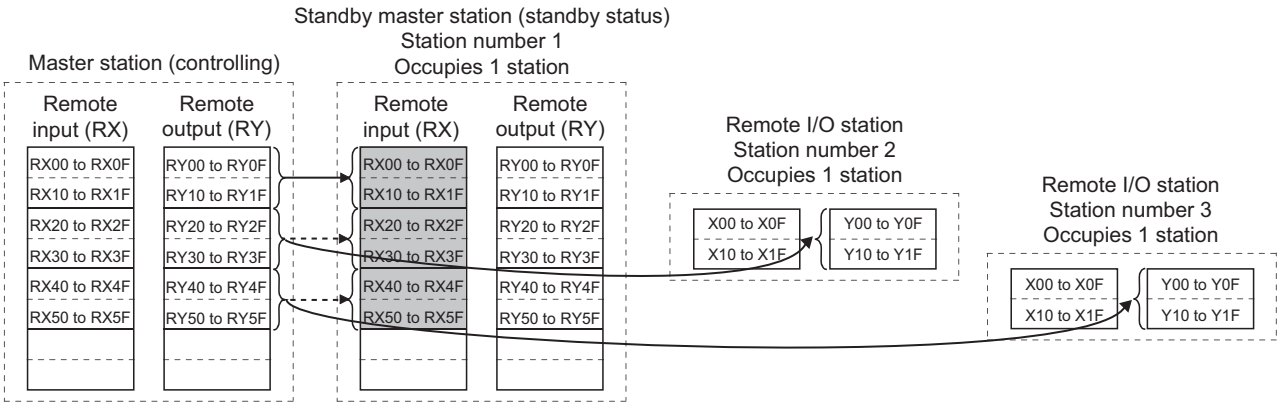
(3) Overview of data transmission of when the standby master function is used

The following is an overview of data transmission of when the standby master function is used.

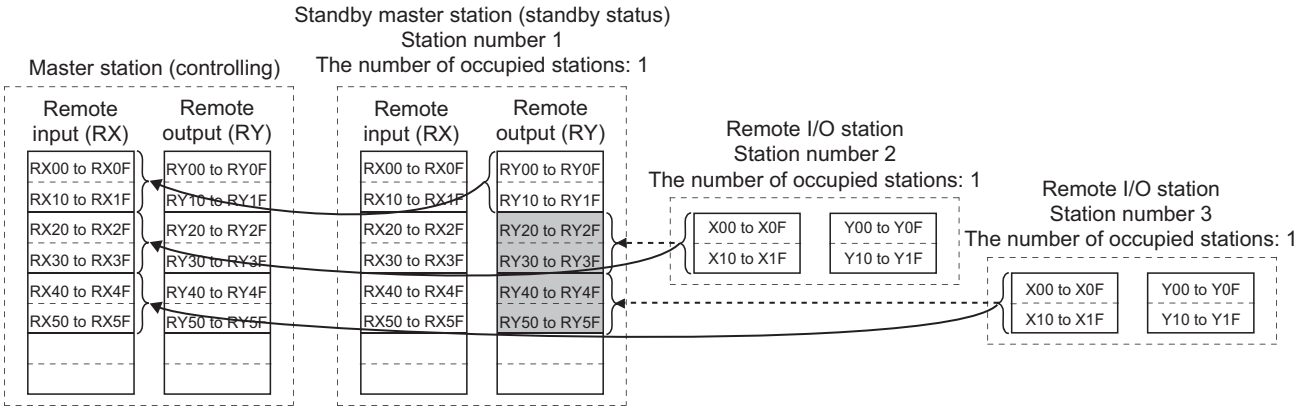
(a) When data link is controlled by the master station

- Output from the master station



Outputs (RY/RWw) from the master station are stored in inputs (RX/RWr) of the standby master station (shaded areas in the figure above).

- Input of the master station



Inputs (RX/RWr) from slave stations to the master station are stored in outputs (RY/RWw) of the standby master station (shaded areas in the figure above).

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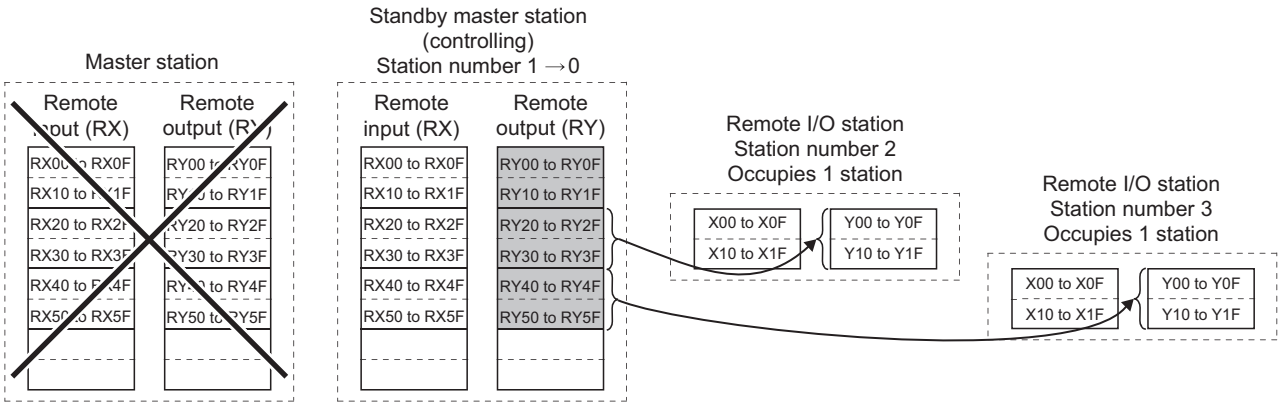
(b) Operation between the master station going down and the standby master station controlling data link

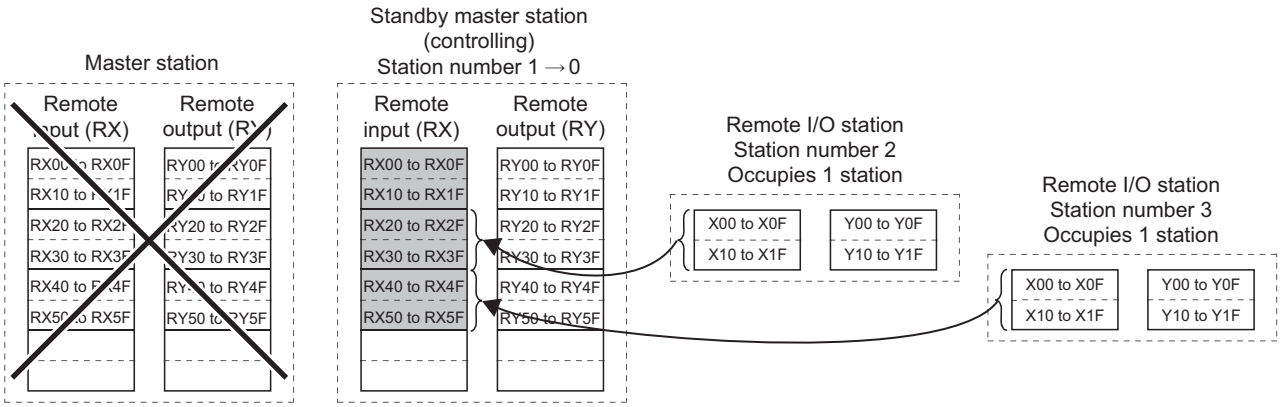
If the master station goes down, the standby master station takes over the control of data link.

- Output from the standby master station



Outputs (RY/RWw) of the master station are stored in inputs (RX/RWr) of the standby master station. By transferring the inputs (RX/RWr) of the standby master station to the outputs (RY/RWw), outputs to the slave stations are continued (shaded areas in the figure above). (☞Page 147, Section 8.2.5 (7))

- Input of the standby master station



Inputs (RX/RWr) of the master station are stored in outputs (RY/RWw) of the standby master station. By transferring the outputs (RY/RWw) of the standby master station to the inputs (RX/RWr), inputs from the slave stations are continued (shaded areas in the figure above). (☞Page 147, Section 8.2.5 (7))

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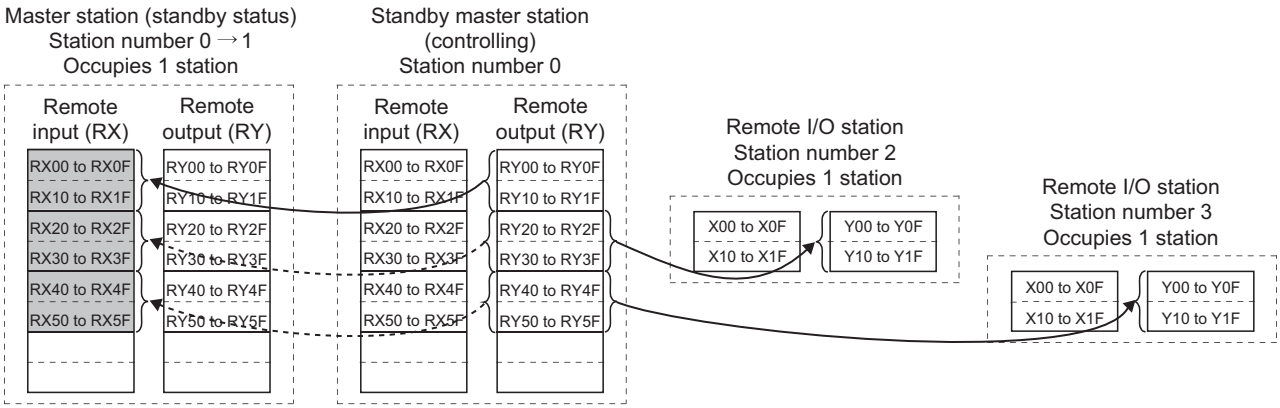
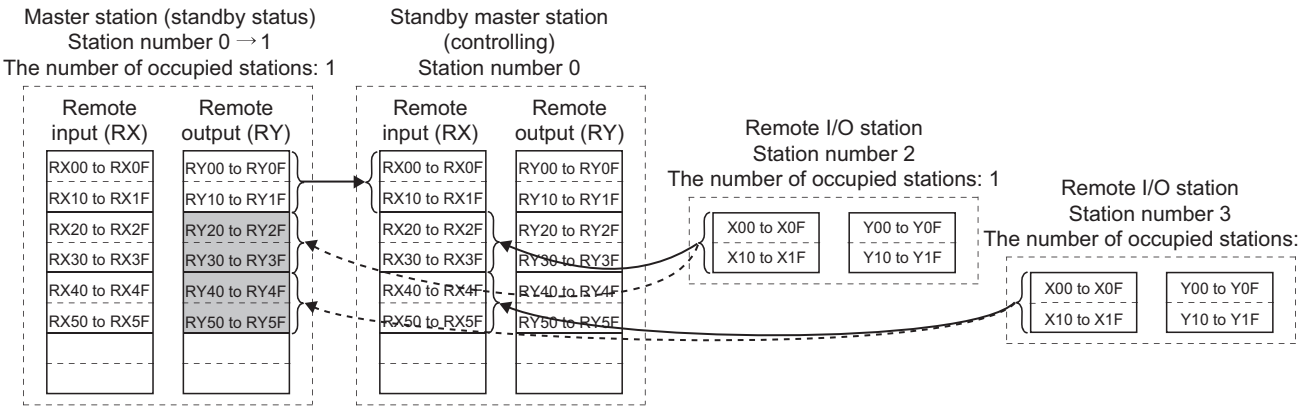
(c) Operation between the master station returning and the standby master station controlling data link

- Output from the standby master station



Outputs (RY/RWw) from the standby master station are stored in inputs (RX/RWr) of the master station (shaded areas in the figure above).

- Input of the standby master station



Inputs (RX/RWr) from slave stations to the standby master station are stored in outputs (RY/RWw) of the master station (shaded areas in the figure above).

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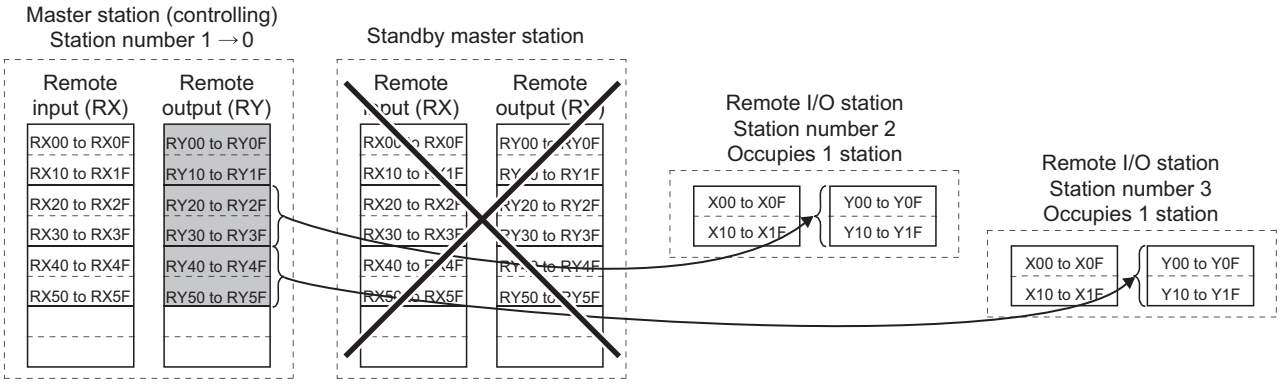
(d) Operation between the standby master station going down and the master station controlling data link

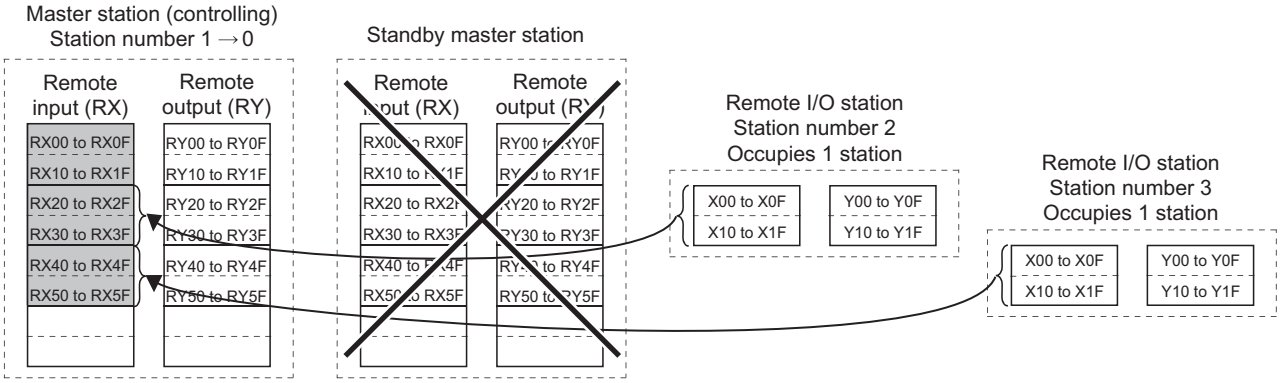
If the standby master station goes down, the master station takes over the control of data link.

- Output from the master station



Outputs (RY/RWw) of the standby master station are stored in inputs (RX/RWr) of the master station. By transferring the inputs (RX/RWr) of the master station to the outputs (RY/RWw), outputs to the slave stations are continued (shaded areas in the figure above). (☞ Page 147, Section 8.2.5 (7))

- Input of the master station



Inputs (RX/RWr) of the standby master station are stored in the outputs (RY/RWw) of the master station. By transferring the outputs (RY/RWw) of the master station to the inputs (RX/RWr), inputs from the slave stations are continued (shaded areas in the figure above). (☞ Page 147, Section 8.2.5 (7))

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(4) Setting method

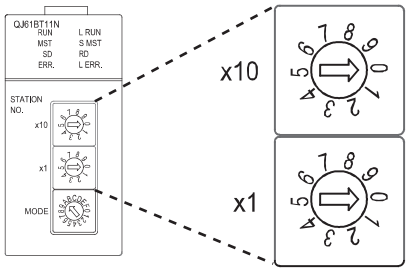
Set the function in the network parameters of a programming tool.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]

(a) Settings for a master station

Configure the settings in "Type" and "Standby Master Station No." of the network parameter as follows. For other settings, refer to Page 97, Section 7.3.2.

1. Set the station number to 0 using the station number setting switch on the master/local module.



2. Open the "Network Parameter" window to configure the setting in "Type" as follows.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]

○: Enabled, ×: Disabled

Function	Operation			Setting in "Type"
	When the master station goes down, the standby master station operates as a master station to continue data link.	When a failed master station becomes normal again, it returns as a standby master station.	When only a standby master station is started up, it starts data link as a master station.	
Master station switching function	○	×	×	Master Station
Master station duplex function	○	○	×	Master Station (Duplex Function)
Data link start function using a standby master station	○	○	○	Master Station (Duplex Function)

3. Set "Standby Master Station No." from 1 to 64.

Ex. When "Master Station (Duplex Function)" is selected in "Type"

	1
Start I/O No.	0000
Operation Setting	Operation Setting
Type	Master Station(Duplex Function)
Master Station Data Link Type	PLC Parameter Auto Start
Mode	Remote Net(Ver.1 Mode)
Total Module Connected(*1)	1
Remote Input(RX)	X1000
Remote Output(RY)	Y1000
Remote Register(RWr)	W0
Remote Register(RWw)	W100
Ver.2 Remote Input(RX)	
Ver.2 Remote Output(RY)	
Ver.2 Remote Register(RWr)	
Ver.2 Remote Register(RWw)	
Special Relay(SB)	SB0
Special Register(SW)	SW0
Retry Count	3
Automatic Reconnection Station Count	1
Standby Master Station No.(*1)	1
PLC Down Select	Stop
Scan Mode Setting	Asynchronous
Delay Time Setting	0
Station Information Setting	CC-Link Configuration Setting
Remote Device Station Initial Setting	Initial Setting
Interrupt Settings	Interrupt Settings

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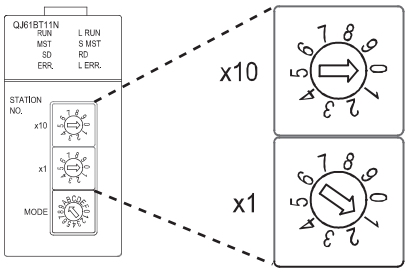
(b) Settings for a standby master station

Configure the settings in "Type" and "Mode" of the network parameter as follows. For other settings, refer to Page 115, Section 7.4.2.

1. Set the station number from 1 to 64 using the station number setting switches on the master/local module.

Set the same number as that of "Standby Master Station No." that was set for the master station.



2. Open the "Network Parameter" window to configure the setting in "Type" as follows.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]

○: Enabled, ×: Disabled

Function	Operation			Setting in "Type"
	When the master station goes down, the standby master station operates as a master station to continue data link.	When a failed master station becomes normal again, it returns as a standby master station.	When only a standby master station is started up, it starts data link as a master station.	
Master station switching function	○	×	×	Standby Master Station
Master station duplex function	○	○	×	Standby Master Station
Data link start function using a standby master station	○	○	○	Master Station (Duplex Function)

3. Set the same mode as that of the master station in "Mode".

4. When "Master Station (Duplex Function)" has been selected in "Type", set the same settings as those of the master station in items other than "Type" and "Mode".

Ex. When "Standby Master Station" is selected in "Type"

	1
Start I/O No.	0000
Operation Setting	Operation Setting
Type	Standby Master Station
Master Station Data Link Type	
Mode	Remote Net(Ver.1 Mode)
Total Module Connected(*1)	
Remote Input(RX)	X1000
Remote Output(RY)	Y1000
Remote Register(RWr)	W0
Remote Register(RWw)	W100
Ver.2 Remote Input(RX)	
Ver.2 Remote Output(RY)	
Ver.2 Remote Register(RWr)	
Ver.2 Remote Register(RWw)	
Special Relay(SB)	SB0
Special Register(SW)	SW0
Retry Count	
Automatic Reconnection Station Count	
Standby Master Station No.(*1)	
PLC Down Select	
Scan Mode Setting	
Delay Time Setting	
Station Information Setting	CC-Link Configuration Setting
Remote Device Station Initial Setting	
Interrupt Settings	Interrupt Settings

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(5) Precautions

(a) The number of standby master stations

One standby master station can be connected in one system.

(b) Right of controlling data link of a standby master station

When a master station goes down, the right of controlling data link is automatically transferred to a standby master station. Note that an instruction to refresh cyclic data is not issued. Use a link special relay (SB) and link special register (SW) to issue a refresh instruction. (☞ Page 145, Section 8.2.5 (6))
After the instruction is issued, information before a master station error is detected is output to each station.

(c) Change in the parameter settings of the master station

While data link is performed by a standby master station, the parameter settings of the master station cannot be changed.

(d) Station number setting for a standby master station

If the station number setting of the station number setting switch on a standby mater station differs from that set in "Standby Master Station No." of the network 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 parameter settings of the master station or changing the station number set using the station number setting switch of the standby master station.

(e) If the terminal block of a master station is removed while the master station is controlling data link

If the terminal block of a 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.

(f) The status of an LED when the right of controlling data link 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 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.

(g) Number of points and range of devices to back up data using a program

The number of 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 backed up using a program vary depending on the system.

(h) If an error is detected in the master station in the initial status (before data link is started)

The operation is not switched from the standby master station to the master station, and data link is not started. (This applies only to the master station switching function and master station duplex function.)

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(i) Data link start function using a standby master station

- Parameters and program set in the master station and standby master station
  Set the same parameters and program in the master station and standby master station. If not, the operation is not guaranteed.
- Line test
  When the data link start function by a standby master station is used, a line test cannot be executed using the switch on the master/local module. Use a programming tool to execute a line test.
  (☞ Page 86, Section 6.5.1 (1))

(j) 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). 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	Remark
Remote net Ver.1 mode Remote I/O net mode	Fixed to 0	—
Remote net Ver.2 mode Remote net additional 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 (after system switching when the Redundant CPU is used (when only one of the two systems is down)). • For sequence scan time, use the minimum value after master switching (after system switching when the Redundant CPU is used (when only one of the two systems is down)).

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(6) Link special relays (SBs) and link special registers (SWs) related to the standby master function

Link special relays (SBs) and link special registers (SWs) related to the standby master function are listed below.

(a) Link special relays (SBs)

Link special relays (SBs) related to the standby master function are listed below.
Values in parentheses are buffer memory addresses and bit numbers.

- Refresh instruction at standby master switching (SB0001) ($5E0_H$, b1)
- Forced master switching (SB000C) ($5E0_H$, b12)
- Refresh instruction acknowledgement status at standby master switching (SB0042) ($5E4_H$, b2)
- Refresh instruction complete status at standby master switching (SB0043) ($5E4_H$, b3)
- Forced master switching executable status (SB0046) ($5E4_H$, b6)
- Master switching request acknowledgement (SB005A) ($5E5_H$, b10)
- Master switching request complete (SB005B) ($5E5_H$, b11)
- Forced master switching request acknowledgement (SB005C) ($5E5_H$, b12)
- Forced master switching request complete (SB005D) ($5E5_H$, b13)
- Host standby master station setting information (SB0062) ($5E6_H$, b2)
- Master station information (SB0070) ($5E7_H$, b0)
- Standby master station information (SB0071) ($5E7_H$, b1)
- Master station return specification information (SB0079) ($5E7_H$, b9)
- Host master/standby master operation status (SB007B) ($5E7_H$, b11)

(b) Link special registers (SWs)

Link special registers (SWs) related to the standby master function are listed below.
Values in parentheses are buffer memory addresses.

- Refresh instruction at standby master switching result (SW0043) (643_H)
- Forced master switching instruction result (SW005D) ($65D_H$)
- Standby master station number (SW0073) (673_H)

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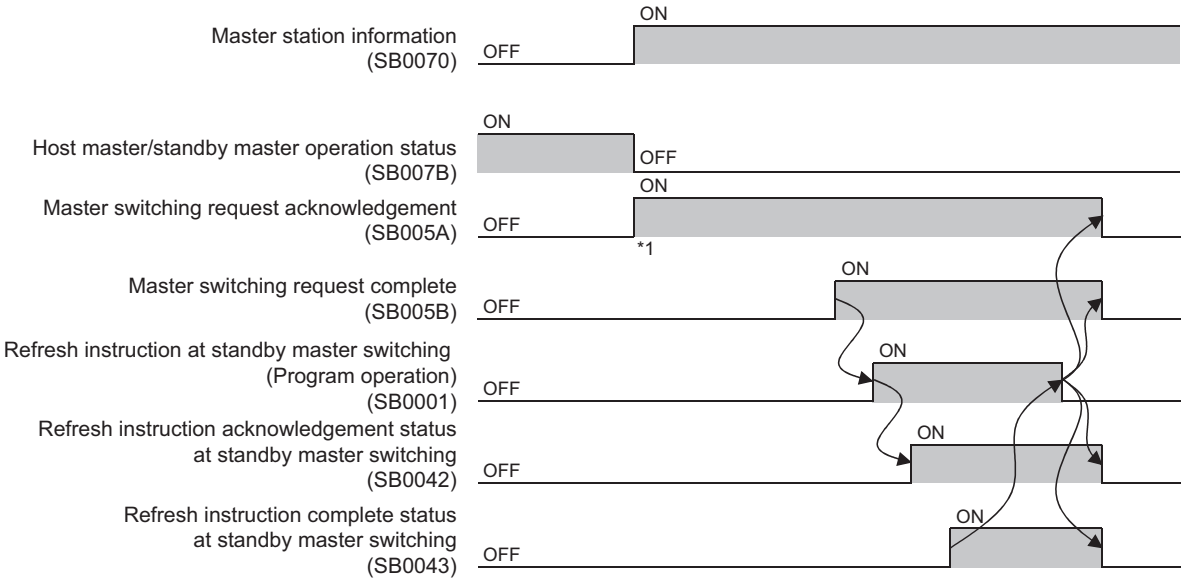
(c) ON/OFF timing of link special relays (SBs) related to the standby master function

The following figure shows the ON/OFF timing of link special relays (SBs) related to the standby master function.



*1 When turning on Master switching request acknowledgement (SB005A), save data stored in RX, RY, RWr, and RWw to the devices and back up data stored in RX to RY, data stored in RY to RX, data stored in RWr to RWw, and data stored in RWw to RWr using a program. In addition, turn on Refresh instruction at standby master switching (SB0001).
After saving data stored in RX, RY, RWr, and RWw to the devices, wait a fixed number of scans and execute the processing that backs up data stored in RX to RY, data stored in RY to RX, data stored in RWr to RWw, and data stored in RWw to RWr using a program and the processing that turns on the Refresh instruction at standby master switching (SB0001).
For details, refer to Page 143, Section 8.2.5 (5).

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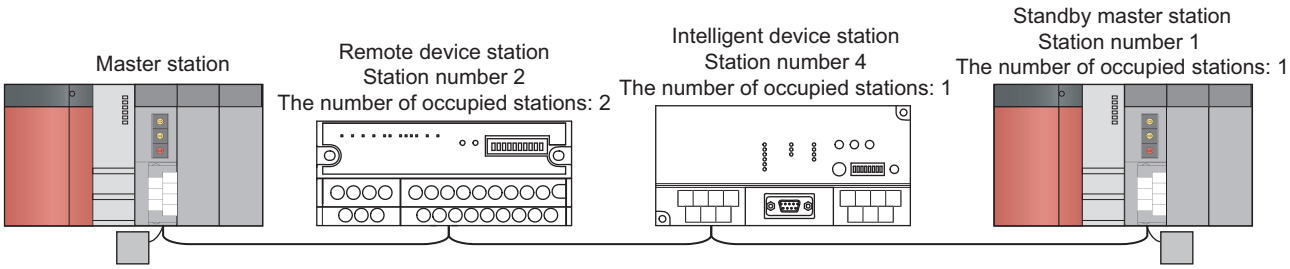
(7) Example of communications when the master station duplex function is used

The following system configuration is used to explain an example of communications.

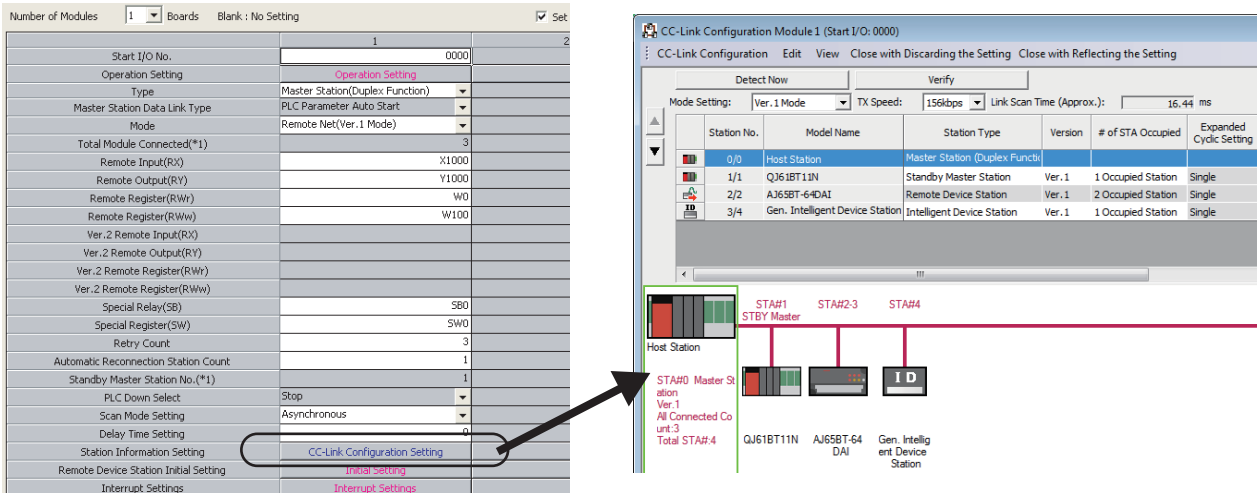
For example of communications when the Redundant CPU is used, refer to the following.

QnPRHCPU User's Manual (Redundant System)

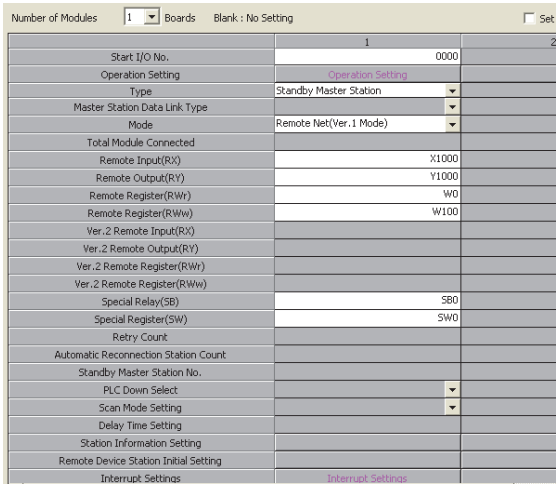
(a) System configuration



(b) Parameter settings for a master station



(c) Parameter settings for a standby master station



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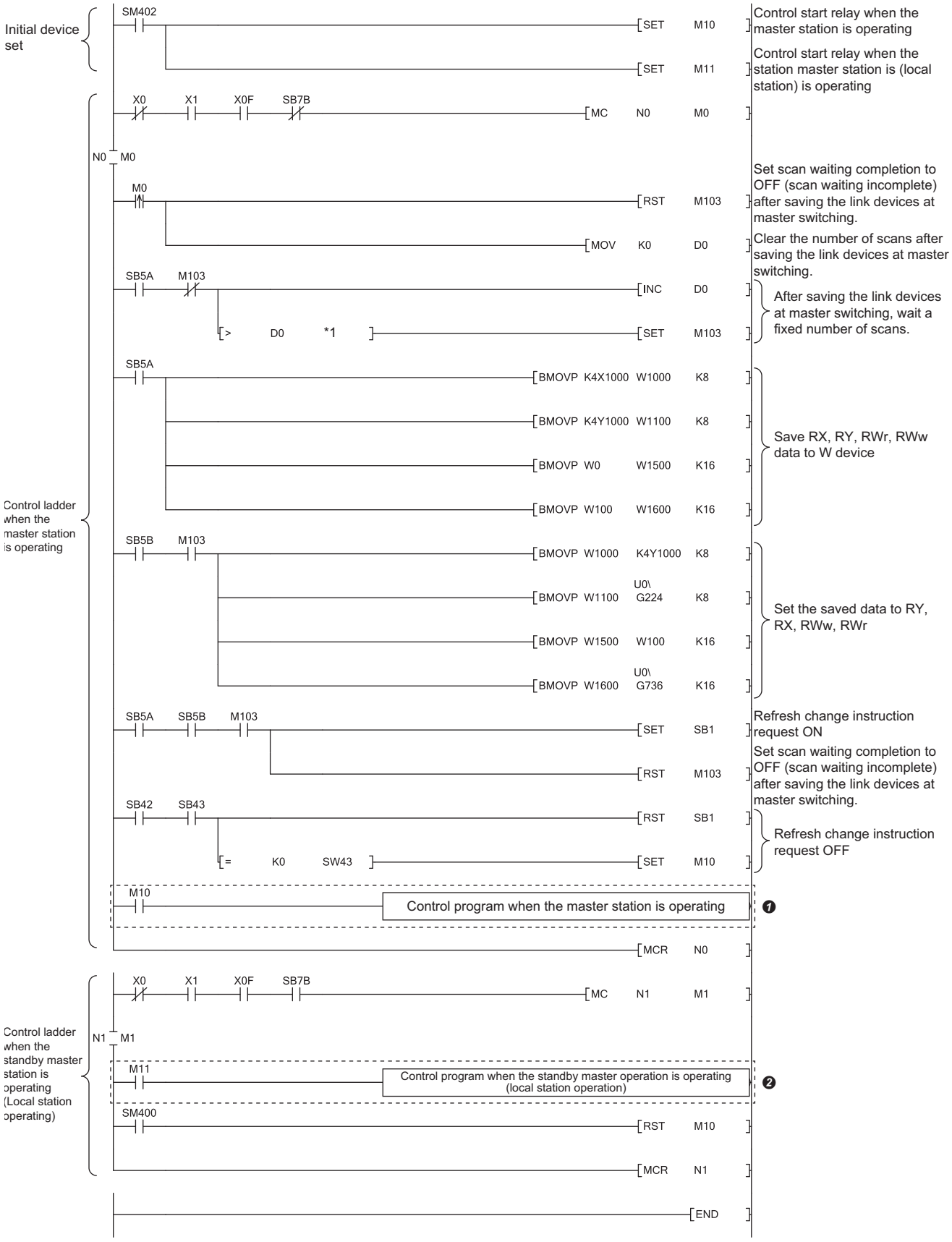
(d) Program example

- Control start relay when the master station is operating: M10
- Control start relay when the standby master station is operating: M11



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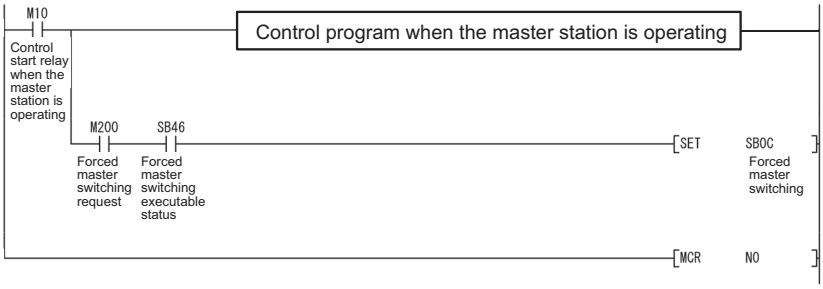
*1 After saving the link devices, wait a fixed number of scans and execute the processing that sets the link devices saved at master switching and Refresh instruction at standby master switching (SB0001).
For details, refer to Page 143, Section 8.2.5 (5).

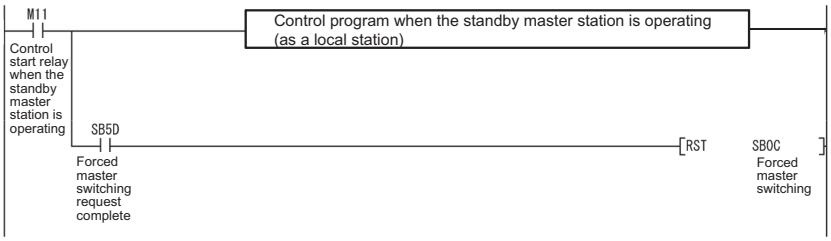
(e) When the right of controlling data link is compulsorily transferred from the standby master station to the master station

In the program example in Page 148, Section 8.2.5 (7) (d), change the sections in the dotted lines ❶ and ❷ as follows.

- Program ❶



- Program ❷



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8.2.6 Cyclic data assurance

This function prevents read/write data from being separated between new and old data.

Point

Before using this function, check the versions of the master/local module and programming tool. (☞ Page 399, Appendix 6 (2))

(1) Block data assurance per station

Cyclic data may be separated between new and old data depending on the timing of the automatic refresh. This function prevents read/write data per slave station from being separated between new and old data. Because the setting is configured only on a programming tool, a program to prevent data separation is not required.

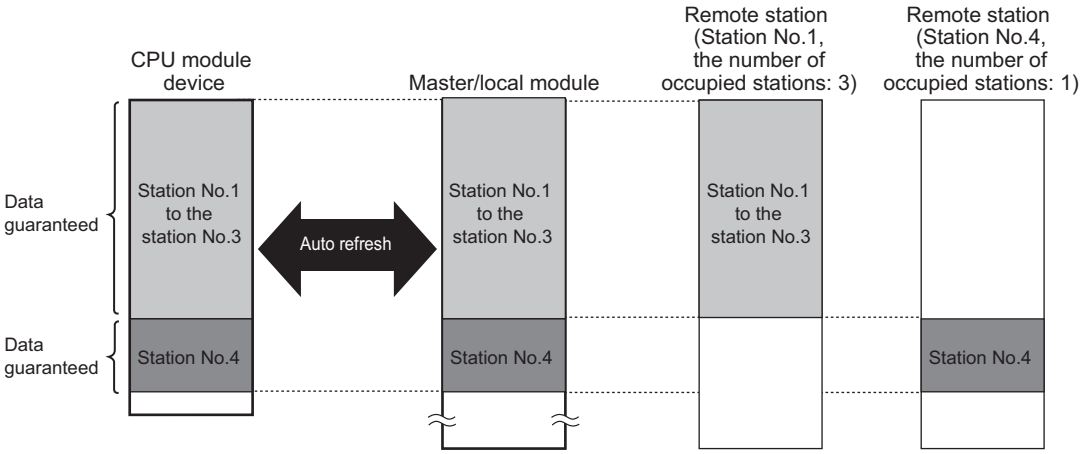
(a) Data to be assured

This function is applicable to data automatically transferred to a CPU module (automatic refresh) by setting the refresh device of the network parameter.
Data in RX, RY, RWr, and RWw are assured per slave station.

(b) Operation of a data assurance

Identity of data per slave station is assured as follows.

Ex. To assure data of the remote stations with the number of occupied stations of 3 and 1



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(c) Setting method

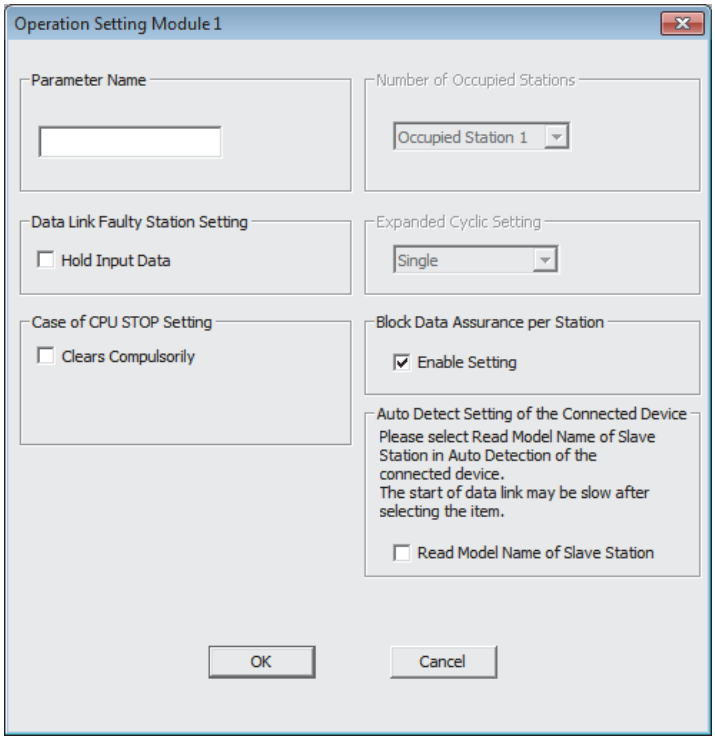
Configure the setting in the master station, local station, and standby master station where data needs to be assured.

1. Open the "Operation Setting" window.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]

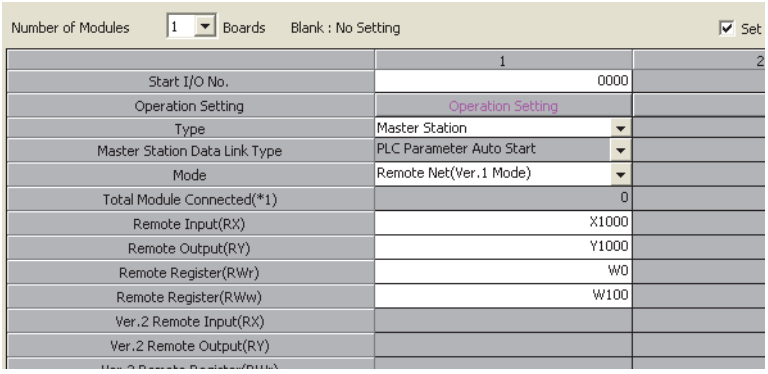
⇨ Operation Setting button

2. Check the checkbox in "Block Data Assurance per Station".



Point

When configuring the setting in the block data assurance per station, set the refresh devices as well.



Number of Modules 1 Boards Blank : No Setting Set

	1	2
Start I/O No.	0000	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver.1 Mode)	
Total Module Connected(*1)	0	
Remote Input(RX)	X1000	
Remote Output(RY)	Y1000	
Remote Register(RWr)	W0	
Remote Register(RWw)	W100	
Ver.2 Remote Input(RX)		
Ver.2 Remote Output(RY)		

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(d) Precautions when using the block data assurance per station function

- Refresh device setting
  When using this function, set the refresh devices in the network parameter. If the refresh devices are not set, the remote input (RX), remote output (RY), and remote register (RWr, RWw) of the buffer memory may not be refreshed.
- Assurance of 32-bit data
  Integrity of 32-bit data in remote register (RWr/RWw) is assured even if "Block Data Assurance per Station" is not set. (☞Page 153, Section 8.2.6 (2))
- Transmission delay time and link refresh time
  When this function is used, transmission delay time and link refresh time become longer than those of when this function is not used. When designing a system based on an existing system, check the transmission delay time and link refresh time at startup of the system. (☞Page 371, Appendix 4.2, Page 389, Appendix 4.4)

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(2) 32-bit data integrity assurance

This function prevents read/write data in 32-bit increments from being separated between new and old data.

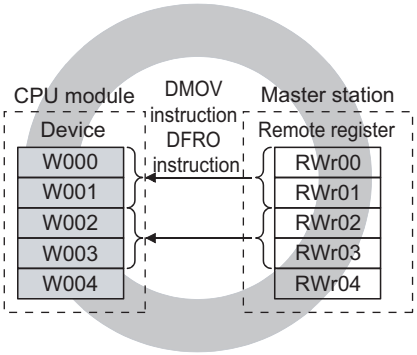
(a) Data to be assured

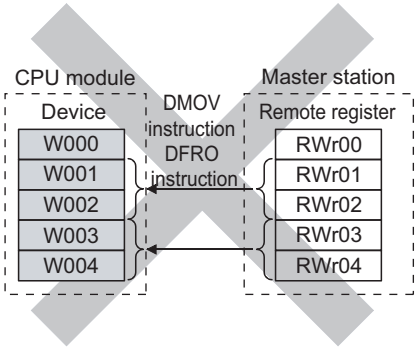
The data in the remote register (RWr/RWw) between a CPU module, master station, and local station are assured.

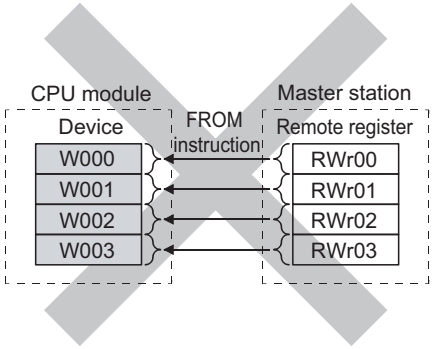
(b) Method of a data assurance

The following two conditions are required for assurance.

- The first address of the remote register (RWr/RWw) has an even number.
- When accessing the remote register (RWr/RWw) using a program, access them with an even number of devices.







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8.3 Useful Applications of the Functions

This section describes the useful functions of a master/local module.

8.3.1 Remote device station initialization procedure registration function

The initial setting of a remote device station, which is performed on a program, can be registered in advance using a programmable tool and can be saved by turning on the link special relay (SB). A program for the initial setting is not required.
For example, in an AJ65BT-64AD, settings such as "A/D conversion enable/prohibit specification" and "Averaging process specification" can be easily configured.

For a setting example using a programming tool, refer to Page 232, Section 10.2.

(1) Number of initial settings registered

(a) Number of remote device stations

The initial settings of up to 16 remote device stations can be registered in one master/local module. Use a program to register the initial settings of stations after the 17th station.

(b) Number of initial settings registered per remote device station

Up to 16 items of the initial settings can be registered per remote device station. Use a program to register 17 items or more. A programming tool and program cannot be used together for the initial setting in one remote device station. If they are used together, a remote device station may malfunction.

(2) If the process has stopped

Information about an initial setting in progress is stored in Remote device station initialization procedure registration execution individual information (SW0110 to SW011F) of a master/local module. If the process has stopped halfway, information such as the number of the procedure that has stopped and the number of the station where the procedure has stopped can be checked.

(3) How to configure the initial setting

Configure the setting in "Remote Device Station Initial Setting" of the network parameter in the master station. Then use Remote device station initialization procedure registration instruction (SB000D) to reflect the initial setting to the remote device station. (☞ Page 108, Section 7.3.2 (3), Page 232, Section 10.2)

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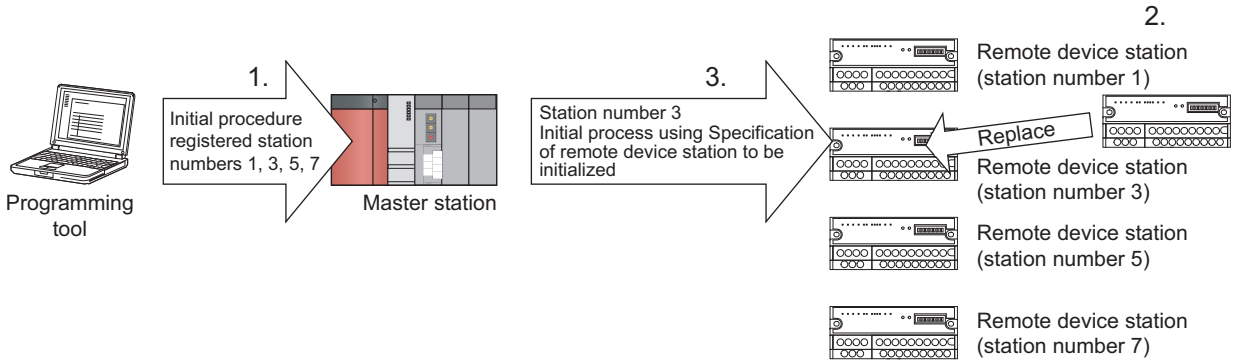
(4) How to perform the initial process only in a specified station (specification of remote device station to be initialized)

When a remote device station in operation was replaced due to failure, the initial process used to be performed in all the stations. Now, the initial process can be performed only in a specified remote device station that has been replaced. Remote device stations other than a specified station continue to operate. (This applies to a master/local module with a serial number (first five digits) of 08032 or later.)

Ex. To specify the remote device station (station number 3)



1. Replace the failed remote device station (station number 3).

2. Use Specification of remote device station to be initialized (SW0014 to SW0017) to specify the station number 3.

Turn on the applicable bit (only the bit of the start station number) in SW0014 to SW0017.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
SW0014	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SW0015	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
SW0016	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
SW0017	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49

Numbers 1 to 64 in the above table indicate the station numbers.

Point

When all bits are off, an initial process is performed in all the stations set in the remote device station initial setting of the network parameter.

3. Configure the initial setting by turning on Remote device station initialization procedure registration instruction (SB000D).

During the initial process in the station number 3, other stations (station numbers 1, 5, and 7) continue the control.

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(5) Precautions

(a) Processing time

Because one step is executed per link scan, more setting items extend the processing time further than that of when a program is used.

(b) While Remote device station initialization procedure registration instruction (SB000D) is on

Data in the remote I/O (RX, RY) and remote register (RWr, RWw) stops to be refreshed.

(c) Handling of signals that are required to be always on (such as CH.□ Conversion enable flag of an AJ65BT-64RD3/4)

Turning off Remote device station initialization procedure registration instruction (SB000D) after the initial process is completed turns off all the RY signals that have turned on while the initial procedure registration is performed. To prevent this, use a program to turn on signals that are required to be always on.

(d) Turning on Completion status of remote device station initialization procedure (SB005F)

When Specification of remote device station to be initialized (SW0014 to SW0017) is selected, Completion status of remote device station initialization procedure (SB005F) does not turn on until the procedure registration is normally completed in all the stations. If a faulty station exists, turn off Remote device station initialization procedure registration instruction (SB000D) depending on the completion status of other stations.

(e) Initialization procedure registration for a standby master station

The initial setting cannot be configured in a standby master station. When replacing a remote device station while a standby master station is operating as a master station, configure the initial setting on a program.

(f) When the instruction is not required

The initialization procedure registration instruction may not be required under some situations, such as when the remote input (RX) is set as a condition device.

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(6) Link special relays (SBs) and link special registers (SWs) related to the remote device station initialization procedure registration

(a) Link special relays (SBs)

Link special relays (SBs) related to the remote device station initialization procedure registration are listed below.

Values in parentheses are buffer memory addresses and bit numbers.

- Remote device station initialization procedure registration instruction (SB000D) ($5E0_H$, b13)
- Execution status of remote device station initialization procedure (SB005E) ($5E5_H$, b14)
- Completion status of remote device station initialization procedure (SB005F) ($5E5_H$, b15)

(b) Link special registers (SWs)

Link special registers (SWs) related to the remote device station initialization procedure registration are listed below.

Values in parentheses are buffer memory addresses.

- Specification of remote device station to be initialized (SW0014 to SW0017) (614_H to 617_H)
- Remote device station initialization procedure registration instruction result (SW005F) ($65F_H$)
- Remote device station initialization procedure registration execution individual information (target 1) (SW0110) (710_H) to Remote device station initialization procedure registration execution individual information (target 16) (SW011F) ($71F_H$)

(7) Replacement of a master/local module in failure

When replacing a master/local module in failure with a new master/local module, do not use a module with a serial number (first five digits) of 08031 or earlier.

If a module with a serial number (first five digits) of 08031 or earlier is used by mistake, and the specification of remote device station to be initialized is performed, each station operates as listed below.

Master station/remote device station	Operation
Master station	The setting of Specification of remote device station to be initialized (SW0014 to SW0017) is ignored, and the initial process is performed in all the remote device stations set in the network parameter.
Remote device station	• In a remote device station where a module has been replaced due to failure, the initial process is completed. • The initial process may not be completed in a remote device station that is normally operating. If the initial process is not completed, check Remote device station initialization procedure registration execution individual information (SW0110 to SW011F).

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8.3.2 Event issuance for the interrupt program

A request for the interrupt to a CPU module is issued when the conditions that have been set using a programming tool are satisfied, and the interrupt program can be executed. This function is used to stop the control and execute an interrupt program upon an error or for other purposes.
Because the conditions are set using a programming tool, the number of steps in a program is reduced, shortening the scan time.
An event can be issued to all stations.

(1) Conditions for event issuance

Up to 16 conditions for event issuance can be set.
The following conditions can be set for interruption.

- When RX, RY, or SB is turned on or off
- Match/mismatch of data in RWr and SW
- When a link scan is completed

(2) How to configure the interrupt settings

Configure the settings in "Interrupt Settings" of the network parameter and in "Intelligent Function Module Interrupt Pointer Setting" of the PLC parameter. (☞Page 111, Section 7.3.2 (4), Page 119, Section 7.4.2 (2))

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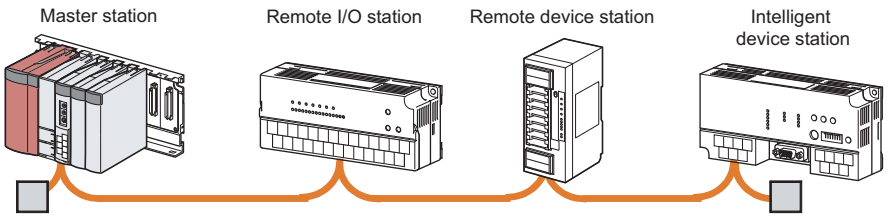
8.3.3 Automatic CC-Link startup

Data link can be performed with the default settings by powering on the master/local module. This function is used to check the operation of when a system is configured.
This function can be also used in a system containing a remote I/O station as well as a remote device station and intelligent device station.



(1) Default parameter settings when CC-Link is automatically started up with a master/local module operating as a master station

When a master/local module is started up with the station number 0, it is started up as a master station.
The table below lists the parameter settings of when CC-Link is automatically started up by a master/local module operating as a master station.

Item	Setting details
Operation Setting	Refer to Page 159, Section 8.3.3 (1) (a).
Mode	Remote Net (Ver.1 Mode)
Total Module Connected	64
Refresh devices	Refer to Page 160, Section 8.3.3 (1) (b).
Retry Count	3
Automatic Reconnection Station Count	1
Standby Master Station No.	No setting
PLC Down Select	Stop (When an error occurs in the CPU module of a master station, data link stops.)
Scan Mode Setting	Asynchronous
Delay Time Setting	0
Station Information Setting	Refer to Page 160, Section 8.3.3 (1) (c).

(a) Operation Setting

Item	Setting details
Data Link Faulty Station Setting	Clear the input data.
Case of CPU STOP Setting	Refresh.
Block Data Assurance per Station	Disable the setting.

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(b) Refresh device setting

- QCPU (excluding a Basic model QCPU)

CPU module side	Direction	Master station/local station side
X1000 to X17FF	←	RX0 to RX7FF
Y1000 to Y17FF	→	RY0 to RY7FF
W1E00 to W1EFF	←	RWr0 to RWrFF
W1F00 to W1FFF	→	RWw0 to RWwFF
SB0600 to SB07FF	↔	SB0000 to SB01FF
SW0600 to SW07FF	↔	SW0000 to SW01FF

- Basic model QCPU

Basic model QCPU side	Direction	Master station/local station side
X400 to X7FF	←	RX0 to RX3FF
Y400 to Y7FF	→	RY0 to RY3FF
W600 to W67F	←	RWr0 to RWr7F
W70 to W77F	→	RWw0 to RWw7F
SB0200 to SB03FF	↔	SB0000 to SB01FF
SW0200 to SW03FF	↔	SW0000 to SW01FF

(c) Specification of a buffer memory size for an intelligent device station in the station information setting

Item	Setting details
Send buffer	64 words
Receive buffer	64 words
Automatic update buffer	128 words

(2) Default parameter settings when CC-Link is automatically started up with a master/local module operating as a local station

When a master/local module is started up with the station numbers 1 to 64, it is started up as a local station.
The table below lists the parameter settings of when CC-Link is automatically started up by a master/local module operating as a local station.

Item	Setting details
Operation Setting	Refer to Page 160, Section 8.3.3 (2) (a).
Mode	Remote Net (Ver.1 Mode)
Refresh devices	Refer to Page 160, Section 8.3.3 (1) (b).

(a) Operation Setting

Item	Setting details
Data Link Faulty Station Setting	Clear the input data.
Case of CPU STOP Setting	Refresh.
Number of Occupied Stations	Occupied Station 1
Block Data Assurance per Station	Disable the setting.

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(3) Number of modules connected

(a) When two or more master/local modules are connected in one programmable controller system

The automatic CC-Link startup function applies to a module with the smallest start I/O number only.
In a multiple CPU system, the function applies to a master/local module with the smallest start I/O number among master/local modules controlled by each CPU module.

(b) Number of connectable network modules

When the automatic CC-Link startup is performed, the number of network modules that can be connected to the CPU module of a master station is as follows.
The number of CC-Link IE Controller Network modules + the number of CC-Link IE Field Network master/local modules + the number of MELSECNET/H modules ≤ 3

(4) Precautions

(a) When a system is changed during data link upon automatic CC-Link startup

When changing a system, such as a module replacement, during data link, execute a line test in all the stations. If a station with a start station number used by another station returns, a station where data link is already being performed (only a station with a station number used) may also go down.

(b) Use of a temporary error invalid station

When the automatic CC-Link startup is executed, a temporary error invalid station cannot be used.

(c) When using a Basic model QCPU

In a Basic model QCPU, the automatic refresh is performed only in stations with station numbers 1 to 32. The automatic refresh is not performed in stations with a station number 33 or later. Read or write data from/to those stations using an intelligent function module device (Un\G□) or FROM/TO instructions.

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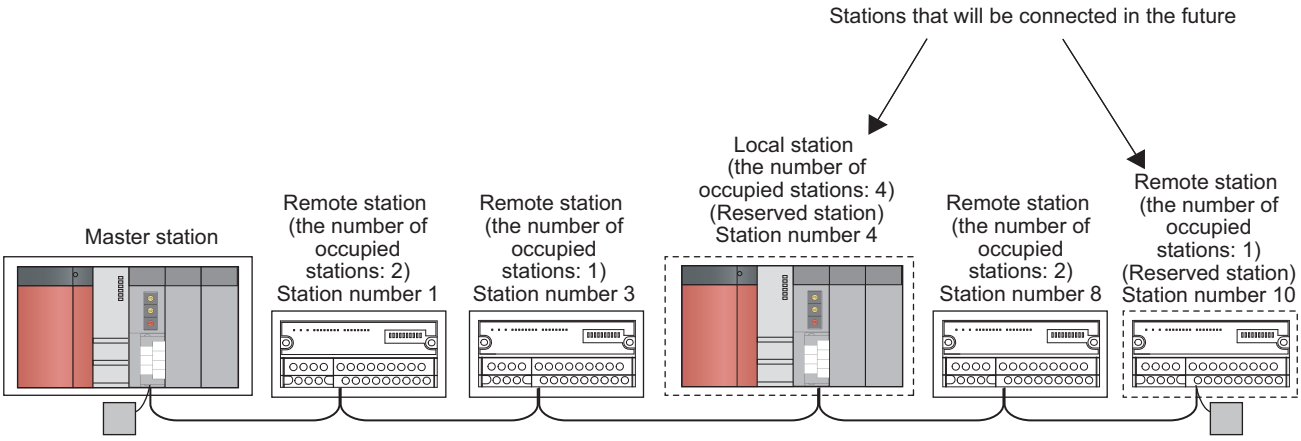
8.3.4 Reserved station function

Slaved stations that are not actually connected (but will be connected in future) are not detected as "Data Link Faulty Station" in the master station and local station.
By setting slave stations that will be connected in future as reserved stations, slave stations can be added without a program change because the RX/RY/RWr/RWw assignment is not changed. In addition, the number of points of a slave station that has been set as a reserved station can be set to zero points.



Point

Data link cannot be performed with a station set as a reserved station.

(1) How to set the number of points of a reserved station to zero points

When a master station is in the remote net Ver.2 mode, the number of points of a reserved station can be set to zero points. Use a programming tool to configure the setting.
The setting cannot be configured using a dedicated instruction. However, the setting can be configured by not reading or writing data from/to a reserved station when cyclic data is refreshed using an intelligent function module device (Un\G□) or FROM/TO instructions.

(2) Setting method

Set a reserved station in "Station Information Setting" of the network parameter. (☞ Page 102, Section 7.3.2 (2))

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8.3.5 Scan synchronization specification

Whether to synchronize the link scan with the sequence scan of a CPU module or not can be selected.
Selecting the asynchronous mode shortens input transmission delay time. Selecting the synchronous mode shortens output transmission delay time.

(1) Difference between the asynchronous and synchronous modes

Item	Description
Asynchronous mode	A link scan is performed asynchronously with the sequence scan of a CPU module. Select this mode to shorten input transmission delay time when a sequence scan takes much longer than a link scan. Note, however, that the output transmission delay time is shortened.
Synchronous mode	Data link is performed with a scan synchronizing a program. (The sequence scan and link scan start simultaneously.) Select this mode to shorten output transmission delay time. Note, however, that the input transmission delay time becomes longer if a sequence scan takes much longer than a link scan. Because a link scan synchronizes a sequence scan, extended sequence scan time increases link scan time.

Point

When a module is operated in the synchronous mode, the L RUN LED may turn on dimly.

(2) Precautions

(a) Sequence scan time when the synchronous mode is used

Do not exceed the following time. If the time exceeds the one listed below, a timeout error occurs in each station.

Transmission speed	Sequence scan time
10Mbps	50ms
5Mbps	50ms
2.5Mbps	100ms
625kbps	400ms
156kbps	800ms

(b) When an A(1S)J61BT11/A(1S)J61QBT11 is connected as a local station in the synchronous mode

Pay attention to the following notes when an A(1S)J61BT11/A(1S)J61QBT11 is connected as a local station in a system with a QJ61BT11N as a master station.

- When an A(1S)J61BT11/A(1S)J61QBT11 is connected as a local station, adjust the sequence scan time of the local station side so that the sequence scan time of the CPU module in the local station becomes longer than ST. For ST, refer to Page 366, Appendix 4.1.
- When an A(1S)J61BT11 is connected as a local station, use XnC as an interlock of the FROM/TO instructions on the local station side.

Point

When an A(1S)J61BT11/A(1S)J61QBT11 is connected as a local station in a system with a QJ61BT11N as a master station, using the asynchronous mode is recommended. To use the synchronous mode, pay attention to the notes described above.

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(3) Setting method

Select the asynchronous mode or synchronous mode in "Scan Mode Setting" of the network parameter. (☞ Page 96, Section 7.3.1)

(4) Data flows in the asynchronous mode and synchronous mode

Data flows in the asynchronous mode and synchronous mode are explained below using examples of communications between a master station and remote I/O station.

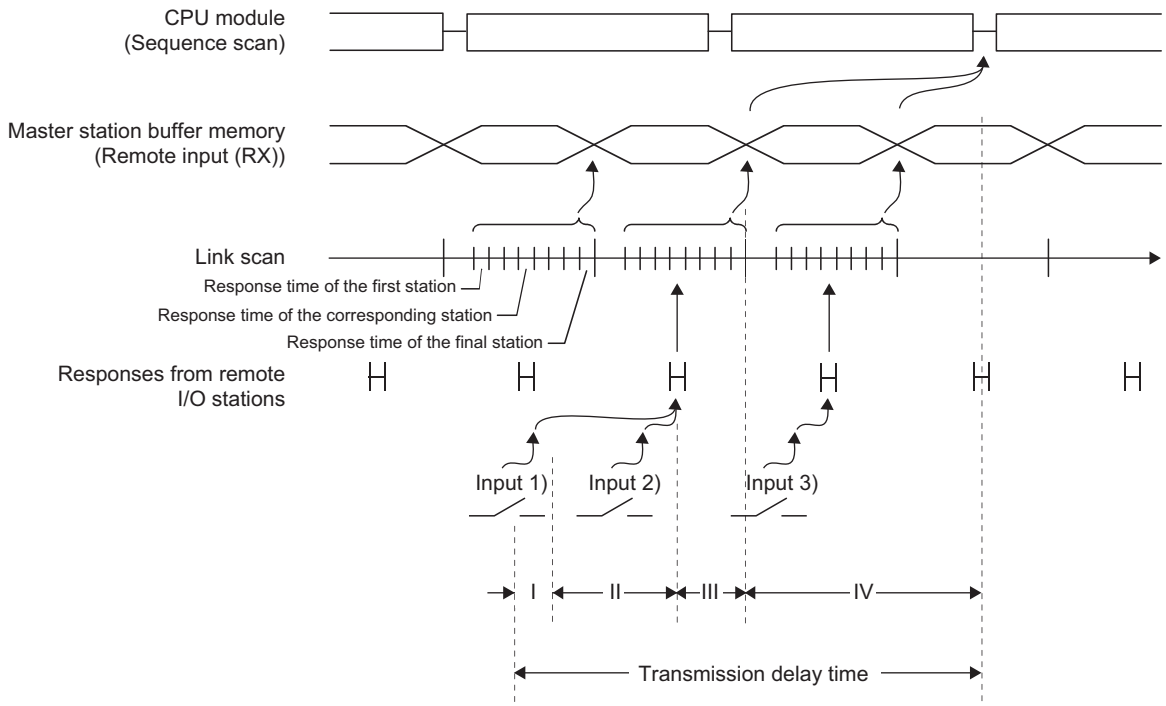
Point

Even if latched device (listed in "CPU side device" in the table below) data are cleared to 0 using a program at reset of the CPU module or at power off and on, the latched data may be output depending on the timing of a link scan and link refresh. For how to prevent output of latched device data, perform actions listed in "How to disable the setting" in the table below.

CPU side device	How to disable the setting
Latch relay (L)	Clear the value of the device to 0 using the initial device value.*1
File register (R, ZR)	
Extended data register (D) (Universal model QCPU only)	Delete all latch range settings.
Extended link register (W) (Universal model QCPU only)	
Device in the latch range	

*1 For how to set an initial device value, refer to the manual for the CPU module used (function explanation, program fundamentals).

(a) Data flow in the asynchronous mode



I: Delay time due to response delay of the remote I/O station

II: Delay time of transmission from the remote I/O station to the master station

III: Delay time between the master station receiving data and the data being stored into the buffer memory

IV: Delay time until information of the master station is refreshed in the CPU module

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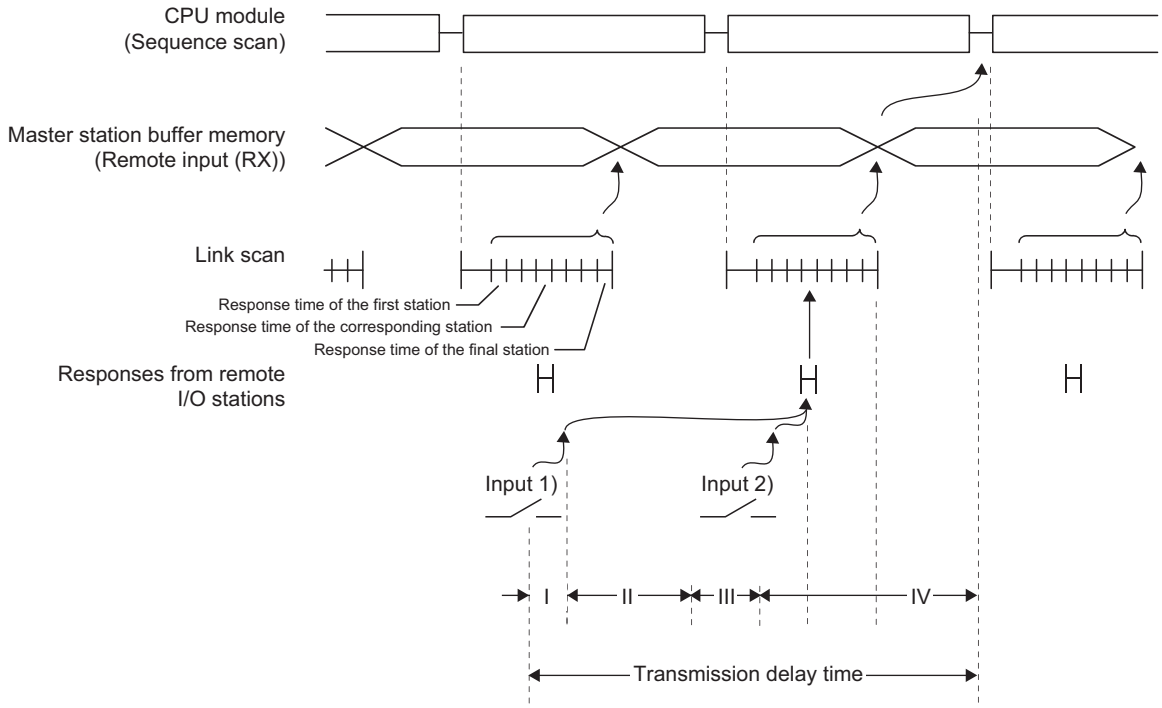
(b) Data flow in the synchronous mode

- Sequence scan ≥ link scan



I: Delay time due to response delay of the remote I/O station

II: Delay time of transmission from the remote I/O station to the master station

III: Delay time between the master station receiving data and the data being stored into the buffer memory

IV: Delay time until information of the master station is refreshed in the CPU module

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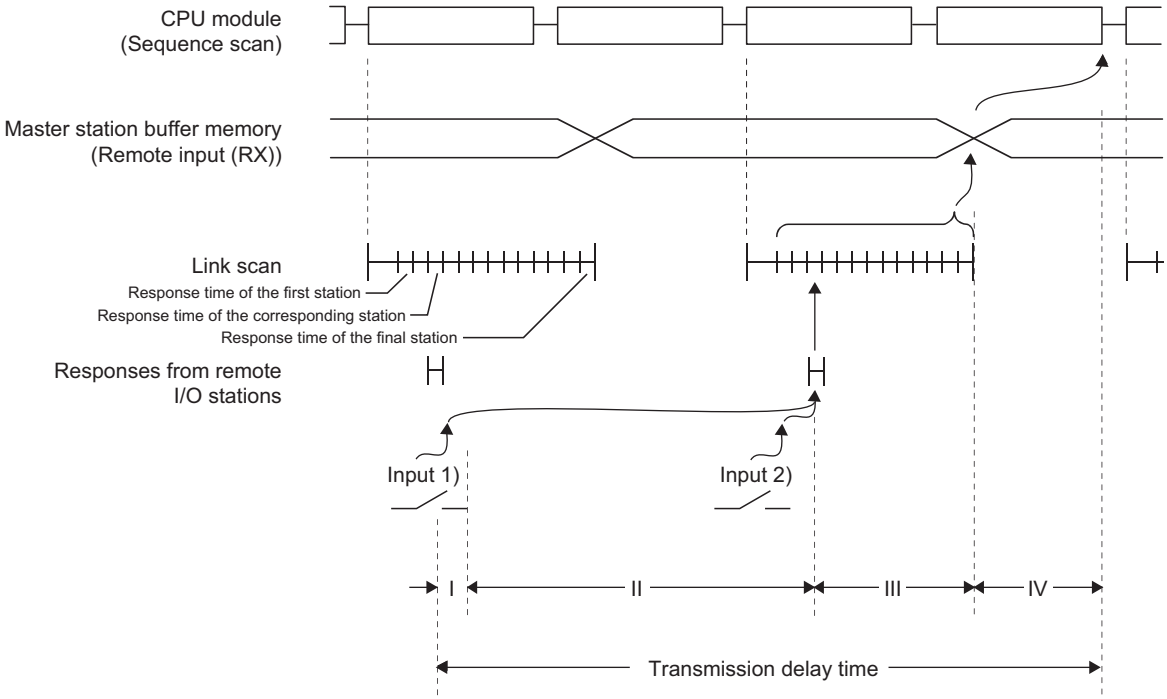
• Sequence scan < Link scan



I: Delay time due to response delay of the remote I/O station

II: Delay time of transmission from the remote I/O station to the master station

III: Delay time between the master station receiving data and the data being stored into the buffer memory

IV: Delay time until information of the master station is refreshed in the CPU module

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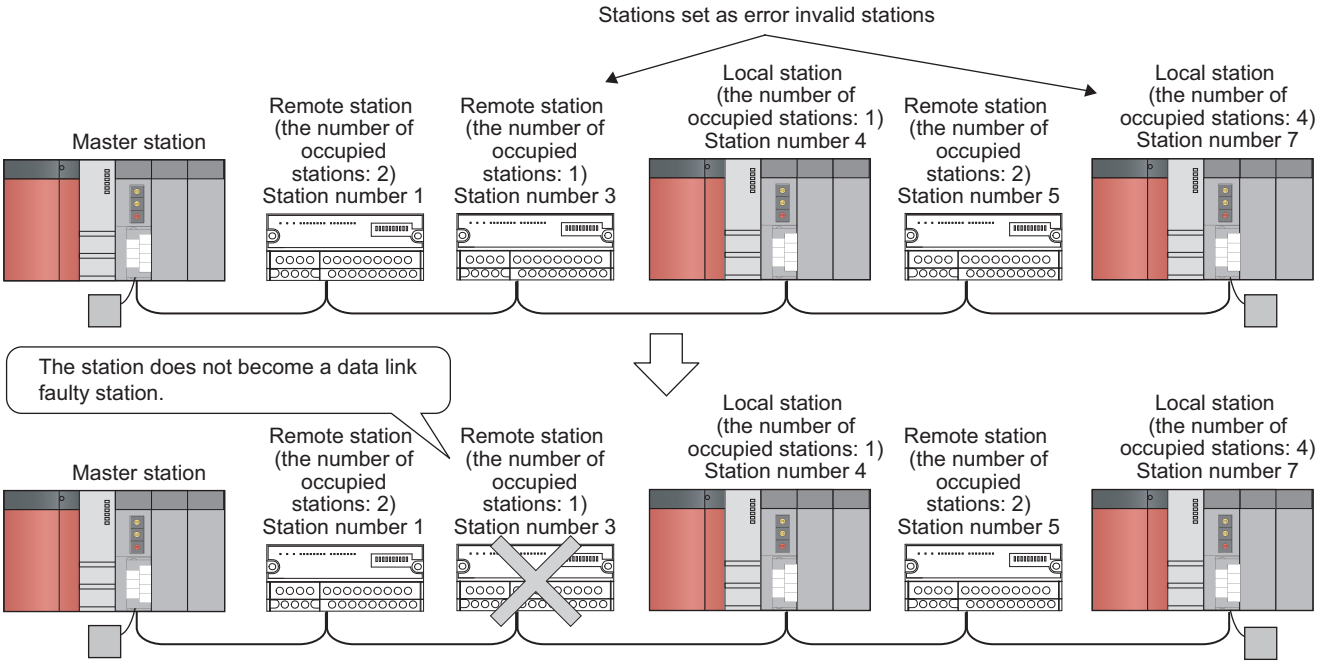
8.3.6 Error invalid station setting function

Even if a data link error occurs in a slave station, the station is not detected as a faulty station in the master station and local station. This function is used when a slave station is powered off as a matter of the system configuration or for other purposes.

Note, however, that an error is not detected in an error invalid station. Because the error invalid station setting is configured in the network parameter, the setting cannot be changed during data link. To change the setting during data link, use the temporary error invalid station setting function. (☞ Page 168, Section 8.3.7)



Point

- When a slave station that has been set as an error invalid station is specified as a reserved station, reserved station selection is prioritized.
- If an error occurs in all the slave stations set as an error invalid station, the ERR. LED turns on.

(1) Setting method

Set an error invalid station in "Station Information Setting" of the network parameter. (☞ Page 102, Section 7.3.2 (2))

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8.3.7 Temporary error invalid station setting function

Even if a data link error occurs in a slave station, the station is not detected as a faulty station in the master station and local station. This setting can be configured even during data link, unlike the error invalid station setting function.
This function is used to exchange slave stations for maintenance or for other purposes during data link.

Point

- If an error occurs in all the slave stations set as a temporary error invalid station, the ERR. LED turns on.

(1) Input and output status of a temporary error invalid station

Cyclic transmission data in a station set as a temporary error invalid station are all refreshed.
If an error occurs in a station set as a temporary error invalid station, the input is held, and the output is turned off.

(2) Setting method

Configure the setting using one of the following methods.

- CC-Link diagnostics (☞ Page 321, Section 11.4.6)
- Link special relays (SBs) or link special registers (SWs)
  Values in parentheses are buffer memory addresses and bit numbers.

Item	Link special relay (SB) and link special register (SW) to be used
Temporary error invalid station specification	• Temporary error invalid request (SB0004) ($5E0_H$, b4) • Temporary error invalid acceptance status (SB0048) ($5E4_H$, b8) • Temporary error invalid complete status (SB0049) ($5E4_H$, b9) • Temporary error invalid station setting information (SB0076) ($5E7_H$, b6) • Multiple temporary error invalid station specification (SW0003) (603_H) • Temporary error invalid station specification (SW0004 to SW0007) (604_H to 607_H) • Temporary error invalid station specification result (SW0049) (649_H) • Temporary error invalid status (SW007C to SW007F) ($67C_H$ to $67F_H$)
Temporary error invalid station specification canceling	• Temporary error invalid canceling request (SB0005) ($5E0_H$, b5) • Temporary error invalid canceling acknowledgement status (SB004A) ($5E4_H$, b10) • Temporary error invalid canceling complete status (SB004B) ($5E4_H$, b11) • Temporary error invalid station setting information (SB0076) ($5E7_H$, b6) • Multiple temporary error invalid station specification (SW0003) (603_H) • Temporary error invalid station specification (SW0004 to SW0007) (604_H to 607_H) • Temporary error invalid station specification cancel result (SW004B) ($64B_H$) • Temporary error invalid status (SW007C to SW007F) ($67C_H$ to $67F_H$)

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8.3.8 Data link stop/restart

Data link of the host station can be stopped or restarted using a programming tool or SB/SW. This function is used to temporarily stop data link for maintenance or other purposes.
If data link of a master station is stopped, data link is stopped in the entire system.

(1) Operation method

Data link can be stopped or restarted using one of the following methods.

- CC-Link diagnostics (☞ Page 320, Section 11.4.5)
- Link special relays (SBs) or link special registers (SWs)
  Values in parentheses are buffer memory addresses and bit numbers.

Item	Link special relay (SB) and link special register (SW) to be used
Data link stop	• Data link stop (SB0002) ($5E0_H$, b2) • Data link stop acceptance (SB0044) ($5E4_H$, b4) • Data link stop complete (SB0045) ($5E4_H$, b5) • Data link stop result (SW0045) (645_H)
Data link restart	• Data link restart (SB0000) ($5E0_H$, b0) • Data link restart acceptance (SB0040) ($5E4_H$, b0) • Data link restart complete (SB0041) ($5E4_H$, b1) • Data link restart result (SW0041) (641_H)

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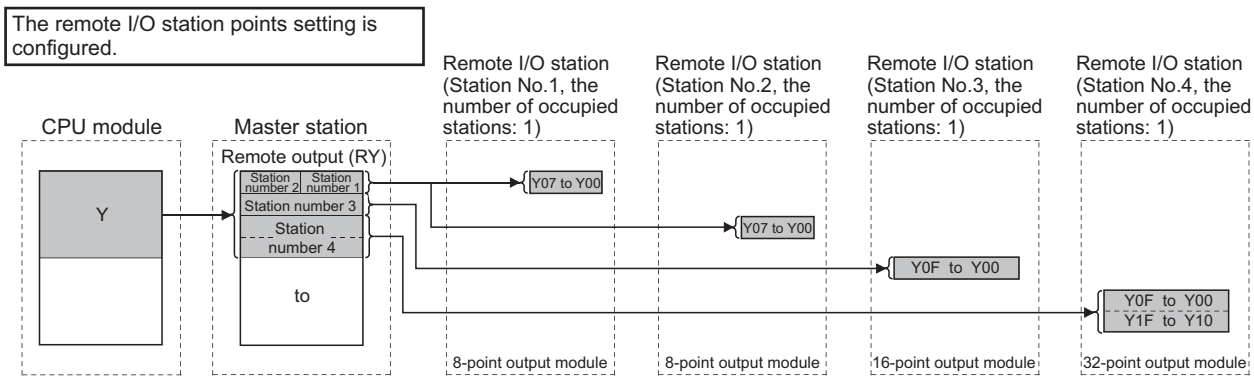
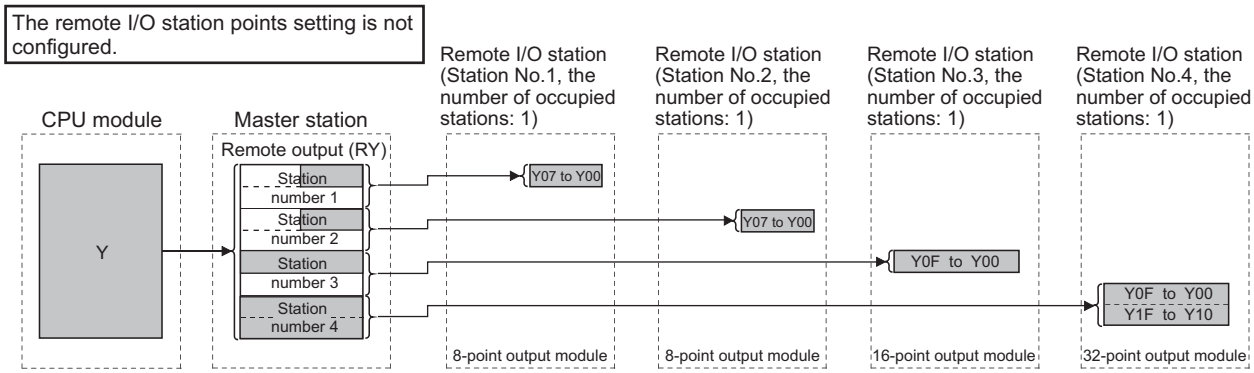
8.3.9 Remote I/O station points setting (remote net Ver.2 mode only)

When the master station is in the remote net Ver.2 mode, the number of refresh points with a remote I/O station can be selected from 8 points, 16 points, and 32 points. Changing the number of points can save the areas of the refresh devices in a CPU module. (In modes other than the remote net Ver.2 mode, only 32 points per station can be selected.)





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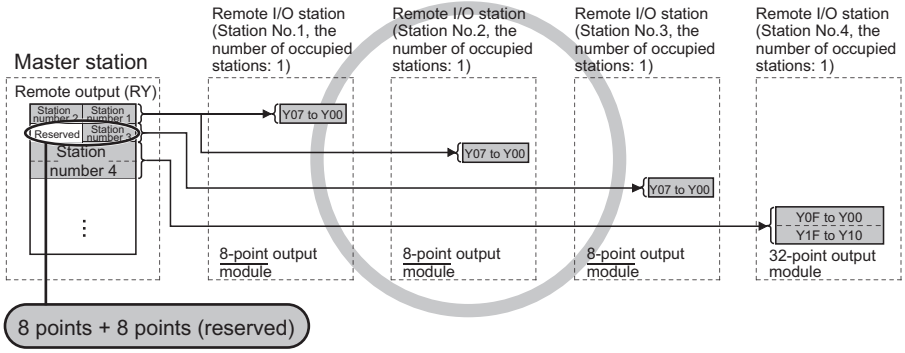
(1) Setting method

Set the number of points of a remote I/O station in "Remote Station Points" under "Station Information Setting" of the network parameter. (☞ Page 102, Section 7.3.2 (2))

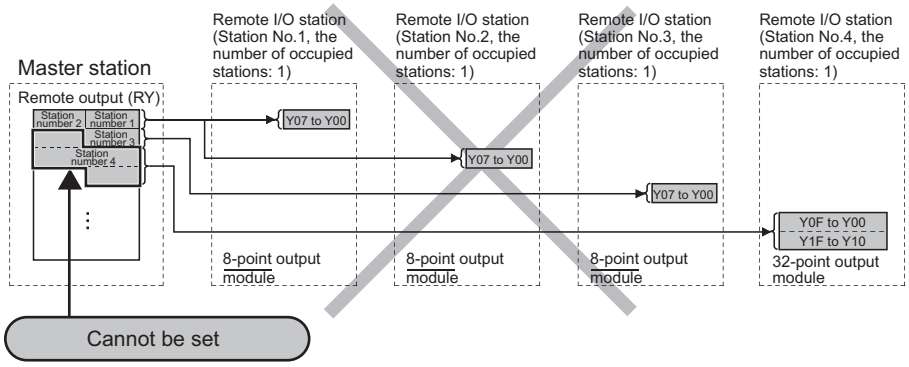
Point

- When setting eight-point remote I/O stations, set an even number of stations consecutively. When setting an odd number of eight-point remote I/O stations, set "8 Points + 8 Points (Reserved)" to the last of consecutive remote I/O stations.

Ex. When three output modules with eight points are connected



When the number of remote I/O stations is odd, eight points cannot be set in the remote station points.



The parameter cannot be set using dedicated instructions. Therefore, read or write data from/to the device in a CPU module according to the number of I/O points of each station using a program. Consequently, the areas in refresh devices can be saved.

- Reading/writing data using an intelligent function module device (Un\G□)
- Reading/writing data using the FROM/TO instructions

(2) Precautions when configuring the number of remote I/O station points

Set the number of points greater than the I/O points of a remote I/O station connected. If the smaller number of points is set in a station, data cannot be normally input to or output from stations after that.

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8.3.10 Master station duplication error canceling function

Even if a master station duplication error has been detected, the error can be cleared without resetting the CPU module or powering off and on the system.

Point

Before using this function, check the version of the master/local module. (☞ Page 399, Appendix 6 (2))

(1) How to cancel the error

1. **Remove the cause of a master station duplication error.**
   Another master station may exist on the same line, or the line may be being influenced by noise.
2. **Turn on Master station duplication error canceling request (SB0007).**

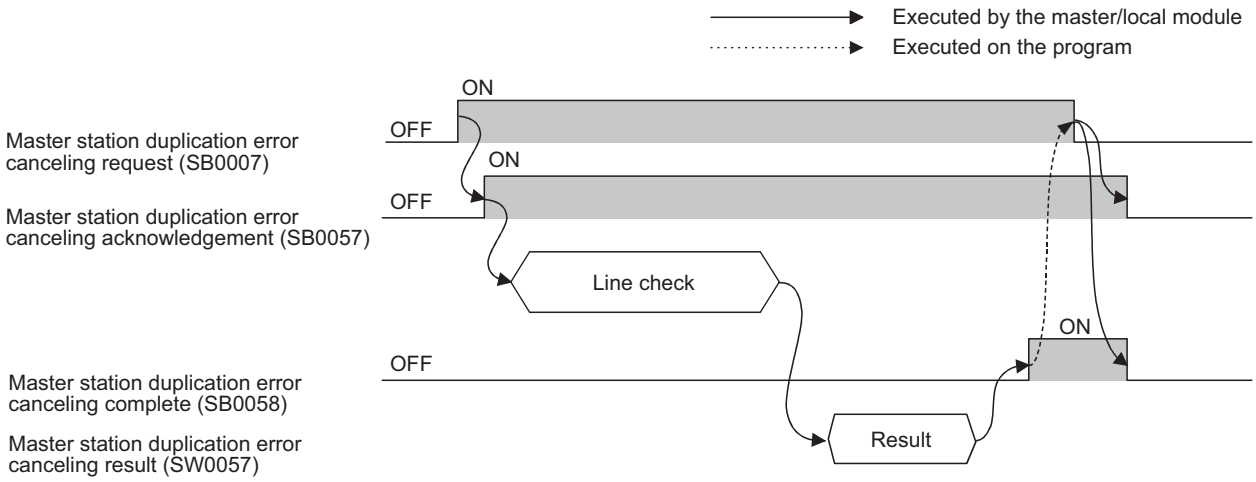
(2) Link special relays (SBs) and a link special register (SW) related to the master station duplication error canceling function

Link special relays (SBs) and a link special register (SW) related to the master station duplication error canceling function are listed below.

Values in parentheses are buffer memory addresses and bit numbers.

- Master station duplication error canceling request (SB0007) ($5E0_H$, b7)
- Master station duplication error canceling acknowledgement (SB0057) ($5E5_H$, b7)
- Master station duplication error canceling complete (SB0058) ($5E5_H$, b8)
- Master station duplication error canceling result (SW0057) (657_H)

(3) Timing chart of the link special relays (SBs) and link special register (SW)



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CHAPTER 9 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
- Network parameter settings for a master station
- Message transmission to remote device stations

9.1 List of Dedicated Instructions, Applicable Devices, and Precautions

(1) List of dedicated instructions

The dedicated instructions that can be used for a master/local module are listed below.

Target station	Instruction	Description	Reference
Master station, local station	G(P).RIRD	Reads data from the buffer memory areas of the target station or the device in the CPU module of the target station.	Page 175, Section 9.2
	G(P).RIWT	Writes data to the buffer memory areas of the target station or the device in the CPU module of the target station.	Page 181, Section 9.3
Intelligent device station	G(P).RIRD	Reads data from the buffer memory areas of the target station.	Page 175, Section 9.2
	G(P).RIWT	Writes data to the buffer memory areas of the target station	Page 181, Section 9.3
	G(P).RIRCV	Automatically performs handshaking with the target station and reads data from the buffer memory areas of the target station. The instruction is available for modules that have interlock signals for the handshake (e.g. AJ65BT-R2(N)).	Page 187, Section 9.4
	G(P).RISEND	Automatically performs handshaking with the target station and writes data to the buffer memory areas of the target station. The instruction is available for modules that have interlock signals for the handshake (e.g. AJ65BT-R2(N)).	Page 192, Section 9.5
	G(P).RIFR	Reads data from the automatic update buffer of the target station. The instruction is available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).	Page 197, Section 9.6
	G(P).RITO	Writes data to the automatic update buffer of the target station. The instruction is available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).	Page 201, Section 9.7
Master station	G(P).RLPASET	Sets the network parameters to the master station and starts up the data link.	Page 205, Section 9.8
Remote device station	G(P).RDMSG	Performs a message transmission to a remote device station. Available for remote device stations that support the message transmission function.	Page 221, Section 9.9

Point

Execute the dedicated instructions while the data link is being performed.
If any of the dedicated instructions is executed offline, no error will occur, but the execution of the dedicated instruction will not be completed.

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(2) Applicable devices

The following devices are available for the dedicated instructions:

Internal device		File register	Constant
Bit*1	Word		
X,Y,M,L,F,V,B	T,ST,C,D,W	R,ZR	K,H

*1 Bit specification of word device can be performed as bit data. Bit specification of word device can be performed by specifying "Word device" . "Bit No.". (Bit No. must be specified in hexadecimal.)
For example, bit 10 of D0 is specified as "D0.A".
Note that the bit specification cannot be performed for timers (T), retentive timers (ST), and counters (C).

(3) Precautions

(a) Use of Monitoring time setting (SW0009) and Dedicated instruction retry count setting (SW000B)

If dedicated instructions are abnormally ended due to noise, increase the monitoring time and retry count to avoid it. Configure the settings using Monitoring time setting (SW0009) and Dedicated instruction retry count setting (SW000B).

- Availability of Dedicated instruction retry count setting (SW000B) (☞Page 351, Appendix 3.2)
  Dedicated instruction retry count setting (SW000B) is applicable to the following dedicated instructions.

○: Applicable, ×: Not applicable

Instruction	Station where dedicated instructions are executed	
	Master station	Local station
G(P).RIRD	○	○
G(P).RIWT	○	○
G(P).RISEND	○	×
G(P).RIRCV	○	×
G(P).RIFR	×	×
G(P).RITO	×	×
G(P).RLPASET	×	×
G(P).RDMSG	×	×

No retry is performed if the target station is disconnected at the execution of the dedicated instruction.

- Timing of the settings
  Set Monitoring time setting (SW0009) and Dedicated instruction retry count setting (SW000B) before executing dedicated instructions.
- Version of a master/local module
  Before using the retry count setting, check the version of the master/local module. (☞Page 399, Appendix 6 (2))

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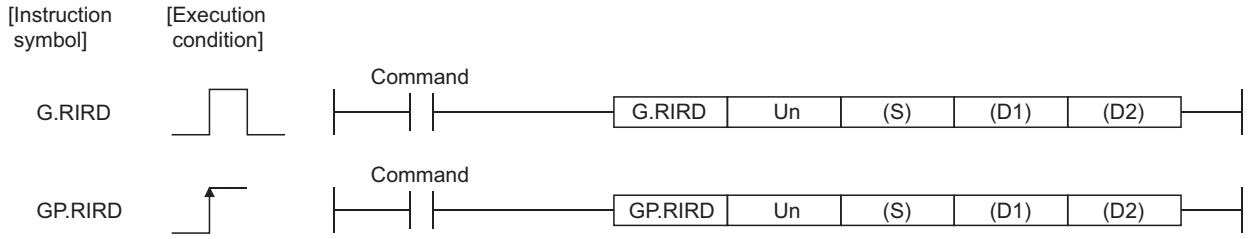
9.2 G(P).RIRD

The G(P).RIRD instruction reads the specified points of data from the buffer memory or the device in the CPU module of the target station.



Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
(S)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(D2)	○			—				—	—	—

(1) Setting data

Device*1	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
(S)	Start number of the device in which control data is stored	Within the range of the specified device	Device name
(D1)	Start number of the device to which read data is stored	Within the range of the specified device	
(D2)	Device that turns on for one scan upon completion of reading. (D2) + 1 also turns on at an abnormal end.	Within the range of the specified device	Bit

*1 The local device and the file register of each program cannot be used as a device for setting data.

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(a) Control data

Device	Item	Setting data	Setting range	Set by
(S) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S) + 1	Station number	Specify the station numbers of the master station, local station, and intelligent device station.	0 to 64	User
(S) + 2	Access code Attribute code	Specify the type of the device to be accessed or the type of the buffer memory. b15 to b8 b7 to b0 Access code | Attribute code	Refer to (b) and (C).	User
(S) + 3	Buffer memory address or device number	Specify the start address of the buffer memory or the start number of the device.	*1	User
(S) + 4	Number of read points	Specify the number of read data (in word units).	1 to 480*2 1 to 32*3	User

*1 For details, refer to the manual for the local station or the intelligent device station from which data are read.
When specifying the random access buffer, specify the start address of the random access buffer as 0.

*2 The value indicates the maximum number of read data.
Specify the value within the buffer memory capacity of the local station or the intelligent device station, or within the receive buffer area setting range set by a parameter.

*3 To read device data from the CPU module of the target station other than the QCPU (Q mode), QCPU (A mode), LCPU, QnACPU or AnUCPU, the setting range must be 1 to 32 words.

(b) Access code and attribute code (When accessing to the buffer memory in the CC-Link)

Buffer memory contents		Access code	Attribute code
Buffer in the intelligent device station		00_H	04_H
Buffers in a master station and a local station	Random access buffer	20_H	
	Remote input	21_H	
	Remote output	22_H	
	Remote register	24_H	
	Link special relay	63_H	
	Link special register	64_H	

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(c) Access code and attribute code (When accessing to the device in a CPU module)

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

- Devices other than above cannot be accessed.
- When accessing a bit device, specify it as 0 or multiples of 16.
- The extended data register of address D65536 or later, and the extended link register of address W10000 or later cannot be specified.

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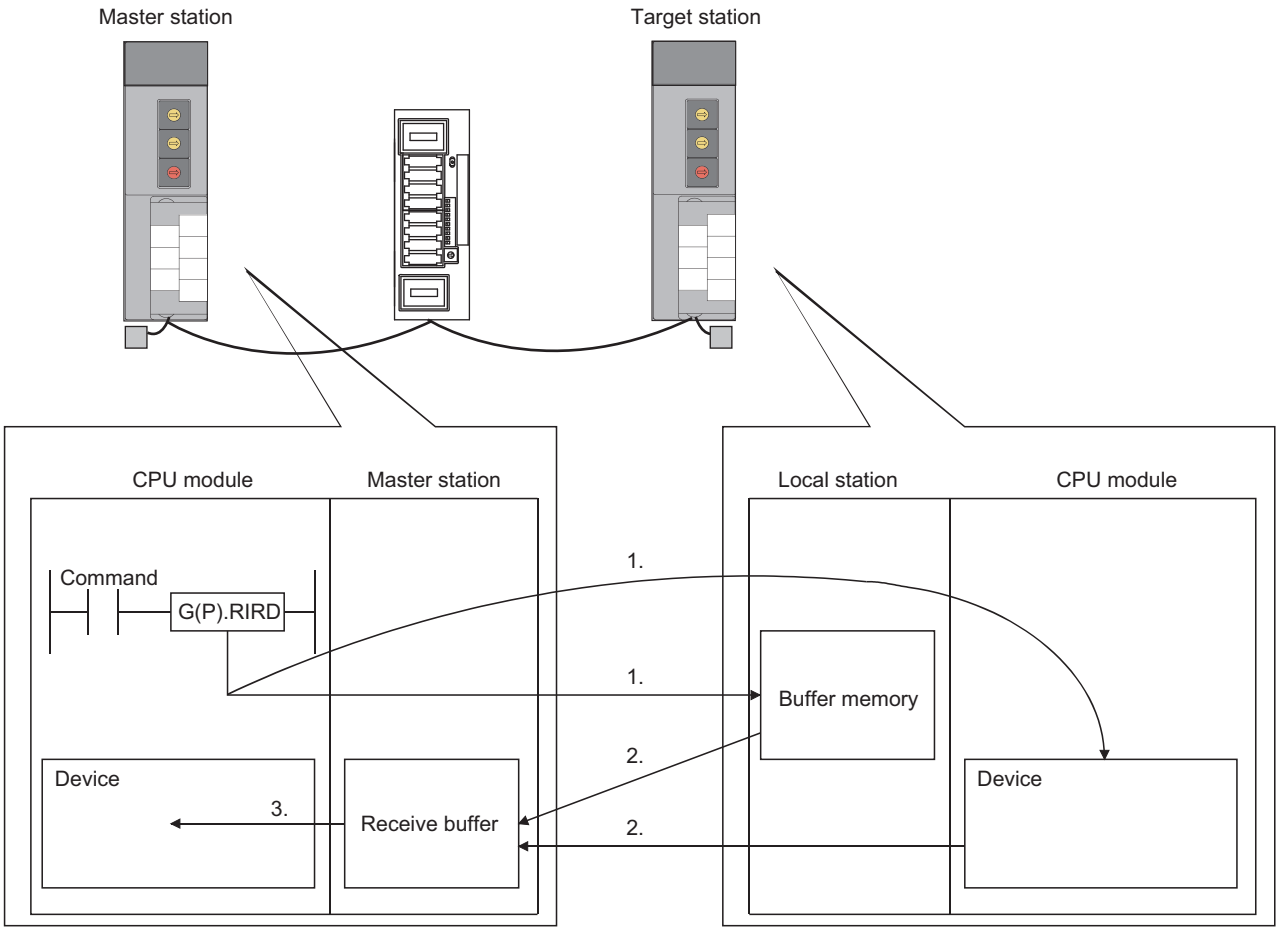
(2) Functions

(a) Operation chart of the G(P).RIRD instruction



1. **The buffer memory specified by (S) + 2 and (S) + 3 of the station specified by (S) + 1, or the device in a CPU module is accessed.**
2. **The data that has been read is stored in the receive buffer of the master station.**
3. **The data that has been read after the device specified by (D1) is stored, and the device specified by (D2) turns on.**

(b) Simultaneous execution of the G(P).RIRD instruction

The G(P).RIRD instruction can be simultaneously executed to multiple local stations or intelligent device stations.

But concurrent execution of the instruction is not allowed to the same station.(including other dedicated instructions)

If the dedicated instruction is executed before the completion of the former dedicated instruction, the latter instruction is ignored.

Because several scans are required to complete the process of the dedicated instruction, create a program so that the next dedicated instruction is executed after Completion device (D2) turns on.

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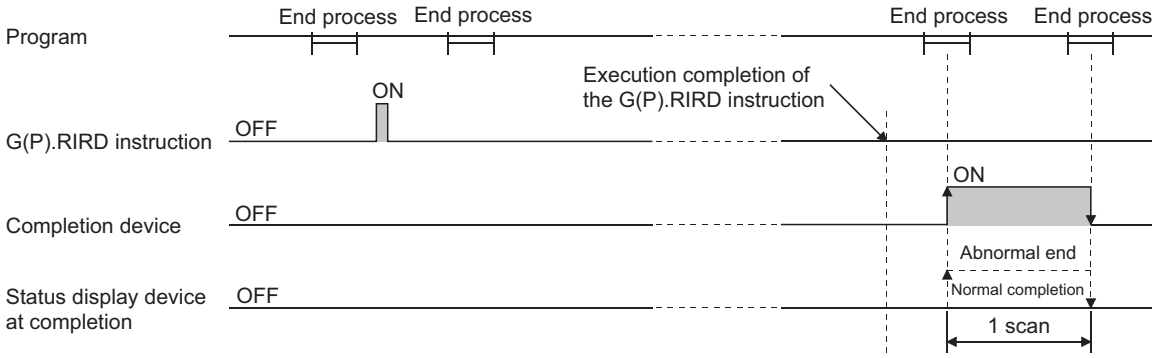
(c) Check of the completion status

There are two types of interlock signals for the G(P).RIRD instruction: Completion device (D2) and Status display device at completion (D2) + 1.

- Completion device
  Turns on in the END process of the scan where the G(P).RIRD instruction is completed, and turns off in the next END process.
- Status display device at completion
  Turns on and off depending on the completion status of the G(P).RIRD instruction.
  Normal completion: Remains off and does not change.
  Abnormal end: Turns on in the END process of the scan where the G(P).RIRD instruction is completed, and turns off in the next END process.



(d) Basic number of steps

The basic number of steps of the G(P).RIRD instruction is eight.

(e) Assignment of the receive buffer

The assignment of the receive buffer is performed in "Station Information Setting" of the network parameter of a programming tool. (☞ Page 102, Section 7.3.2 (2))

(3) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When attempting to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the data that cannot be used for the instruction is contained
4101	When the number of data used for the instruction is set beyond the allowable range. Or when the storage data or constants of the device specified with the instruction exceeds the allowable range

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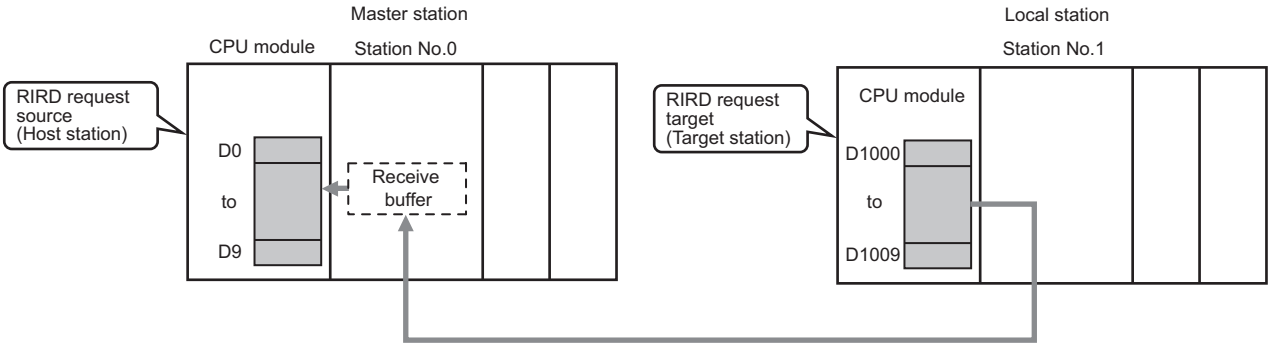
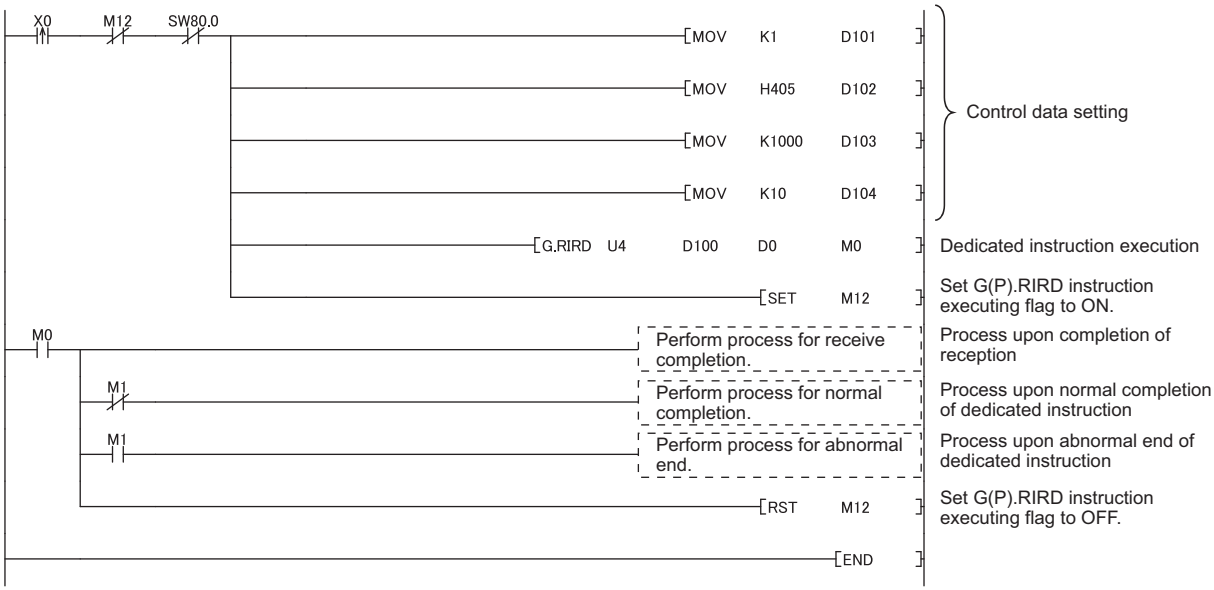
9.2.1 Program example

This section shows an example of the program to read 10-word data from the area starting from D1000 in the local station (station number 1) to the area starting from D0 in the master station when X0 is turned on in the following system configuration.

- Assume that the I/O number of the master station is X/Y40 to X/Y5F.
- Assume that SW0 is set to the refresh device of the link special register (SW).
- M12 is the G(P).RIRD instruction executing flag.





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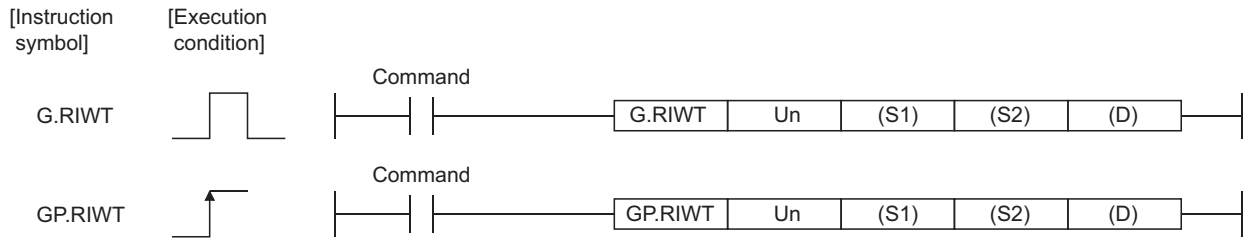
9.3 G(P).RIWT

The G(P).RIWT instruction writes the specified points of data to the buffer memory areas of the target station or the device in the CPU module of the target station.



Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
(S1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(D)	○			—				—	—	—

(1) Setting data

Device*1	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
(S1)	Start number of the device in which control data is stored	Within the range of the specified device	Device name
(S2)	Start number of the device to which data to be written is stored	Within the range of the specified device	
(D)	Device that turns on for one scan upon completion of writing. (D) + 1 also turns on at an abnormal end.	Within the range of the specified device	Bit

*1 The local device and the file register of each program cannot be used as a device for setting data.

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(a) Control data

Device	Item	Setting data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S1) + 1	Station number	Specify the station numbers of the master station, local station and intelligent device station.	0 to 64	User
(S1) + 2	Access code Attribute code	Specify the type of the device to be accessed or the type of the buffer memory. b15 to b8 b7 to b0 Access code | Attribute code	Refer to (b) and (C).	User
(S1) + 3	Buffer memory address or device number	Specify the start address of the buffer memory or the start number of the device.	*1	User
(S1) + 4	Number of write points	Specify the number of write data (in word units).	1 to 480*2 1 to 10*3	User

*1 For details, refer to the manual for the local station or the intelligent device station to which data are written.
When specifying the random access buffer, specify the start address of the random access buffer as 0.

*2 The value indicates the maximum number of write data.
Specify the value within the buffer memory capacity of the local station or the intelligent device station, or within the send buffer area setting range set by a parameter.

*3 To write device data to the CPU module of the target station other than the QCPU (Q mode), QCPU (A mode), LCPU, QnACPU or AnUCPU, the setting range must be 1 to 10 words.

(b) Access code and attribute code (When accessing to the buffer memory in the CC-Link)

Buffer memory contents		Access code	Attribute code
Buffer in the intelligent device station		00_H	04_H
Buffers in a master station and a local station	Random access buffer	20_H	
	Remote input	21_H	
	Remote output	22_H	
	Remote register	24_H	
	Link special relay	63_H	
	Link special register	64_H	

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(c) Access code and attribute code (When accessing to the device in a CPU module)

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

- Devices other than above cannot be accessed.
- When accessing a bit device, specify it as 0 or multiples of 16.
- The extended data register of address D65536 or later, and the extended link register of address W10000 or later cannot be specified.

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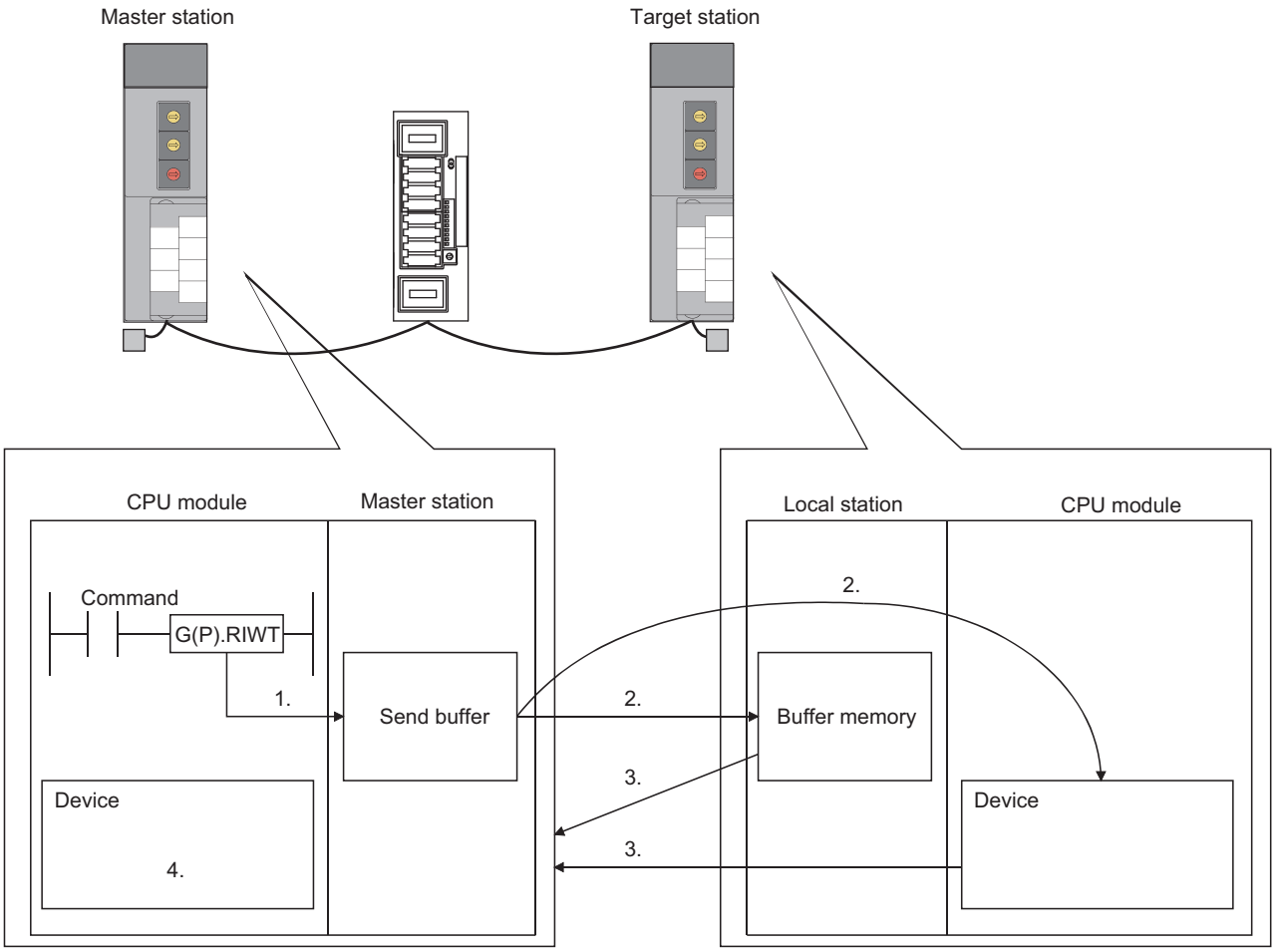
(2) Functions

(a) Operation chart of the G(P).RIWT instruction



1. **The data to be written to the target station is stored in the send buffer of the master station.**
2. **The data specified by (S2) is written to the buffer memory specified by (S1) + 2 and (S1) + 3 of the station specified by (S1) + 1, or written to the device in a CPU module.**
3. **The target station sends the response of write completion to the master station.**
4. **The device specified by (D) turns on.**

(b) Simultaneous execution of the G(P).RIWT instruction

The G(P).RIWT instruction can be simultaneously executed to multiple local stations or intelligent device stations.

But concurrent execution of the instruction is not allowed to the same station.(including other dedicated instructions)

If the dedicated instruction is executed before the completion of the former dedicated instruction, the latter instruction is ignored.

Because several scans are required to complete the process of the dedicated instruction, create a program so that the next dedicated instruction is executed after Completion device (D) turns on.

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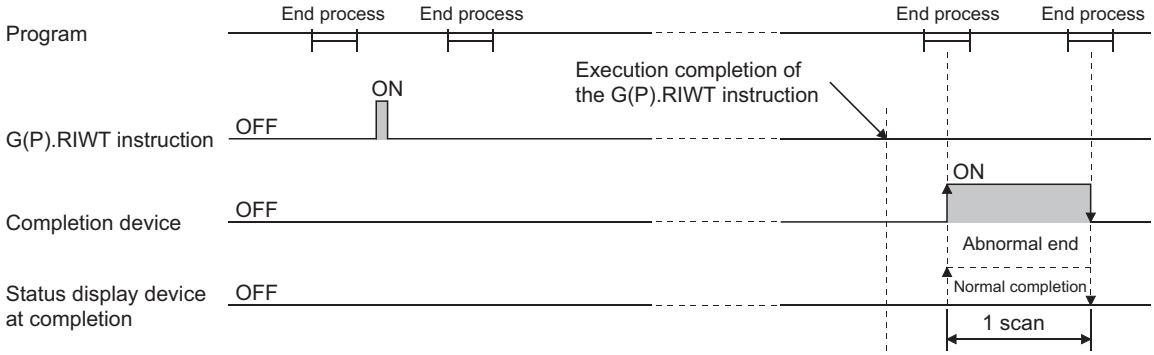
(c) Check of the completion status

There are two types of interlock signals for the G(P).RIWT instruction: Completion device (D) and Status display device at completion (D) + 1.

- Completion device
  Turns on in the END process of the scan where the G(P).RIWT instruction is completed, and turns off in the next END process.
- Status display device at completion
  Turns on and off depending on the completion status of the G(P).RIWT instruction.
  Normal completion: Remains off and does not change.
  Abnormal end: Turns on in the END process of the scan where the G(P).RIWT instruction is completed, and turns off in the next END process.



(d) Basic number of steps

The basic number of steps of the G(P).RIWT instruction is eight.

(e) Assignment of the send buffer

The assignment of the send buffer is performed in "Station Information Setting" of the network parameter of a programming tool. (☞ Page 102, Section 7.3.2 (2))

(3) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When attempting to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the data that cannot be used for the instruction is contained
4101	When the number of data used for the instruction is set beyond the allowable range. Or when the storage data or constants of the device specified with the instruction exceeds the allowable range

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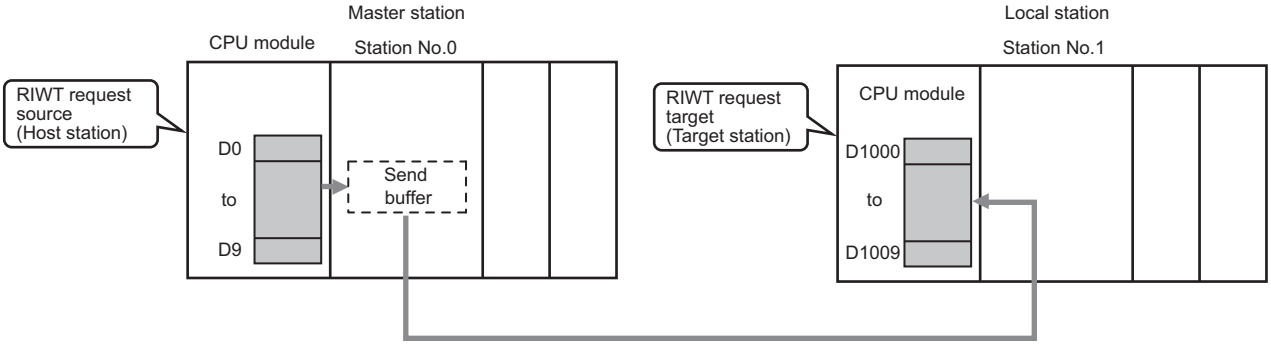
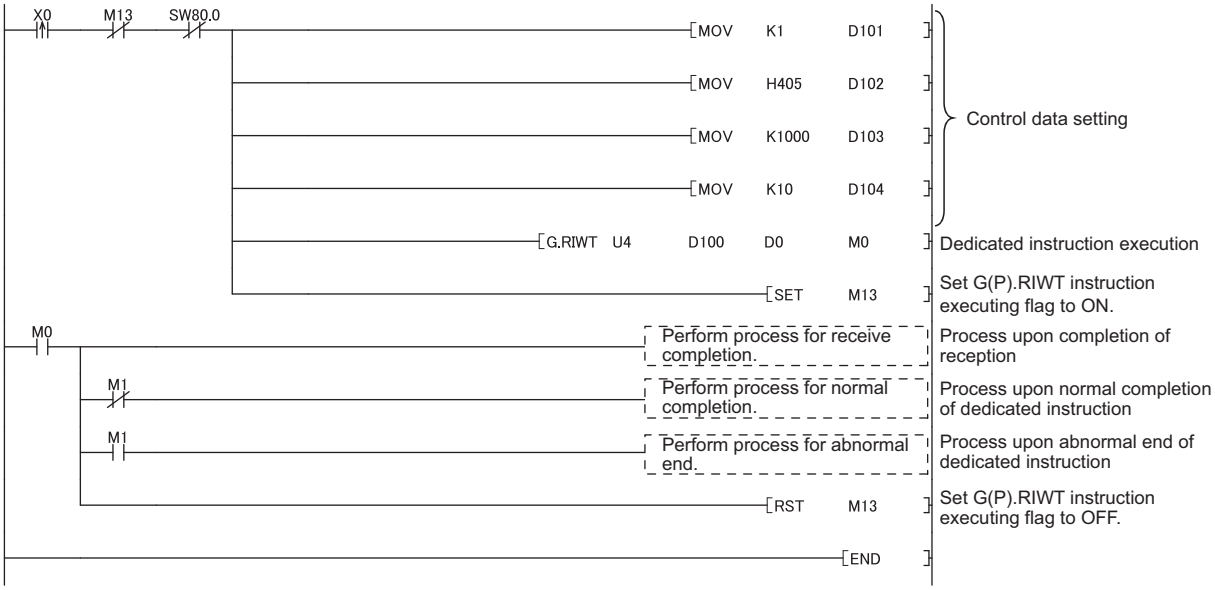
9.3.1 Program example

This section shows an example of the program to write 10-word data from the area starting from D0 in the master station to the area starting from D1000 in the local station (station number 1) when X0 is turned on in the following system configuration.

- Assume that the I/O number of the master station is X/Y40 to X/Y5F.
- Assume that SW0 is set to the refresh device of the link special register (SW).
- M13 is the G(P).RIWT instruction executing flag.





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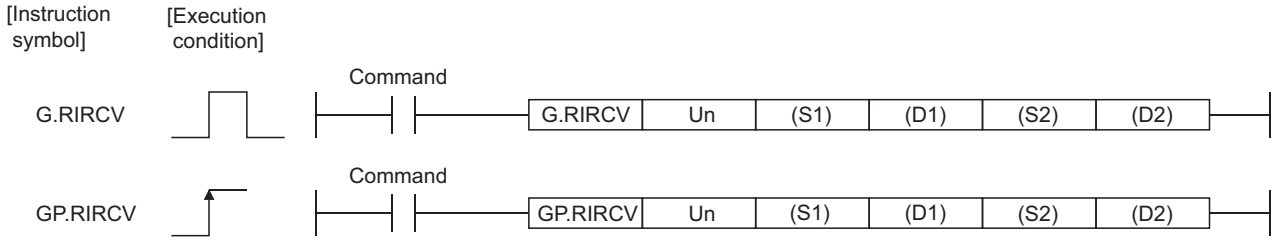
9.4 G(P).RIRCV

The G(P).RIRCV instruction automatically performs handshaking with the intelligent device station and reads data from the buffer memory areas of the specified intelligent device station.
The instruction is available for modules that have a handshake signal (e.g. AJ65BT-R2(N)).



Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
(S1)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(D2)	○			—				—	—	—

(1) Setting data

Device*1	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
(S1)	Start number of the device in which control data is stored	Within the range of the specified device	Device name
(D1)	Start number of the device to which read data is stored	Within the range of the specified device	
(S2)	Start number of the device in which an interlock signal is stored	Within the range of the specified device	
(D2)	Device that turns on for one scan upon completion of reading. (D2) + 1 also turns on at an abnormal end.	Within the range of the specified device	Bit

*1 The local device and the file register of each program cannot be used as a device for setting data.

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(a) Control data

Device	Item	Setting data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S1) + 1	Station number	Specify the station number of the intelligent device station.	0 to 64	User
(S1) + 2	Access code Attribute code	Set "0004_H".	0004_H	User
(S1) + 3	Buffer memory address	Specify the start address of the buffer memory.	*1	User
(S1) + 4	Number of read points	Specify the number of read data (in word units).	1 to 480*2	User

*1 For details, refer to the manual for the intelligent device station from which data are read.
*2 The value indicates the maximum number of read data.
Specify the value within the buffer memory capacity of the intelligent device station, or within the receive buffer area setting range set by a parameter.

(b) Interlock signal storage device

Device	Item	Setting data	Setting range	Set by
(S2) + 0	b15 to b8 b7 to b0 0 | RY	RY: Request device	0 to 127	User
		Set 0 to the upper eight bits.	0	User
(S2) + 1	b15 to b8 b7 to b0 RWr *1 | RX	RX: Completion device	0 to 127	User
		RWr: Error code storage device If the error code storage device does not exist, set FF_H.	0 to 15, FF_H	User
(S2) + 2	b15 to b0 Completion mode	0: The host station completes the process by checking the contents of one device (RXn). 1: The host station completes the process by checking the contents of two devices (RXn and RXn + 1). (RXn + 1 turns on at an abnormal end.)	0/1	User

*1 The same error code as that for Completion status of the control data is stored in the error code storage device.

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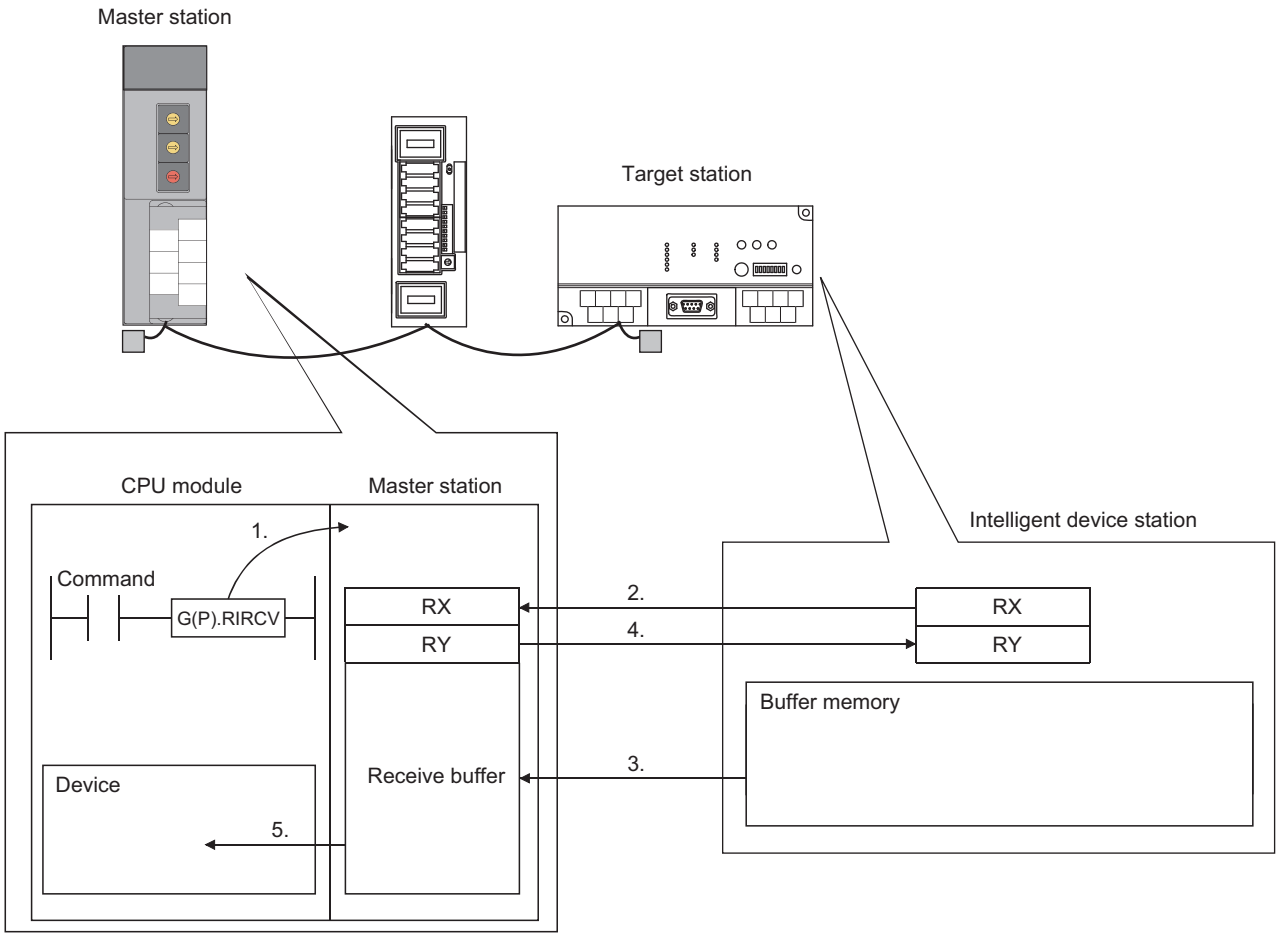
(2) Functions

(a) Operation chart of the G(P).RIRCV instruction



1. **Reading of data from the buffer memory specified by (S1) + 2 and (S1) + 3 of the station specified by (S1) + 1 is commanded.**
2. **The master station monitors the remote input (RX) specified by (S2) + 1.**
3. **When the remote input (RX) specified by (S2) + 1 turns on, the master station reads data from the buffer memory of the target station.**
   The read data is stored in the receive buffer of the master station.
4. **The master station turns on the remote output (RY) specified by (S2) + 0.**
   When the remote input (RX) specified by (S2) + 1 turns off, the remote output (RY) specified by (S2) + 0 is turned off.
5. **The data read from the target station are stored in the device specified by (D1) and subsequent devices, and the device specified by (D2) turns on.**

(b) Simultaneous execution of the G(P).RIRCV instruction

The G(P).RIRCV instruction can be simultaneously executed to multiple intelligent device stations.
But concurrent execution of the instruction is not allowed to the same station. (including other dedicated instructions)
If the dedicated instruction is executed before the completion of the former dedicated instruction, the latter instruction is ignored.
Because several scans are required to complete the process of the dedicated instruction, create a program so that the next dedicated instruction is executed after Completion device (D2) turns on.

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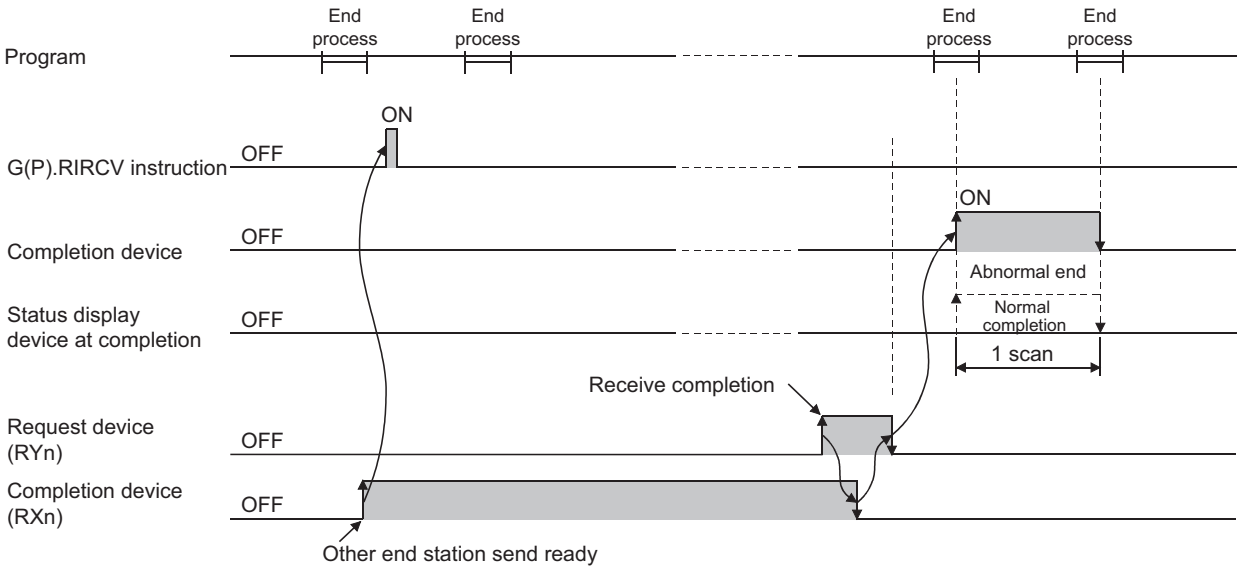
(c) Check of the completion status

There are two types of interlock signals for the G(P).RIRCV instruction: Completion device (D2) and Status display device at completion (D2) + 1.

- Completion device
  Turns on in the END process of the scan where the G(P).RIRCV instruction is completed, and turns off in the next END process.
- Status display device at completion
  Turns on and off depending on the completion status of the G(P).RIRCV instruction.
  Normal completion: Remains off and does not change.
  Abnormal end: Turns on in the END process of the scan where the G(P).RIRCV instruction is completed, and turns off in the next END process.



(d) Basic number of steps

The basic number of steps of the G(P).RIRCV instruction is ten.

(e) Assignment of the receive buffer

The assignment of the receive buffer is performed in "Station Information Setting" of the network parameter of a programming tool. (☞ Page 102, Section 7.3.2 (2))

(3) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When attempt to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the data that cannot be used for the instruction is contained
4101	When the number of data used for the instruction is set beyond the allowable range. Or when the storage data or constants of the device specified with the instruction exceeds the allowable range

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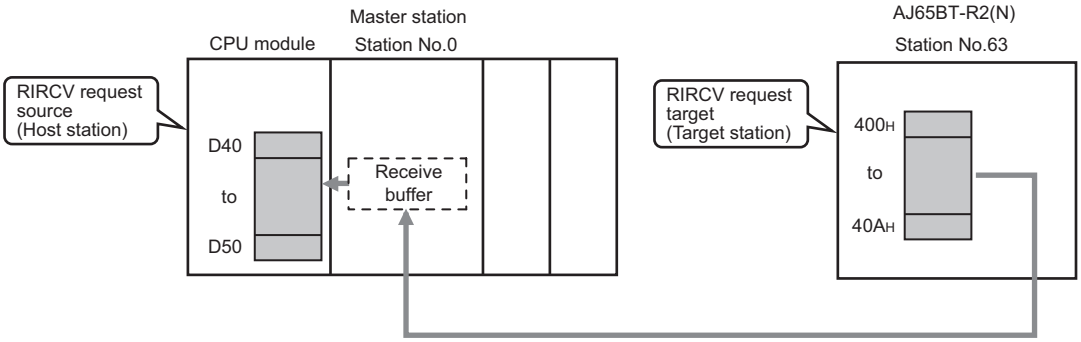
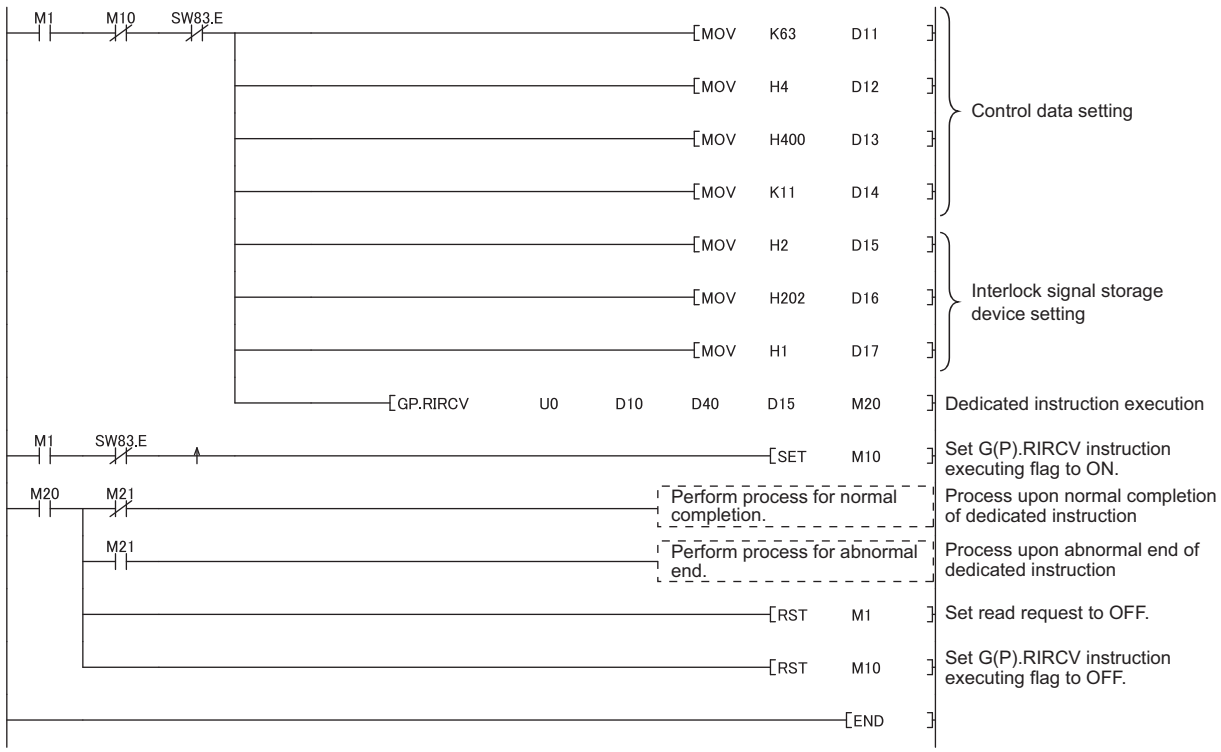
9.4.1 Program example

This section shows an example of the program to read 11-word data from the buffer memory address 400_H or later in the AJ65BT-R2(N) (station number 63) to the area starting from D40 in the master station when M1 is turned on in the following system configuration.

- Assume that the I/O number of the master station is X/Y00 to X/Y1F.
- Assume that SW0 is set to the refresh device of the link special register (SW).
- M10 is the G(P).RIRCV instruction executing flag.
- Assume that the settings of the interlock signal storage device are Request device: RY2, Completion device: RX2, Error code storage device: RWr2, and Completion mode: 1.





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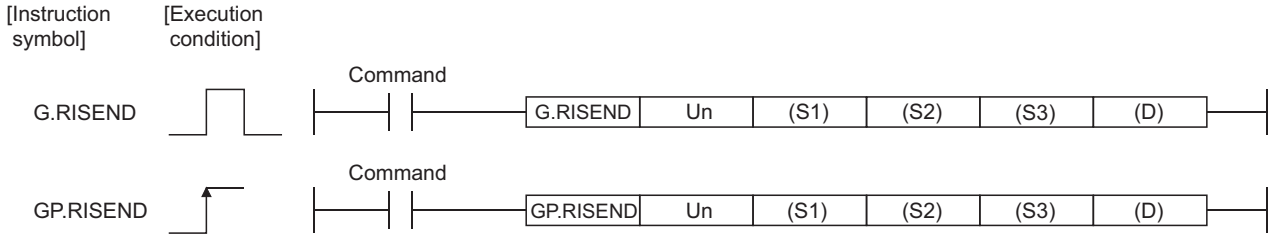
9.5 G(P).RISEND

The G(P).RISEND instruction automatically performs handshaking with the intelligent device station and writes data to the buffer memory areas of the specified intelligent device station.
The instruction is available for modules that have a handshake signal (e.g. AJ65BT-R2(N)).



Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
(S1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(S3)	—	○		—				—	—	—
(D)	○			—				—	—	—

(1) Setting data

Device*1	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
(S1)	Start number of the device in which control data is stored	Within the range of the specified device	Device name
(S2)	Start number of the device to which data to be written is stored	Within the range of the specified device	
(S3)	Start number of the device in which an interlock signal is stored	Within the range of the specified device	
(D)	Device that turns ON for one scan upon completion of writing. (D) + 1 also turns ON at an abnormal end.	Within the range of the specified device	Bit

*1 The local device and the file register of each program cannot be used as a device for setting data.

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(a) Control data

Device	Item	Setting data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S1) + 1	Station number	Specify the station number of the intelligent device station.	0 to 64	User
(S1) + 2	Access code Attribute code	Set "0004_H".	0004_H	User
(S1) + 3	Buffer memory address	Specify the start address of the buffer memory.	*1	User
(S1) + 4	Number of write points	Specify the number of write data (in word units).	1 to 480*2	User

*1 For details, refer to the manual for the intelligent device station to which data are written.
*2 The value indicates the maximum number of write data.
Specify the value within the buffer memory capacity of the intelligent device station, or within the receive buffer area setting range set by a parameter.

(b) Interlock signal storage device

Device	Item	Setting data	Setting range	Set by
(S3) + 0	b15 to b8 b7 to b0 0 | RY	RY: Request device	0 to 127	User
		Set 0 to the upper eight bits.	0	User
(S3) + 1	b15 to b8 b7 to b0 RWr *1 | RX	RX: Completion device	0 to 127	User
		RWr: Error code storage device If the error code storage device does not exist, set FF_H.	0 to 15, FF_H	User
(S3) + 2	b15 to b0 completion mode	0: The host station completes the process by checking the contents of one device (RXn). 1: The host station completes the process by checking the contents of two devices (RXn and RXn + 1). (RXn + 1 turns on at an abnormal end.)	0/1	User

*1 The same error code as that for Completion status of the control data is stored in the error code storage device.

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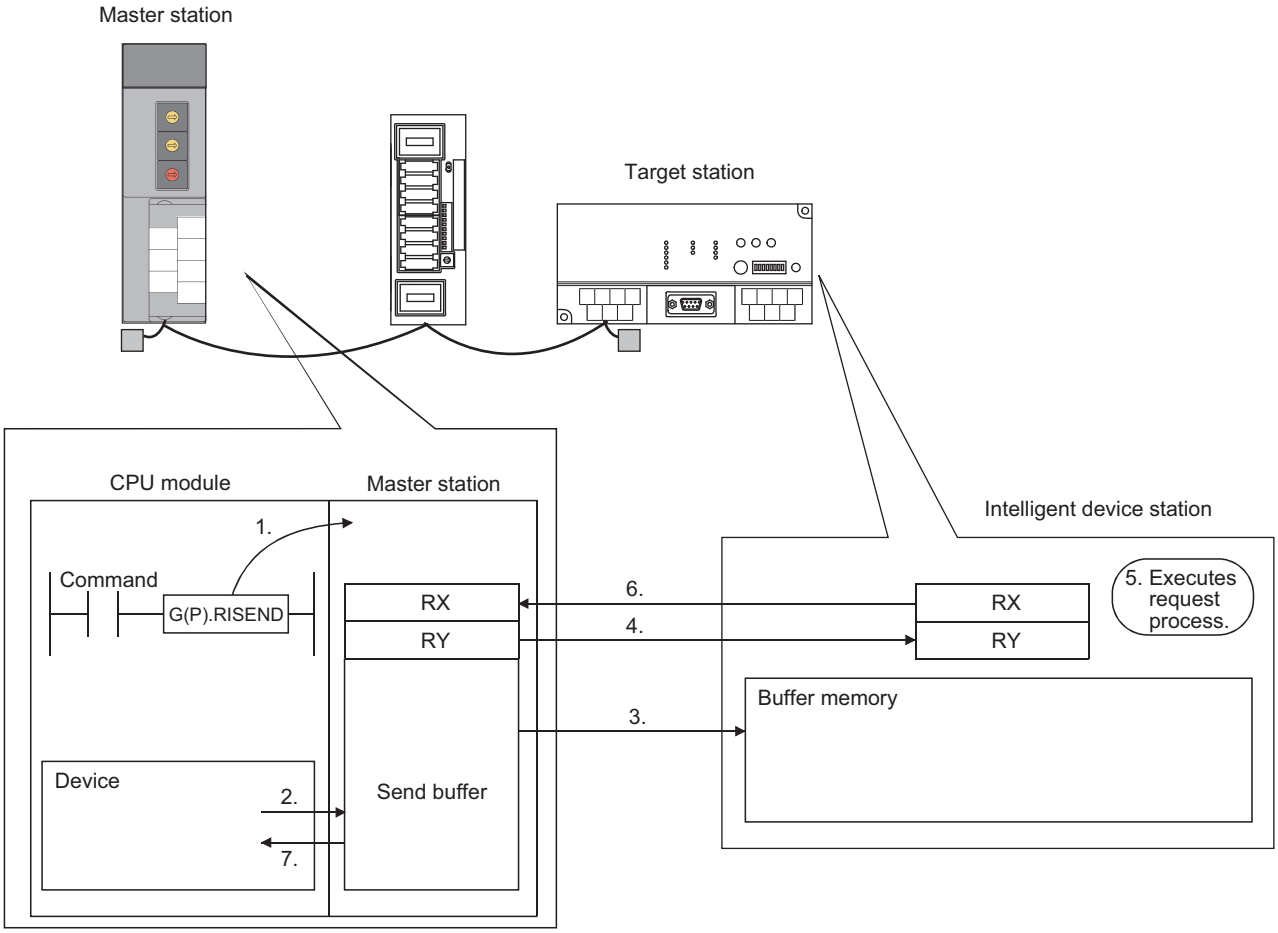
(2) Functions

(a) Operation chart of the G(P).RISEND instruction



1. **Writing of data to the buffer memory specified by (S1) + 2 and (S1) + 3 of the station specified by (S1) + 1 is commanded.**
2. **The data to be written to the target station is stored in the send buffer of the master station.**
3. **Data are written to the buffer memory specified by (S1) + 2 and (S1) + 3 of the station specified by (S1) + 1.**
4. **The master station turns on the remote output (RY) specified by (S3) + 0.**
5. **The station specified by (S1) + 1 performs the process for the remote output (RY).**
6. **Upon completion of the process for the remote output (RY), the station specified by (S1) + 1 turns on the remote input (RX) specified by (S3) + 1, and the remote output (RY) specified by (S3) + 0 is turned off.**
   Also, the response indicating write completion to the master station is returned.
7. **The device specified by (D) turns on.**

(b) Simultaneous execution of the G(P).RISEND instruction

The G(P).RISEND instruction can be simultaneously executed to multiple intelligent device stations.
But concurrent execution of the instruction is not allowed to the same station. (including other dedicated instructions)
If the dedicated instruction is executed before the completion of the former dedicated instruction, the latter instruction is ignored. Because several scans are required to complete the process of the dedicated instruction, create a program so that the next dedicated instruction is executed after Completion device (D) turns on.

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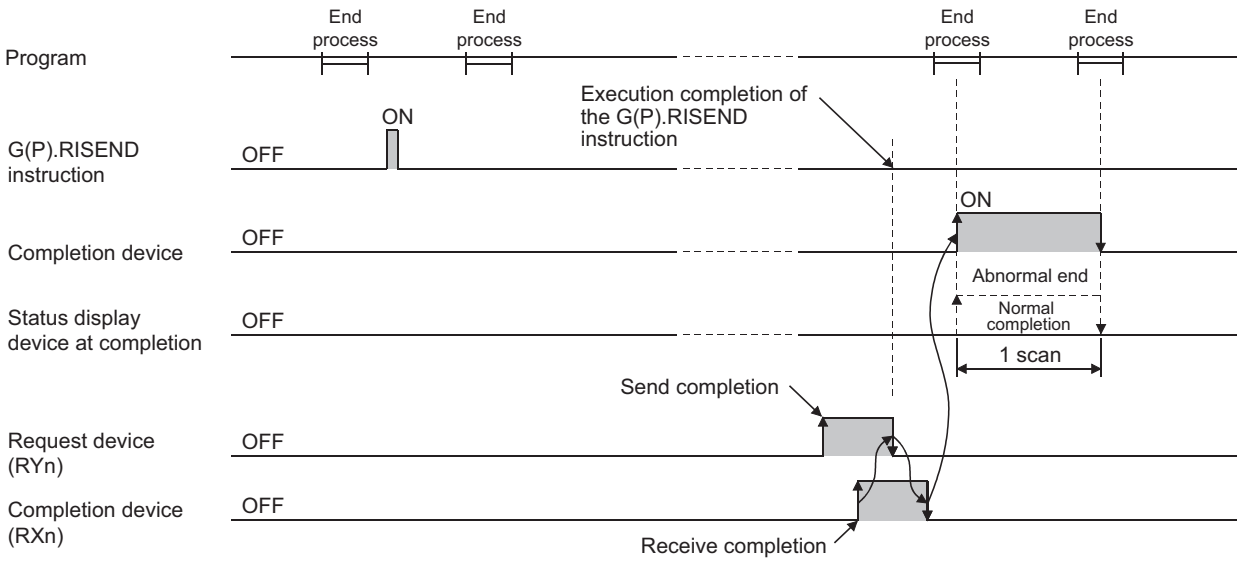
(c) Check of the completion status

There are two types of interlock signals for the G(P).RISEND instruction: Completion device (D) and Status display device at completion (D) + 1.

- Completion device
  Turns on in the END process of the scan where the G(P).RISEND instruction is completed, and turns off in the next END process.
- Status display device at completion
  Turns on and off depending on the completion status of the G(P).RISEND instruction.
  Normal completion: Remains off and does not change.
  Abnormal end: Turns on in the END process of the scan where the G(P).RISEND instruction is completed, and turns off in the next END process.



(d) Basic number of steps

The basic number of steps of the G(P).RISEND instruction is ten.

(e) Assignment of the send buffer

The assignment of the send buffer is performed in "Station Information Setting" of the network parameter of a programming tool. (☞ Page 102, Section 7.3.2 (2))

(3) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When attempt to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the data that cannot be used for the instruction is contained
4101	When the number of data used for the instruction is set beyond the allowable range. Or when the storage data or constants of the device specified with the instruction exceeds the allowable range

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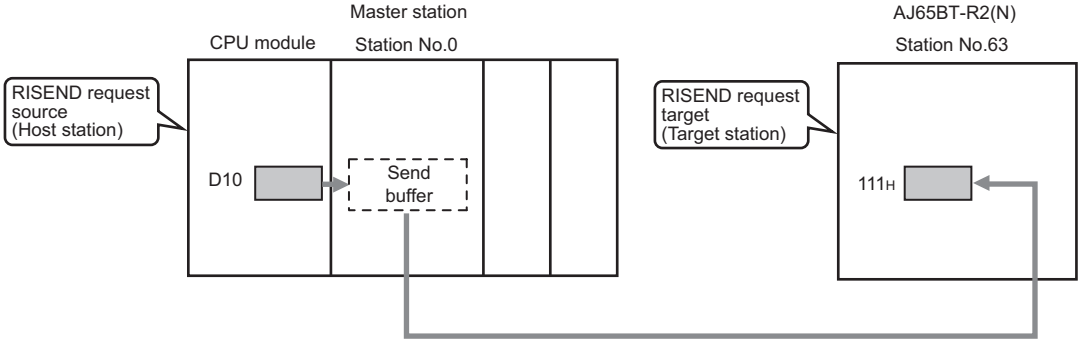
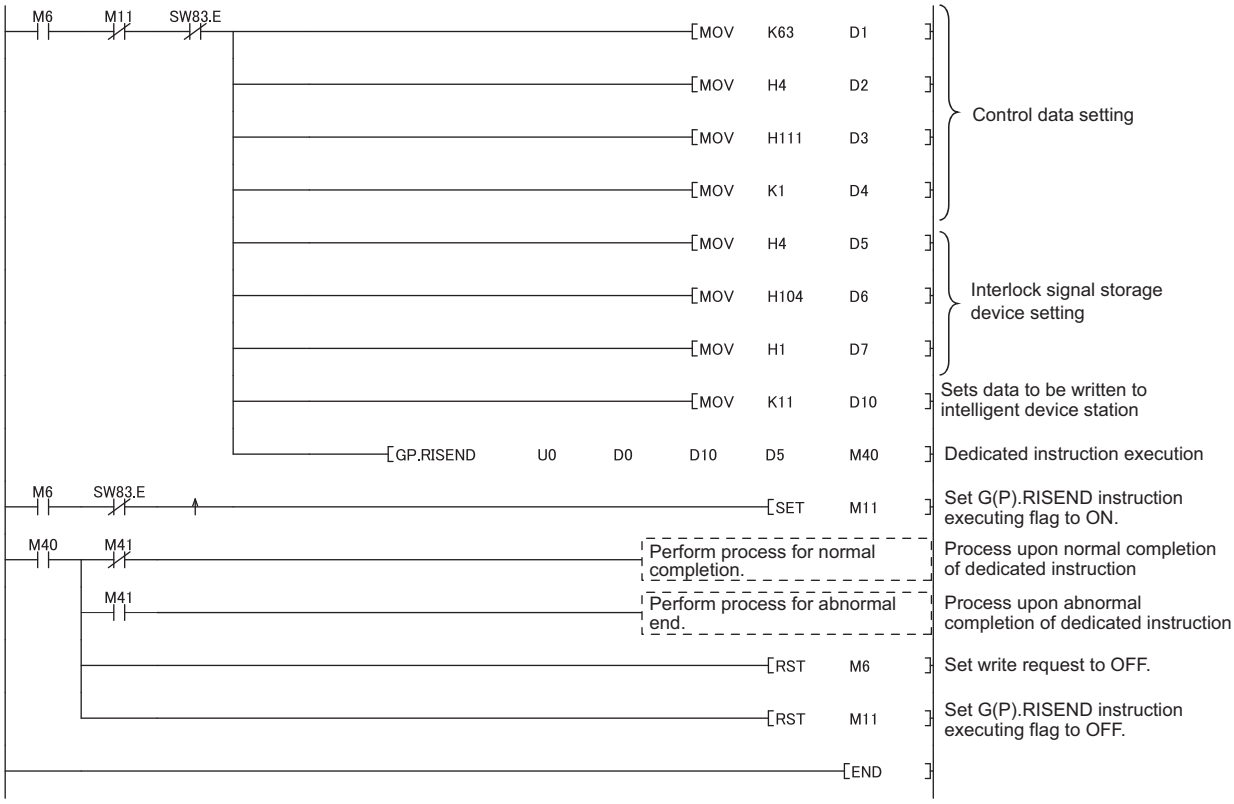
9.5.1 Program example

This section shows an example of the program to write 1-word data from D10 in the master station to the buffer memory address 111_H in the AJ65BT-R2(N) (station number 63) when M6 is turned on in the following system configuration.

- Assume that the I/O number of the master station is X/Y00 to X/Y1F.
- Assume that SW0 is set to the refresh device of the link special register (SW).
- M11 is the G(P).RISEND instruction executing flag.
- Assume that the settings of the interlock signal storage device are Request device: RY4, Completion device: RX4, Error code storage device: RWr1, and Completion mode: 1.





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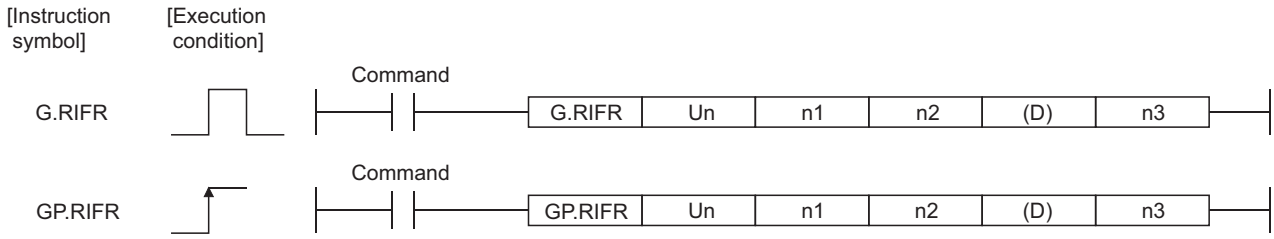
9.6 G(P).RIFR

The G(P).RIFR instruction reads data from the automatic update buffer of the target station.
The instruction is available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).



Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
n1	○	○		—				○	—	—
n2	○	○		—				○	—	—
(D)	—	○		—				—	—	—
n3	○	○		—				○	—	—

(1) Setting data

Device	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
n1	The station number of the intelligent device station	1 to 64	
	Random access buffer specification	FF_H	
n2	The offset value of the automatic update buffer of the intelligent device station specified by the master station, or the offset value of the random access buffer	Between 0 and parameter setting value*1	
(D)	Start number of the device to which read data is stored	Within the range of the specified device	Device
n3	Number of read points	0 to 4096*2	16-bit binary

*1 The value that was set in the station information setting of the network parameter of a programming tool
*2 No process is performed when "0" is set.

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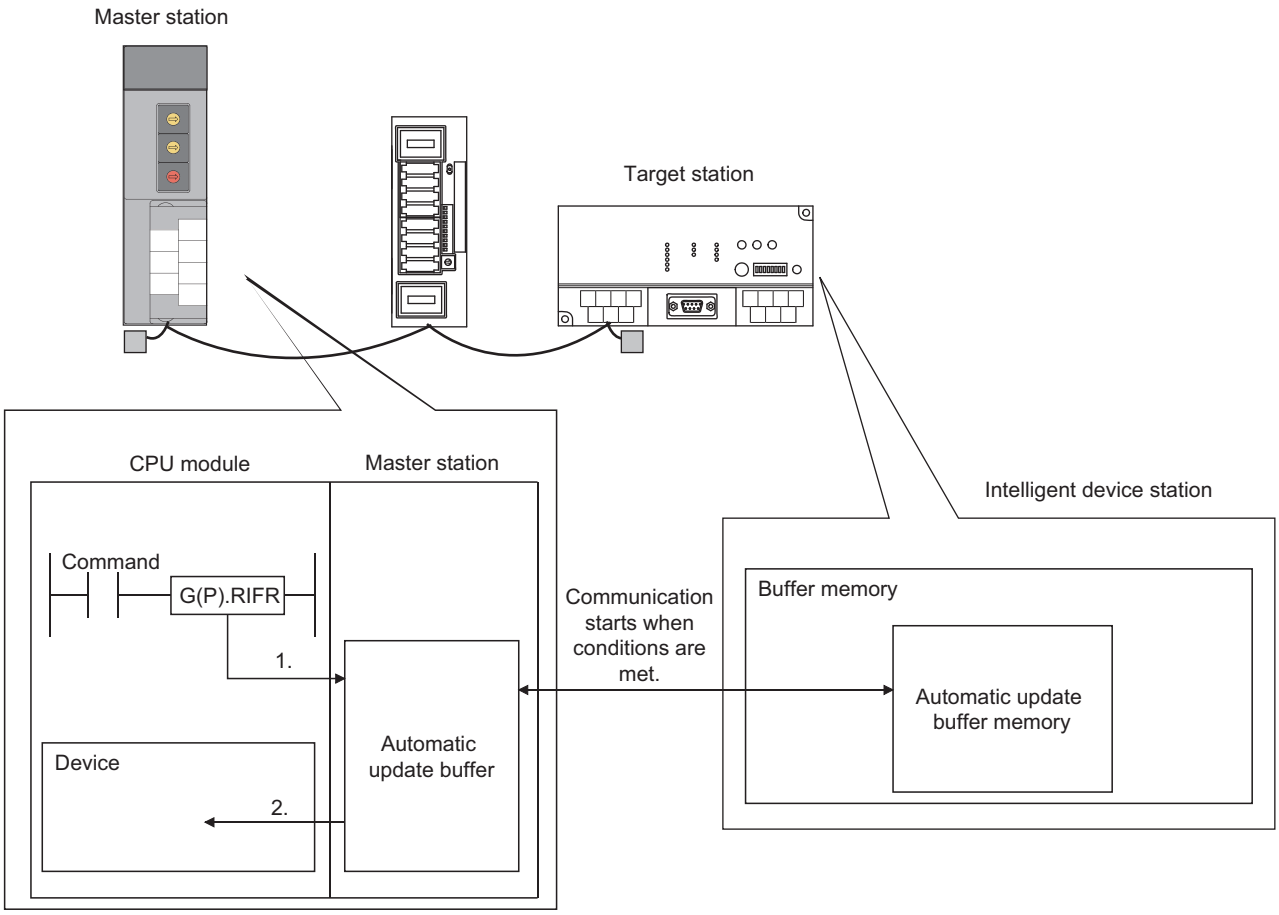
(2) Functions

(a) Operation chart of the G(P).RIFR instruction



1. **The automatic update buffer specified by n1 and n2 of the master station specified by Un is accessed.**
2. **The data read after the device specified by (D) is stored.**

(b) Timing of reading data

The G(P).RIFR instruction reads data while it is being executed.
But the concurrent execution of the instruction from two or more locations is not allowed for the same intelligent device station.

(c) The number of allowable read points

The maximum number of points that can be read by the G(P).RIFR instruction is 4096.

(d) Basic number of steps

The basic number of steps of the G(P).RIFR instruction is nine.

(e) Assignment of the automatic update buffer

The assignment of the automatic update buffer is performed in "Station Information Setting" of the network parameter of a programming tool. (☞ Page 102, Section 7.3.2 (2))

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(3) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When attempt to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the number of read points (n3) is set beyond the setting range
	When the station number specified by n1 does not exist

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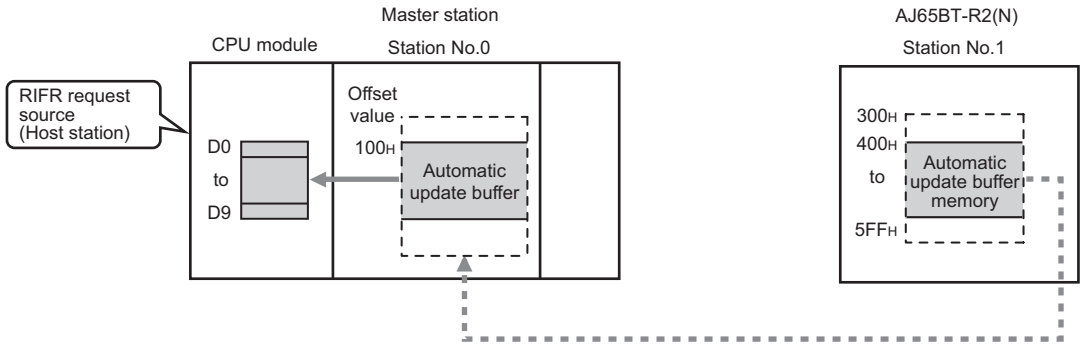
9.6.1 Program example

This section shows an example of the program to read 10-word data from the offset value 100_H of automatic update buffer in the master station (400_H in the intelligent device station) to the area starting from D0 when X0 is turned on in the following system configuration.

- Assume that the I/O number of the master station is X/Y40 to X/Y5F.
- Assume that SW0 is set to the refresh device of the link special register (SW).



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9.7 G(P).RITO

The G(P).RITO instruction writes data to the automatic update buffer of the target station.
The instruction is available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).

Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
n1	○	○		—				○	—	—
n2	○	○		—				○	—	—
(D)	—	○		—				—	—	—
n3	○	○		—				○	—	—

(1) Setting data

Device	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
n1	The station number of the intelligent device station	1 to 64	
	Random access buffer specification	FF_H	
n2	The offset value of the automatic update buffer of the intelligent device station specified by the master station, or the offset value of the random access buffer	Between 0 and parameter setting value*1	
(D)	Start number of the device to which data to be written is stored	Within the range of the specified device	Device
n3	Number of write points	0 to 4096*2	16-bit binary

*1 The value that was set in the station information setting of the network parameter of a programming tool
*2 No process is performed when "0" is set.

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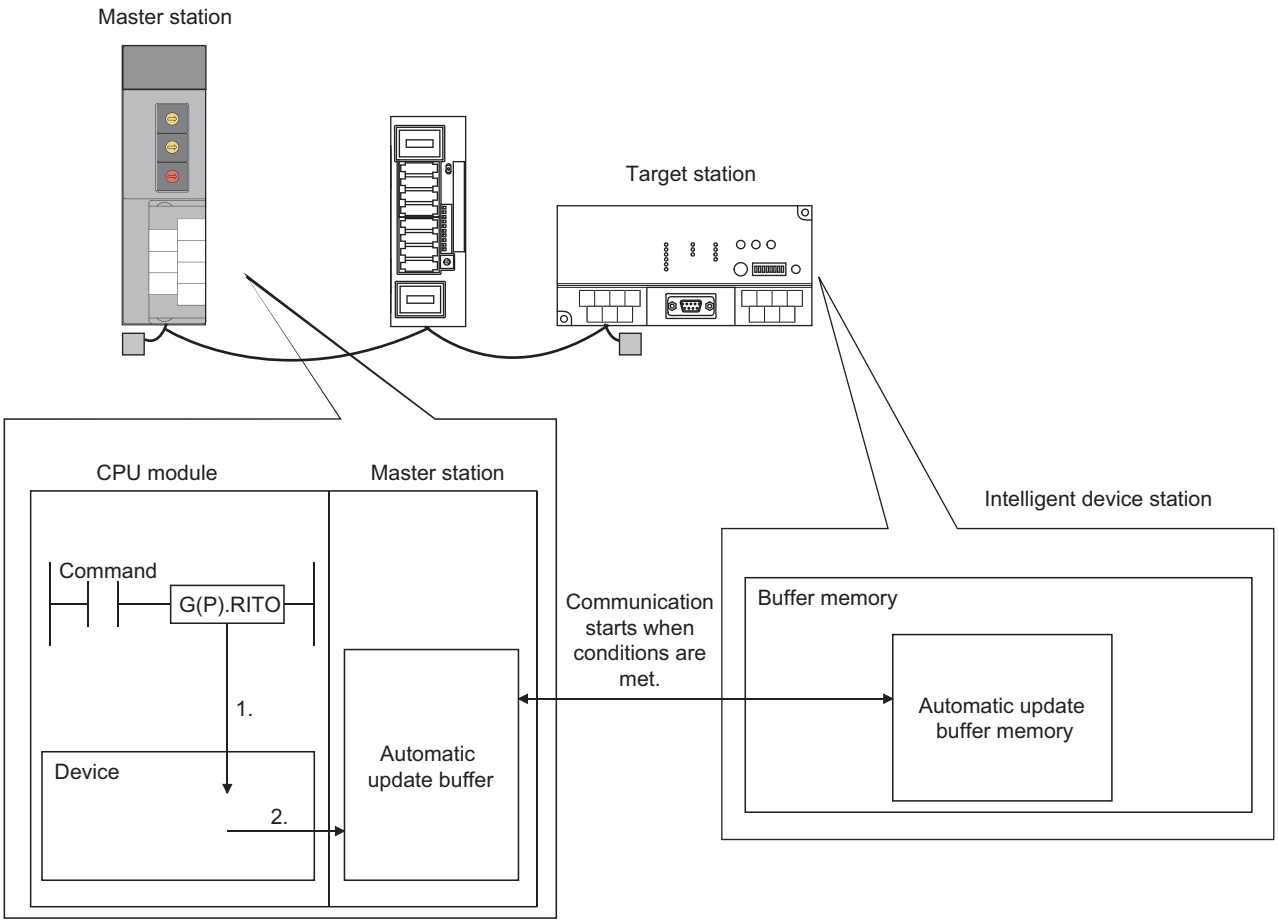
(2) Functions

(a) Operation chart of the G(P).RITO instruction



1. **The device after the device specified by (D) of the master station specified by Un is accessed.**

2. **Data are written to the automatic update buffer specified by n1 and n2.**

(b) Timing of writing data

The G(P).RITO instruction writes data while it is being executed.
But the concurrent execution of the instruction from two or more locations is not allowed for the same intelligent device station.

(c) The number of allowable write points

The maximum number of points that can be written by the G(P).RITO instruction is 4096.

(d) Basic number of steps

The basic number of steps of the G(P).RITO instruction is nine.

(e) Assignment of the automatic update buffer

The assignment of the automatic update buffer is performed in "Station Information Setting" of the network parameter of a programming tool. (☞Page 102, Section 7.3.2 (2))

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(3) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When attempt to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the number of write points (n3) is set beyond the setting range
	When the station number specified by n1 does not exist

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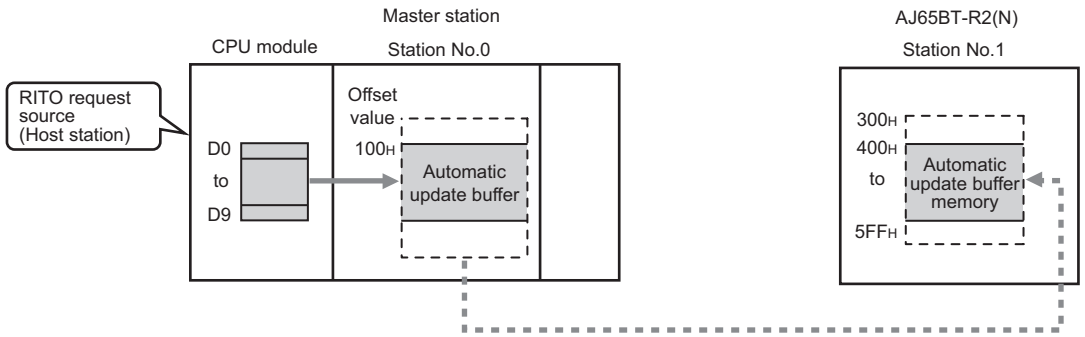
9.7.1 Program example

This section shows an example of the program to write 10-word data from the area starting from D0 in the master station to the offset value 100_H of automatic update buffer or later (400_H or later in the intelligent device station) when X0 is turned on in the following system configuration.

- Assume that the I/O number of the master station is X/Y40 to X/Y5F.
- Assume that SW0 is set to the refresh device of the link special register (SW).



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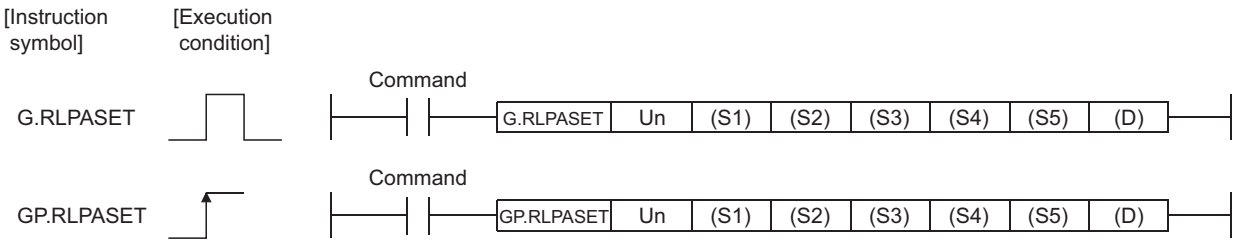
9.8 G(P).RLPASET

The G(P).RLPASET instruction sets the network parameters to the master station and starts up the data link.



Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
(S1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(S3)	—	○		—				—	—	—
(S4)	—	○		—				—	—	—
(S5)	—	○		—				—	—	—
(D)	○			—				—	—	—

(1) Master station setting data

Device*1	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
(S1)	Start number of the device in which control data is stored	Within the range of the specified device	Device name
(S2)*2	Start number of the device in which slave station setting data is stored	Within the range of the specified device	
(S3)*2	Start number of the device in which reserved station specification data is stored	Within the range of the specified device	
(S4)*2	Start number of the device in which error invalid station specification data is stored	Within the range of the specified device	
(S5)*2	Start number of the device in which communication and automatic update buffer assignment data is stored.	Within the range of the specified device	
(D)	Device that turns on for one scan upon completion of setting. (D) + 1 also turns on at an abnormal end.	Within the range of the specified device	Bit

*1 The local device and the file register of each program cannot be used as a device for setting data.
*2 When (S2) to (S5) are not to be set, specify a dummy device.

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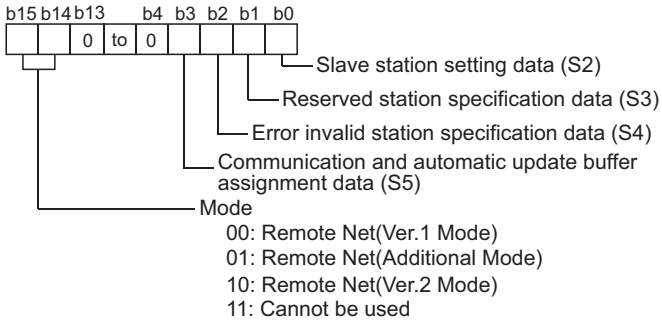
(a) Control data

Device	Item	Setting data	Setting range*2	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S1) + 1	Setting flag	Specify whether the individual setting data for (S2) to (S5) is valid or invalid. 0: Invalid*1 1: Valid  	—	User
(S1) + 2	Total module connected	Set the number of connected slave stations.	1 to 64	
(S1) + 3	Retry count	Set the number of retries to a faulty station.	1 to 7	
(S1) + 4	Automatic reconnection station count	Set the number of slave stations that can return per one link scan.	1 to 10	
(S1) + 5	Operation specification when CPU is down	Specify the data link status when a master station programmable controller CPU error occurs. 0: Stop 1: Continue	0, 1	
(S1) + 6	Scan mode setting	Select whether to synchronize the link scan with the sequence scan or not. Selecting Asynchronous shortens input transmission delay time. Selecting Synchronous shortens output transmission delay time. 0: Asynchronous 1: Synchronous	0, 1	
(S1) + 7	Delay time setting	Set 0.	0	

*1 For the setting data specified as Invalid, default value will be applied. (☞ Page 207, Section 9.8 (1) (b) to Page 209, Section 9.8 (1) (e))

*2 Setting a value outside the setting range results in abnormal end.

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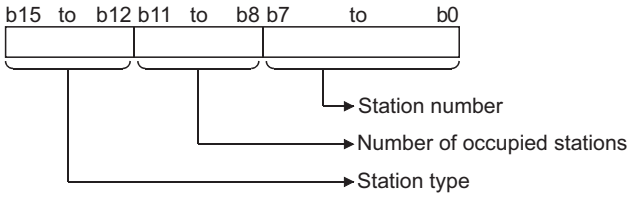
(b) Slave station setting data

<table>
<tr><th>Device</th><th>Item</th><th>Setting data</th><th>Setting range</th><th>Set by</th></tr>
<tr><td rowspan="4">(S2) + 0
to
(S2) + 63</td><td rowspan="4">Setting for 1 to 64 stations*1</td><td>Set the station type, number of occupied stations, and station number as follows:
 

The default values are "0101_H to 0140_H" (station number: 1 to 64, number of occupied stations: 1, station type: Ver.1-compatible remote I/O station).</td><td>—</td><td rowspan="4">User</td></tr>
<tr><td>(1) Station number setting
1 to 64 (BIN setting)</td><td>1 to 40_H</td></tr>
<tr><td>(2) Number of occupied stations setting
<table>
<tr><th>Number of occupied stations</th><th>Setting</th></tr>
<tr><td>1</td><td>1_H</td></tr>
<tr><td>2</td><td>2_H</td></tr>
<tr><td>3</td><td>3_H</td></tr>
<tr><td>4</td><td>4_H</td></tr>
</table></td><td>1 to 4_H</td></tr>
<tr><td>(3) Station type setting*2*3
<table>
<tr><th>Station type</th><th>Setting</th></tr>
<tr><td>Ver.1-compatible remote I/O station</td><td>0_H</td></tr>
<tr><td>Ver.1-compatible remote device station</td><td>1_H</td></tr>
<tr><td>Ver.1-compatible intelligent device station</td><td>2_H</td></tr>
<tr><td>Ver.2-compatible remote device station (single)</td><td>5_H</td></tr>
<tr><td>Ver.2-compatible intelligent device station (single)</td><td>6_H</td></tr>
<tr><td>Ver.2-compatible remote device station (double)</td><td>8_H</td></tr>
<tr><td>Ver.2-compatible intelligent device station (double)</td><td>9_H</td></tr>
<tr><td>Ver.2-compatible remote device station (quadruple)</td><td>B_H</td></tr>
<tr><td>Ver.2-compatible intelligent device station (quadruple)</td><td>C_H</td></tr>
<tr><td>Ver.2-compatible remote device station (octuple)</td><td>E_H</td></tr>
<tr><td>Ver.2-compatible intelligent device station (octuple)</td><td>F_H</td></tr>
</table></td><td>0 to F_H</td></tr>
</table>

*1 Configure settings as many number as the one set for the total module connected of the control data.
*2 Select the intelligent device station for a local station or standby master station.
*3 Setting a value outside the setting range results in abnormal end.

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(c) Reserved station specification data

<table>
<tr><th>Device</th><th>Item</th><th>Setting data</th><th>Setting range</th><th>Set by</th></tr>
<tr><td>(S3) + 0
to
(S3) + 3</td><td>Specification of 1 to 64 stations*1</td><td>Specify reserved stations.*2
0: Not specified
1: Specified
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>(S3)+0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>(S3)+1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>(S3)+2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>(S3)+3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.
Default value is "0: Not specified" for all stations.</td><td>—</td><td>User</td></tr>
</table>

*1 Configure settings for station numbers up to the largest one set for the slave station setting data.
*2 Set the start station number of the module only for a slave station that occupies two or more stations.

(d) Error invalid station specification data

<table>
<tr><th>Device</th><th>Item</th><th>Setting data</th><th>Setting range</th><th>Set by</th></tr>
<tr><td>(S4) + 0
to
(S4) + 3</td><td>Specification of 1 to 64 stations*1</td><td>Specify error invalid stations.*2
0: Not specified
1: Specified
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>(S4)+0</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>(S4)+1</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>(S4)+2</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>(S4)+3</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.
Default value is "0: Not specified" for all stations.</td><td>—</td><td>User</td></tr>
</table>

*1 Configure settings for station numbers up to the largest one set for the slave station setting data.
*2 Set only the start station number of the module for a slave station that occupies two or more stations.
If both an error invalid station and a reserved station are specified for the same station, the reserved station is preferentially specified.

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(e) Communication and automatic update buffer assignment data

Device	Item	Setting data	Setting range	Set by
(S5) + 0 to (S5) + 77	Specification of 1 to 26 stations*1	Specify assignments of buffer memory size at transient transmission to local stations and intelligent device stations. (S5)+0 Send buffer size (S5)+1 Receive buffer size (S5)+2 Automatic update buffer size } Settings for the first station to (S5)+75 Send buffer size (S5)+76 Receive buffer size (S5)+77 Automatic update buffer size } Settings for the 26th station The default values are send buffer size: 40_H, receive buffer size: 40_H, and automatic update buffer size: 80_H.	Communication buffers*2 : 0_H (no setting), 40_H to 1000_H 0 (word) (no setting) 64 to 4096 (words) Automatic update buffer*3 : 0_H (no setting), 80_H to 1000_H 0 (word) (no setting) 128 to 4096 (words)	User

*1 Configure settings for stations specified as local stations or intelligent device stations in the slave station setting data, starting from the smallest station number.

*2 The total size of the communication buffers must be within 1000_H (4096 (word)).
Specify the size of data to be communicated plus seven words for the communication buffers sizes.
Setting a value outside the setting range results in abnormal end.

*3 The total size of the automatic update buffer must be within 1000_H (4096 (word)).
Specify the necessary size for each intelligent device station as the automatic update buffer size.
Setting a value outside the setting range results in abnormal end.

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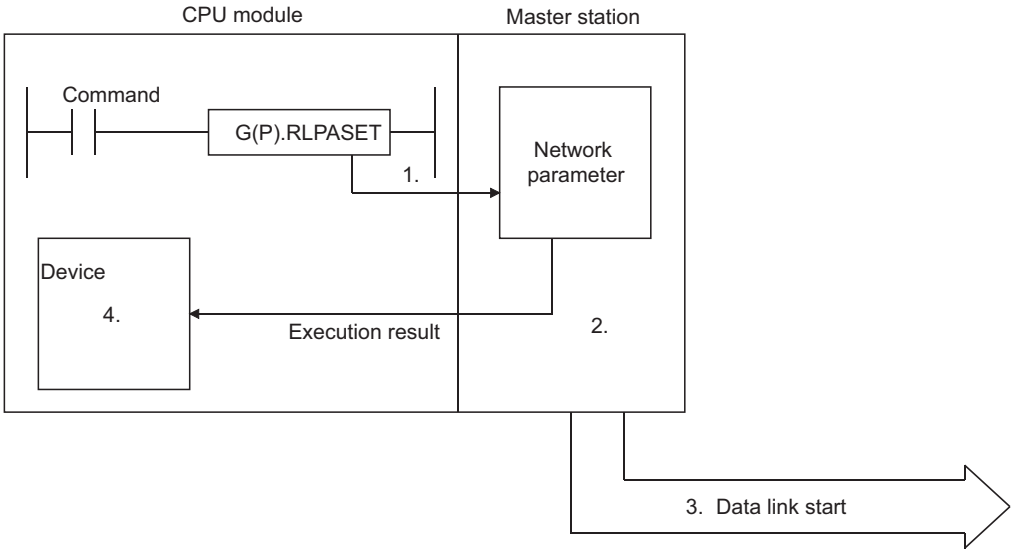
(2) Functions

(a) Operation chart of the G(P).RLPASET instruction



1. **The network parameters set in (S1) to (S5) are transferred to the master station specified by Un.**
2. **The master station analyzes the settings of the network parameters.**
3. **If the network parameter settings are correct, the data link is started.**
4. **The device specified by (D) turns on.**

(b) Simultaneous execution of the G(P).RLPASET instruction

Two or more G(P).RLPASET instructions cannot be executed simultaneously.

(c) Check of the completion status

There are two types of interlock signals for the G(P).RLPASET instruction: Completion device (D) and Status display device at completion (D) + 1.

- Completion device
  Turns on in the END process of the scan where the G(P).RLPASET instruction is completed, and turns off in the next END process.
- Status display device at completion
  Turns on and off depending on the completion status of the G(P).RLPASET instruction.

Normal completion:	Remains off and does not change.
Abnormal end:	Turns on in the END process of the scan where the G(P).RLPASET instruction is completed, and turns off in the next END process.

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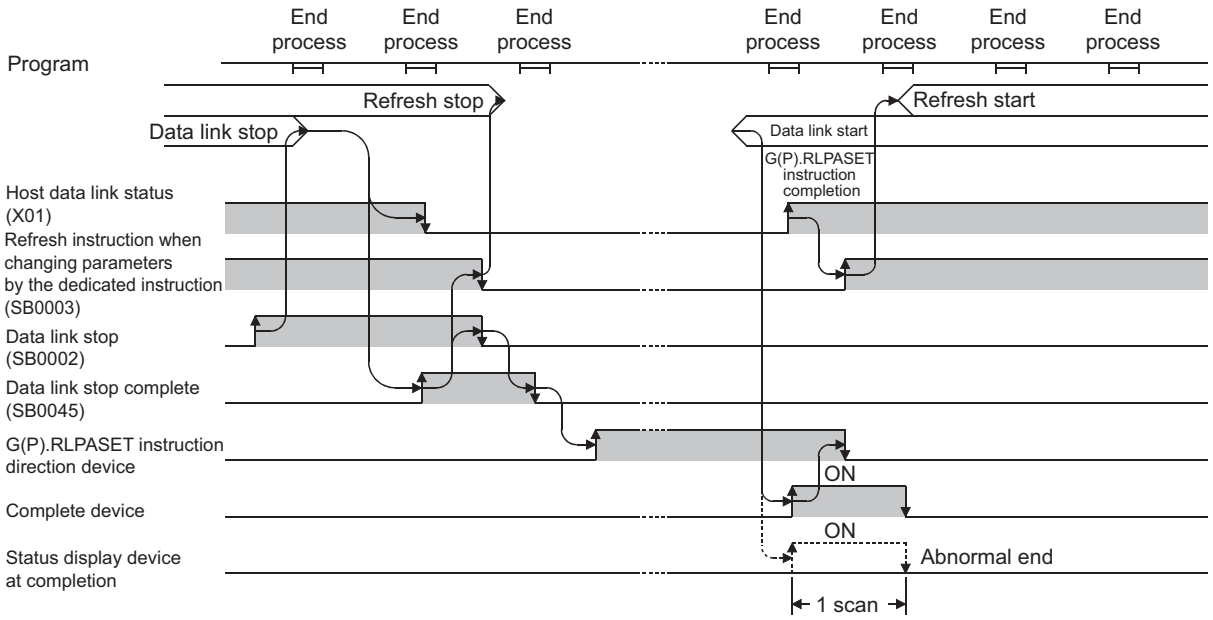
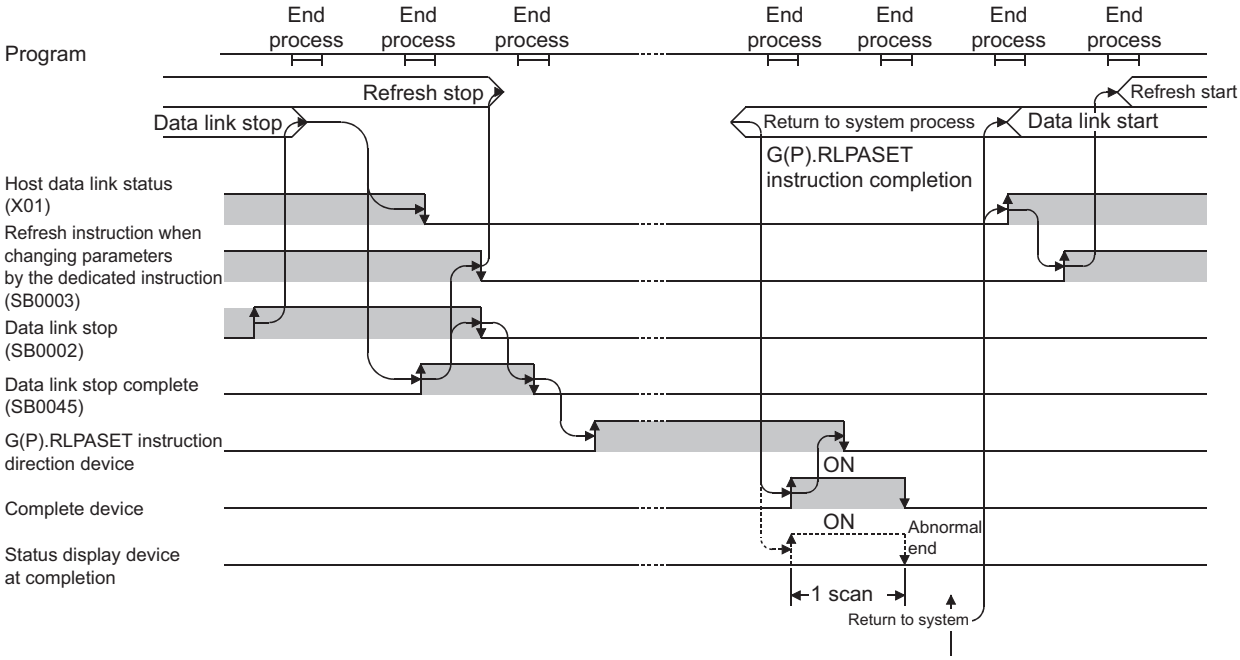
(d) Process after the completion of the G(P).RLPASET instruction

After the completion of the G(P).RLPASET instruction, turn on Refresh instruction when changing parameters by the dedicated instruction (SB0003) and refresh cyclic data.

[When all the stations are normal]



[When all the stations are faulty]



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(3) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
4002	When attempt to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the data that cannot be used for the instruction is contained
4101	When the number of data used for the instruction is set beyond the allowable range. Or when the storage data or constants of the device specified with the instruction exceeds the allowable range (including a dummy device). The number of points required for each data is described below. • Control data: 8 points • Slave station setting data: 64 points • Reserved station specification data: 4 points • Error invalid station specification data: 4 points • Communication and automatic update buffer assignment data: 78 points
	Ex. If D12284 is set as the start device number of the slave station setting data (S2) on the condition that D0 to D12287 is set to the device in the CPU module, the slave station setting data (S2) becomes D12284 to D12347 (64 points) and an error occurs due to values out of the range.

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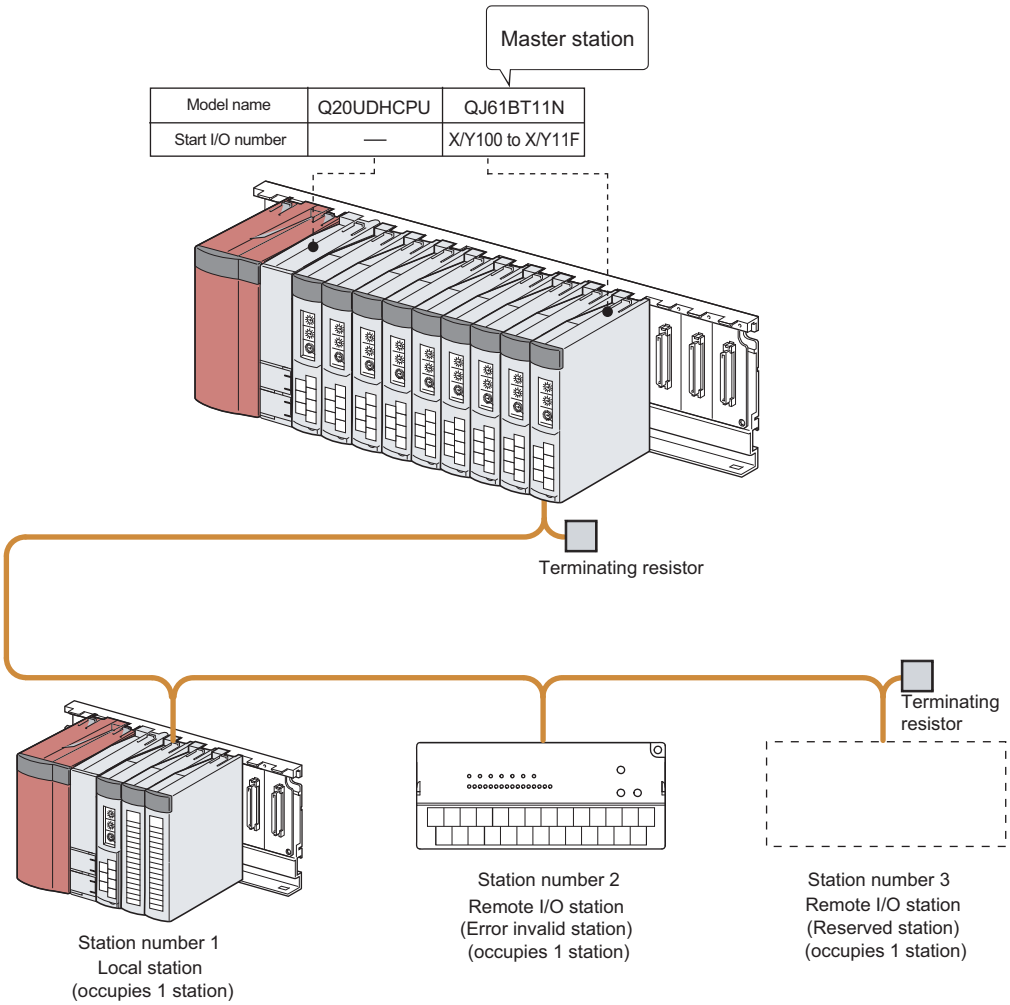
9.8.1 Program example (parameter setting example)

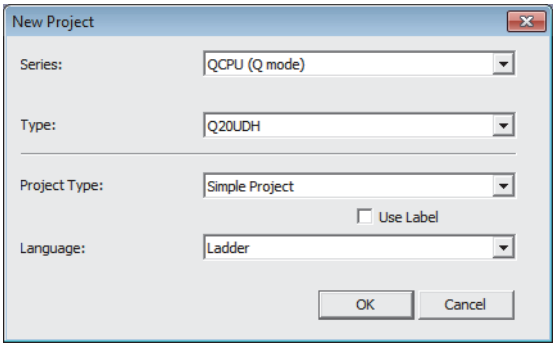
This section shows an example of configuring settings for a master/local module in the following system configuration.



1. Create a project on a programming tool.

Select "QCPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

[Project] ⇨ [New]



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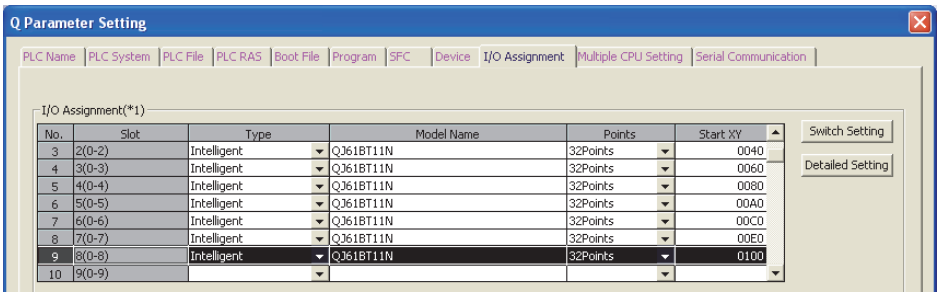
2. Open the "I/O Assignment" tab of "PLC Parameter", and configure the settings as follows.

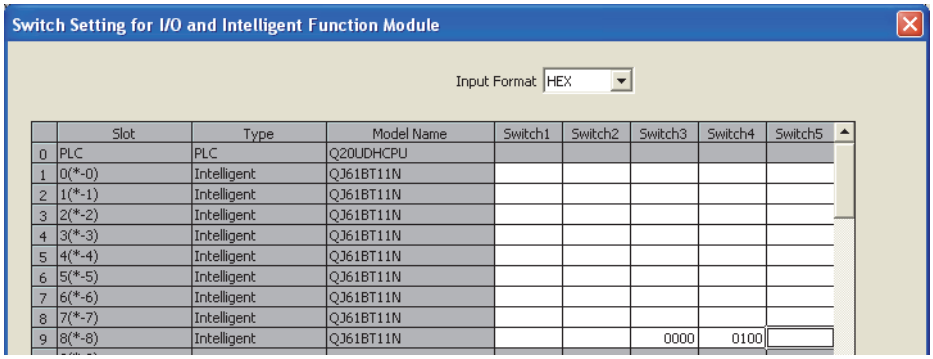
Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "I/O Assignment" tab



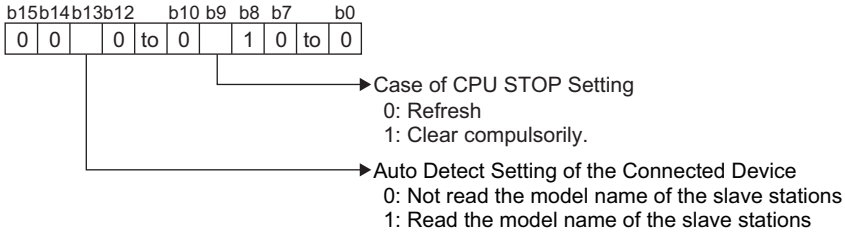
No.	Slot	Type	Model Name	Points	Start XY
3	2(0-2)	Intelligent	QJ61BT11N	32Points	0040
4	3(0-3)	Intelligent	QJ61BT11N	32Points	0060
5	4(0-4)	Intelligent	QJ61BT11N	32Points	0080
6	5(0-5)	Intelligent	QJ61BT11N	32Points	00A0
7	6(0-6)	Intelligent	QJ61BT11N	32Points	00C0
8	7(0-7)	Intelligent	QJ61BT11N	32Points	00E0
9	8(0-8)	Intelligent	QJ61BT11N	32Points	0100
10	9(0-9)				

3. Open the "Switch Setting for I/O and Intelligent Function Module" window by clicking the Switch Setting button and configure the settings as follows.

Click the Switch Setting button.



	Slot	Type	Model Name	Switch1	Switch2	Switch3	Switch4	Switch5
0	PLC	PLC	Q20UDHCPU					
1	0(*-0)	Intelligent	QJ61BT11N					
2	1(*-1)	Intelligent	QJ61BT11N					
3	2(*-2)	Intelligent	QJ61BT11N					
4	3(*-3)	Intelligent	QJ61BT11N					
5	4(*-4)	Intelligent	QJ61BT11N					
6	5(*-5)	Intelligent	QJ61BT11N					
7	6(*-6)	Intelligent	QJ61BT11N					
8	7(*-7)	Intelligent	QJ61BT11N					
9	8(*-8)	Intelligent	QJ61BT11N			0000	0100	

Switch	Description
Switch1	Blank
Switch2	Blank
Switch3	Set the mode for a master/local module. (Mode setting) • Remote net Ver.1 mode: 0000_H • Remote net Ver.2 mode: 0200_H • Remote net additional mode: 0100_H
Switch4	Set the "Case of CPU STOP Setting"*1 and "Auto Detect Setting of the Connected Device"*2 for a master/local module. • When "Auto Detect Setting of the Connected Device" is 0 and "Case of CPU STOP Setting" is 0: 0100_H • When "Auto Detect Setting of the Connected Device" is 0 and "Case of CPU STOP Setting" is 1: 0300_H • When "Auto Detect Setting of the Connected Device" is 1 and "Case of CPU STOP Setting" is 1: 2300_H 
Switch5	Blank

*1 It can be set for the master/local module with a serial number (first five digits) of 09112 or later.

*2 It can be set for the master/local module with a serial number (first five digits) of 17012 or later.

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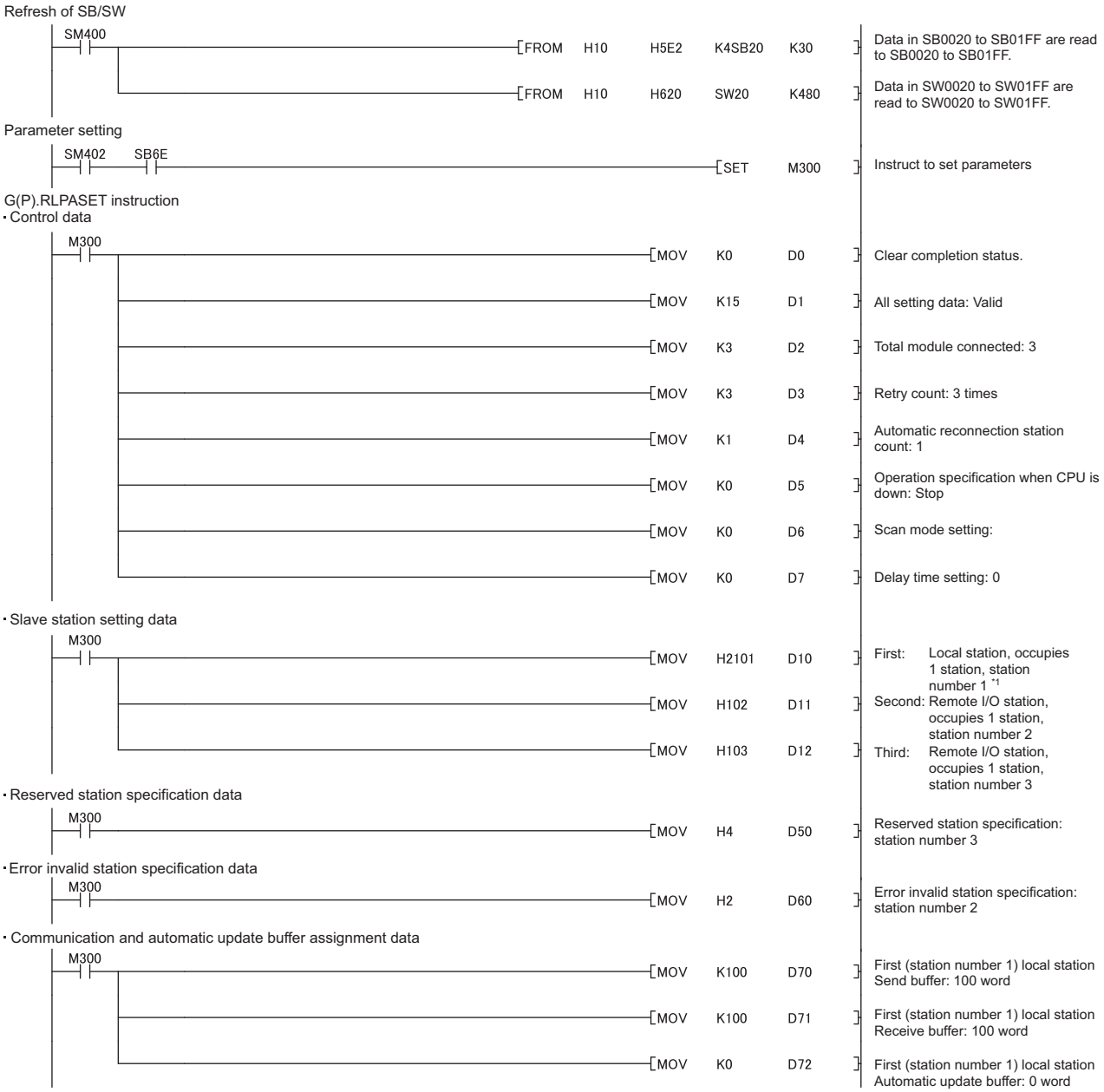
Point

- Set the switch 3 and switch 4 within the range listed in the above table. If a value outside the range is set or no value is set, the G(P).RLPASET instruction ends abnormally. Note that CC-Link is automatically started up for the master/local module with the smallest start I/O number instead. (☞ Page 159, Section 8.3.3)
- Keep the switches 1, 2, and 5 blank. If any values are set, the normal operation is not guaranteed.

4. Click the End button to terminate the setting.

5. Create the following program.



*1 Set the station number in hexadecimal. (Example) Set 14H for station No. 20.

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・Parameter registration (data link startup)

M300 [GP.RLPASET U10 D0 D10 D50 D60 D70 M301] — Dedicated instruction (G(P).RLPASET)

Process at completion of the G(P).RLPASET instruction

M301 [RST M300] — Turn the parameter setting instruction off.

M302 [SET SB3] — Instruct to refresh at normal completion of the G(P).RLPASET instruction.

[SET M310] — Instruct to start the control program at normal completion of the G(P).RLPASET instruction.

M302 — Perform abnormal completion process.

Parameter setting change

M500 (Parameter change instruction) SB6E [SET SB2] — Instruct to stop data link

SB45 [RST SB2] — Turn the data link stop instruction off

[RST SB3] — Instruct to stop refreshing

SB45 [SET M303] — Instruct to change parameters

G(P).RLPASET instruction

・Control data

M303

[MOV	K0	D100]	Clear completion status.
[MOV	K9	D101]	Slave station setting data/ communication and automatic update buffer assignment data: Valid
[MOV	K3	D102]	Total module connected: 3
[MOV	K3	D103]	Retry count: 3 times
[MOV	K1	D104]	Automatic reconnection station count: 1
[MOV	K0	D105]	Operation specification when CPU is down: Stop
[MOV	K0	D106]	Scan mode setting: Asynchronous
[MOV	K0	D107]	Delay time setting: 0

・Slave station setting data

M303

[MOV	H2101	D110]	First: Local station, occupies 1 station, station number 1 *1
[MOV	H102	D111]	Second: Remote I/O station, occupies 1 station, station number 2
[MOV	H103	D112]	Third: Remote I/O station, occupies 1 station, station number 3

*1 Set the station number in hexadecimal. (Example) Set 14H for station No. 20.

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・Communication and automatic update buffer assignment data

```
M303 ─┤├─[MOV  K100  D170]   First (station number 1) local station Send buffer: 100 word
      │
      ├──[MOV  K100  D171]   First (station number 1) local station Receive buffer: 100 word
      │
      ├──[MOV  K0    D172]   First (station number 1) local station Automatic update buffer: 0 word
```

・Parameter registration (data link startup)

```
M303 ─┤├─[GP.RLPASET  U10  D100  D110  D150  D160  D170  M304]   Dedicated instruction (G(P).RLPASET) *2
```

Process at completion of the G(P).RLPASET instruction

```
M304 ─┤├─[RST  M303]   Turn the parameter setting instruction off.
      │
      ├─M305 ─┤/├─[SET  SB3]   Instruct to refresh at normal completion of the G(P).RLPASET instruction.
      │       │
      │       └──[SET  M310]   Instruct to start the control program at normal completion of the G(P).RLPASET instruction
      │
      └─M305 ─┤├─[Perform abnormal end process.]
```

Start of the control program

```
M310 ─┤├─X100 ─┤/├─X101 ─┤├─X10F ─┤├─[MC  N0  M320]
      │
N0 ─┤├─M320
```

Refresh of RX

```
SB6E ─┤/├─[FROM  H10  H0E0  K4X1000  K6]   Data in RX00 to RX5F are read to X1000 to X105F.
```

Refresh of RWr

```
SB6E ─┤/├─[FROM  H10  H2E0  D1000  K4]   Data in RWr0 to RWr3 are read to D1000 to D1003.
```

Station number 1 control program

```
SW80.0 ─┤/├─[Station number 1 control program]
```

Station number 2 control program

```
SW80.1 ─┤/├─[Station number 2 control program]
```

Station number 3 control program

```
SW80.2 ─┤/├─[Station number 3 control program]
```

Refresh of RWw

```
SB6E ─┤/├─[TO  H10  H1E0  D2000  K4]   Data in RWw0 to RWw3 are written into D2000 to D2003.
```

Refresh of RY

```
SB6E ─┤/├─[TO  H10  H160  K4Y1000  K6]   Data in RY00 to RY5F are written into Y1000 to Y105F.
      │
      └──[MCR  N0]
```

Refresh of SB/SW

```
SM400 ─┤├─[TO  H10  H5E0  K4SB0  K2]   Data in SB0000 to SB001F are refreshed.
       │
       └──[TO  H10  H600  SW0  K32]   Data in SW0000 to SW001F are refreshed.

[END]
```

*2 D150 and D160 are dummy devices.

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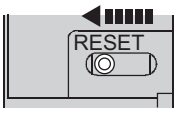
6. **Write the PLC parameters and program to the CPU module. Then reset the CPU module or power off and on the system.**

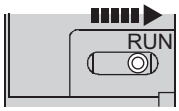


or power off → on

7. **Set the switch on the CPU module in the master station to RUN to execute the program.**

The G(P).RLPASET instruction is executed by executing the program, and the network parameters are reflected to the master/local module.

- The network parameters are changed by turning on M500. (The error invalid station with station number 2 and the reserved station with station number 3 are canceled.)



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(1) Precautions when setting parameters using the G(P).RLPASET instruction

(a) The differences from the parameter settings using a programming tool

The items that can be set are different between the parameter settings using the dedicated instruction and the ones using a programming tool.

Item			Parameter settings using a programming tool	Parameter settings using the dedicated instruction (G(P).RLPASET instruction)
Program for parameter settings			Not necessary	Necessary
Network parameter settings	Operation Setting	Data Link Faulty Station Setting	Can be set	Cannot be set
		Case of CPU STOP Setting	Can be set	Can be set
		Block Data Assurance per Station	Can be set	Cannot be set
	Type	Master Station	Can be set	Can be set
		• Master Station(Duplex Function) • Master station (Extension Base) • Local Station • Standby Master Station	Can be set	Cannot be set
	Mode	• Remote Net(Ver.1 Mode) • Remote Net(Ver.2 Mode) • Remote Net(Additional Mode)	Can be set	Can be set
		Remote I/O Net Mode	Can be set	Cannot be set
	Refresh device (auto refresh)		Can be set	Cannot be set
	Retry Count		Can be set	Can be set
	Automatic Reconnection Station Count		Can be set	Can be set
	Standby Master Station No.		Can be set	Cannot be set
	PLC Down Select		Can be set	Can be set
	Scan Mode Setting		Can be set	Can be set
	Delay Time Setting		Can be set	Can be set
	Station Information Setting	Remote Station Points	Can be set	Cannot be set
		Other than the above	Can be set	Can be set
	Remote Device Station Initial Setting		Can be set	Cannot be set
	Interrupt Settings		Can be set	Cannot be set
Number of modules that can be set			*1	*1
Parameter change while a CPU module is set to RUN			Cannot be changed	Can be changed

*1 For the number of modules that can be set, refer to the user's manual for the CPU module used.

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(b) Network parameter of a programming tool

- Do not use a programming tool to set network parameters for the modules where settings are configured using the G(P).RLPASET instructions. Also do not use the G(P).RLPASET instructions to configure settings for the modules where network parameters have been set using a programming tool. Doing so causes abnormal end of the instruction and the settings are not reflected.
- When set "Number of Modules" of the network parameter of a programming tool, do not include the number of modules that are set using the G(P).RLPASET instruction.

(c) Network parameter change during data link

Network parameters cannot be changed during data link. Therefore, stop the data link using Data link stop (SB0002) and execute the G(P).RLPASET instruction.

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

The setting of a status input from a data link faulty station is not allowed. The input from a data link faulty station is cleared.

(e) Standby master function

The standby master station cannot be connected. To connect the standby master station, configure settings using a programming tool.

(f) Output when a CPU module is switched from RUN to STOP

The outputs from the remote output (RY) in the master station to a remote station, local station, intelligent device station, and standby master station are held. (For the master/local module with a serial number (first five digits) of 09111 or earlier)

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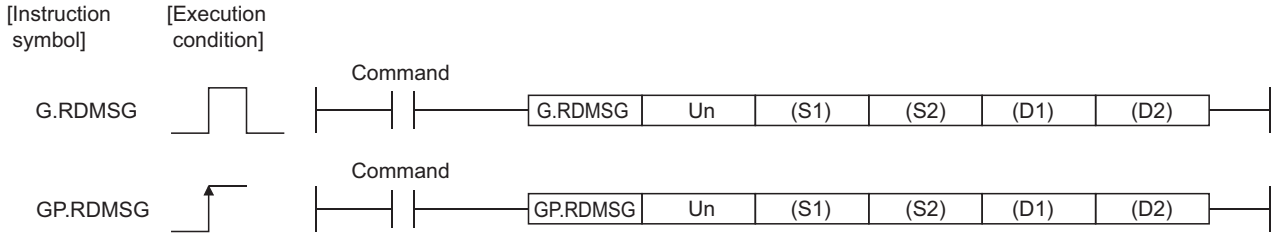
9.9 G(P).RDMSG

With this instruction, a message is sent to a remote device station. (The first five digits of serial No. must be 10032 or later.)
This instruction is available for remote device stations that support the message transmission function.



Setting data	Applicable device									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Others
	Bit	Word		Bit	Word			K, H	$	
(S1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(D2)	○			—				—	—	—

(1) Setting data

Device*1	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE_H	16-bit binary
(S1)	Start number of the device in which control data is stored	Within the range of the specified device	Device name
(S2)*2	Start number of the device that stores data to be sent	Within the range of the specified device	
(D1)*2	Start number of the device that stores received data	Within the range of the specified device	
(D2)	Device that turns on for one scan upon completion of reading. (D2) + 1 also turns on at an abnormal end.	Within the range of the specified device	Bit

*1 The local device and the file register of each program cannot be used as a device for setting data.
*2 For details of the send data and receive data, refer to the manual for the remote device station that supports the message transmission function.

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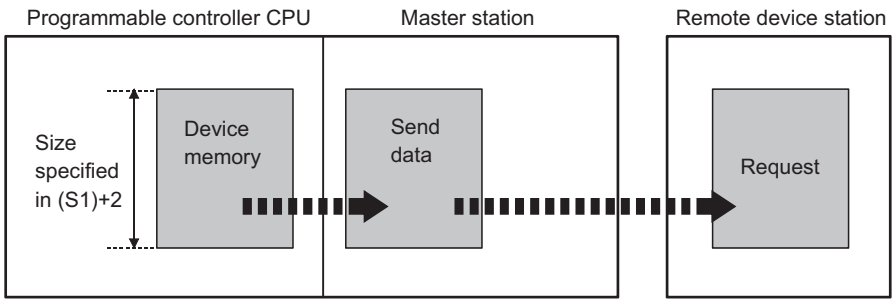
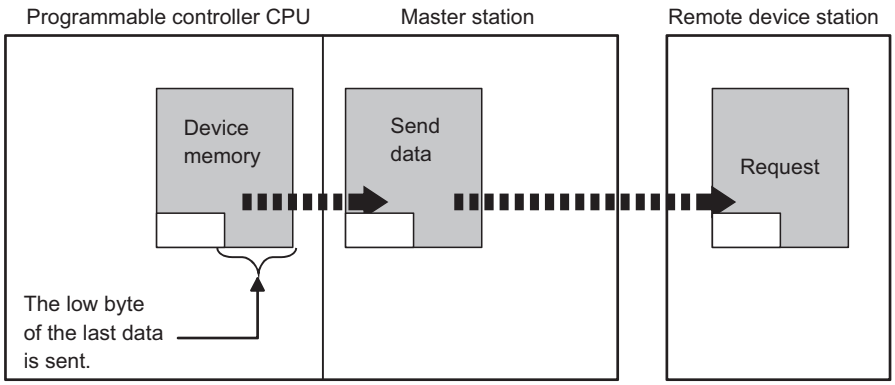
(2) Control data

Device	Item	Setting data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S1) + 1	Station number	Specify the station number of the remote device station.	1 to 64	User
(S1) + 2	Send data size	Specify a send data size (in bytes).	1 to 255 (☞ Page 222, Section 9.9 (2) (a))	
(S1) + 3	Receivable data size	Specify the maximum size of the device that stores received data (in bytes).	0 to 255 (☞ Page 223, Section 9.9 (2) (b))	
(S1) + 4	Receive data size	The size of received data (in bytes) is stored.	0 to 255 (☞ Page 223, Section 9.9 (2) (b))	System

(a) Send data size



When the send data size ((S1)+2) is an odd number of bytes, the low byte of the last data is sent as the last byte.



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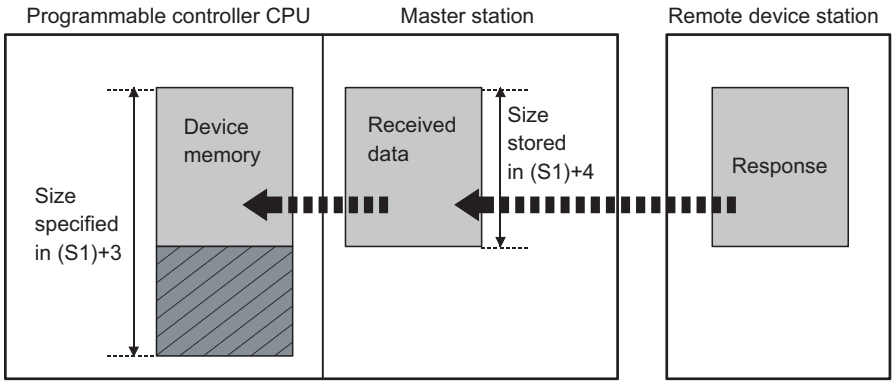
(b) Receivable data size and receive data size

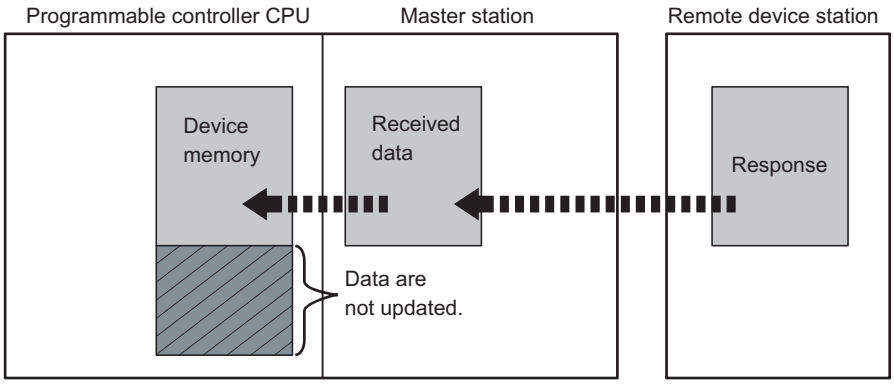
Set a receivable data size ((S1)+3) so that it will satisfy the following conditional expression:
Receivable data size ((S1)+3) ≥ Receive data size ((S1)+4)



If the receivable data size ((S1)+3) is smaller than the receive data size ((S1)+4), data sent from a remote device station cannot be received.
The G(P).RDMSG instruction will fail (error code: $B418_H$).

The following explains the operations when the receivable data size ((S1)+3) is not equal to the receive data size ((S1)+4).

- Receivable data size ((S1)+3) > Receive data size ((S1)+4)



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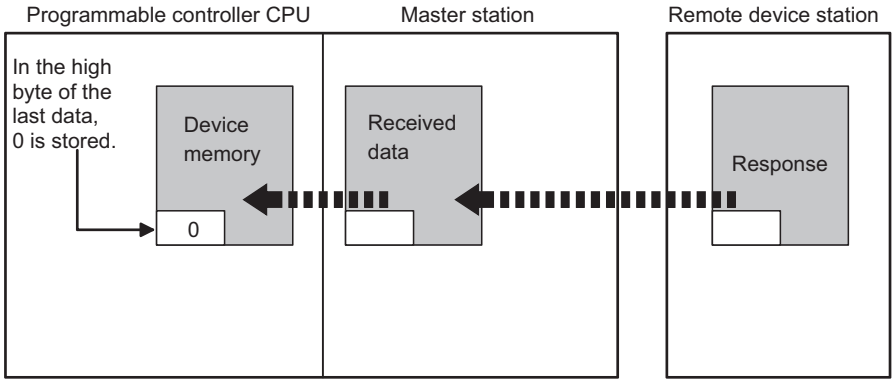
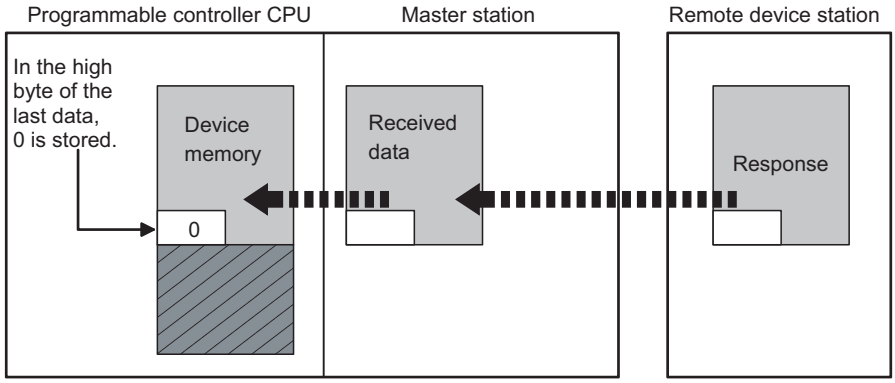
- When the receivable data size ((S1)+3) is an odd number of bytes



- When the receive data size ((S1)+4) is an odd number of bytes (when data received from a remote device station is an odd number of bytes in length)



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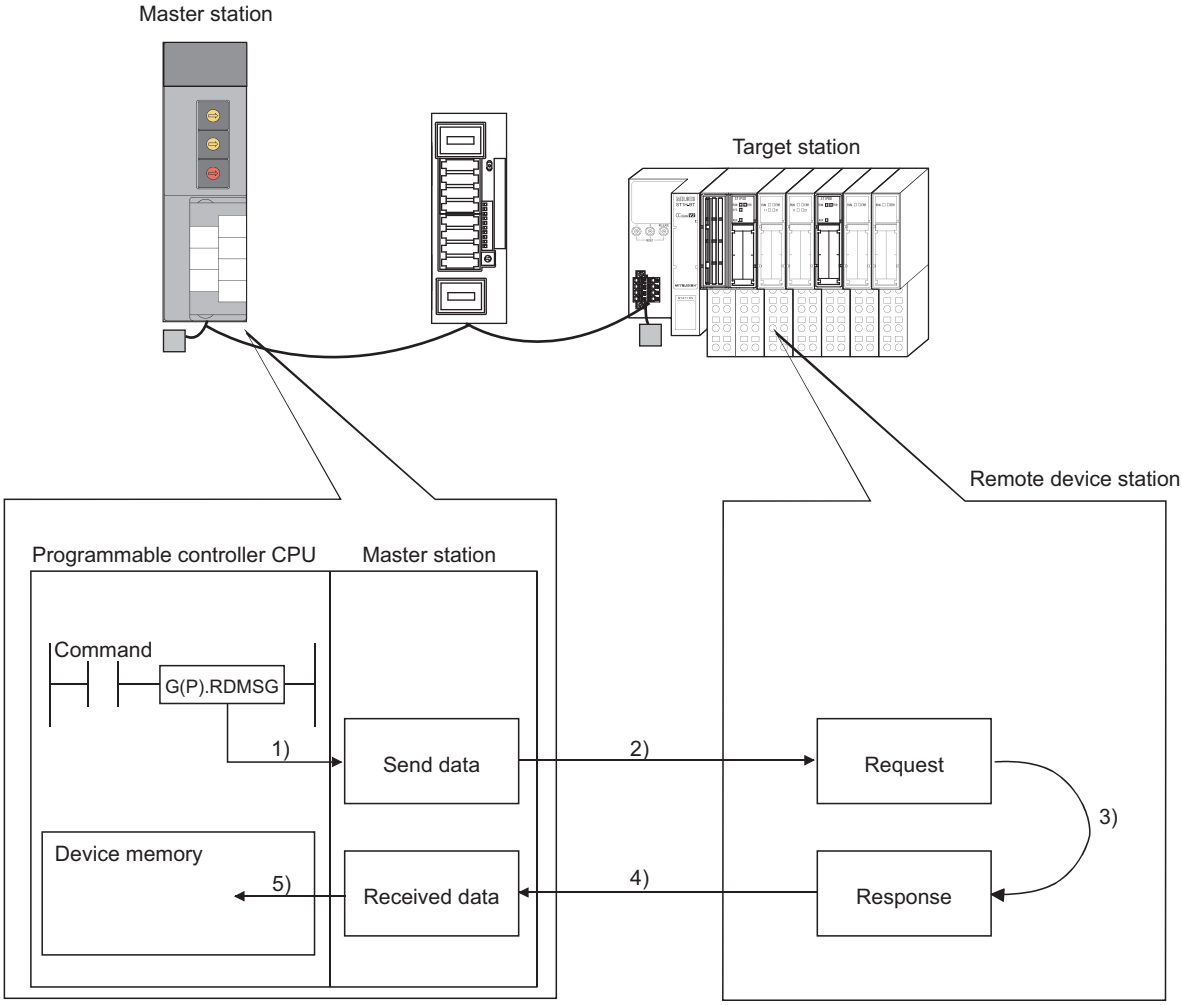
(3) Functions

(a) Operation chart of the G(P).RDMSG instruction



1. **The send data (S2) in the size specified in (S1)+2 are stored into the master station.**
2. **The send data are sent to the station specified in (S1)+1.**
3. **Processing for the send data is executed at the station specified in (S1)+1.**
4. **A processing result is received from the station specified in (S1)+1.**
5. **The received data are stored in the area from the device specified in (D1), and the device specified in (D2) is set to ON.**

(b) Simultaneous execution of the G(P).RDMSG instruction

The G(P).RDMSG instruction can be simultaneously executed to multiple remote device stations (up to four stations). To the same remote device station, however, simultaneous execution of multiple instructions including other dedicated instruction(s) is not allowed. Because several scans are required to complete the process of the dedicated instruction, create a program so that the next dedicated instruction is executed after Completion device (D2) turns on.

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(c) Check of the completion status

There are two types of interlock signals for the G(P).RDMSG instruction: Completion device (D2) and Status display device at completion (D2) + 1.

- Completion device

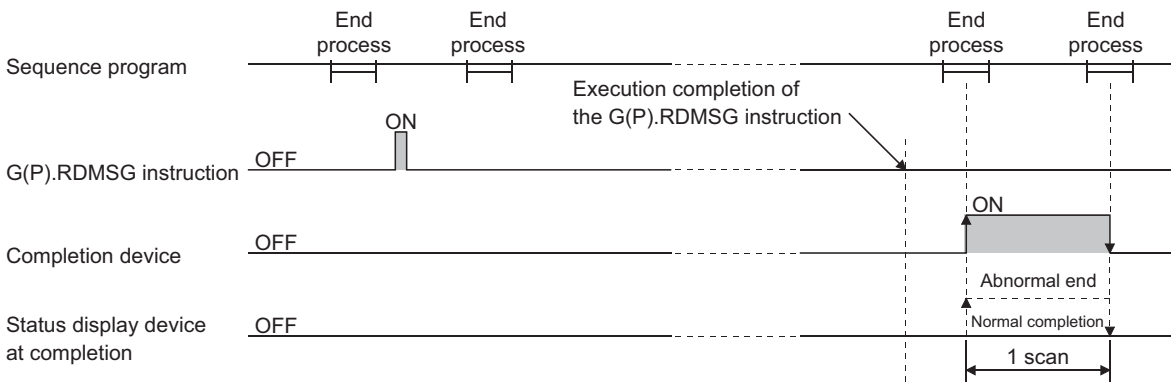
  Turns on in the END process of the scan where the G(P).RDMSG instruction is completed, and turns off in the next END process.

- Status display device at completion

  Turns on and off depending on the completion status of the G(P).RDMSG instruction.

  Normal completion: Remains off and does not change.

  Abnormal end: Turns on in the END process of the scan where the G(P).RDMSG instruction is completed, and turns off in the next END process.



(d) Basic number of steps

The basic number of steps of the G(P).RDMSG instruction is ten.

(4) Operation error

For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

Error code	Condition that an operation error occurs
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When attempting to execute an unsupported instruction
4003	When the number of devices for the instruction is incorrect
4004	When the device that cannot be used for the instruction is specified
4100	When the data that cannot be used for the instruction is contained
4101	When the number of data used for the instruction is set beyond the allowable range. Or when the storage data or constants of the device specified with the instruction exceeds the allowable range

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9.9.1 Program example

For program examples, refer to the manual for the remote device station that supports the message transmission function.

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CHAPTER 10 PROGRAMMING

This chapter describes precautions for programming, communication examples, and sample programs when data are communicated at master/local modules.

The examples of communications shown in this chapter are the one between a master station and a remote device station, or the one between a master station and a local station.
For the other communication examples, refer to the following.

- Communications between a master station and a remote I/O station: ☞ Page 59, Section 4.1
- Communications between a master station and an intelligent device station:
  Manual for the intelligent device station used
- Transient transmission example: ☞ Page 180, Section 9.2.1 to Page 213, Section 9.8.1

10.1 Precautions for Programming

This section describes precautions when creating a program for a master/local module.

(1) Interlock program

When creating a program to perform cyclic transmission, create the program that can detect data link status in a slave station and interlock with the station. Use Other station data link status (SW0080 to SW0083) to detect data link status in a slave station. (☞ Page 351, Appendix 3.2)
Also create an error-handing program.

Ex. Interlock method
Assume that the start I/O number of the master/local module is 0000 and a refresh device is set as follows.

Number of Modules 1 Boards Blank : No Setting ☑ Set

	1	2
Start I/O No.	0000	
Operation Setting	Operation Setting	
Type	Master Station	
Master Station Data Link Type	PLC Parameter Auto Start	
Mode	Remote Net(Ver.1 Mode)	
Total Module Connected(*1)	2	
Remote Input(RX)		
Remote Output(RY)		
Remote Register(RWr)		
Remote Register(RWw)		
Ver.2 Remote Input(RX)		
Ver.2 Remote Output(RY)		
Ver.2 Remote Register(RWr)		
Ver.2 Remote Register(RWw)		
Special Relay(SB)	SB0	
Special Register(SW)	SW0	

Refresh device

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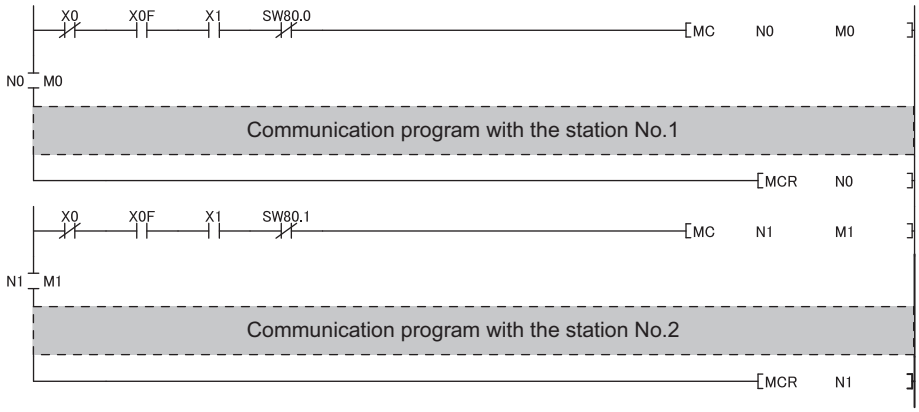
Devices used for the program example

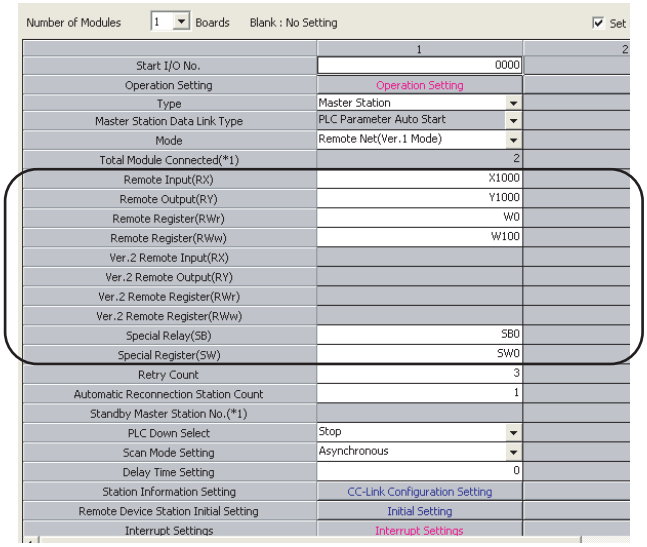
Device	Description	Device	Description
X0	Module error	SW0080.0	Other station data link status (station number 1)
X1	Host data link status	SW0080.1	Other station data link status (station number 2)
XF	Module ready	-	



(2) Refresh devices to be set

Set the refresh devices without overlaps with the following.

- Refresh parameters of modules on the network
- I/O numbers used for an I/O module and an intelligent function module
- Auto refresh settings of an intelligent function module
- Auto refresh using a multiple CPU shared memory



Refresh device

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(3) Remote device station initial settings using a programming tool

(a) Reflection of the settings

The initial settings registered using a programming tool are reflected to a remote device station by writing the settings to a CPU module and turning on Remote device station initialization procedure registration instruction (SB000D).

(b) Signals that are required to be always on even after the initial process is completed

Turning off Remote device station initialization procedure registration instruction (SB000D) after the initial process is completed turns off all the remote output (RY)s that turned on during the initial procedure registration. For signals that are required to be always on (such as a conversion enable signal), turn them on using a program.

(c) When a faulty station exists in the station to which the initial settings are to be executed

Completion status of remote device station initialization procedure (SB005F) does not turn on unless the execution is completed to all the stations that are registered in the remote device station initial setting of a programming tool.
If a faulty station exists, create the program so that Remote device station initialization procedure registration instruction (SB000D) is turned off depending on the completion status of other stations.

(4) A program when the module is connected to a Redundant CPU

For precautions for programming and a program example, refer to the manual for the Redundant CPU used.

QnPRHCPU User's Manual (Redundant System)

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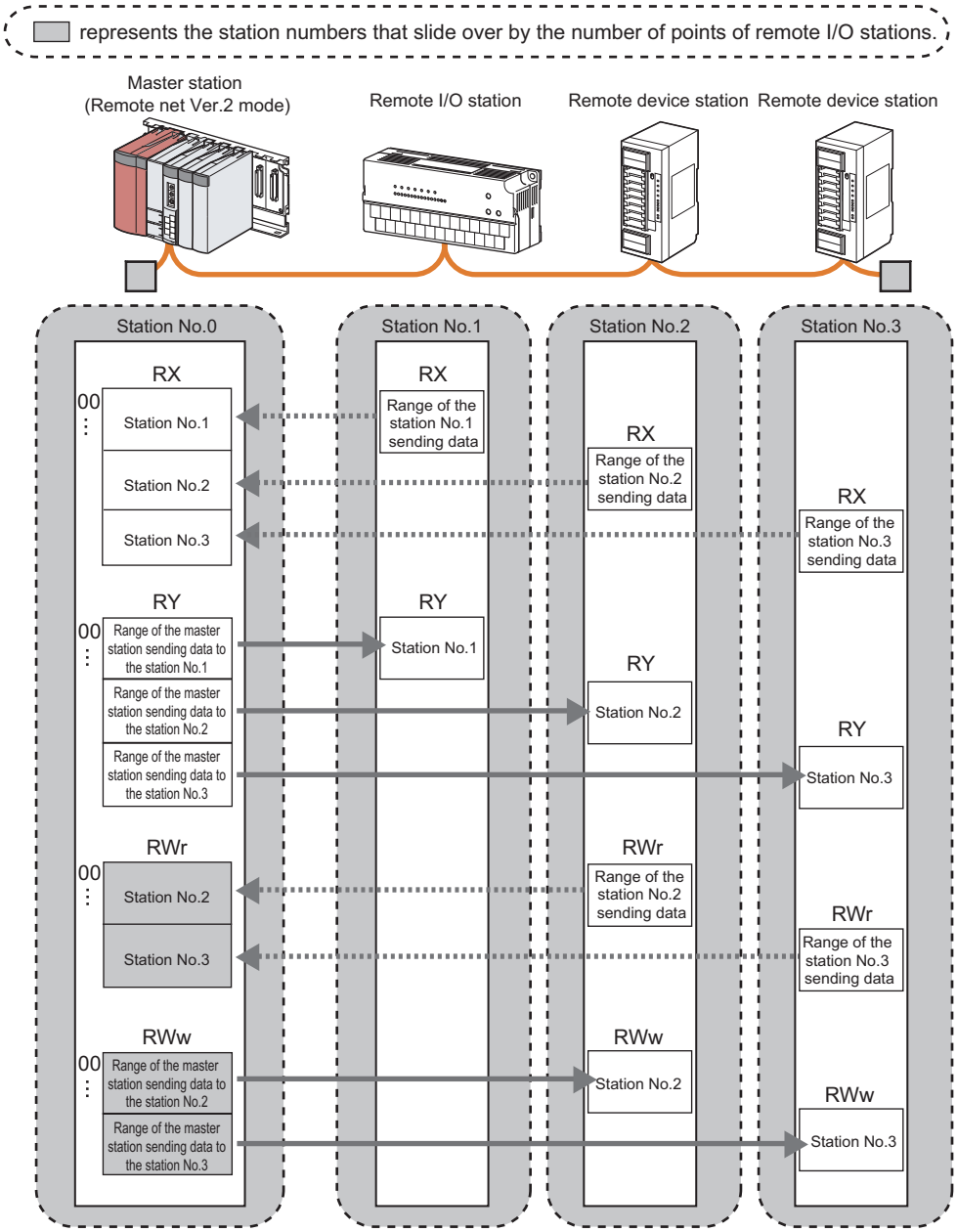
(5) For the configuration where a remote I/O station is connected in the remote net Ver.2 mode

Different from the remote net Ver.1 mode, RWr/RWw slide over by the number of points of remote I/O stations in a master station and a local station.
RX/RY also slide over if the points are changed in "Remote Station Points" of "Station Information Setting".
Consider it when assign them.

Ex. Assignment example when RWr/RWw slide over



Point

The storage locations for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503).
(☞ Page 335, Appendix 2 (4))

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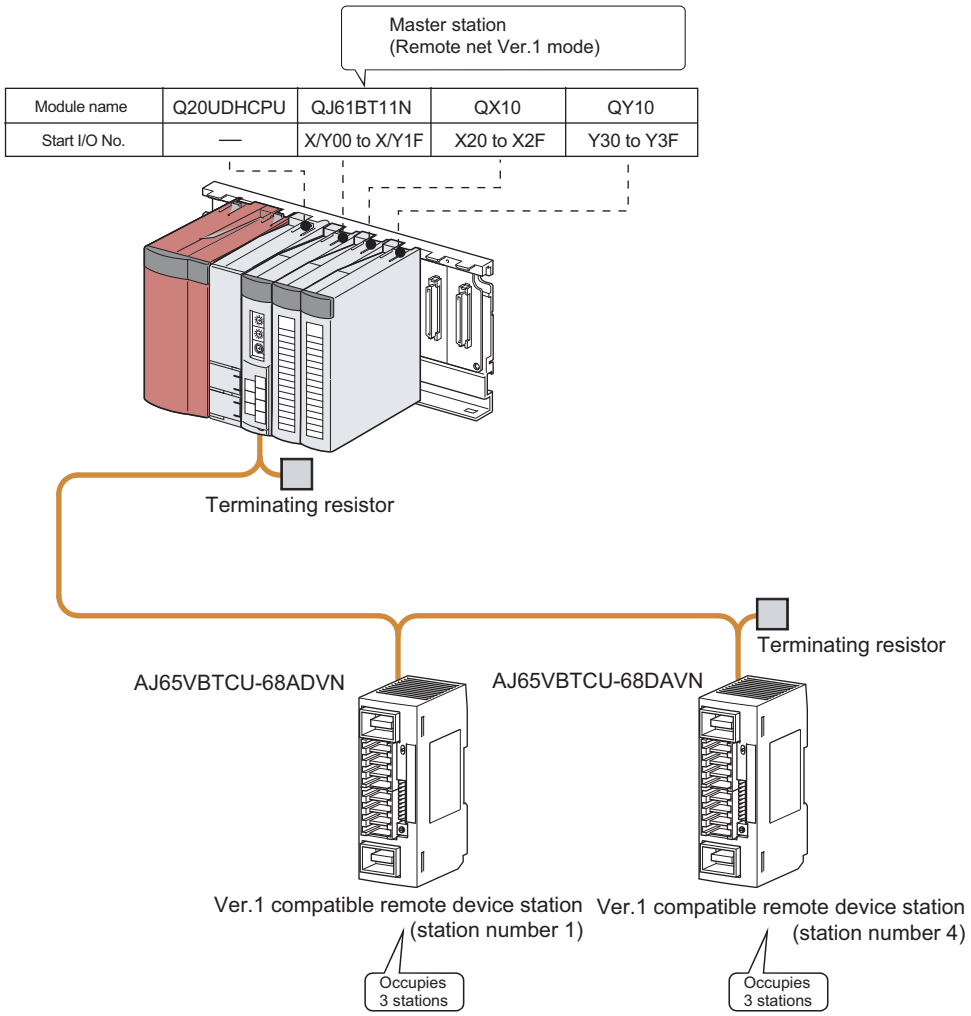
10.2 Example of Communications Between a Master Station and a Remote Device Station

This section describes an example of how to configure the initial settings for the remote device station and perform an analog input and digital output.
If an error occurs, the error code of the remote device station is stored in the device of a CPU module.

10.2.1 System configuration

(1) System configuration

The following system is used for explanation purpose.



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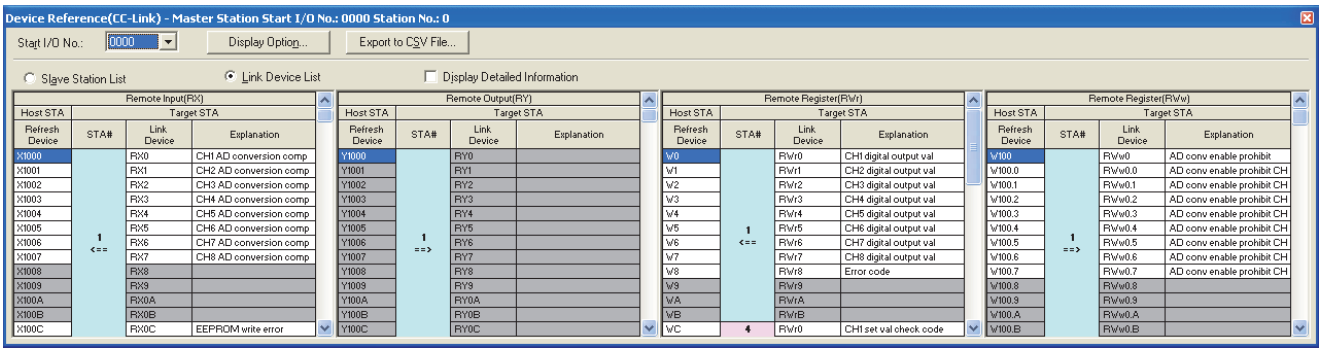
(2) Assignment of the remote I/O (RX, RY) and remote register (RWr, RWw)

In the program example, the following assignment is used to perform data link.

Point

The status of a device assignment can be checked on GX Works2 by setting information of a slave station on the CC-Link configuration window on GX Works2. (Page 102, Section 7.3.2 (2) (a))

[View] ⇨ [Docking Window] ⇨ [Device Reference]



Remark

- When a master station is in the remote net Ver.2 mode or remote net additional mode
  In the system configuration of the program example, the assignment is the same as that in the remote net Ver.1 mode, except for buffer memory addresses of data storage locations. (Page 48, Section 3.6.4, Page 51, Section 3.6.5)
- The remote I/O (RX/RY) and remote register (RWr/RWw) of the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN
  For details on the signals, refer to the following.
  Manual for the remote station used

(a) Remote input (RX)

Plan the assignment using the assignment sheet on Page 407, Appendix 8.1 (1).

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)
	Hexadecimal	Decimal			
X1000 to X100F	$E0_H$	224	1	AJ65VBTCU-68ADVN	RX0 to RXF
X1010 to X101F	$E1_H$	225			RX10 to RX1F
X1020 to X102F	$E2_H$	226	2	AJ65VBTCU-68ADVN	RX20 to RX2F
X1030 to X103F	$E3_H$	227			RX30 to RX3F
X1040 to X104F	$E4_H$	228	3	AJ65VBTCU-68ADVN	RX40 to RX4F
X1050 to X105F	$E5_H$	229			RX50 to RX5F
X1060 to X106F	$E6_H$	230	4	AJ65VBTCU-68DAVN	RX0 to RXF
X1070 to X107F	$E7_H$	231			RX10 to RX1F
X1080 to X108F	$E8_H$	232	5	AJ65VBTCU-68DAVN	RX20 to RX2F
X1090 to X109F	$E9_H$	233			RX30 to RX3F
X10A0 to X10AF	EA_H	234	6	AJ65VBTCU-68DAVN	RX40 to RX4F
X10B0 to X10BF	EB_H	235			RX50 to RX5F

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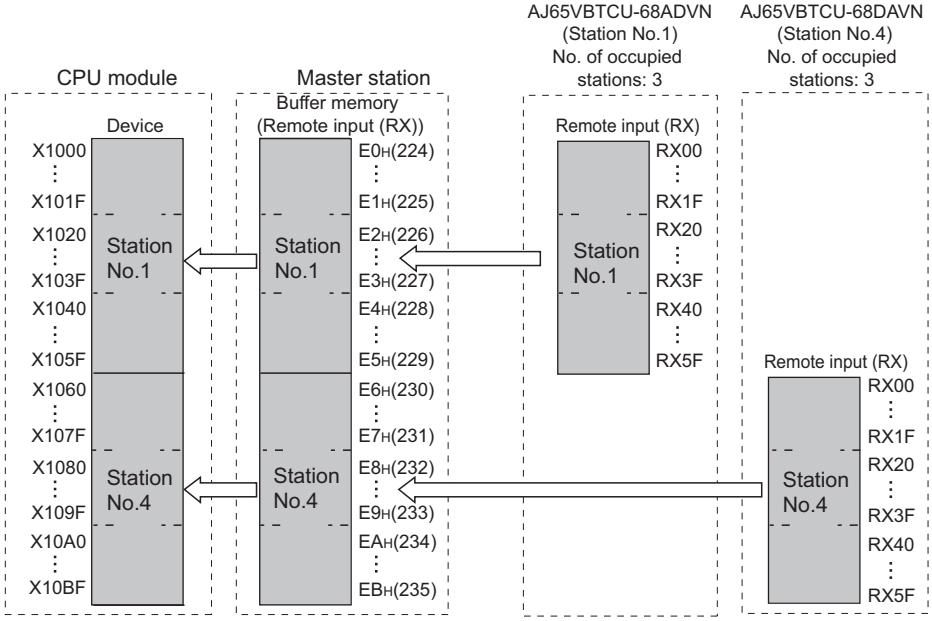
The assignment by each signal of the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN are shown below.



CPU module	Remote station		
Device	**Module name**	**Remote input (RX)**	**Signal name**
X1000	AJ65VBTCU-68ADVN	RX00	CH.1 A/D conversion completion flag
X1001		RX01	CH.2 A/D conversion completion flag
X1002		RX02	CH.3 A/D conversion completion flag
X1003		RX03	CH.4 A/D conversion completion flag
X1004		RX04	CH.5 A/D conversion completion flag
X1005		RX05	CH.6 A/D conversion completion flag
X1006		RX06	CH.7 A/D conversion completion flag
X1007		RX07	CH.8 A/D conversion completion flag
X1008		RX08	Reserved
to		to	
X100B		RX0B	
X100C		RX0C	E^2PROM write error flag
X100D		RX0D	Reserved
to		to	
X1017		RX17	
X1018		RX18	Initial data processing request flag
X1019		RX19	Initial data setting completion flag
X101A		RX1A	Error status flag
X101B		RX1B	Remote READY
X101C		RX1C	Reserved
to		to	
X105F		RX5F	

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CPU module	Remote station		
Device	**Module name**	**Remote input (RX)**	**Signal name**
X1060	AJ65VBTCU-68DAVN	RX00	Reserved
to		to	
X106B		RX0B	
X106C		RX0C	E^2PROM write error flag
X106D		RX0D	Reserved
to		to	
X1077		RX17	
X1078		RX18	Initial data processing request flag
X1079		RX19	Initial data setting complete flag
X107A		RX1A	Error status flag
X107B		RX1B	Remote READY
X107C		RX1C	Reserved
to		to	
X10BF		RX5F	

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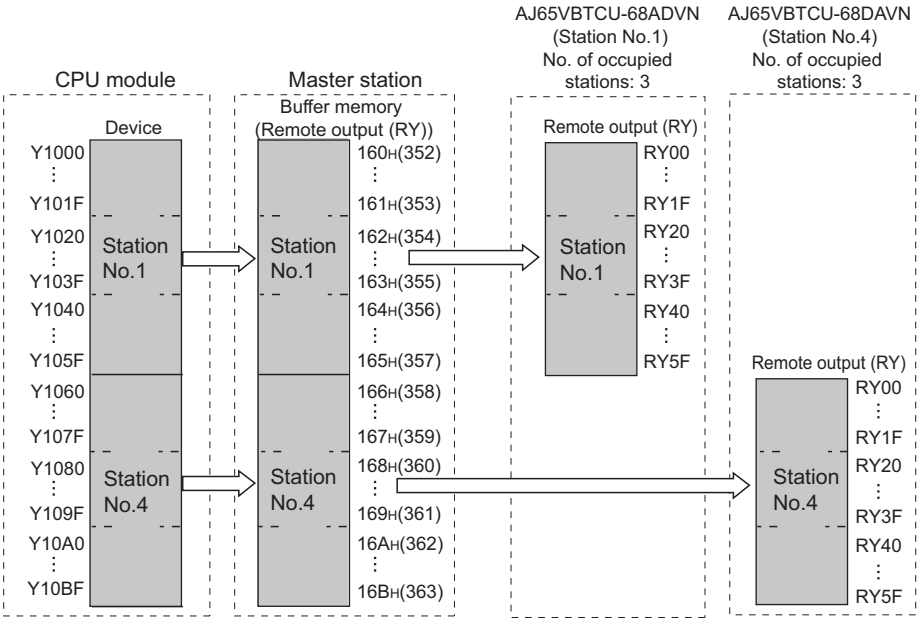
(b) Remote output (RY)

Plan the assignment using the assignment sheet on Page 407, Appendix 8.1 (1).

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)
	Hexadecimal	Decimal			
Y1000 to Y100F	160_H	352	1	AJ65VBTCU-68ADVN	RY0 to RYF
Y1010 to Y101F	161_H	353			RY10 to RY1F
Y1020 to Y102F	162_H	354	2	AJ65VBTCU-68ADVN	RY20 to RY2F
Y1030 to Y103F	163_H	355			RY30 to RY3F
Y1040 to Y104F	164_H	356	3	AJ65VBTCU-68ADVN	RY40 to RY4F
Y1050 to Y105F	165_H	357			RY50 to RY5F
Y1060 to Y106F	166_H	358	4	AJ65VBTCU-68DAVN	RY0 to RYF
Y1070 to Y107F	167_H	359			RY10 to RY1F
Y1080 to Y108F	168_H	360	5	AJ65VBTCU-68DAVN	RY20 to RY2F
Y1090 to Y109F	169_H	361			RY30 to RY3F
Y10A0 to Y10AF	$16A_H$	362	6	AJ65VBTCU-68DAVN	RY40 to RY4F
Y10B0 to Y10BF	$16B_H$	363			RY50 to RY5F

The assignment by each signal of the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN are shown below.



CPU module	Remote station		
Device	Module name	Remote output (RY)	Signal name
Y1000	AJ65VBTCU-68ADVN	RY00	Reserved
to		to	
Y1017		RY17	
Y1018		RY18	Initial data processing completion flag
Y1019		RY19	Initial data setting request flag
Y101A		RY1A	Error reset request flag

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CPU module	Remote station		
Device	Module name	Remote output (RY)	Signal name
Y101B	AJ65VBTCU-68ADVN	RY1B	Reserved
to		to	
Y105F		RY5F	
Y1060	AJ65VBTCU-68DAVN	RY00	CH.1 analog output enable/disable flag
Y1061		RY01	CH.2 analog output enable/disable flag
Y1062		RY02	CH.3 analog output enable/disable flag
Y1063		RY03	CH.4 analog output enable/disable flag
Y1064		RY04	CH.5 analog output enable/disable flag
Y1065		RY05	CH.6 analog output enable/disable flag
Y1066		RY06	CH.7 analog output enable/disable flag
Y1067		RY07	CH.8 analog output enable/disable flag
Y1068		RY08	Reserved
to		to	
Y1077		RY17	
Y1078		RY18	Initial data processing complete flag
Y1079		RY19	Initial data setting request flag
Y107A		RY1A	Error reset request flag
Y107B		RY1B	Reserved
to		to	
Y10BF		RY5F	

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(c) Remote register (RWr)

Plan the assignment using the assignment sheet on Page 408, Appendix 8.1 (2).

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote register (RWr/RWw)
	Hexadecimal	Decimal			
W0	$2E0_H$	736	1	AJ65VBTCU-68ADVN	RWr0
W1	$2E1_H$	737			RWr1
W2	$2E2_H$	738			RWr2
W3	$2E3_H$	739			RWr3
W4	$2E4_H$	740	2	AJ65VBTCU-68ADVN	RWr4
W5	$2E5_H$	741			RWr5
W6	$2E6_H$	742			RWr6
W7	$2E7_H$	743			RWr7
W8	$2E8_H$	744	3	AJ65VBTCU-68ADVN	RWr8
W9	$2E9_H$	745			RWr9
WA	$2EA_H$	746			RWrA
WB	$2EB_H$	747			RWrB
WC	$2EC_H$	748	4	AJ65VBTCU-68DAVN	RWr0
WD	$2ED_H$	749			RWr1
WE	$2EE_H$	750			RWr2
WF	$2EF_H$	751			RWr3
W10	$2F0_H$	752	5	AJ65VBTCU-68DAVN	RWr4
W11	$2F1_H$	753			RWr5
W12	$2F2_H$	754			RWr6
W13	$2F3_H$	755			RWr7
W14	$2F4_H$	756	6	AJ65VBTCU-68DAVN	RWr8
W15	$2F5_H$	757			RWr9
W16	$2F6_H$	758			RWrA
W17	$2F7_H$	759			RWrB

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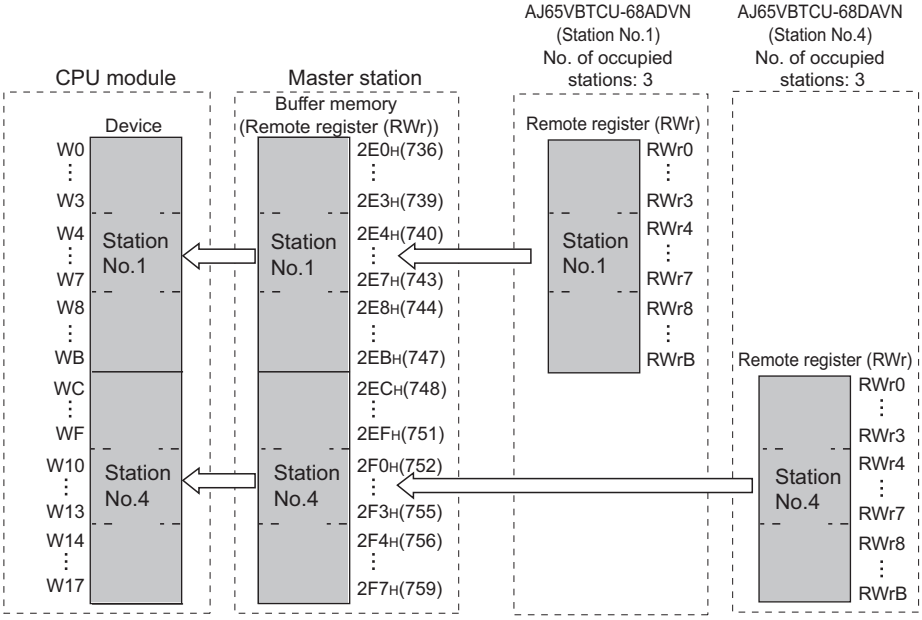
The assignment by each data of the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN are shown below.



CPU module	Remote station		
Device	**Module name**	**Remote register (RWr)**	**Data name**
W0	AJ65VBTCU-68ADVN	RWr0	CH.1 digital output value
W1		RWr1	CH.2 digital output value
W2		RWr2	CH.3 digital output value
W3		RWr3	CH.4 digital output value
W4		RWr4	CH.5 digital output value
W5		RWr5	CH.6 digital output value
W6		RWr6	CH.7 digital output value
W7		RWr7	CH.8 digital output value
W8		RWr8	Error code
W9		RWr9	Reserved
to		to	
WB		RWrB	
WC	AJ65VBTCU-68DAVN	RWr0	CH. 1 check code
WD		RWr1	CH. 2 check code
WE		RWr2	CH. 3 check code
WF		RWr3	CH. 4 check code
W10		RWr4	CH. 5 check code
W11		RWr5	CH. 6 check code
W12		RWr6	CH. 7 check code
W13		RWr7	CH. 8 check code
W14		RWr8	Error code
W15		RWr9	Reserved
to		to	
W17		RWrB	

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(d) Remote register (RWw)

Plan the assignment using the assignment sheet on Page 408, Appendix 8.1 (2).

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote register (RWr/RWw)
	Hexadecimal	Decimal			
W100	$1E0_H$	480	1	AJ65VBTCU-68ADVN	RWw0
W101	$1E1_H$	481			RWw1
W102	$1E2_H$	482			RWw2
W103	$1E3_H$	483			RWw3
W104	$1E4_H$	484	2	AJ65VBTCU-68ADVN	RWw4
W105	$1E5_H$	485			RWw5
W106	$1E6_H$	486			RWw6
W107	$1E7_H$	487			RWw7
W108	$1E8_H$	488	3	AJ65VBTCU-68ADVN	RWw8
W109	$1E9_H$	489			RWw9
W10A	$1EA_H$	490			RWwA
W10B	$1EB_H$	491			RWwB
W10C	$1EC_H$	492	4	AJ65VBTCU-68DAVN	RWw0
W10D	$1ED_H$	493			RWw1
W10E	$1EE_H$	494			RWw2
W10F	$1EF_H$	495			RWw3
W110	$1F0_H$	496	5	AJ65VBTCU-68DAVN	RWw4
W111	$1F1_H$	497			RWw5
W112	$1F2_H$	498			RWw6
W113	$1F3_H$	499			RWw7
W114	$1F4_H$	500	6	AJ65VBTCU-68DAVN	RWw8
W115	$1F5_H$	501			RWw9
W116	$1F6_H$	502			RWwA
W117	$1F7_H$	503			RWwB

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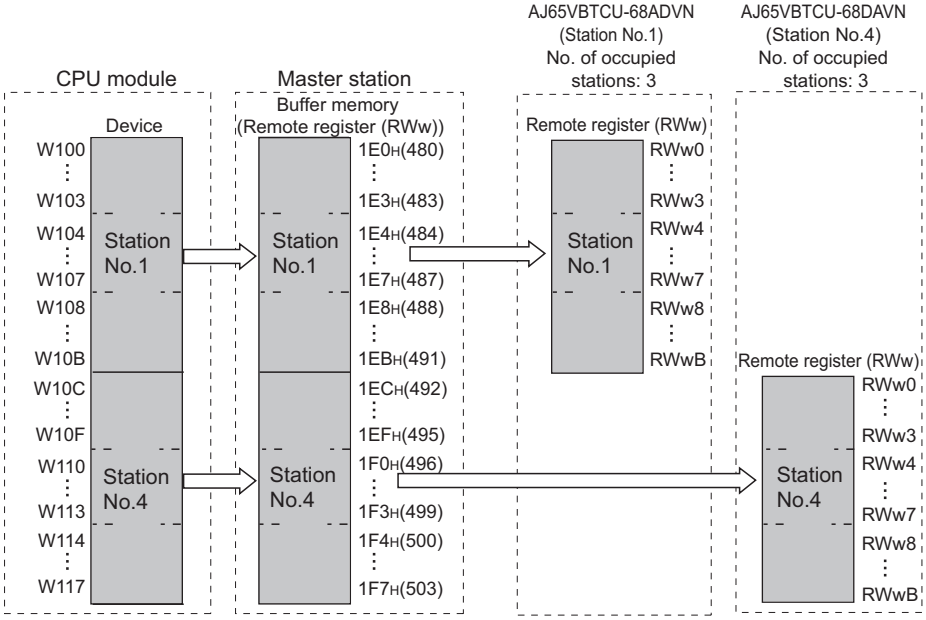
The assignment by each data of the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN are shown below.



CPU module	Remote station		
Device	**Module name**	**Remote register (RWw)**	**Data name**
W100	AJ65VBTCU-68ADVN	RWw0	A/D conversion enable/prohibit specification
W101		RWw1	CH.1 to 4 input range setting
W102		RWw2	CH.5 to 8 input range setting
W103		RWw3	Average processing specification
W104		RWw4	CH.1 average time, number of times setting
W105		RWw5	CH.2 average time, number of times setting
W106		RWw6	CH.3 average time, number of times setting
W107		RWw7	CH.4 average time, number of times setting
W108		RWw8	CH.5 average time, number of times setting
W109		RWw9	CH.6 average time, number of times setting
W10A		RWwA	CH.7 average time, number of times setting
W10B		RWwB	CH.8 average time, number of times setting
W10C	AJ65VBTCU-68DAVN	RWw0	CH. 1 digital value setting
W10D		RWw1	CH. 2 digital value setting
W10E		RWw2	CH. 3 digital value setting
W10F		RWw3	CH. 4 digital value setting
W110		RWw4	CH. 5 digital value setting
W111		RWw5	CH. 6 digital value setting
W112		RWw6	CH. 7 digital value setting
W113		RWw7	CH. 8 digital value setting
W114		RWw8	Analog output enable/disable setting
W115		RWw9	CH. 1 to 4 output range setting
W116		RWwA	CH. 5 to 8 output range setting
W117		RWwB	HOLD/CLEAR setting

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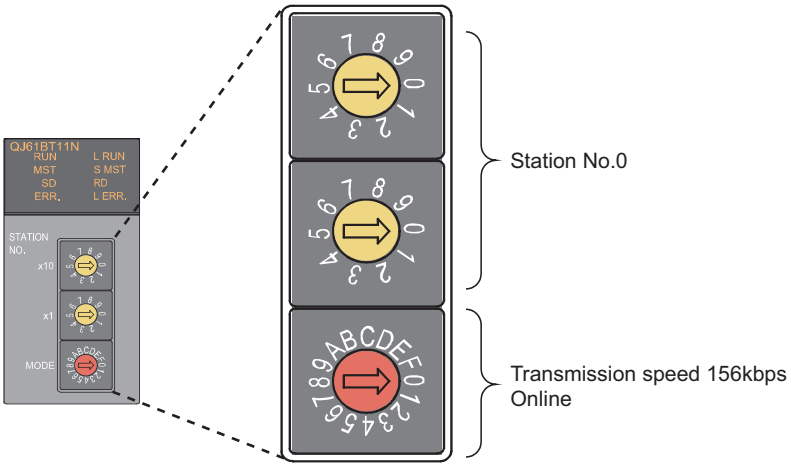
10.2.2 Settings for a master station

(1) Settings for a master/local module

Set the station number and transmission speed of the master/local module. (☞Page 21, CHAPTER 2)



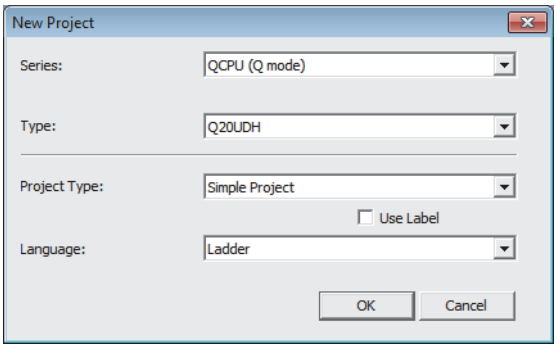
(2) Parameter settings by using a programming tool

Connect a CPU module to a programming tool to set the parameters of the master/local module. (☞Page 96, Section 7.3)

1. Create a project on a programming tool.

Select "QCPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

[Project] ⇨ [New]



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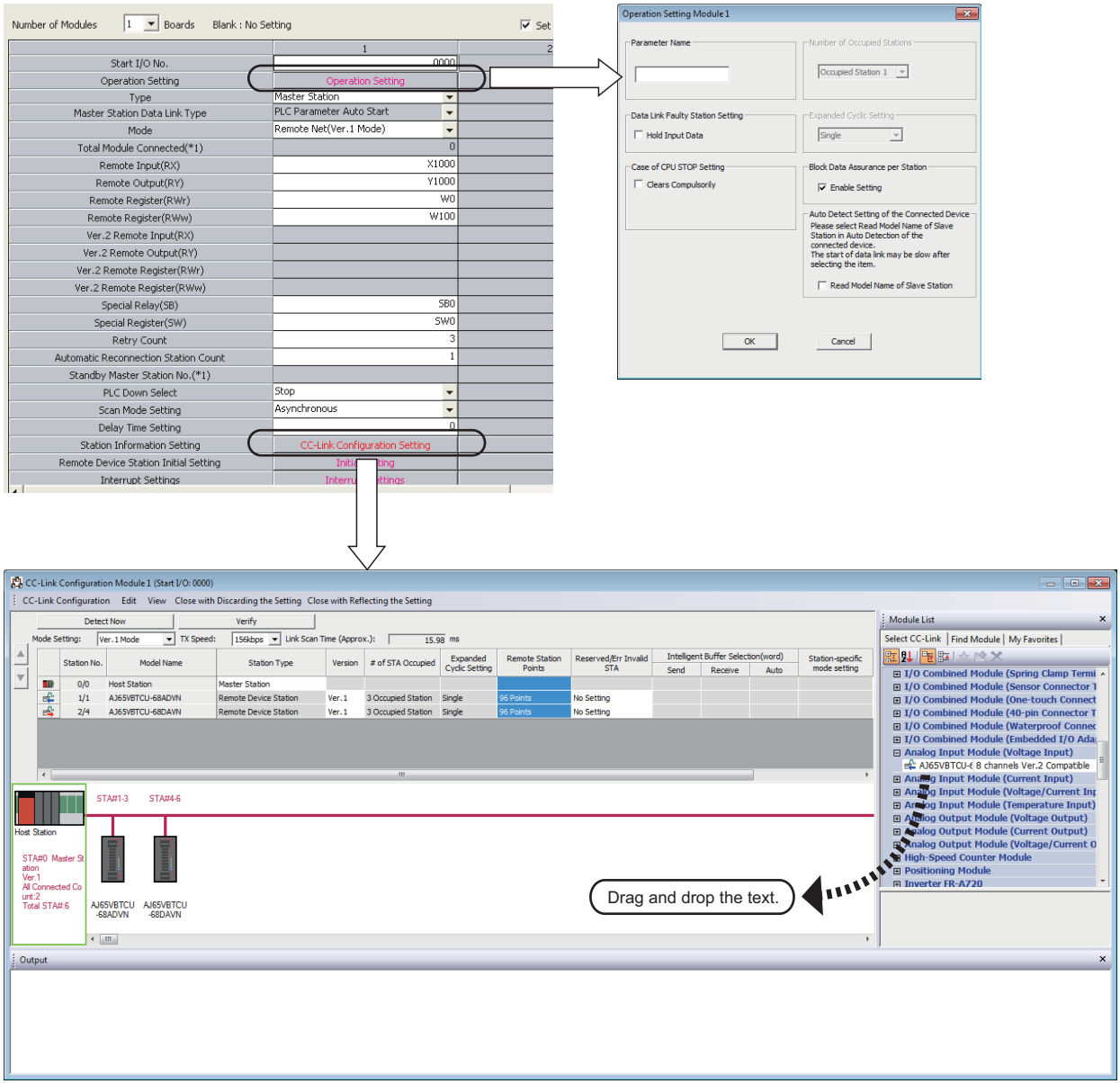
2. Open the "Network Parameter" window to configure the setting as follows.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]



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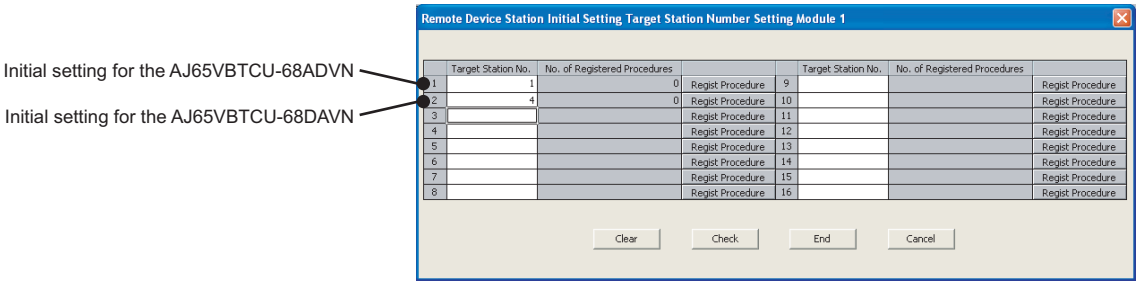
3. **Open the "Remote Device Station Initial Setting" window to configure the setting as follows.**

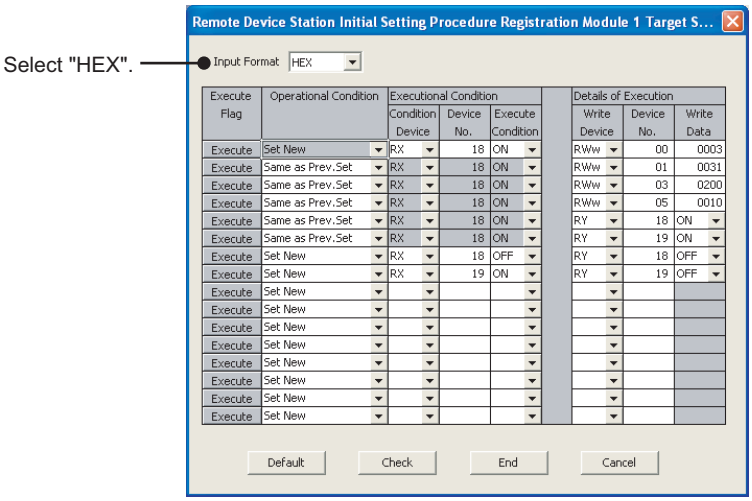
Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Initial Setting button



4. **Click the Regist Procedure button to open the "Remote Device Station Initial Setting Procedure Registration" window.**

5. **Select "HEX" in "Input Format" and enter information in other columns.**

• Initial setting for an AJ65VBTCU-68ADVN (station number 1)



Configuring the initial setting executes the following processes from the first condition.

Condition	Description
1st	The channels 1 and 2 are set to the A/D conversion enable.
2nd	An input range is set. • Channel 1: 0 to 5V • Channel 2: User range setting 1 (-10 to 10V)
3rd	Whether a sampling process or averaging process is executed is set. • Channel 1: Sampling process • Channel 2: Averaging process (count average)
4th	The average count of the channel 2 is set to 16.
5th	Initial data processing completion flag is turned on.
6th	Initial data setting request flag is turned on.
7th	Initial data processing completion flag is turned off.
8th	Initial data setting request flag is turned off.

Downloaded from Arrow.com.

• Initial setting for an AJ65VBTCU-68DAVN (station number 4)

Select "HEX".

Remote Device Station Initial Setting Procedure Registration Module 1 Target S...

Input Format HEX

Execute Flag	Operational Condition	Executional Condition			Details of Execution		
		Condition Device	Device No.	Execute Condition	Write Device	Device No.	Write Data
Execute	Set New	RX	18	ON	RWw	08	00FC
Execute	Same as Prev.Set	RX	18	ON	RWw	09	0031
Execute	Same as Prev.Set	RX	18	ON	RWw	0B	0000
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
Execute	Set New						
Execute	Set New						
Execute	Set New						
Execute	Set New						
Execute	Set New						
Execute	Set New						
Execute	Set New						
Execute	Set New						

Default Check End Cancel

Configuring the initial setting executes the following processes from the first condition.

Condition	Description
1st	The channels 1 and 2 are set to the analog output enable.
2nd	An output range is set. • Channel 1: 0 to 5V • Channel 2: User range setting 1 (-10 to 10V)
3rd	The HOLD/CLEAR setting is configured. • Channel 1: CLEAR • Channel 2: CLEAR
4th	Initial data processing completion flag is turned on.
5th	Initial data setting request flag is turned on.
6th	Initial data processing completion flag is turned off.
7th	Initial data setting request flag is turned off.

Remark

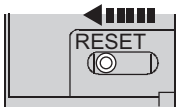
The initial setting of a remote device station can be also configured on a program. (☞ Page 252, Section 10.2.6)

6. Click the End button to terminate the setting.

7. Write the set parameters to the CPU module. Then reset the CPU module or power off and on the system.

Data link is started.

[Online] ⇨ [Write to PLC]



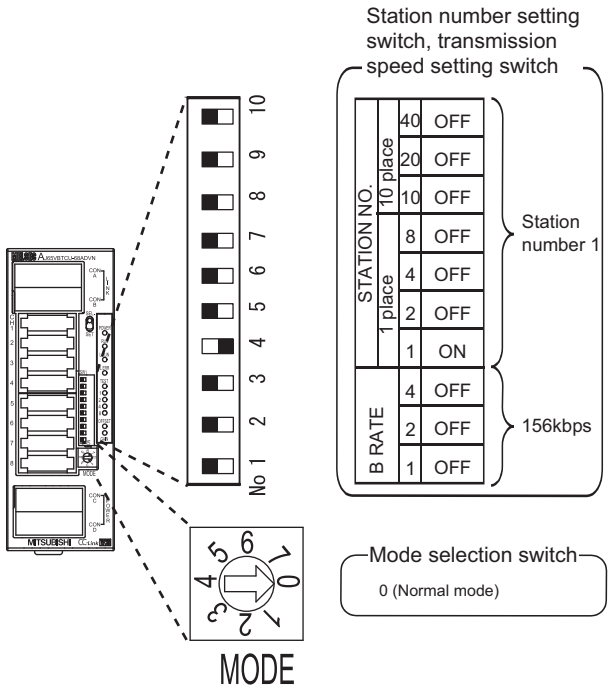
or power off → on

Downloaded from Arrow.com.

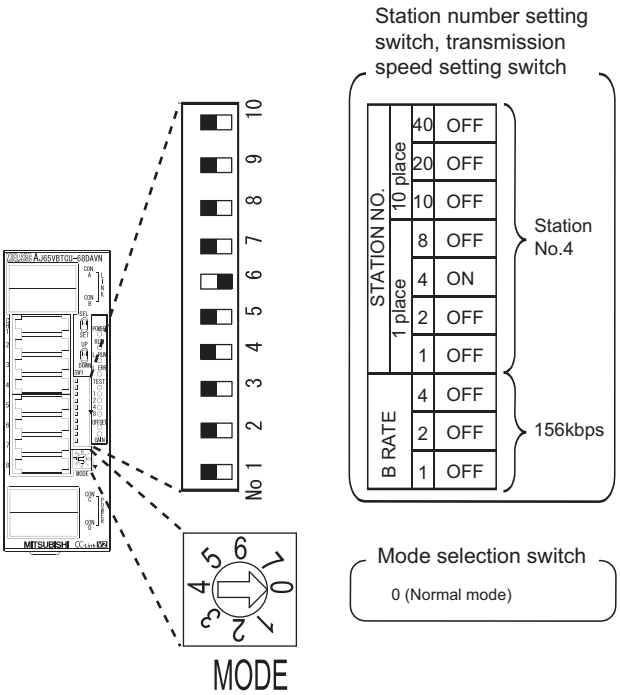
10.2.3 Settings for a remote device station

Set the station number, transmission speed, and mode using the switches on the remote device station.

(1) Switch setting on an AJ65VBTCU-68ADVN



(2) Switch setting on an AJ65VBTCU-68DAVN

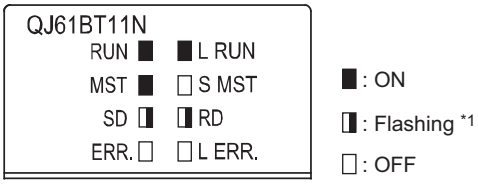


Downloaded from Arrow.com.

10.2.4 Checking the status of data link

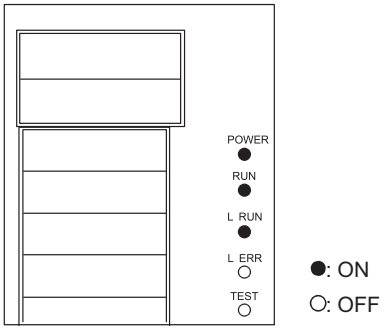
Power on the remote station, then master station to start data link.
When the LEDs are in the following states, data link is being performed normally.

(1) LEDs on the master station



*1 The LEDs may look dimly lit or off depending on the communication status.

(2) LEDs on the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN



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10.2.5 Program example

This section provides a program example. Write a program to the CPU module in a master station.

(1) Devices to be used

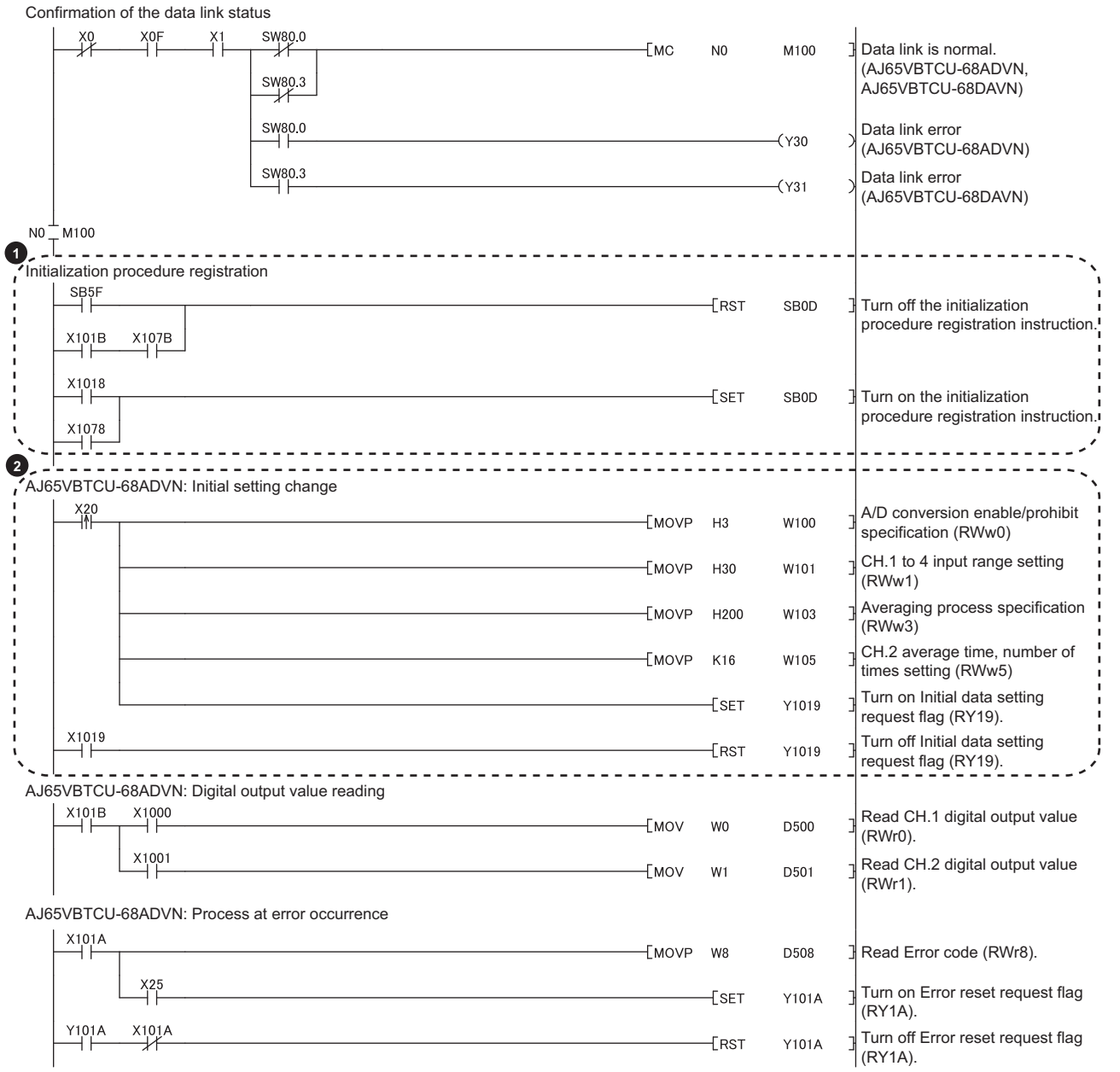
The following table lists the devices to be used in the program example.

Device	Description	Module
X0	Module error	QJ61BT11N
X1	Host data link status	
XF	Module ready	
SB000D	Remote device station initialization procedure registration instruction	
SB005F	Completion status of remote device station initialization procedure	
SW0080.0	Other station data link status (station number 1)	
SW0080.3	Other station data link status (station number 4)	
X20	Initial setting change of the AJ65VBTCU-68ADVN	QX10
X21	Initial setting change of the AJ65VBTCU-68DAVN	
X22	Digital value setting of the AJ65VBTCU-68DAVN	
X23	Analog output enable of the AJ65VBTCU-68DAVN	
X25	Error reset of the AJ65VBTCU-68ADVN	
X26	Error reset of the AJ65VBTCU-68DAVN	
Y30	Data link error flag (station number 1)	QY10
Y31	Data link error flag (station number 4)	
M100	Communication condition established flag	–
X1000 to X105F	Remote input (RX0 to RX5F)	AJ65VBTCU-68ADVN (☞ Page 233, Section 10.2.1 (2))
Y1000 to Y105F	Remote output (RY0 to RY5F)	
W0 to WB	Remote register (RWr0 to RWrB)	
W100 to W10B	Remote register (RWw0 to RWwB)	
D500 to D501	CH.1 digital output value, CH.2 digital output value	
D508	Error code	
X1060 to X10BF	Remote input (RX0 to RX5F)	AJ65VBTCU-68DAVN (☞ Page 233, Section 10.2.1 (2))
Y1060 to Y10BF	Remote output (RY0 to RY5F)	
WC to W17	Remote register (RWr0 to RWrB)	
W10C to W117	Remote register (RWw0 to RWwB)	
D510 to D511	CH.1 check code, CH.2 check code	
D518	Error code	

Downloaded from Arrow.com.

(2) Program example

1. Create the following program on a programming tool.



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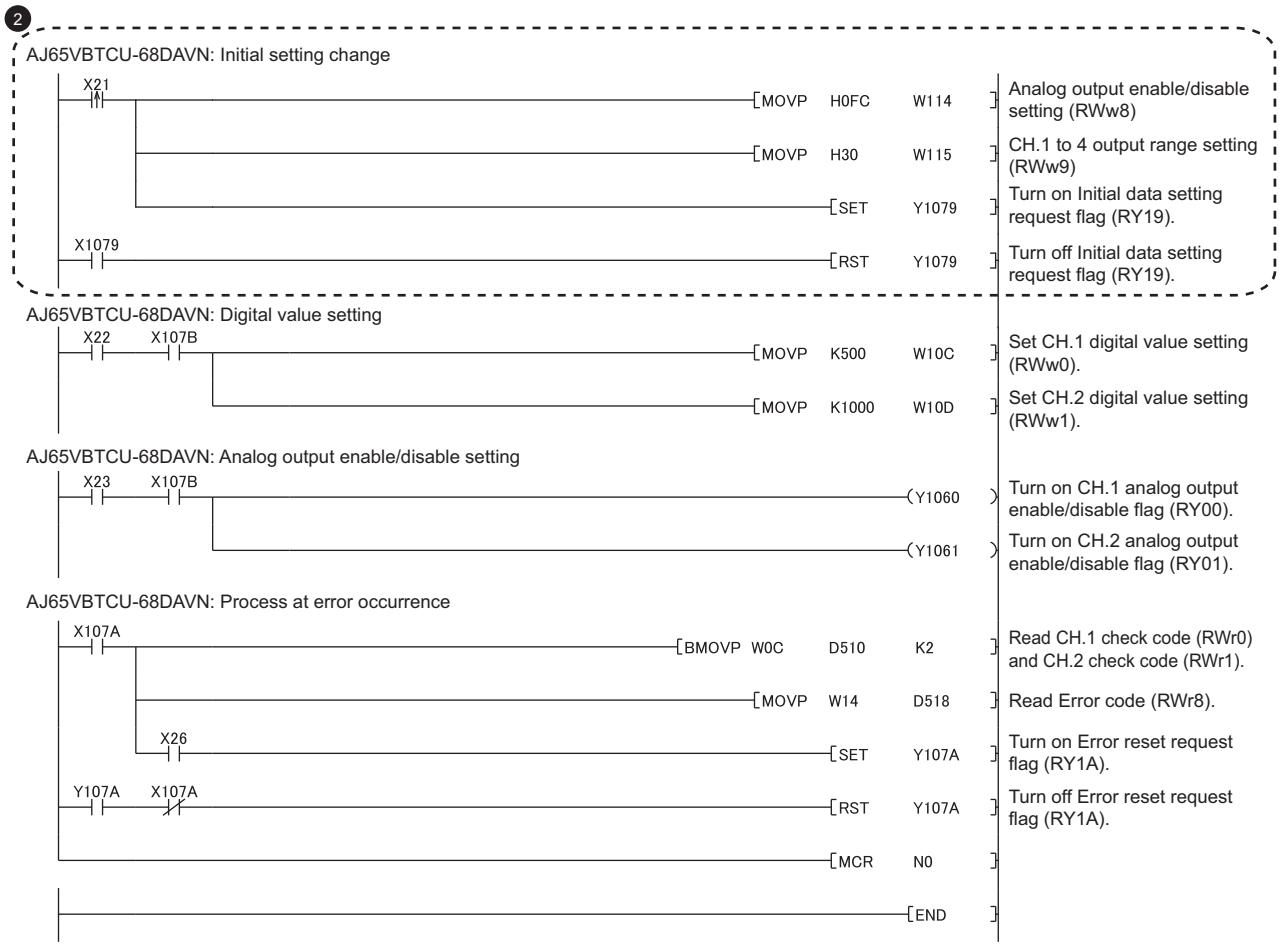
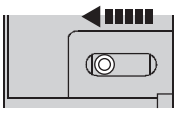


When creating the program ❶ , refer to the manual for the remote device station used and change the program as needed.

The program ❷ is needed only for the initial setting change.

2. Write the program to the CPU module in the master station. Then reset the CPU module or power off and on the system.

[Online] ⇨ [Write to PLC]

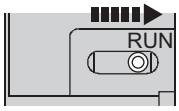


or power off → on

Downloaded from Arrow.com.

3. Set the switch on the CPU module in the master station to RUN to execute the program.

Executing the program turns on Remote device station initialization procedure registration instruction (SB000D). Then the initial setting is executed.



When the initial setting is completed, the input value of the AJ65VBTCU-68ADVN is converted into a digital value. CH.1 digital output value is stored into D500, and CH.2 digital output value is stored into D501.

If an error occurs in the AJ65VBTCU-68ADVN, an error code is stored into D508. After the cause of the error is removed and X25 is turned on, the error is reset.

4. Turning on X22 sets the digital value of the AJ65VBTCU-68DAVN.

5. Turning on X23 outputs the analog value from the AJ65VBTCU-68DAVN.

If an error occurs in the AJ65VBTCU-68DAVN, an error code is stored into D518. After the cause of the error is removed and X26 is turned on, the error is reset.

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10.2.6 Program example (when the initial setting is configured only on a program)

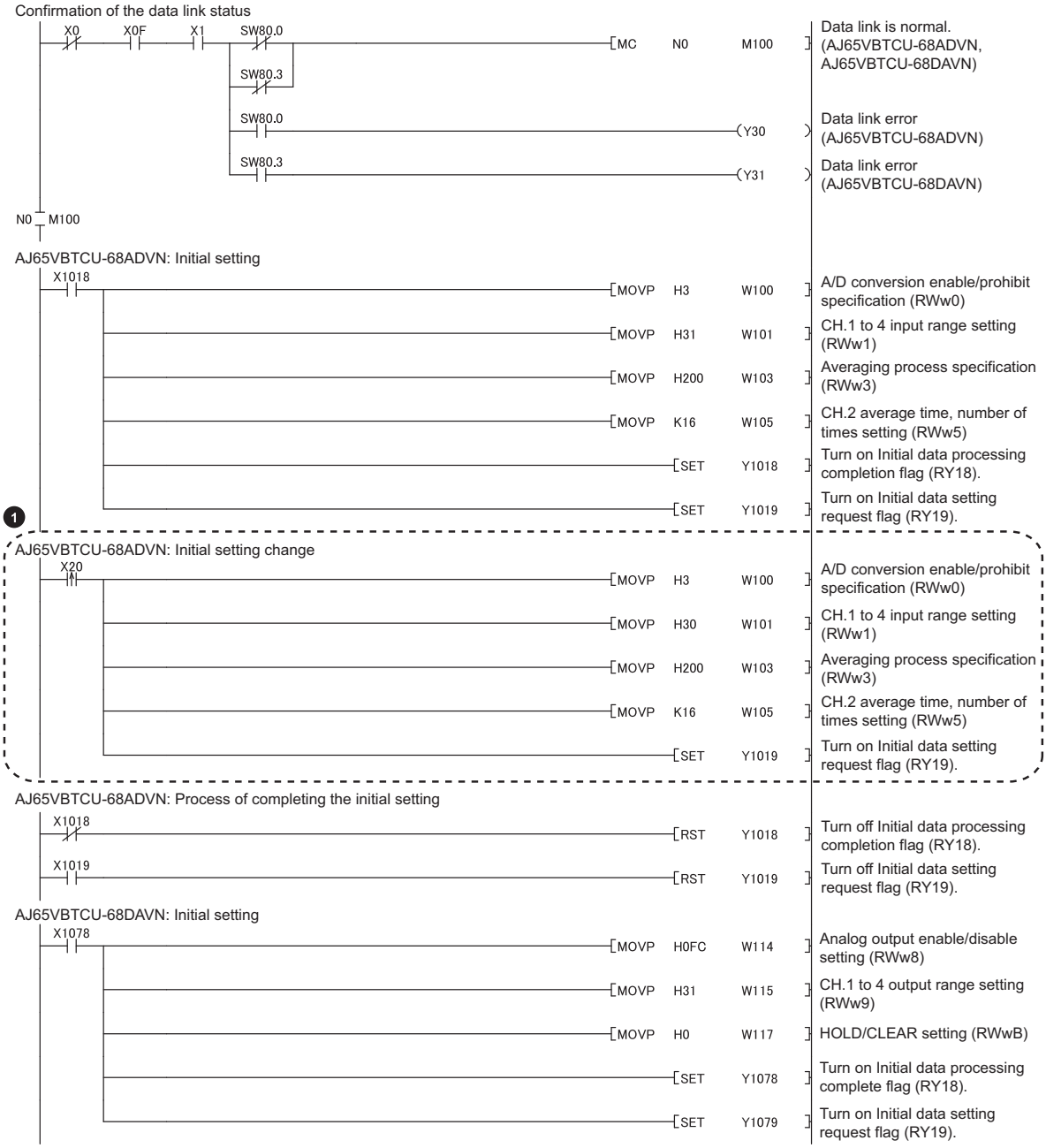
This section provides an example of when the initial setting is configured only on a program, not on a programming tool.

(1) Devices to be used

Devices are the same as those when the initial setting is configured on a programming tool. (☞Page 248, Section 10.2.5 (1))

(2) Program example

1. Create the following program on a programming tool.



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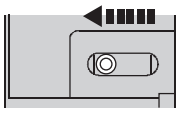
```
❶
AJ65VBTCU-68DAVN: Initial setting change
X21 ──┤├──[MOVP  H0FC   W114 ]  Analog output enable/disable setting (RWw8)
      ├──[MOVP  H30    W115 ]  CH.1 to 4 output range setting (RWw9)
      └──[SET   Y1079 ]  Turn on Initial data setting request flag (RY19).

AJ65VBTCU-68DAVN: Process of completing the initial setting
X1078 ──┤/├──[RST  Y1078 ]  Turn off Initial data processing complete flag (RY18).
X1079 ──┤├──[RST  Y1079 ]  Turn off Initial data setting request flag (RY19).

AJ65VBTCU-68ADVN: Digital output value reading
X101B ──┤├──┬──┤├──[MOV  W0   D500 ]  Read CH.1 digital output value (RWr0).
X1000 ────┤├──┘
          X1001 ──┤├──[MOV  W1   D501 ]  Read CH.2 digital output value (RWr1).

AJ65VBTCU-68ADVN: Process at error occurrence
X101A ──┤├──┬──[MOVP  W8   D508 ]  Read Error code (RWr8).
          X25 ──┤├──[SET  Y101A ]  Turn on Error reset request flag (RY1A).
Y101A ──┤├──┬──┤/├──[RST  Y101A ]  Turn off Error reset request flag (RY1A).
X101A ────┘

AJ65VBTCU-68DAVN: Digital value setting
X22 ──┤├──┬──┤├──[MOVP  K500   W10C ]  Set CH.1 digital value setting (RWw0).
X107B ────┘
          └──[MOVP  K1000  W10D ]  Set CH.2 digital value setting (RWw1).

AJ65VBTCU-68DAVN: Analog output enable/disable setting
X23 ──┤├──┬──┤├──(Y1060 )  Turn on CH.1 analog output enable/disable flag (RY00).
X107B ────┘
          └──(Y1061 )  Turn on CH.2 analog output enable/disable flag (RY01).

AJ65VBTCU-68DAVN: Process at error occurrence
X107A ──┤├──┬──[BMOVP W0C  D510  K2 ]  Read CH.1 check code (RWr0) and CH.2 check code (RWr1).
             ├──[MOVP  W14  D518 ]  Read Error code (RWr8).
             X26 ──┤├──[SET  Y107A ]  Turn on Error reset request flag (RY1A).
Y107A ──┤├──┬──┤/├──[RST  Y107A ]  Turn off Error reset request flag (RY1A).
X107A ────┘
             └──[MCR  N0 ]

             └──[END ]
```

The program ❶ is needed only for the initial setting change.

2. Write the program to the CPU module in the master station. Then reset the CPU module or power off and on the system.

[Online] ⇨ [Write to PLC]



or power off → on

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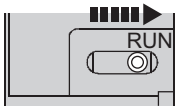
3. Set the switch on the CPU module in the master station to RUN to execute the program.

Executing the program turns on Initial data processing request flag (RX18) of the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN. Then the initial setting is executed.



When the initial setting is completed, the input value of the AJ65VBTCU-68ADVN is converted into a digital value. CH.1 digital output value is stored into D500, and CH.2 digital output value is stored into D501.

If an error occurs in the AJ65VBTCU-68ADVN, an error code is stored into D508. After the cause of the error is removed and X25 is turned on, the error is reset.

4. Turning on X22 sets the digital value of the AJ65VBTCU-68DAVN.

5. Turning on X23 outputs the analog value from the AJ65VBTCU-68DAVN.

If an error occurs in the AJ65VBTCU-68DAVN, an error code is stored into D518. After the cause of the error is removed and X26 is turned on, the error is reset.

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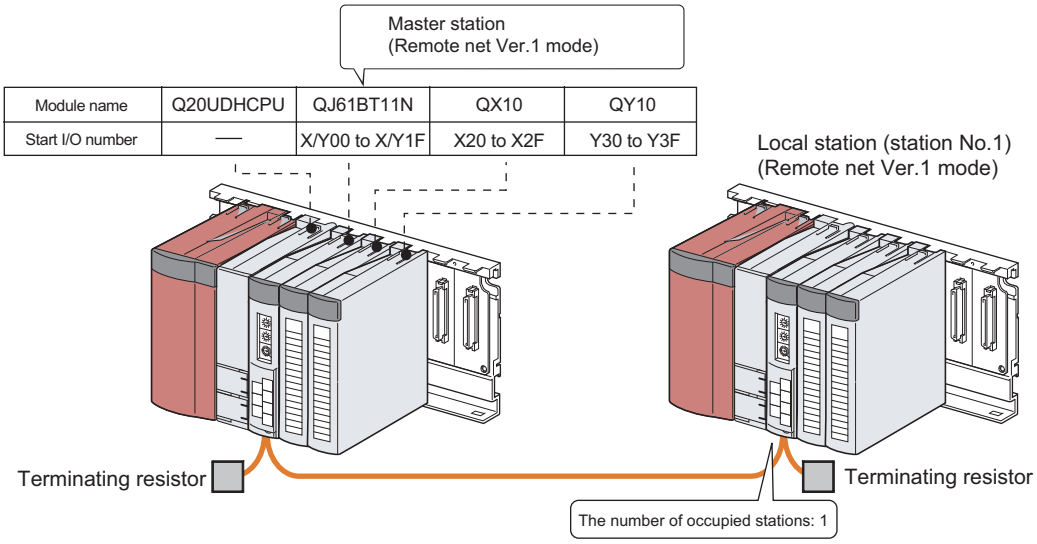
10.3 Example of Communications Between a Master Station and a Local Station

This section provides an example of data link between a master station and a local station.

10.3.1 System configuration

(1) System configuration

The following system is used for explanation purpose. The same system is used for the master station and local station.



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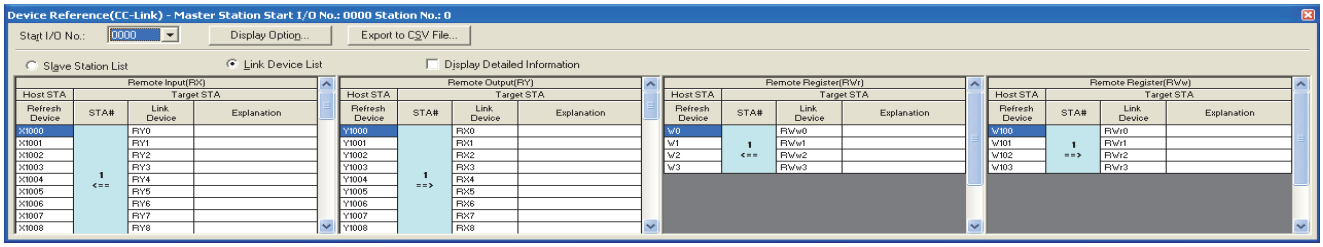
(2) Assignment of the remote I/O (RX, RY) and remote register (RWr, RWw)

In the program example, the following assignment is used to perform data link.

Point

The status of a device assignment can be checked on GX Works2 by setting information of a slave station on the CC-Link configuration window on GX Works2. (☞ Page 102, Section 7.3.2 (2) (a))

[View] ⇨ [Docking Window] ⇨ [Device Reference]



Remark

- When a master/local module is in the remote net Ver.2 mode or remote net additional mode
  In the system configuration of the program example, the assignment is the same as that in the remote net Ver.1 mode, except for buffer memory addresses of data storage locations. (☞ Page 48, Section 3.6.4, Page 51, Section 3.6.5)

(a) Remote I/O (RX/RY)

Plan the assignment using the assignment sheet on Page 407, Appendix 8.1 (1).

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)
	Hexadecimal	Decimal			
X1000 to X100F	$E0_H$	224	1	QJ61BT11N	RY0 to RYF
X1010 to X101D	$E1_H$	225			RY10 to RY1D

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)
	Hexadecimal	Decimal			
Y1000 to Y100F	160_H	352	1	QJ61BT11N	RX0 to RXF
Y1010 to Y101D	161_H	353			RX10 to RX1D

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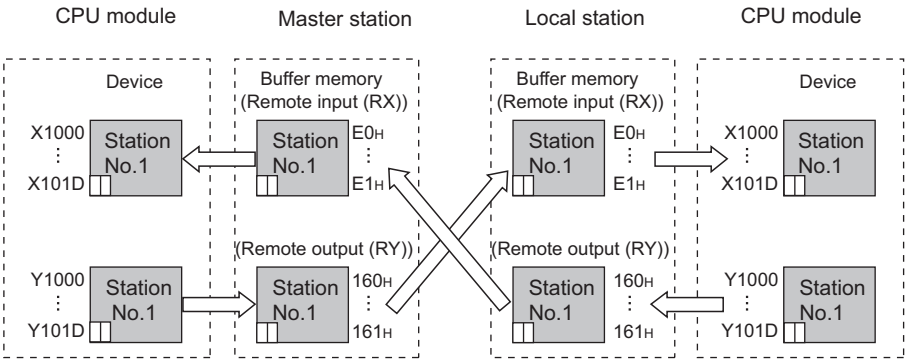


Point

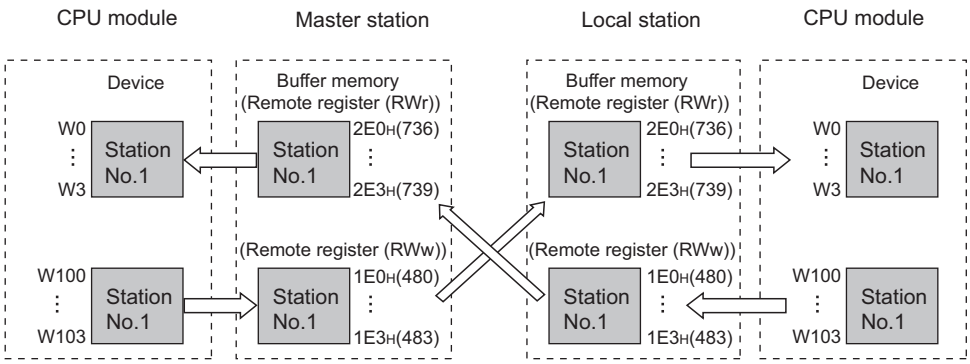
The last two bits in RX and RY cannot be used for communications between a master station and a local station.

(b) Remote register (RWr/RWw)

Plan the assignment using the assignment sheet on Page 408, Appendix 8.1 (2).

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote register (RWr/RWw)
	Hexadecimal	Decimal			
W0	$2E0_H$	736	1	QJ61BT11N	RWw0
W1	$2E1_H$	737			RWw1
W2	$2E2_H$	738			RWw2
W3	$2E3_H$	739			RWw3

CPU module	Master station		Slave station		
Device	Buffer memory address		Station number	Module name	Remote register (RWr/RWw)
	Hexadecimal	Decimal			
W100	$1E0_H$	480	1	QJ61BT11N	RWr0
W101	$1E1_H$	481			RWr1
W102	$1E2_H$	482			RWr2
W103	$1E3_H$	483			RWr3



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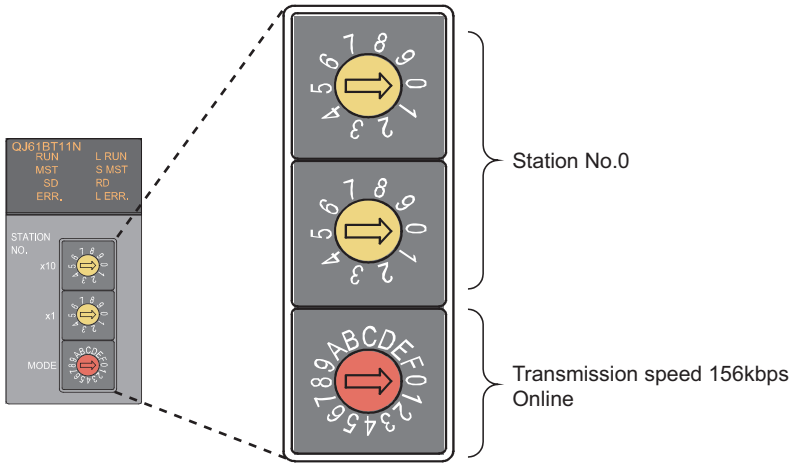
10.3.2 Settings for a master station

(1) Settings for a master/local module

Set the station number and transmission speed of the master/local module. (☞Page 21, CHAPTER 2)



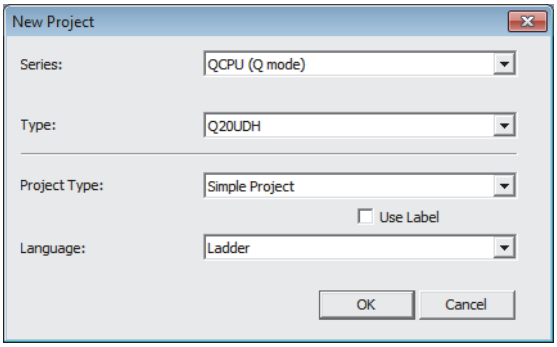
(2) Parameter settings by using a programming tool

Connect a CPU module to a programming tool to set the parameters of the master/local module. (☞Page 96, Section 7.3)

1. Create a project on a programming tool.

Select "QCPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

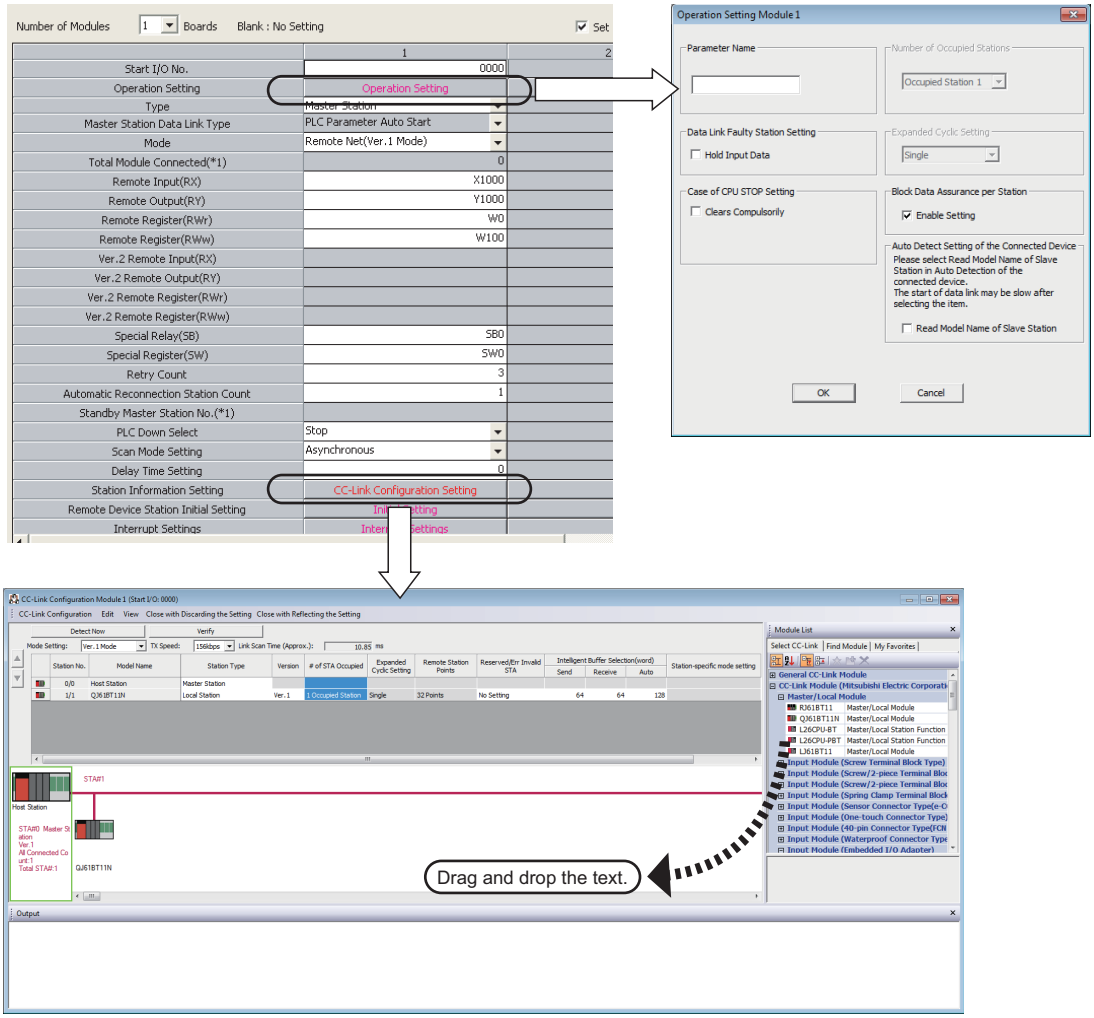
[Project] ⇨ [New]



Downloaded from Arrow.com.

2. Open the "Network Parameter" window to configure the setting as follows.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]

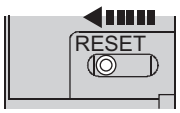


3. Click the End button to terminate the setting.

4. Write the set parameters to the CPU module. Then reset the CPU module or power off and on the system.

Data link is started.

[Online] ⇨ [Write to PLC]



or power off → on

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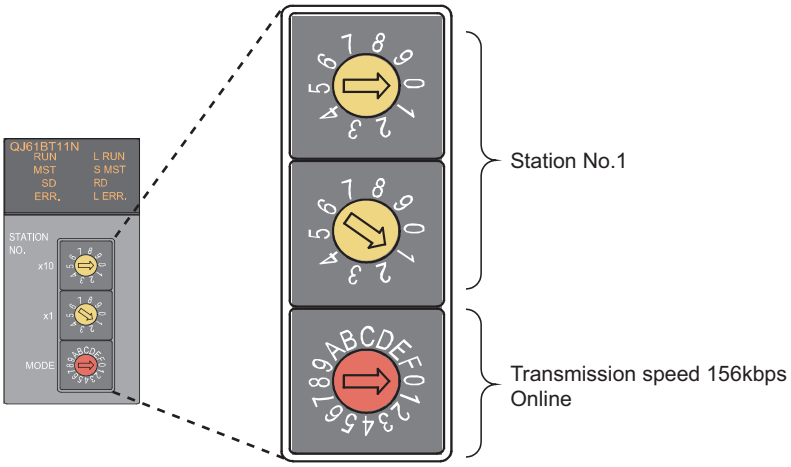
10.3.3 Settings for a local station

(1) Settings for a master/local module

Set the station number and transmission speed of the master/local module. (☞Page 21, CHAPTER 2)



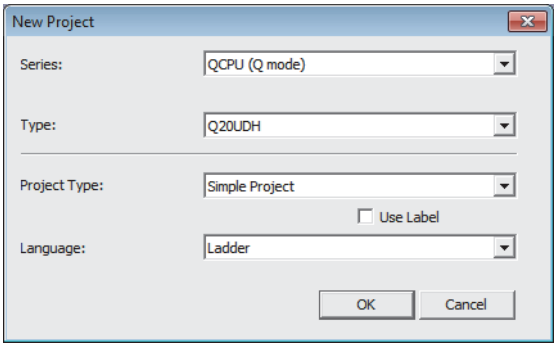
(2) Parameter settings by using a programming tool

Connect a CPU module to a programming tool to set the parameters of the master/local module. (☞Page 96, Section 7.3)

1. Create a project on a programming tool.

Select "QCPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

[Project] ⇨ [New]



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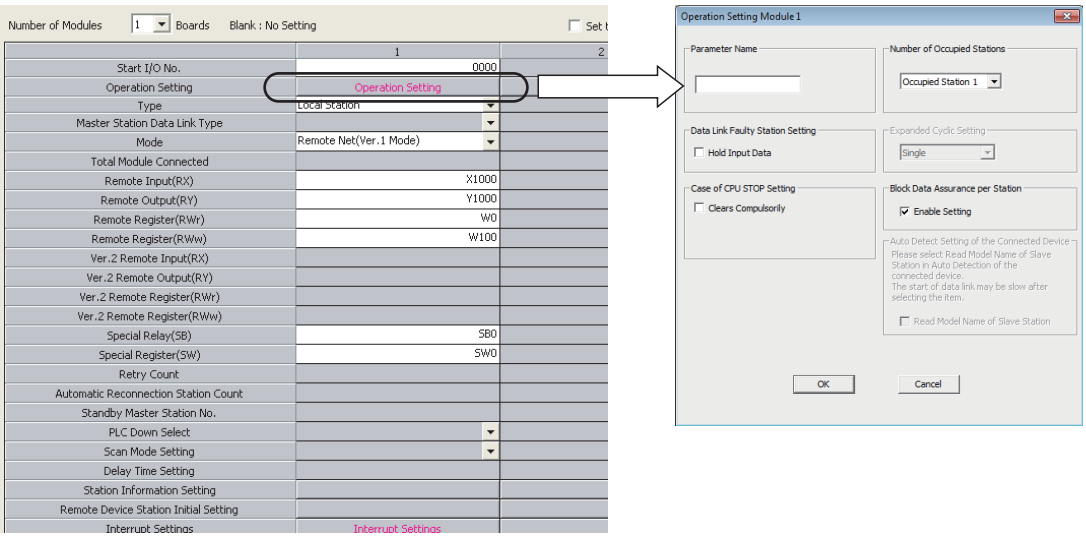
2. Open the "Network Parameter" window to configure the setting as follows.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]

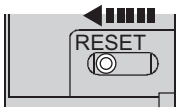


3. Click the End button to terminate the setting.

4. Write the parameters to the CPU module. Then reset the CPU module or power off and on the system.

Data link is started.

[Online] ⇨ [Write to PLC]



or power off → on

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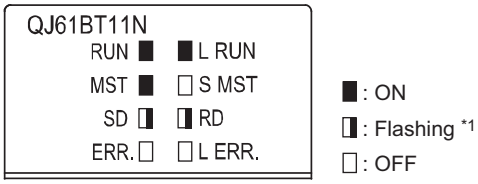
10.3.4 Checking the status of data link

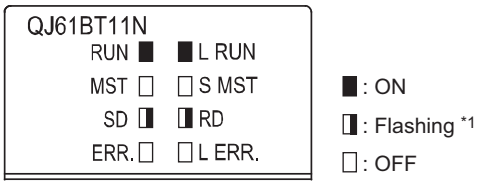
Power on the local station, then master station to start data link.
When the LEDs are in the following states, data link is being performed normally.

(1) LEDs on the master station



*1 The LEDs may look dimly lit or off depending on the communication status.

(2) LEDs on the local station



*1 The LEDs may look dimly lit or off depending on the communication status.

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10.3.5 Program example

This section provides a program example.

(1) Devices to be used

The following table lists the devices to be used in the program example.

(a) Devices in the master station

Device	Description	Module
X0	Module error	QJ61BT11N (master station)
X1	Host data link status	
XF	Module ready	
SW0080.0	Other station data link status (station number 1)	
X20	Data send to the local station flag	QX10
Y31	Output from RY1 in the local station	QY10
Y3F	Data link error flag (station number 1)	
M100	Communication condition established flag	–
X1000 to X101D	Remote input (RX0 to RX1D)	QJ61BT11N (local station) (☞ Page 256, Section 10.3.1 (2))
Y1000 to Y101D	Remote output (RY0 to RY1D)	
W0 to W3	Remote register (RWr0 to RWr3)	
W100 to W103	Remote register (RWw0 to RWw3)	

(b) Devices in the local station

Device	Description	Module
X0	Module error	QJ61BT11N (local station)
X1	Host data link status	
XF	Module ready	
X21	Data send to the master station flag	QX10
Y30	Output from RY0 in the master station	QY10
M100	Communication condition established flag	–
X1000 to X101D	Remote input (RX0 to RX1D)	QJ61BT11N (master station) (☞ Page 256, Section 10.3.1 (2))
Y1000 to Y101D	Remote output (RY0 to RY1D)	
W0 to W3	Remote register (RWr0 to RWr3)	
W100 to W103	Remote register (RWw0 to RWw3)	

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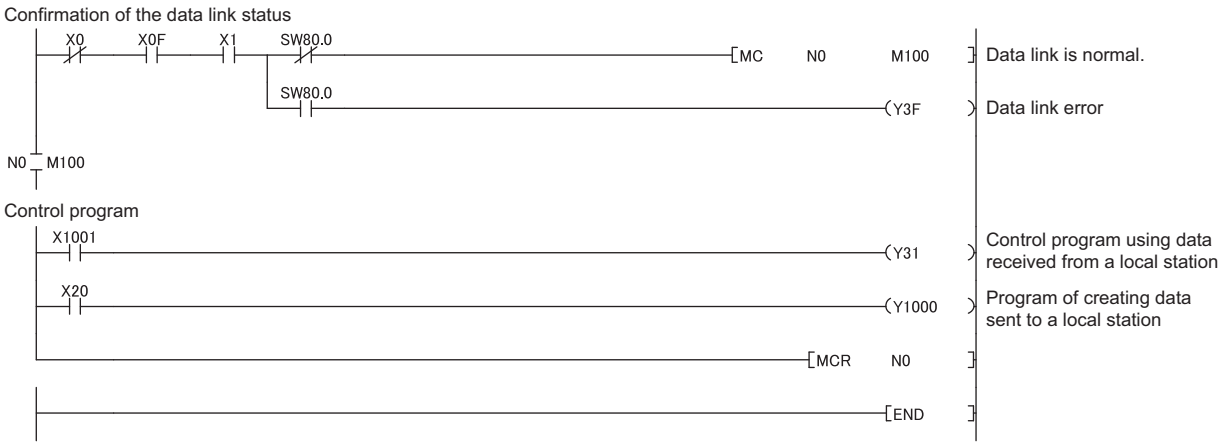
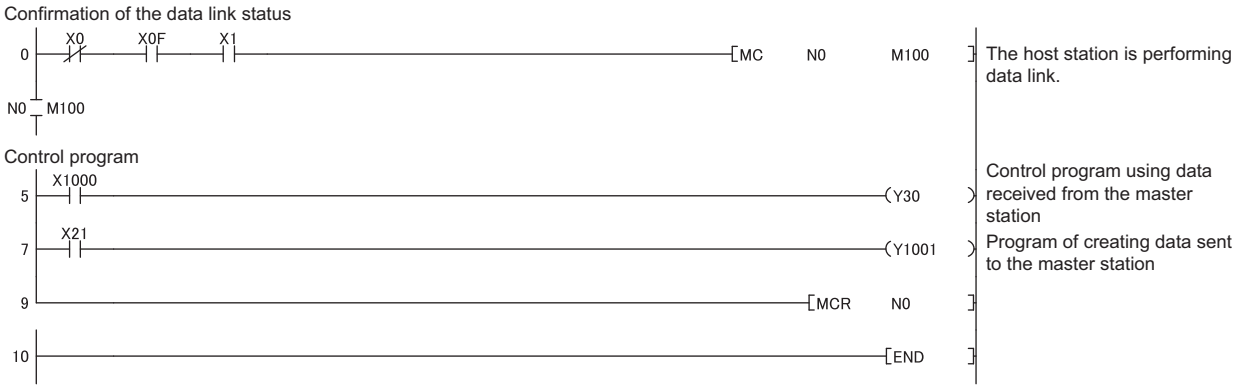
(2) Program example

1. Create the following program on a programming tool.

• Program for the master station



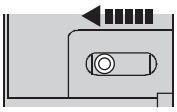
• Program for the local station



2. Write the program to the CPU module. Then reset the CPU module or power off and on the system.

Write the program created for the master station to the CPU module in the master station.
Write the program created for the local station to the CPU module in the local station.

[Online] ⇨ [Write to PLC]



or power off → on

3. Set the switches on the CPU modules in the master station and local station to RUN to execute the programs.

4. Turning on X20 in the master station turns on X1000 in the local station.

When X1000 in the local station turns on, Y30 in the local station turns on.

5. Turning on X21 in the local station turns on X1001 in the master station.

When X1001 in the master station turns on, Y31 in the master station turns on.

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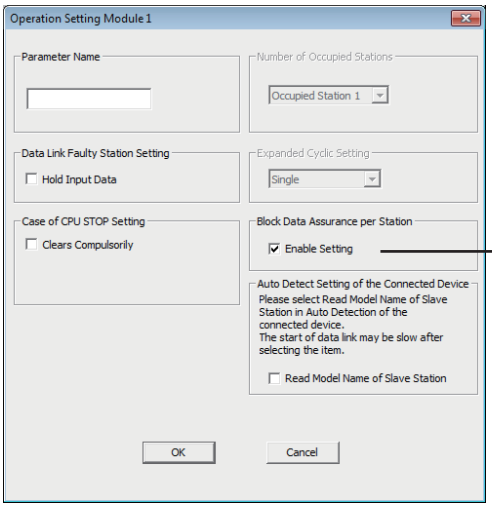
10.3.6 Program example (to assure the integrity of cyclic data in each slave station)

One of the following actions assures the integrity of cyclic data in each slave station.
Note that data integrity is not assured across slave stations.

(1) Using a programming tool

On the "Operation Setting" window, check the checkbox in "Block Data Assurance per Station".

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link] ⇨ Operation Setting button



Check the checkbox.

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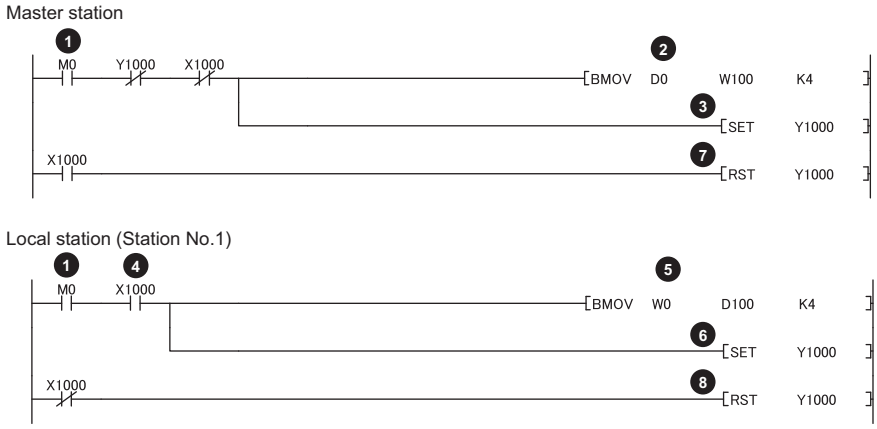
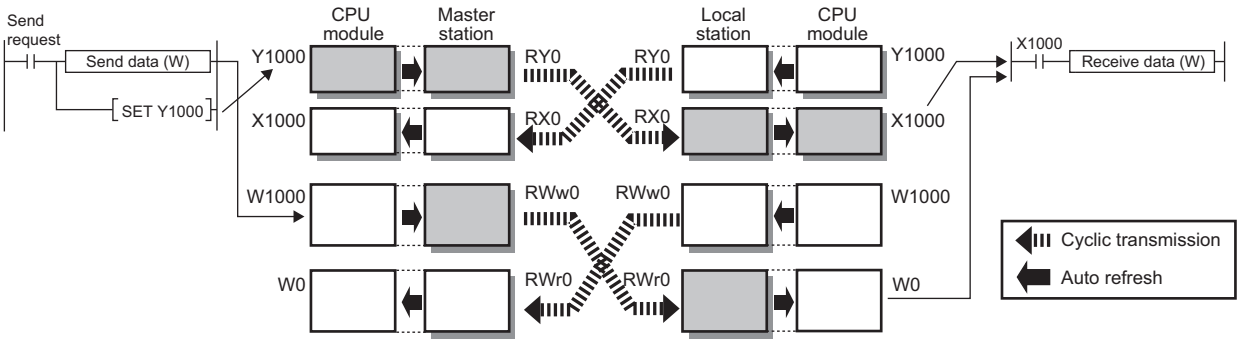
(2) Using a program

Set an interlock in the remote I/O (RX/RY).





❶ Turn on Send request (M0) in the master station. Turn on Receive request (M0) in the local station.

❷ Information in D0 to D3 is transferred to W100 to W103 (RWw0 to RWw3).

❸ After the information is stored in W100 to W103, turn on Y1000 for a handshake in the master station.*1

❹ Data in RWw is sent before data in RY is sent by cyclic transmission. Then X1000 in the local station turns on.

❺ Information in W0 to W3 is stored into D100 to D103.

❻ After the information is stored in D100 to D103, turn on Y1000 for a handshake in the local station.*1

❼ Turning on Y1000 in the local station turns off Y1000 in the master station.

❽ Turning off Y1000 in the master station turns off Y1000 in the local station.

*1 If a handshake is performed in one bit of the remote I/O (RX/RY) in a station with the number of occupied stations of two or more, the integrity of cyclic data is assured per slave station. An interlock for the number of occupied stations (in units of four words) is not required.

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CHAPTER 11 TROUBLESHOOTING

This chapter describes details on errors that might occur when the master/local module is used and the troubleshooting.

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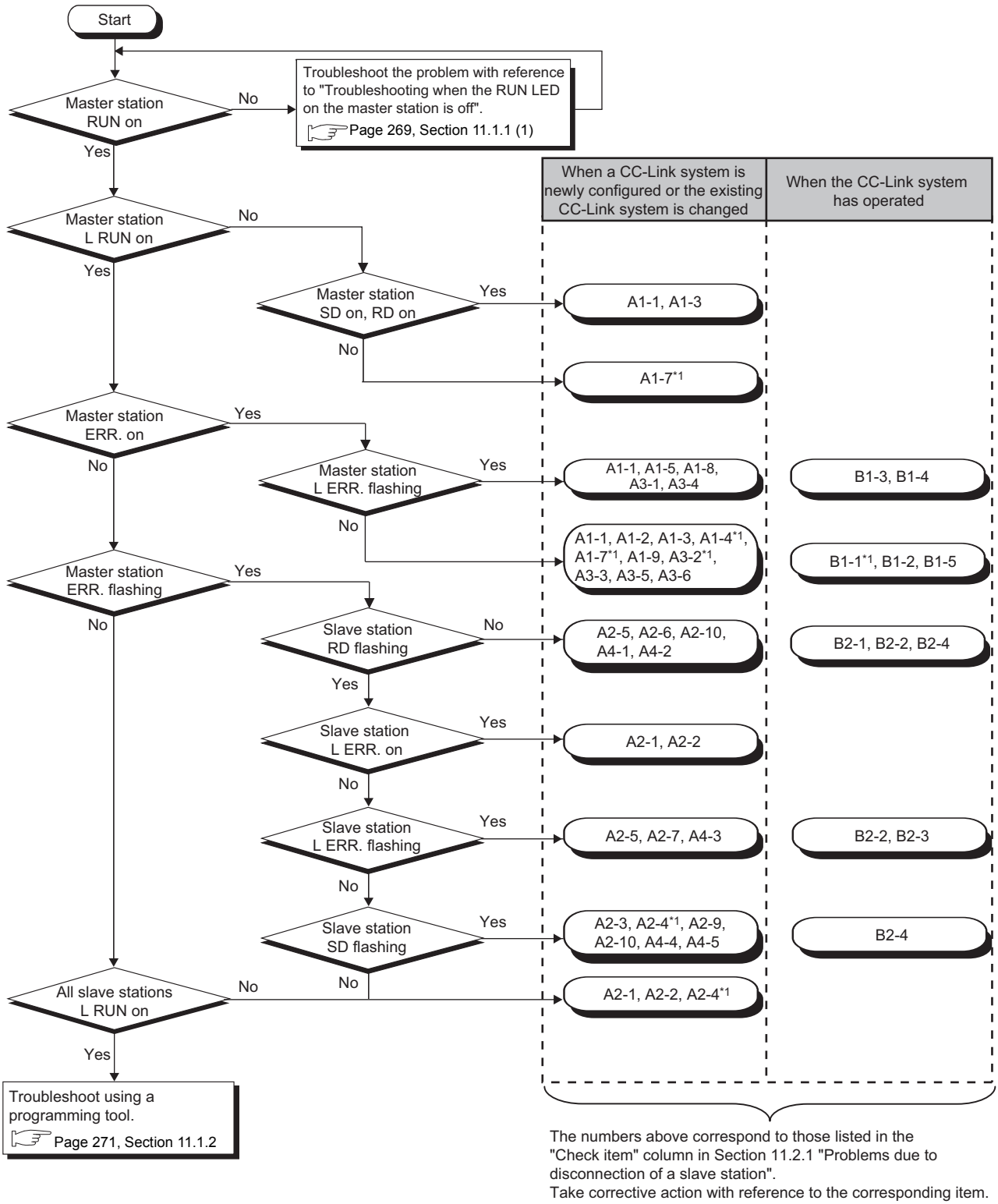
11.1 Troubleshooting Flowcharts

11.1.1 Troubleshooting using LEDs



*1 To check error details, a programming tool is required.

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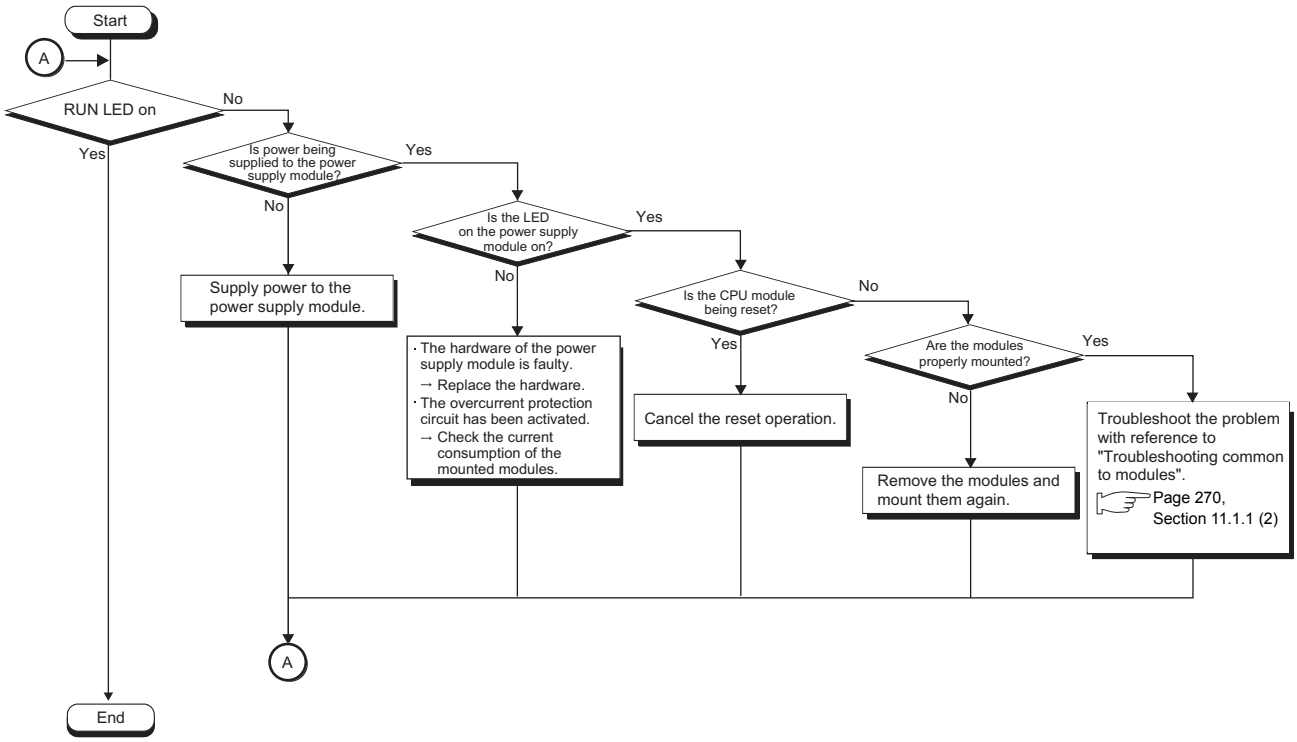
(1) Troubleshooting when the RUN LED on the master station is off



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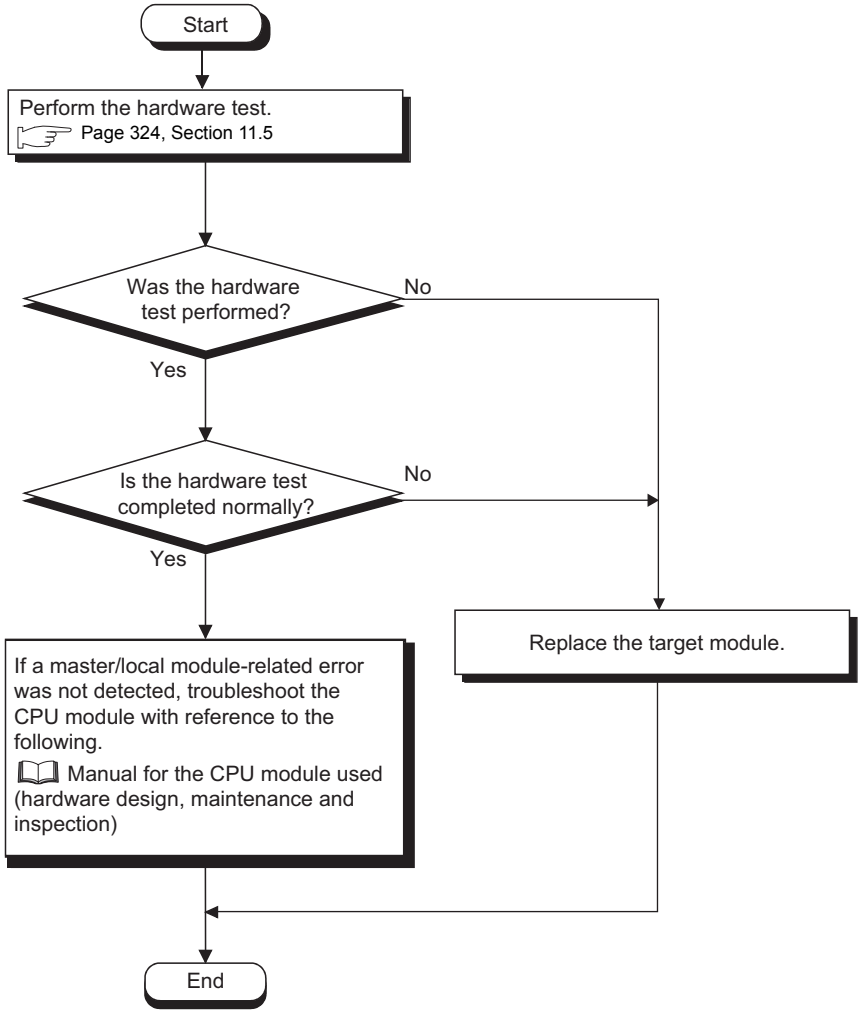
(2) Troubleshooting common to modules



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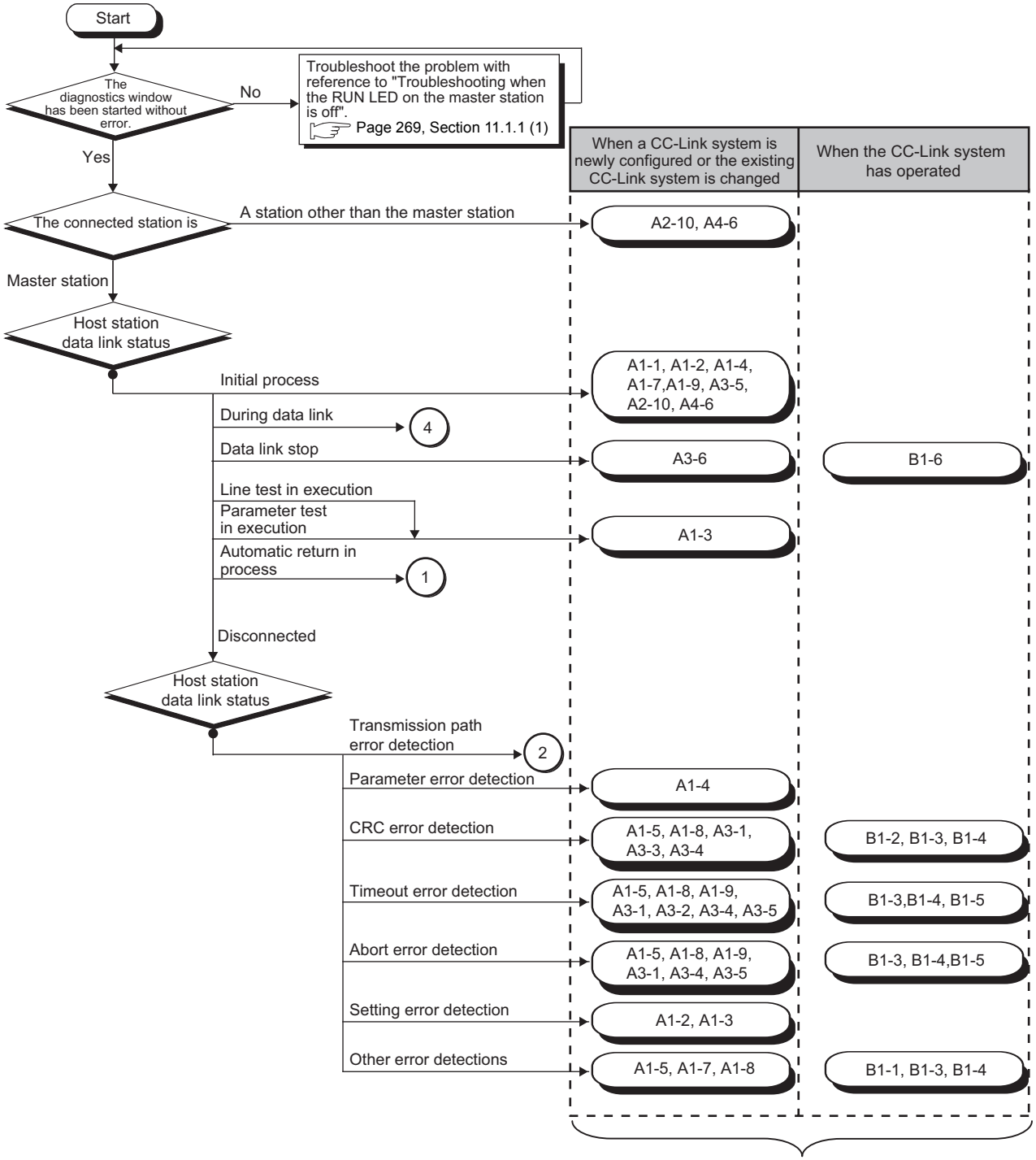
11.1.2 Troubleshooting using a programming tool

(1) Troubleshooting by the CC-Link diagnostics

Connect a programming tool to the master station and execute the CC-Link diagnostics.



The numbers above correspond to those listed in the "Check item" column in Section 11.2.1 "Problems due to disconnection of a slave station".
Take corrective action with reference to the corresponding item.

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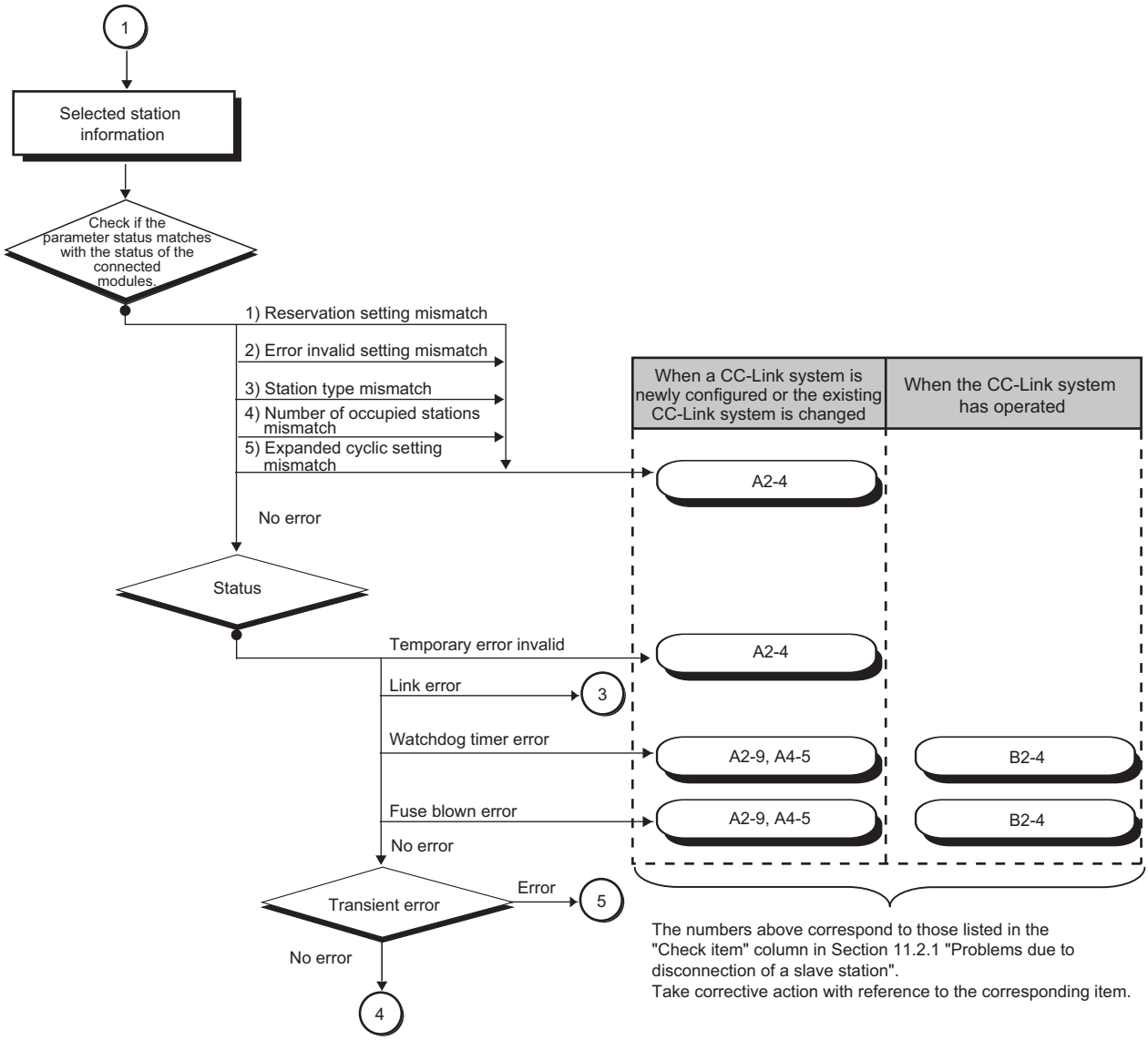

*1 To check error details, a programming tool is required.

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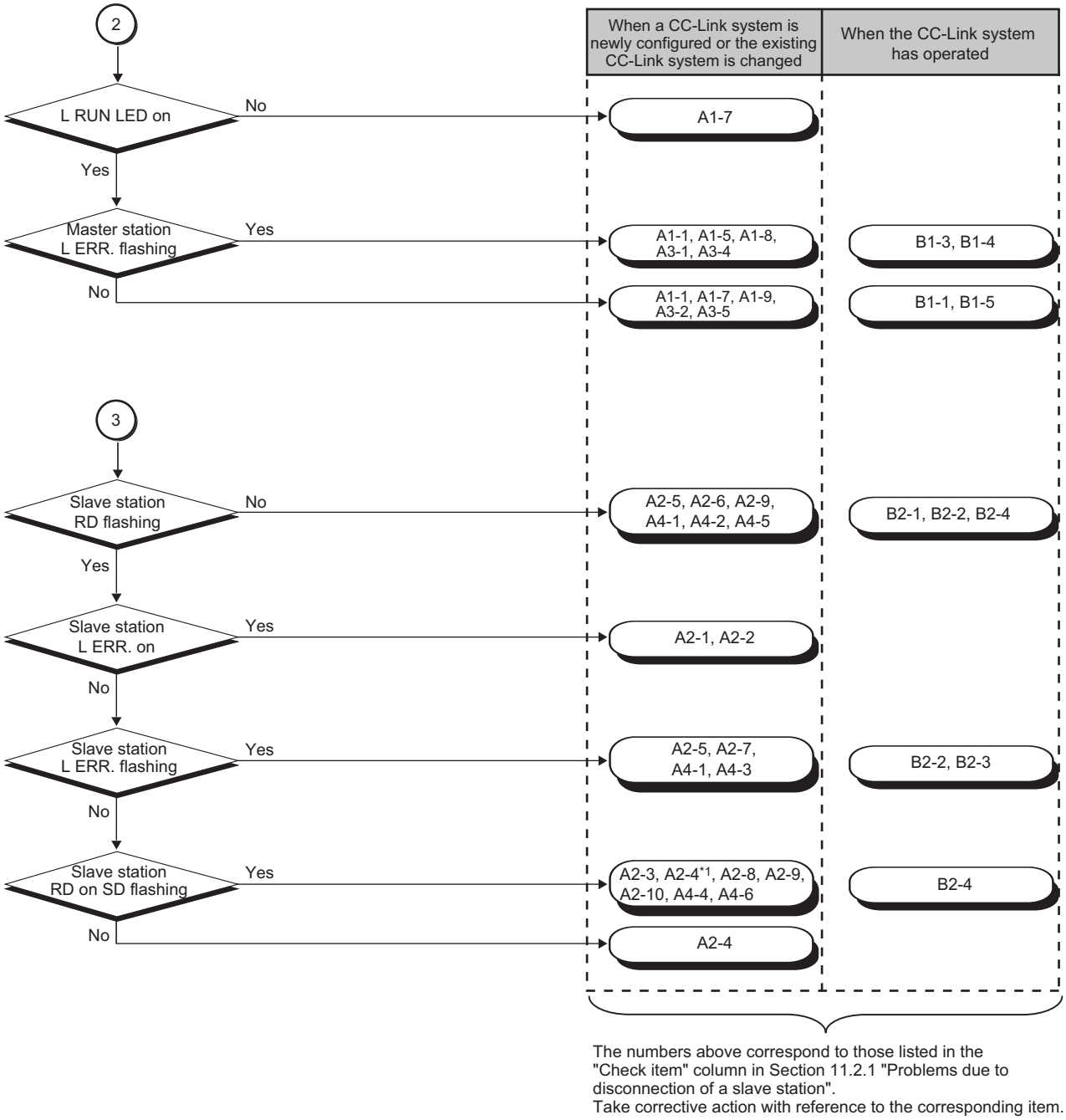

*1 To check error details, a programming tool is required.

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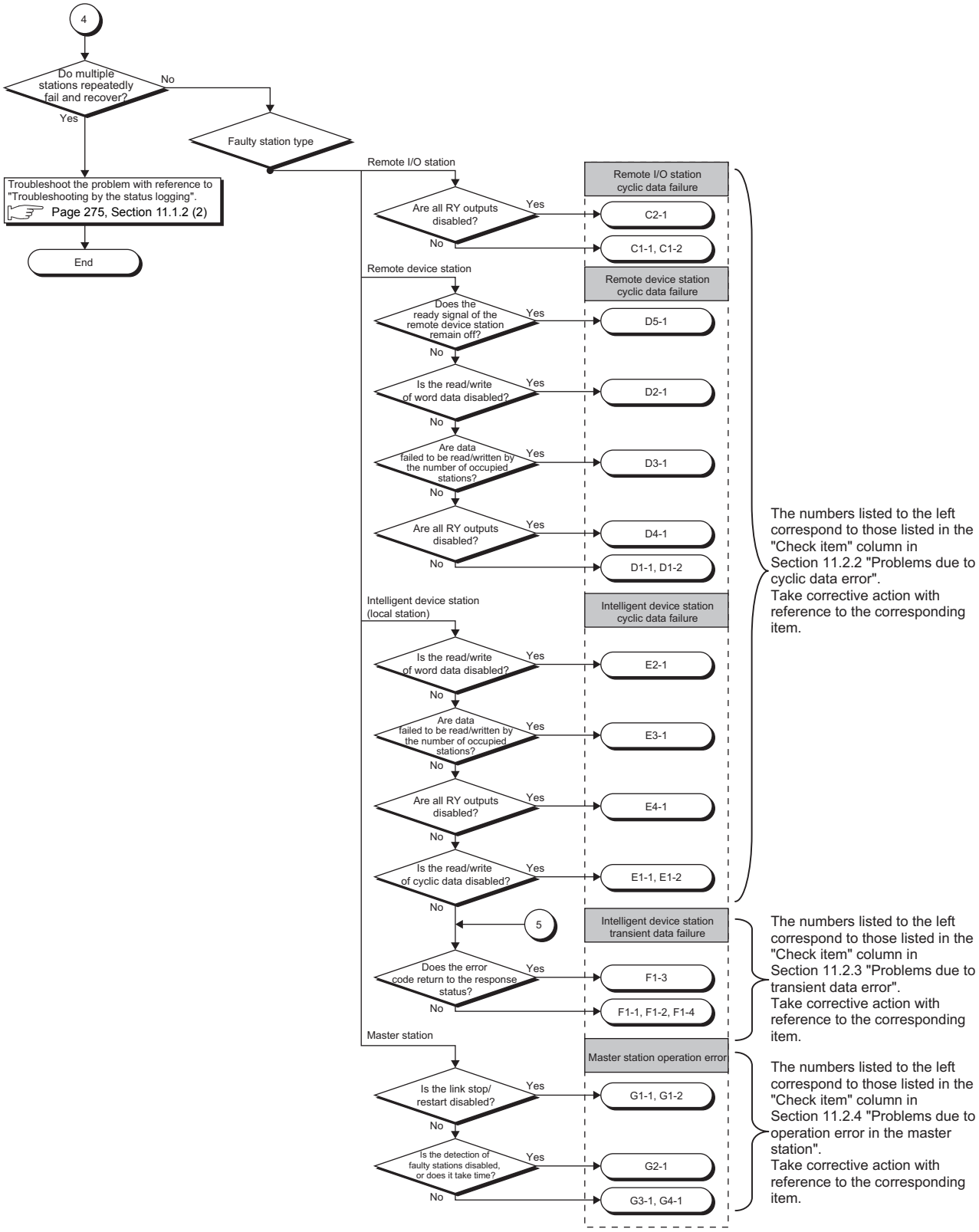

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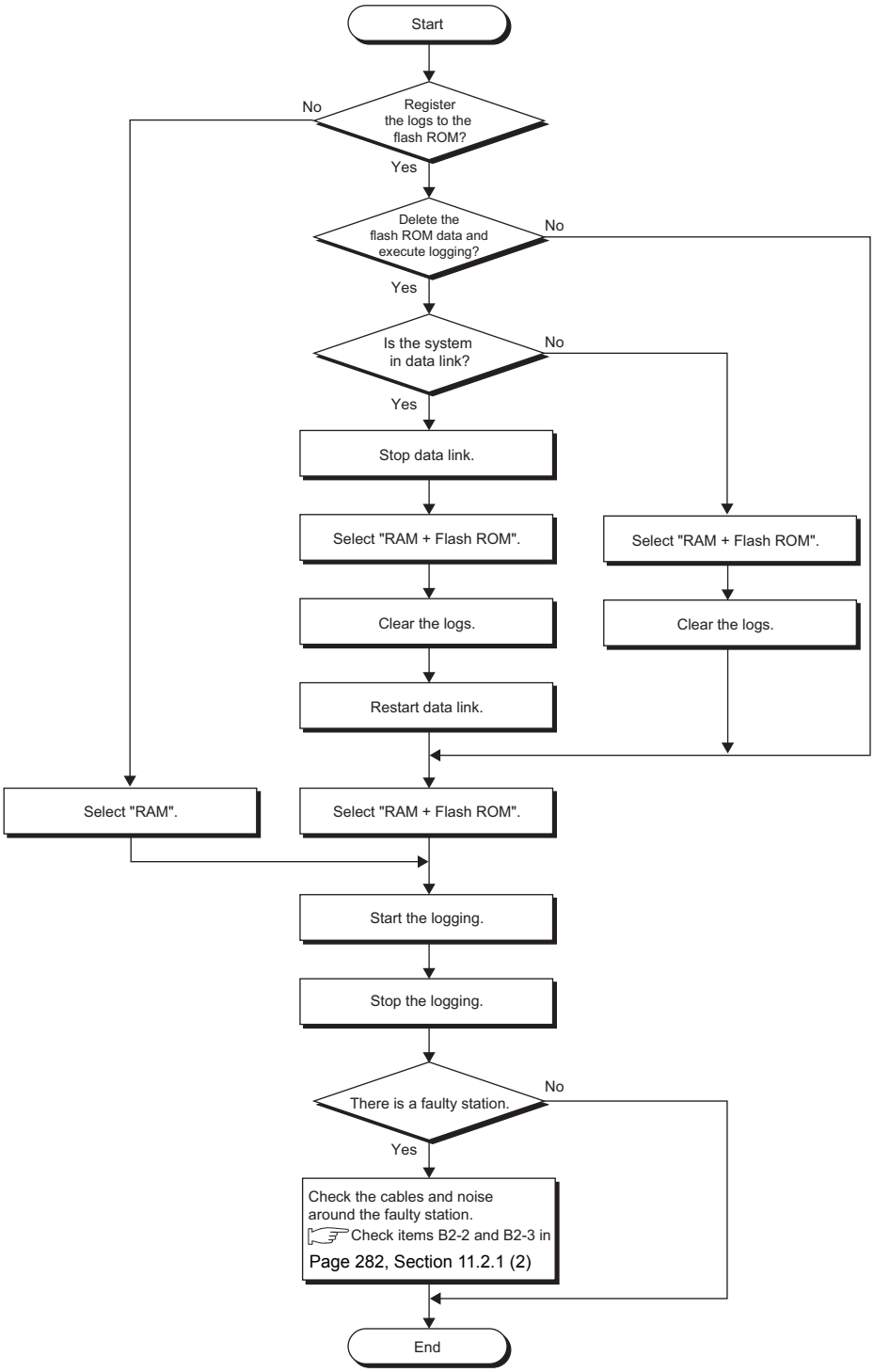
(2) Troubleshooting by the status logging



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11.2 Lists of Problems

11.2.1 Problems due to disconnection of a slave station

(1) Problems due to disconnection of a slave station when a CC-Link system is newly configured or the existing CC-Link system is changed

Problem	Check item		Description	Check method	Corrective action
Data link cannot be performed in the entire system.	A1-1	Station number	Is the station number correctly set for the faulty station?	Check the station number setting.	Correct the setting.
	A1-2	Transmission speed	Are the transmission speed values set within the range and same between the master station and slave stations?	Check the transmission speed values of all stations.	Correct the value.
	A1-3	Mode	Is the online mode set to the master station?	Check the mode of the master station.	Set the online mode.
	A1-4	Parameter setting	• Are the network parameters for CC-Link, such as the number of stations and station information, correctly set? • Does the master station have no error? • Are the network parameters for a network other than CC-Link correctly set?	Check the network parameters of the CPU module on the master station using the programming tool.	Correct the network parameter. Format the CPU module memory then write the network parameters.
				Check Host station number (SW0061) and Mode setting status (SW0060).	
				Check SW0068, SW0069, SW0070, SW0071, SW0072, SW0074 to SW0077, SW0098 to SW009B, SW009C to SW009F, and SW0144 to SW0147.	
			Are the settings correct? (Automatic CC-Link startup)	Check if values are not set in the intelligent function module switch setting.	Disable the intelligent function module switch setting of the programming tool.
	A1-5	Cable or other parts	Are there no disconnection, short circuit, incorrect wiring, poor connection, and coexistence of different cables? Do a transmission distance, station-to-station distance, transmission cable, and FG terminal grounding meet the specifications?	Check if cables between the master station and slave stations are not disconnected.	Correct the wiring.
			Are terminating resistors connected?	Check if a station with built-in terminating resistor is connected other than at both ends in the CC-Link system.	Connect terminating resistors to the both ends in the CC-Link system.
				Check if a station with built-in terminating resistor is connected other than at both ends in the CC-Link system.	

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Problem	Check item		Description	Check method	Corrective action
Data link cannot be performed in the entire system.	A1-6	Link start	Is the CPU module set to status other than RESET when network parameters are set?	Check if the switch on the CPU module is not at the RESET position.	Cancel the RESET status.
			Was the system started by the automatic CC-Link startup?	Check if values are not set in the intelligent function module switch setting.	Disable the intelligent function module switch setting of the programming tool.
	A1-7	CPU module	Does the CPU module on the master station have no error?	Check the error code of the CPU module.	Remove the error. User's manual for the CPU module used (hardware design, maintenance and inspection)
				Check if the module has been identified.	Take corrective action so that the CPU module may identify the master/local module. User's manual for the CPU module used (hardware design, maintenance and inspection)
			Isn't the sequence scan time long in the synchronous mode?	Check if the sequence scan time is within the allowable range. 10Mbps: 50ms 5Mbps: 50ms 2.5Mbps: 100ms 625kbps: 400ms 156kbps: 800ms	Set the asynchronous mode or reduce the transmission speed.
	A1-8	Noise	Is the transmission cable free from noise?	Check if the transmission cable is away from the power cable.	Keep the transmission cable away from the power cable. (Keep a distance of 100mm or more is recommended.)
				Check if the FG terminal is grounded separately from the GND terminal of the power system.	Ground the terminals separately.
				Reduce the transmission speed and check if the frequency of occurrence of noise is reduced.	Take noise reduction measures. Reduce the transmission speed.
	A1-9	Failure of the master station	Do modules on the master station normally operate?	Replace the modules and check if the station normally operates.	Repair or replace the module on the master station.

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Problem	Check item		Description	Check method	Corrective action
A station cannot perform data link.	A2-1	Station number	Is the station number correctly set for the faulty station?	Check the station number setting.	Correct the setting.
	A2-2	Transmission speed	Is the transmission speed value correctly set for the faulty station?	Check the transmission speed.	Set the value same as that set for other stations.
	A2-3	Online status (slave station)	Is the CC-Link interface of the faulty station online?	Check the faulty station.	Set it online.
	A2-4	Parameter setting	• Are the network parameters for CC-Link, such as the number of stations and station information, correctly set? • Does the master station have no error? • Are the network parameters for a network other than CC-Link correctly set?	Check the network parameters of the CPU module on the master station using the programming tool.	Correct the network parameter. Format the CPU module memory then write the network parameters.
				Check SW0068, SW0069, SW0070, SW0071, SW0072, SW0074 to SW0077, SW0098 to SW009B, SW009C to SW009F, and SW0144 to SW0147.	
			Are the settings correct? (Automatic CC-Link startup)	Check if values are not set in the intelligent function module switch setting.	Disable the intelligent function module switch setting of the programming tool.

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Problem	Check item		Description	Check method	Corrective action
A station cannot perform data link.	A2-5	Cable or other parts	Are there no disconnection, short circuit, incorrect wiring, poor connection, and coexistence of different cables? Do a transmission distance, station-to-station distance, transmission cable, and FG terminal grounding meet the specifications?	Check if the SD LED and RD LED on the faulty station are flashing.	Correct the wiring.
				When faulty stations occur sequentially to one end on the transmission path, check cables connected to faulty stations close to the master station.	Correct the wiring.
			Are terminating resistors connected?	Check if terminating resistors are connected to the both ends in the CC-Link system.	Connect terminating resistors to the both ends in the CC-Link system.
				Check if a station with built-in terminating resistor is connected other than at both ends in the CC-Link system.	
	A2-6	Power supply (for communications)	Is the power on and is the applied voltage within the specified range?	Are modules on the faulty station on?	Power on the module.
				Is the applied voltage within the specified range?	Apply the voltage within the specified range.
	A2-7	Noise	Is the transmission cable free from noise?	Check if the transmission cable is away from the power cable.	Keep the transmission cable away from the power cable. (Keep a distance of 100mm or more is recommended.)
				Check if the FG terminal is grounded separately from the GND terminal of the power system.	Ground the terminals separately.
				Reduce the transmission speed and check if the frequency of occurrence of noise is reduced.	Take noise reduction measures. Reduce the transmission speed.
	A2-9	Failure of a slave station	Do slave stations normally operate?	Replace modules on the faulty station and check for operation.	Repair or replace the module on the faulty station.
	A2-10	Standby master station	Isn't the standby master station controlling the data link?	Check if the standby master station is not set as a station controlling the data link by the CC-Link diagnostics of the master station.	Reboot the system so that the master station will control the data link.

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Problem	Check item		Description	Check method	Corrective action
Data link cannot be performed in the entire system occasionally.	A3-1	Cable or other parts	Are cables and connectors securely connected and do they meet specifications?	Check cables between the master station and slave stations.	Correct the wiring.
	A3-2	Parameter setting	Isn't the sequence scan time long in the synchronous mode?	Check if the sequence scan time is within the allowable range. 10Mbps: 50ms 5Mbps: 50ms 2.5Mbps: 100ms 625kbps: 400ms 156kbps: 800ms	Set the asynchronous mode or reduce the transmission speed.
	A3-3	Power supply (for communications)	Is the power on and is the applied voltage within the specified range?	Check power supplied to the master station and all slave stations.	Apply the voltage within the specified range.
	A3-4	Noise	Is the transmission cable free from noise?	Check if the transmission cable is away from the power cable.	Keep the transmission cable away from the power cable. (Keep a distance of 100mm or more is recommended.)
				Check if the FG terminal is grounded separately from the GND terminal of the power system.	Ground the terminals separately.
				Reduce the transmission speed and check if the frequency of occurrence of noise is reduced.	Take noise reduction measures. Reduce the transmission speed.
	A3-5	Failure of the master station	Do modules on the master station normally operate?	Replace the modules and check if the station normally operates.	Repair or replace the module on the master station.
	A3-6	Link stop	Is Data link stop instruction correctly executed?	Check if Data link stop (SB0002) is off.	Do not turn on Data link stop (SB0002). Do not write data to the refresh source device of Data link stop (SB0002) from multiple locations.

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Problem	Check item		Description	Check method	Corrective action
Data link cannot be performed in the entire system occasionally.	A4-1	Cable or other parts	Are there no disconnection, short circuit, incorrect wiring, poor connection, and coexistence of different cables? Do a transmission distance, station-to-station distance, transmission cable, and FG terminal grounding meet the specifications?	Check cables connected to the faulty station.	Correct the wiring.
				When faulty stations occur sequentially to one end on the transmission path, check cables connected to faulty stations close to the master station.	
			Are terminating resistors connected?	Check if terminating resistors are connected to the both ends in the CC-Link system.	Connect terminating resistors to the both ends in the CC-Link system.
				Check if a station with built-in terminating resistor is connected other than at both ends in the CC-Link system.	
	A4-2	Power supply (for communications)	Is the power on and is the applied voltage within the specified range?	Check power supplied to the faulty station.	Apply the voltage within the specified range.
	A4-3	Noise	Is the transmission cable free from noise?	Check if the transmission cable is away from the power cable.	Keep the transmission cable away from the power cable.
				Check if the FG terminal is grounded separately from the GND terminal of the power system.	Ground the terminals separately.
				Reduce the transmission speed and check if the frequency of occurrence of noise is reduced.	Take noise reduction measures. Reduce the transmission speed.
	A4-4	Startup	Has the faulty station started in the correct procedure?	Check if the faulty station normally starts in a different procedure.	Start the faulty station in the procedure described in the manual for the station.
	A4-5	Failure of a slave station	Do slave stations normally operate?	Replace modules on the faulty station and check for operation.	Repair or replace the module on the faulty station.
	A4-6	Standby master station	Isn't the standby master station controlling the data link?	Check if the standby master station is not set as a station controlling the data link by the CC-Link diagnostics of the master station.	Reboot the system so that the master station will control the data link.

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(2) Problems due to disconnection of a slave station when the CC-Link system has already operated

Problem	Check item		Description	Check method	Corrective action
Data link cannot be performed in the entire system.	B1-1	CPU module	Does the CPU module on the master station have no error?	Check the error code of the CPU module.	Remove the error. User's manual for the CPU module used (hardware design, maintenance and inspection)
				Check if the module has been identified.	Take corrective action so that the CPU module may identify the master/local module. User's manual for the CPU module used (hardware design, maintenance and inspection)
	B1-2	Power supply (for communications)	Isn't a voltage low?	Check power supplied to the master station and all slave stations.	Apply the voltage within the specified range.
	B1-3	Cable or other parts	Are there no disconnection, short-circuit, and poor connection?	Check if cables between the master station and slave stations are not disconnected.	Correct the wiring.
	B1-4	Noise	Is the transmission cable free from noise?	Check if the transmission cable is away from the power cable.	Keep the transmission cable away from the power cable. (Keep a distance of 100mm or more is recommended.)
				Check if the FG terminal is grounded separately from the GND terminal of the power system.	Ground the terminals separately.
				Reduce the transmission speed and check if the frequency of occurrence of noise is reduced.	Take noise reduction measures. Reduce the transmission speed.
	B1-5	Failure of the master station	Do modules on the master station normally operate?	Replace the modules and check if the station normally operates.	Repair or replace the module on the master station.
	B1-6	Link stop	Is Data link stop instruction correctly executed?	Check if Data link stop (SB0002) is off.	Do not turn on Data link stop (SB0002). Do not write data to the refresh source device of Data link stop (SB0002) from multiple locations.

(To the next page)

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Problem	Check item		Description	Check method	Corrective action
Data link cannot be performed in the entire system occasionally.	B2-1	Power supply (for communications)	Isn't a voltage low?	Check power supplied to the faulty station.	Apply the voltage within the specified range.
	B2-2	Cable or other parts	Are cables and connectors securely connected and do they meet specifications?	Check cables connected to the faulty station.	Correct the wiring.
				When faulty stations occur sequentially to one end on the transmission path, check cables connected to faulty stations close to the master station.	
	B2-3	Noise	Is the transmission cable free from noise?	Check if the transmission cable is away from the power cable.	Keep the transmission cable away from the power cable. (Keep a distance of 100mm or more is recommended.)
				Check if the FG terminal is grounded separately from the GND terminal of the power system.	Ground the terminals separately.
				Reduce the transmission speed and check if the frequency of occurrence of noise is reduced.	Take noise reduction measures. Reduce the transmission speed.
	B2-4	Failure of a slave station	Do slave stations normally operate?	Replace modules on the faulty station and check for operation.	Repair or replace the module on the faulty station.

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11.2.2 Problems due to cyclic data error

(1) Problems due to cyclic data error in a remote I/O station

Problem	Check item		Description	Check method	Corrective action
Cyclic data cannot be read/written.	C1-1	Refresh data area	Have refresh devices (RX, RY, SB, and SW) been correctly set in the network parameter?	Check if the devices have been set within the range.	Correct the device setting.
				Check if no device overlaps with ones used in programs or in other networks. Note that the number of points of 8-point or 16-point I/O modules per station is 32 points (fixed) (except the case when the remote I/O station points setting is configured).	Set the devices so that they do not overlap with ones used in programs and in other networks.
			Are the auto refresh to refresh devices using the network parameter and the refresh process using a program (Un\G□ or FROM/TO instructions) executed at the same time?	Check the program. Check the refresh devices set in the network parameter.	Execute either of the refresh processes.
			Is the correct buffer memory area read/written (RX, RY, SB, and SW)?	Check the program. Note that the number of points of 8-point or 16-point I/O modules per station is 32 points (fixed) (except the case when the remote I/O station points setting is configured).	Access the correct buffer memory area in the corresponding station. Set the devices so that they do not overlap with ones used in programs and in other networks.
	C1-2	Parameter setting	Isn't a station to which reading/writing cannot be performed specified as a reserved station?	Check if the bit corresponding to the faulty station is not "1" in Reserved station specified status (SW0074 to SW0077).	Cancel the reserved station setting.
Data cannot be output from RY.	C2-1	Refresh instruction	Is Refresh instruction when changing parameters by the dedicated instruction (SB0003) on?	Check if Refresh instruction when changing parameters by the dedicated instruction (SB0003) is on.	Turn on Refresh instruction when changing parameters by the dedicated instruction (SB0003).

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(2) Problems due to cyclic data error in a remote device station

Problem	Check item		Description	Check method	Corrective action
Cyclic data cannot be read/written.	D1-1	Refresh data area	Has the auto refresh been correctly set (RX, RY, RWw, RWr, SB, and SW)?	Check if no device overlaps with ones used in programs or in other networks.	Set the devices so that they do not overlap with ones used in programs and in other networks.
			Is the accessed buffer memory area correct (RX, RY, RWw, RWr, SB, and SW)?	Check if no device overlaps with ones used in programs or in other networks.	Access the correct buffer memory area in the corresponding station. Set the devices so that they do not overlap with ones used in programs.
	D1-2	Parameter setting	Isn't a station to which reading/writing cannot be performed specified as a reserved station?	Check if the bit corresponding to the faulty station is not "1" in Reserved station specified status (SW0074 to SW0077).	Cancel the reserved station setting.
Word data cannot be read/written.	D2-1	Parameter setting	Do the parameter settings match with the status of the connected modules?	Check if a remote I/O station is not connected to the corresponding station.	Match the model set by the parameter with that of the connected module.
Cyclic data (lower area) cannot be read/written.	D3-1	Parameter setting	Do the parameter settings match with the status of the connected modules?	Check if a module with the small number of occupied stations is not connected to the corresponding station.	Match the number of occupied stations set by the parameter with that of the connected module.
Data cannot be output from RY.	D4-1	Refresh instruction	Is Refresh instruction when changing parameters by the dedicated instruction (SB0003) on?	Check if Refresh instruction when changing parameters by the dedicated instruction (SB0003) is on.	Turn on Refresh instruction when changing parameters by the dedicated instruction (SB0003).
A remote device station does not become ready (RXn1B remains off).	D5-1	Initial setting	Has the initial setting completed?	Were Initial data processing completion flag (RYn18) and Initial data setting request flag (RYn19) turned off?	Perform the initial data process.
			Has the remote device station initialization procedure registration completed?	Check if Remote device station initialization procedure registration instruction (SB000D) is off. Check Remote device station initialization procedure registration instruction result (SW005F).	Change the registration.
			Is the initial setting for the remote device station correct?	Check the parameter. Check the program.	Correctly configure the initial setting for the station.
			Has the initial setting been enabled?	Check if Remote device station initialization procedure registration instruction (SB000D) has been turned on using a program.	Turn on Remote device station initialization procedure registration instruction (SB000D), and check that the initial setting is enabled.

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(3) Problems due to cyclic data error in an intelligent device station (local station)

Problem	Check item		Description	Check method	Corrective action
Cyclic data cannot be read/written.	E1-1	Refresh data area	Has the auto refresh been correctly set (RX, RY, RWw, RWr, SB, and SW)?	Check if no device overlaps with ones used in programs or in other networks.	Set the devices so that they do not overlap with ones used in programs and in other networks.
			Is the accessed buffer memory area correct (RX, RY, RWw, RWr, SB, and SW)?	Check if no device in the master station overlaps with ones used in programs or in other networks.	Access the correct buffer memory area in the master station. Set the devices so that they do not overlap with ones used in programs.
				Check if no device in the local station overlaps with ones used in programs or in other networks.	Access the correct buffer memory area in the local station. Set the devices so that they do not overlap with ones used in programs.
	E1-2	Parameter setting	Isn't a station to which reading/writing cannot be performed specified as a reserved station?	Check if the bit corresponding to the faulty station is not "1" in Reserved station specified status (SW0074 to SW0077).	Cancel the reserved station setting.
Word data cannot be read/written.	E2-1	Parameter setting	Do the parameter settings match with the status of the connected modules?	Check if a remote I/O station is not connected to the corresponding station.	Match the model set by the parameter with that of the connected module.
Cyclic data (lower area) cannot be read/written.	E3-1	Parameter setting	Do the parameter settings match with the status of the connected modules?	Check if a module with the small number of occupied stations is not connected to the corresponding station.	Match the number of occupied stations set by the parameter with that of the connected module.
Data cannot be output from RY.	E4-1	Refresh instruction	Is Refresh instruction when changing parameters by the dedicated instruction (SB0003) on?	Check if Refresh instruction when changing parameters by the dedicated instruction (SB0003) is on.	Turn on Refresh instruction when changing parameters by the dedicated instruction (SB0003).

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11.2.3 Problems due to transient data error

(1) Problems due to transient data error in an intelligent device station (local station)

Problem	Check item		Description	Check method	Corrective action
Transient error	F1-1	Refresh data area	Is the transient transmission (dedicated instruction) correctly performed?	Check if the correct destination is accessed.	Access the correct area in the corresponding station.
	F1-2	Parameter setting	Do the parameter settings match with the status of the connected modules?	Check if a remote I/O station or remote device station is not connected.	Match the model set by the parameter with that of the connected module.
	F1-3	Response status	Error code B404 (response timeout)	Check if a response is received from the request destination station within the monitoring time.	Increase the monitoring time value. If the error persists, check the modules and cables at the destination.
			Is the transient transmission (dedicated instruction) correctly performed?	Check the error code stored in Completion status when the dedicated instruction was executed.	Take corrective action according to the error code.
			Do the master station and the intelligent device station have no error?	Check the error code of the CPU module. Check the error code of the master station. Check the operating status of the master station and the target intelligent device station.	Take corrective action according to the error code.
	F1-4	Target station number	Is the target station number correct?	Check if transient transmission is not being executed for the same station number at the same time.	Correct the station number setting. If executing for the same station number, shift the execution timing.

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11.2.4 Problems due to operation error in the master station

(1) Problems due to operation error in the master station

Problem	Check item		Description	Check method	Corrective action
Data link cannot be stopped/ restarted.	G1-1	Data link stop	Is Data link stop (SB0002) on?	Check the program. Check the refresh devices set in the network parameter.	Correctly set the link special relay (SB). Turn on Data link stop (SB0002).
			Does no error occur?	Check Data link stop result (SW0045).	Take a corrective action according to the error code.
	G1-2	Data link restart	Is Data link restart (SB0000) on?	Check the program. Check the refresh devices set in the network parameter.	Correctly set the link special relay (SB). Turn on Data link restart (SB0000).
			Does no error occur?	Check Data link restart result (SW0041).	Take a corrective action according to the error code.
			Isn't the corresponding station disconnected?	Check cables visually or by the line test using a programming tool. Check the parameter. Check the operating status of the CPU module on the corresponding station (for local station).	Correct the cables and settings of the corresponding station and start the system.
A faulty station cannot be detected.	G2-1	Error invalid station setting	Isn't the station set as an error invalid station?	Check Error invalid station specified status (SW0078 to SW007B).	Cancel the error invalid station setting.
				Check Temporary error invalid status (SW007C to SW007F).	Cancel the temporary error invalid station setting.
		Are station numbers unique?	Are station numbers unique?	Check the station number setting.	Correct the station number.
A station becomes faulty at a certain transmission speed.	G3-1	Can a faulty station be identified using Other station data link status (SW0080 to SW0083)? Do communications normal at a slower transmission speed (e.g. 156kbps)?	Can a faulty station be identified using Other station data link status (SW0080 to SW0083)? Do communications normal at a slower transmission speed (e.g. 156kbps)?	Check transmission speed of the faulty station.	Set the transmission speed same as the master station.
				Check if the cables are properly wired.	Correct the wiring.
				Check if the cables are grounded by the shielded part.	Ground the shielded part.
				Are terminating resistors connected to the both ends in a CC-Link system?	Connect terminating resistors to the both ends in the CC-Link system.
				Check if a station with built-in terminating resistor is connected other than at both ends in the CC-Link system.	

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Problem	Check item		Description	Check method	Corrective action
When multiple remote stations are simultaneously powered off at a speed of 156kbps, the "L RUN" LED turns off temporarily.	G4-1	Number of retries setting	Number of retries setting	Check the number of retries.	Increase the transmission speed. Reduce the number of retries.

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11.3 Error Codes

If an error such as a data link error occurs, the error cause can be identified by checking an error code.

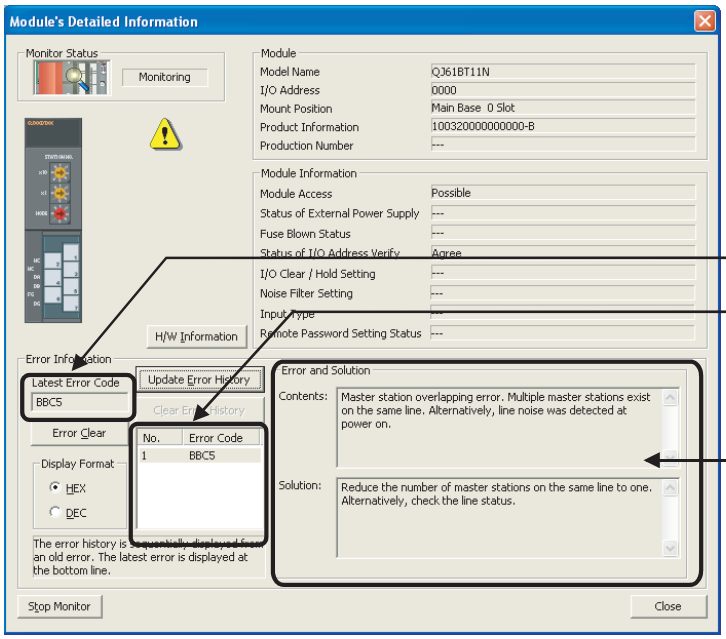
11.3.1 How to check error codes

Error codes can be checked using a programming tool as well as link special registers (SWs). (☞ Page 351, Appendix 3.2)

(1) Checking in the "Module's Detailed Information" window

This window displays error codes, error details, and corrective action.

[Diagnostics] ⇨ [System Monitor] ⇨ Detailed Information button



Displays the latest error code.

Displays error history.

Displays the description of the error code selected under "Error History" and the corrective action for the error.

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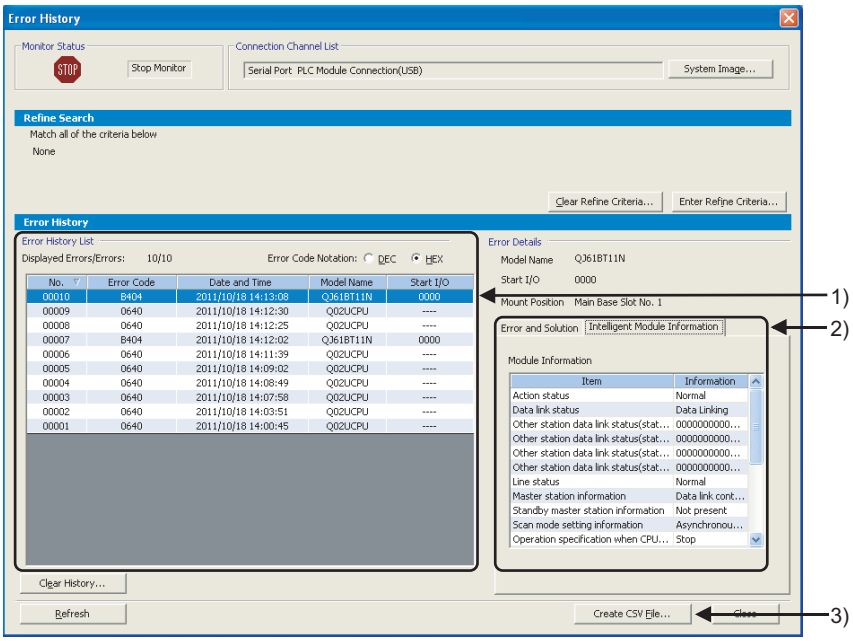
(2) Checking in the "Error History" window

This window lists errors including those that have occurred in other modules, and the error logs can be output in a CSV file.

Even after the CPU module is reset or the system is powered off and on, error codes and date and time of errors can be displayed.

[Diagnostics] ⇨ [System Monitor] ⇨ System Error History button



Item	Description
Error History List	Displays error logs of modules. For an error (Ex. Station number setting error) that has occurred during the initial process in the CPU module, the date and time of the error will be displayed as "0000/00/00 00:00:00"; therefore; error logs are not displayed in reverse chronological order.
Error and Solution	Displays the details and the corrective action of an error selected under "Error History List".
Intelligent Module Information	Displays the status of a master/local module when an error selected under "Error History List" has occurred.*1
Create CSV File... button	Outputs module error logs in a CSV file.

*1 If an error that occurs simultaneously with a CC-Link system error is selected, the status immediately before the error occurrence may be displayed under "Intelligent Module Information". For a master/local module, the following information is displayed.

Item	Description
Host station operation status	Displays the operating status of the host station.
Host data link status	Displays the data link status of the host station.
Other station data link status (SW0080 to SW0083)	Displays data link status of each station. 0: Normal 1: Data link error
Line status (SW0090)	Displays line status.
Master station information (SB0070)	Displays data link status.
Standby master station information (SB0071)	Displays whether a standby master station exists.
Scan mode setting information (SB0072)	Displays the setting status of the scan mode.

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Item	Description
Operation specification when CPU is down status (SB0073)	Displays the operating status if a CPU module goes down set by the parameter.
Reserved station specified status (SB0074)	Displays the status of the reserved station setting configured by the parameter.
Error invalid station specified status (SB0075)	Displays the status of the error invalid station setting configured by the parameter.
Temporary error invalid station setting information (SB0076)	Displays the status of the temporary error invalid station setting.
Parameter receive status (SB0077)	Displays whether parameters have been received from the master station.
Host station switch change detection (SB0078)	Displays detected setting changes in the setting switches on the host station during data link.
Master station return specification information (SB0079)	Displays which of "Master Station" or "Master Station (Duplex Function)" has been set in "Type" in the network parameter window.
Host master/standby master operation status (SB007B)	Displays whether the host station is operating as a master station or a standby master station.
Slave station refresh/compulsory clear setting status in case of programmable controller CPU STOP (SB007C)	Displays the status of the slave station refresh/compulsory clear setting in case of programmable controller CPU STOP configured by the parameter.
Dedicated instruction where an error has occurred	Displays a dedicated instruction where an error has occurred.
Station number where an error has occurred	Displays a station number where transient transmission is to be performed. When the error is not a transient transmission error, "No Information" is displayed.

Point

- Before opening the "Error History" window, check the versions of the master/local module and programming tool. (☞ Page 399, Appendix 6 (2))
- If errors frequently occur in the master/local module, "*HST.LOSS*" may be displayed instead of an error code under "Error Code".

No.	Error Code	Date and Time	Model Name	Start I/O
00103	*HST.LOSS*	2011/08/19 13:56:20	QJ61BT11N	0000
00102	0C21	2011/08/19 11:23:35	Q20UDEHCPU	----

  In such case, increase the number of collected module errors per scan in the "PLC RAS" tab of the PLC parameter window. For the setting, refer to the following.

  User's manual for the CPU module used (function explanation, program fundamentals)

- If errors with the same error code consecutively occur, only the information on the first error is displayed in the "Error History" window.

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11.3.2 Error code list

The following table lists error codes.
When a standby master station is used, refer to the respective columns under "Delectability" 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

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
4000 to 4FFF	Error detected in a CPU module (QCPU User's Manual (Hardware Design, Maintenance and Inspection))				
7000 to 7FFF	Error detected in a serial communication module (Serial Communication Module User's Manual and other relevant manuals)				
B002	System error	—	Please consult your local Mitsubishi representative.	○	×
B101 and B102					○
B103 to B106					×
B109					
B10A	Data link error in target stations	A data link error occurred on target stations during a message transmission.	Check the operation of the target remote device station.	○	×
B10C	Message transmission function unsupported	The message transmission function was executed for the remote device station that does not support the function.	Check the station No. of the target station. Or, check if the target station supports the message transmission function.	○	×
B110	Transient data receiving disabled	A line error has occurred.	Modify the line.	○	○
B111	Transient data receiving order error	A line error has occurred.	Modify the line.	○	○
B112	Transient data length error	A line error has occurred.	Modify the line.	○	○
B113	Transient data identification error	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.	○	○
B115	Link error	A line error has occurred.	Modify the line.	○	○
B116	Packet error	A line error has occurred.	Modify the line.	○	○
B120	Forced termination of the remote device station initialization procedure registration function	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 then turn off the remote device station initialization procedure registration instruction.	○	×
B122	System error	—	Please consult your local Mitsubishi representative.	○	○
B123					×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B124	Setting error of the station where the remote device station initialization procedure registration function is to be performed	The remote device station initialization procedure registration instruction was turned on in a station other than the master station.	Turn on the instruction in the master station (station number 0).	×	○
B125	Remote device station initialization procedure registration function parameter not set	The remote device station initialization procedure registration instruction was turned on without setting the remote device station initialization procedure registration.	Set the remote device station initialization procedure registration then turn on the remote device station initialization procedure registration instruction.	○	×
		A bit other than the one corresponding to the start station number was turned on in Specification of remote device station to be initialized (SW0014 to SW0017) to instruct the remote device station initialization procedure registration.	Turn on only the bit corresponding to the start station number in Specification of remote device station to be initialized (SW0014 to SW0017).		
B201	Corresponding station error during sending	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 set, or if the corresponding station is stopped.	○	○
B202 and B203	System error	—	Please consult your local Mitsubishi representative.	○	○
B204	Transient request overload error	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again.	○	○
B205	Transient target station error	A transient request was issued to a station other than an intelligent device station.	Change the target station.	○	○
B301	Process request error during link stop	A line test request was issued during link stop.	Execute a line test while data link is being performed.	○	○
B302	Specified station number setting error	The destination station number of the temporary error invalid request or temporary error invalid canceling request has exceeded the maximum station number that can communicate.	Specify a station number smaller than or equal to the maximum station number.	○	×
B303	No station number setting error	Although the temporary error invalid request or temporary error invalid canceling request was issued, the target station number has not been set.	Set the station number. (SW0003, SW0004 to SW0007)	○	×
B304	Line test faulty station detected	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, and standby master station have been started, and the cables are not disconnected.	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B305	System error	—	Please consult your local Mitsubishi representative.	○	×
B306	Specified station number setting error	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 number.	○	×
B307	Data link error in all stations	When one of the following requests is issued, a data link error has occurred in all stations. • Data link restart (SB0000) • Data link stop (SB0002)	Make sure that the data link returns to normal then issue the request again.	○	○
B308	Station number setting error (installation status)	A slave station number is outside of 1 to 64.	Set the number within 1 to 64.	○	×
B309	Station number already in use error	The station number of the connected module is already in use (including the station numbers of occupied stations and excluding the start station number).	Check the station number of the corresponding modules.	○	×
B30A	Mismatch between the connected module status and parameter setting	The station type differs between the mounted modules and parameter settings. Ex. Connected module: Remote device — Parameter setting: Remote I/O Connected module: Intelligent device — Parameter setting: Remote I/O / Remote device	Correct the parameter.	○	×
		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.	Set the parameter of the master station, local station, or standby master station again, and reset the CPU module.		
B30B	Mismatch between the connected module status and parameter setting	The network parameter setting does not match with the connected module status.	Match them.	○	×
B30C	Standby master station specification error	The master station switching was instructed to a station other than the standby master station.	Set the standby master station number.	○	○
B30D	Initial status	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.	Start the data link then issue the request.	○	○

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B30E	Unsupported service error	A function that is started using SB/SW and executable on the master station only was tried to be performed on a local station.	Perform the function from the master station.	×	○
B30F	Temporary error invalid station specification error	A temporary error invalid station was specified while data link was being performed upon automatic CC-Link startup.	Specify a temporary error invalid station while data link is being performed with parameters set using a programming tool or dedicated instructions.	○	×
B310	Data link restart error	Data link restart (SB0000) was executed to the station that was performing data link.	Execute Data link restart (SB0000) to the station where data link has been stopped using Data link stop (SB0002).	○	○
B311	Data link stop error	Data link stop (SB0002) was executed to the station where data link had been stopped.	Execute Data link stop (SB0002) to the station performing data link.	○	○
B312	Standby master station absence error	Forced master switching (SB000C) was executed in a system where no standby master station existed or the standby master station was down.	Start the data link of the standby master station then execute Forced master switching (SB000C).	○	×
B313	Error in all stations	Forced master switching (SB000C) was executed in a system where all stations were faulty.	Start the data link of the standby master station then execute Forced master switching (SB000C).	○	×
B314	Switching target error	Forced master switching (SB000C) was executed to a station other than the master station.	Execute Forced master switching (SB000C) to the master station.	×	○
B315	Forced master station switching error	While the master station was being switched to the standby master station, Forced master switching (SB000C) was executed again.	Correct the Forced master switching (SB000C) setting.	○	×
B316	System error	—	Please consult your local Mitsubishi representative.	○	×
B317	Network startup setting mode error	The G(P).RLPASET instruction was executed to a module where parameters had been set using a programming tool. The parameter setting was changed without powering off and on the programmable controller system or resetting the CPU module.	Clear network parameter settings for the target module using a programming tool then set the network parameters using the G(P).RLPASET instruction. (☞ Page 213, Section 9.8.1)	○	×
B31A	Data link in progress	The master station duplication error canceling instruction was executed while data link had already been started.	Do not execute the instruction during data link.	○	×
B31B	Transmission speed test execution error	The transmission speed test was executed during data link.	Turn on Data link stop (SB0002) then Transmission speed test request (SB000B).	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B31C and B31D	System error	—	Please consult your local Mitsubishi representative.	○	○
B31E	Status logging start error	Logging was started while logs were being deleted.	Delete the logs then start logging.	○	○
B31F	Status logging clear error	Logs were deleted during logging.	Stop the logging then delete the logs.	○	○
B320	Status logging mode invalid	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.	○	○
B321	System error	—	Please consult your local Mitsubishi representative.	○	○
B322	Status logging flash ROM deletion invalid	The logs were deleted during data link with "RAM + Flash ROM" selected.	Stop the data link then delete the logs.	○	○
B323	Status logging flash ROM deletion failed	Although the logs had been set to be deleted with "RAM + Flash ROM" selected, logging was started while the logs have not yet been deleted.	Delete the logs again with "RAM + Flash ROM" selected.	○	○
B324	Status logging flash ROM storage error	Logs were tried to be stored on the flash ROM although 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.	○	○
B325	Status logging flash ROM error	The cumulative number of times that logs are stored on the flash ROM has exceeded 100,000 times.	Start logging with "RAM" selected. To execute logging with "RAM + Flash ROM" selected, replace the module.	○	○
B384	Station number setting error (parameter)	In the station information parameter, a number other than 1_H to 40_H is set for the station number (including the station numbers of occupied stations).	Set the number within 1_H to 40_H.	○	×
B385	Total number of stations error (parameter)	The total number of occupied stations set in the station information parameter has exceeded 64.	Set the value to 64 or less.	○	×
B386	Number of occupied stations setting error (parameter)	In the station information parameter, all the number of occupied stations are set to 0.	Set the values within 1 to 4.	○	×
B387	Delay time setting error (parameter)	The delay time setting in the network parameter of the master station is outside the range.	Set "0" for the delay time.	○	×
B388	Station type setting error (parameter)	A value set for the station type in the station information parameter is outside the range in the remote net Ver.1 mode.	Set a value within 0 to 2 in the remote net Ver.1 mode.	○	×
B38A	System error	—	Please consult your local Mitsubishi representative.	○	×
B38B	Remote device station setting error (parameter)	More than 42 remote device stations are set in the station information parameter.	Set the value to 42 or less.	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B38C	Intelligent device station setting error (parameter)	More than 26 intelligent device stations (including local stations) are set in the station information parameter.	Set the value to 26 or less.	○	×
B38D	Invalid station specification error (parameter)	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 numbers 5 to 8), a bit corresponding to a station number other than the station number 5 is on.	Set the start station number of the module. Do not set a station number not set in the parameter.	○	×
B38E	Communication buffer assignment error (parameter)	The total size of the communication buffer set in the station information parameter has exceeded 4k words.	Set the total size within 4k words.	○	×
B38F	Automatic update buffer assignment error (parameter)	The total size of the automatic update buffer set in the station information parameter has exceeded 4k words.	Set the total size within 4k words.	○	×
B390	Standby master station specification error (parameter)	A value other than 1 to 64 is set in the standby master station specification parameter.	Set the value within 1 to 64.	○	×
B391	Number of retries setting error (parameter)	A value other than 1 to 7 is set in the number of retries parameter.	Set the value within 1 to 7.	○	×
B392	Operation specification when CPU is down error (parameter)	A value other than 0 and 1 is set in the operation specification when CPU is down parameter.	Set 0 or 1.	○	×
B393	Scan mode setting error (parameter)	A value other than 0 and 1 is set in the scan mode setting parameter.	Set 0 or 1.	○	×
B394	Number of automatic return stations setting error (parameter)	A value other than 1 to 10 is set in the number of automatic return stations parameter.	Set the value within 1 to 10.	○	×
B395	System error	—	Please consult your local Mitsubishi representative.	○	×
B396	Station number already in use error (parameter)	The station number is already in use in the station information parameter.	Set a unique number.	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B397	Station information setting error (parameter)	The station information parameter setting does not meet the following condition: (16 × A) + (54 × B) + (88 × C) ≤ 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 meeting the condition described to the left.	○	×
B398	Number of occupied stations setting error (parameter)	A value other than 1 to 4 is set as the number of occupied stations in the station information parameter.	Set the value within 1 to 4.	○	×
B399	Number of connected modules setting error (parameter)	A value other than 1 to 64 is set in the number of connected modules parameter.	Set the value within 1 to 64.	○	×
B39A	Standby master station specification error (installation status)	The station number set using the station number setting switches of the standby master station differs from that set in "Standby Master Station No." of the network parameter for the master station, or the station set in "Standby Master Station No." of the network parameter for the master station is a local station.	Change the parameter setting of the master station or change the station number using the station number setting switches of the local station or standby master station then reset the CPU module on the local station or standby master station.	×	○
B39B	Reserved station specification error	All stations are set as a reserved station.	Correct the reserved station specification.	○	×
B39C	Standby master station setting error	A station other than an intelligent device station is set as the station type of the station set in "Standby Master Station No." of the network 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.	○	×
B39D	0-point setting error (reserved station)	Zero points are set for a reserved station in the remote net additional mode.	Set the remote net Ver.2 mode.	○	×
		Zero points are set for a station other than a reserved station.	Set zero points for a reserved station.		

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B39E	8-point/16-point setting error (remote I/O station)	The remote I/O station points setting is set to 8 points or 16 points in the remote net additional mode.	Set the remote net Ver.2 mode.	○	×
		8 points or 16 points are set for a station other than a remote I/O station.	Set 8 points or 16 points for a 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 station.		
B39F	Remote net additional mode station number invalid	In the remote net additional mode, the maximum station number of Ver.1-compatible slave station is set greater than the minimum station number of Ver.2-compatible slave station in the network parameter.	In the remote net additional mode, set the network parameter so that the maximum station number of Ver.1-compatible slave station may be less than the minimum station number of Ver.2-compatible slave station.	○	×
B3A0	Invalid mode (among the master station, local station, and standby master station)	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. • A local station is set to the remote net additional mode, and the master station is set to the mode other than the remote net additional mode. • A local station is in the remote net Ver.2 mode or the remote net additional mode, and the master station is in the remote net Ver.1 mode.	Correct the mode setting in the master station, local station, or standby master station then reset the CPU module.	×	○
B3A1	Standby master setting invalid	An invalid value is set for the switch 5 of the intelligent function module switch setting parameter using a dedicated instruction.	Set a correct value to the switch 5.	○	×
B3A2	Invalid station type in remote I/O net mode	In the remote I/O net mode, a station other than a remote I/O station is set in the station type parameter using a dedicated instruction.	Set all stations as a remote I/O station.	○	×
B3A3	Assignment error	In the remote net Ver.2 mode or remote net additional mode, the total number of remote station points set in the station information parameter has exceeded 8192, the maximum number of points.	Change the number of remote station points.	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B3A4	Parameter mismatch	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 network parameter setting of the master station.	○	×
B3A5	Invalid mode (parameter)	The mode set in the control data of the G(P).RLPASET instruction differs from that set using the switch 3 of the intelligent function module switch setting.	Correct the control data or the switch 3 setting.	○	×
B3F1 to B3F3	System error	—	Please consult your local Mitsubishi representative.	○	×
B401	Parameter setting change error	The parameter setting was changed during transient request.	Change the parameter after all transient requests are completed or before the request is issued.	○	○
B404	Response error	A response is not received from the request destination station within the monitoring time.	Increase the monitoring time value. If the error persists, check the modules and cables at the destination.	○	○
B405	Transient request error	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 (overload due to many transient requests).	○	○
B407	System error	—	Please consult your local Mitsubishi representative.	○	○
B409				×	
B410	Receive buffer size error	The receive buffer size of the dedicated instruction is smaller than the response data size.	Change the receive buffer size.	○	○
B411	Data length outside the range	The number of read/write points in the control data of the dedicated instruction is outside the range.	Change the number of points within the range.	○	○
B412	Station number outside the range	The station number stored in the control data of the dedicated instruction is outside the range.	Change the station number within the range.	○	○
B413	Request error	Multiple dedicated instructions were executed to the same station.	Modify the program.	○	○
B414	Interlock signal data outside the range	The value set to the interlock signal storage device of the G(P).RIRCV or G(P).RISEND instruction is outside the range.	Set the device value within the range.	○	×
B415	Execution station type error	The dedicated instruction only for the master station was executed on a station other than the master station.	Check if the host station type is a master station.	×	○
B416 to B418	System error	—	Please consult your local Mitsubishi representative.	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B419 to B41A	System error	—	Please consult your local Mitsubishi representative.	○	○
B601	Request type error	An unsupported request was received.	Check the request data and the target station number.	○	○
B602 and B603	Transient request overload error	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again.	○	○
B604	Line test in progress	Transient transmission was performed during a line test.	Wait for a while and send the request again.	○	×
B605	Transient storage buffer data failed to be obtained	The transient storage buffer data was failed to be obtained.	Wait for a while and send the request again.	○	○
B606	System error	—	Please consult your local Mitsubishi representative.	○	○
B607	Target station CPU error	The CPU module on the target station is in error.	Check the CPU module.	○	○
B608	Transient transmission target station mode setting error	Transient transmission was performed to the AJ61BT11 or A1SJ61BT11 in the I/O mode.	Set the intelligent mode for the target station.	○	○
B60C B700	System error	—	Please consult your local Mitsubishi representative.	○	○
B701 to B704	Transient transmission failure	Transient transmission failed.	• Reduce the load placed on the transient transmission and perform the transmission again. • If the same error persists after taking the above action, please consult your local Mitsubishi representative.	○	○
B705 and B706	System error	—	Please consult your local Mitsubishi representative.	○	○
B771	Transient request overload error	Too many transient requests were sent to the corresponding station.	Wait for a while and send the request again (overload due to many transient requests).	○	○
B772 and B773	System error	—	Please consult your local Mitsubishi representative.	○	○
B774	Transient request error	The target station was not an intelligent device station.	Check if the target station is an intelligent device station.	○	○
B775 to B777	Transient type error	Unsupported transient data was received.	Check the application of the request source.	○	○
B778	Response timeout	A response has not been received from the request destination.	Check modules and cables at the request destination.	○	○
B779	System error	—	Please consult your local Mitsubishi representative.	○	○
B780	Module mode setting error	Transient transmission was performed although the I/O mode had been set for the target station.	Set the intelligent mode for the target station.	○	○
B781	System error	—	Please consult your local Mitsubishi representative.	○	○

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B782	Station number specification error	When connection to another station has been 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 host station.	○	○
B783	Transient storage buffer error	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.	○	○
B801	Access code setting error	A non-existing access code or attribute is set.	Set the correct access code or attribute.	○	○
B802	Access code error	A non-existing access code was used.	Use the correct access code.	○	○
B803	Number of data points error	The number of data points is outside the range.	Set the number of data points within 1 to 960 bytes.	○	○
B804	Attribute definition error Transient transmission unsupported station specification error	The attribute definition is invalid. Or transient transmission was performed although the target station did not support transient transmission.	Change the definition. Change the target station number setting. Or check the function version of the target local station and software version.	○	○
B805	Number of data points error	The number of data points is outside the range.	Set a value within 1 to 100 for writing or within 1 to 160 for reading.	○	○
B807	Device number error	The start device number is outside the range. Or the address was not multiples of 16 when the bit device was accessed.	Set the start device number within the range. Or set the address in multiples of 16 when the bit device is accessed.	○	○
B80A	System error	—	Please consult your local Mitsubishi representative.	○	○
B80D	Setting range error	The set combination of the address and the number of points has exceeded the processable range.	Set the number of points to be processed within the device range.	○	○
B80F to B812	System error	—	Please consult your local Mitsubishi representative.	○	○
B814	File register capacity setting error	The file register capacity is not set.	Set the capacity.	○	○
B815	Module mode setting error	Transient transmission was performed although the I/O mode had been set for the target station.	Set the intelligent mode for the target station.	○	○
B817 B821 and B822	System error	—	Please consult your local Mitsubishi representative.	○	○
B823	Remote control mode error	The mode setting of the remote control is incorrect.	Check the setting.	○	○
B824 B826	System error	—	Please consult your local Mitsubishi representative.	○	○

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
B903	Transient request error	A transient request was issued to a station that had not secured a communication buffer.	Secure a communication buffer area using the parameter.	○	○
B904	Communication buffer size setting error	When a dedicated instruction was executed, the communication buffer size of the corresponding station was outside the range.	Set the communication buffer size within the range.	○	○
B905	Transient data length error	When the dedicated instruction was executed, the transient data length was greater than the communication buffer size of the corresponding station.	Increase the communication buffer size so that it may be greater than the transient data length.	○	○
B981 and B982	System error	—	Please consult your local Mitsubishi representative.	○	×
B983					○
B984					×
B985 to B987					○
B9FF					
BA01	Error (hardware test)	A hardware error has been detected.	Please consult your local Mitsubishi representative.	○	○
BA02	System error	—	Please consult your local Mitsubishi representative.	○	○
BA05					
BA06 to BA13	Error (hardware test)	A hardware error has been detected.	Please consult your local Mitsubishi representative.	○	○
BA14	Error (hardware test)	A hardware (communication circuit) error has been detected.	• Check if 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 same error persists after taking the above action, please consult your local Mitsubishi representative.	○	○
BA15	Error (hardware test)	A hardware error has been detected.	Please consult your local Mitsubishi representative.	○	○
BA16 and BA17	Error (hardware test)	A hardware (communication circuit) error has been detected.	• Check if 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 same error persists after taking the above action, please consult your local Mitsubishi representative.	○	○
BA19	Corresponding station error	The target station of the line test cannot be communicated.	Check the cables and the target station.	○	×
BA1B	Error in all stations	A communication failure has occurred in all stations during execution of the line test 1.	Check the cables.	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BA1E to BA21	System error	—	Please consult your local Mitsubishi representative.	○	○
BB01	Concurrent execution error	The following requests (including the same request) were tried to be executed to the same station at the same time. • Message transmission function • Remote device station initialization procedure registration function • G(P).RISEND or G(P).RIRCV instruction • Access from a peripheral to a remote device station	Perform the processes one by one.	○	○
BBC1	Mode setting error	The remote I/O net mode is set for a station other than the station number 0.	When setting the remote I/O net mode, set the station number setting switches to 0.	○	×
BBC2	Station number setting error	A station number is set to a number other than 0 to 64 using the station number setting switches on the module, or the last station number has exceeded 64.	Check the station number and the number of occupied stations of the module.	○	○
BBC3	System error	—	Please consult your local Mitsubishi representative.	○	○
BBC5	Multiple master stations error	Multiple master stations exist on the same line. Or noise has been detected on the line at power-on.	Reduce the number of master stations on the same line to one. Or when the data link starts by turning on Master station duplication error canceling request (SB0007), check the line status.*1	○	×
BBC7 and BBC8	System error	—	Please consult your local Mitsubishi representative.	○	○

*1 The master/local module with the serial number (first five digits) of 09112 or later supports this function.
When using the master/local module with the serial number (first five digits) of 09111 or earlier, reset the CPU module.

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BBCA	Multiple standby master stations error	Multiple standby master stations exist on the same line.	Reduce the number of standby master stations on the same line to one. Or check the line status.	×	○
BBD1	System error	—	Please consult your local Mitsubishi representative.	○	○
BBD3	System error	—	Please consult your local Mitsubishi representative.	○	○
BC01	All stations data link error	A data link error has occurred on all stations during a message transmission.	Issue the request after data link has started.	○	×
BC02	System error	—	Please consult your local Mitsubishi representative.	○	×
BC03	Message transmission target station failure	The target station specified for the message transmission function is in any of the following status. • No network parameter is set. • The specified station No. is not the head station number. • The station has been set as a reserved station. • A data link error (including All stations data link error) has occurred.	Check network parameters or target stations' operations.	○	×
BC04	Message transmission target station error	The message transmission was performed to a station other than remote device stations and intelligent device stations.	Check the target station.	○	×
BC05	Station No. out of range (Message transmission function)	The station No. specified for the message transmission function is outside of the range between "1 to 64".	Check the specified station No.	○	×
BC06	Message transmission function executing station invalid	Execution of the message transmission function was attempted from a station other than the master station.	Execute the message transmission function on the master station.	×	○
BC07	Send data size out of range	The send data size was out of the range when message transmission was executed.	Change the send data size within the range.	○	×
BC08 to BC09	System error	—	Please consult your local Mitsubishi representative.	○	×
BC30					
BC33 to BC34					
BC35 to BC39				○	○
BC3A				×	○

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BC50	Message transmission handshake failure	With the message transmission function, abnormal data were received.	Check the program to see if any prohibited remote output (RY) has not been accessed. If the same error persists after checking the above, the master module or remote device station may be faulty. Please consult your local Mitsubishi representative.	○	×
BC51		During execution of message transmission, a data link error has occurred on the corresponding station.	Check the operation of the target remote device station.	○	×
		During execution of message transmission, some parameters were changed.	Stop the data link, and then change parameters.		
		With the message transmission function, abnormal data were received.	Check the program to see if any prohibited remote output (RY) has not been accessed. If the same error persists after checking the above, the master module or remote device station may be faulty. Please consult your local Mitsubishi representative.		
BC52	Message transmission handshake timeout	With the message transmission function, a communication timeout has occurred.	Increase the value for Monitoring time setting (SW0009). If the error occurs again, check the request destination module and cables.	○	×
		Data link stop (SB0002) was executed during the message transmission.	Stop data link after completion of message transmission.		
		In the message transmission function, a stop error in the CPU module has been detected.	Set "Continue" in "PLC Down Select" to execute the message transmission while the stop error has occurred in the CPU module.		
BC53	Message transmission handshake timeout	With the message transmission function, a communication timeout has occurred.	Increase the value for Monitoring time setting (SW0009). If the error occurs again, check the request destination module and cables.	○	×
		Data link stop (SB0002) was executed during the message transmission.	Stop data link after completion of message transmission.		
		In the message transmission function, a stop error in the CPU module has been detected.	Set "Continue" in "PLC Down Select" to execute the message transmission while the stop error has occurred in the CPU module.		
BC54	Message transmission handshake failure	With the message transmission function, abnormal data were received.	Execute the message transmission function again. If the same error persists, the master module or remote device station may be faulty. Please consult your local Mitsubishi representative.	○	×
BC55					

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BC57	Multiple requests error	Multiple peripherals tried to access the same message transmission or remote device station at the same time.	Perform the processes one by one.	○	×
BC58	Message transmission handshake failure	With the message transmission function, abnormal data were received.	Execute the message transmission function again. If the same error persists, the master module or remote device station may be faulty. Please consult your local Mitsubishi representative.	○	×
BC59					
BC5A	System error	—	Please consult your local Mitsubishi representative.	○	×
BC5B	Abnormal response received	With the message transmission function, an abnormal response was received.	Check the operation of the target remote device station.	○	×
BC5C to BC5F	Message transmission handshake failure	With the message transmission function, abnormal data were received.	Execute the message transmission function again. If the same error persists, the master module or remote device station may be faulty. Please consult your local Mitsubishi representative.	○	×
BC60	Invalid number of messages that were simultaneously transmitted	• 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.	Execute four requests or less at the same time.	○	×
BC70	Number of concurrent execution error (remote device station access)	The peripherals sent requests to the remote device station exceeding the number of concurrent execution.	Execute four requests or less at the same time.	○	×
BC71	Unsupported function error (remote device station access)	The remote device station access function was attempted to be performed to a station other than the master station.	Perform the function from the master station.	×	○
BC72	Target station error (remote device station access)	The remote device station to be accessed from the peripherals is any of the following. • The station is not set in the network parameter. • The station is not the station with the start station number. • The station has been reserved. • A data link error (including an error in all stations) has occurred.	Check the parameters or operations of the target station.	○	×

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BC73	Target station specification error (remote device station access)	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.	○	×
BC74	Device number error (remote device station access)	The specified device (RX, RY, RWw, or RWr) number is outside the device range for the connected target station.	Check the parameters and the device range of the target station.	○	×
BC75	Data link error in all stations (remote device station access)	A data link error has occurred in all stations during access from the peripherals to the remote device station.	Start the data link then issue the request.	○	×
BC76	Time check over (remote device station access)	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 operations of the target slave station.	○	×
BC81	System error	—	Please consult your local Mitsubishi representative.	○	○
BC90	Message transmission result read target module station number error	The message transmission result read request was received from the station with an unacceptable target station number.	Correct the station number of the target station at the request source, and execute the function again.	○	○
BC91	Message transmission response receive timeout error	Timeout occurred in receiving message transmission response data.	Set a longer Monitoring time setting (SW0009) and execute the function again. If the same error occurs again, check the target station and cables.	○	×
BD83 to BD84	System error	—	Please consult your local Mitsubishi representative.	○	○
BD85	Hardware error detection	A hardware error has been detected.	Please consult your local Mitsubishi representative.	○	○
BD86 and BD87	System error	—	Please consult your local Mitsubishi representative.	○	○
BF11 to BF1C					
BF20					
BF30 to BF37					
BF38	Execution result read error (remote device station access)	An error has been detected in reading the execution result in access from the peripherals to the remote device station.	• Check the application of the request source. • Check if another peripheral is not accessing the remote device station.	○	○
BF39	Request procedure error (remote device station access)	An error has been detected in the request procedure in access from the peripherals to the remote device station.	• Check the application of the request source. • Check if multiple peripherals are not accessing the remote device station. • Check if a value is not written in the system area in the buffer memory.	○	○
BF40 to BF42	System error	—	Please consult your local Mitsubishi representative.	○	○

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Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Delectability	
				Master station	Local station
BF43	Message transmission target module station type error	The station type of a target station for the message transmission is not either a remote device station or intelligent device station.	Correct the station type of a target station, and execute the function again.	○	○
BF44	System error	—	Please consult your local Mitsubishi representative.	○	○
BFFA	Invalid number of messages that were simultaneously transmitted	The message transmission function was executed simultaneously for five or more intelligent device stations.	Execute four requests or less at the same time.	○	×
BFFB	Transient request overload error	Too many transient requests were sent from the programming tool or GOT.	Wait for a while and send the request again.	○	○
BFFE	CPU monitoring timer timeout	The CPU monitoring timer timed out.	Check operations of the target station.	○	○
C000 to CFFF	Error detected in a Ethernet interface module (Ethernet Interface Module User's Manual QnUCPU User's Manual (Communication via Built-in Ethernet Port))				
D000 to DFFF	Error detected in a CC-Link IE Field Network (CC-Link IE Field Network User's Manual)				
E000 to EFFF	Error detected in a CC-Link IE Controller Network (CC-Link IE Controller Network Reference Manual)				
F000 to FFFF	Error detected in a MELSECNET/H or MELSECNET/10 network system (MELSECNET/H or MELSECNET/10 Network System Reference Manual)				

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11.4 CC-Link Diagnostics Using GX Works2

The status of a CC-Link system can be checked using a programming tool. Unlike link special relays (SBs) and link special registers (SWs), the system status can be checked on a graphical window; therefore, corrective action can be easily taken.
This section describes the CC-Link diagnostics using GX Works2.

Remark

For the CC-Link diagnostics using GX Developer, refer to Page 402, Appendix 7.3.

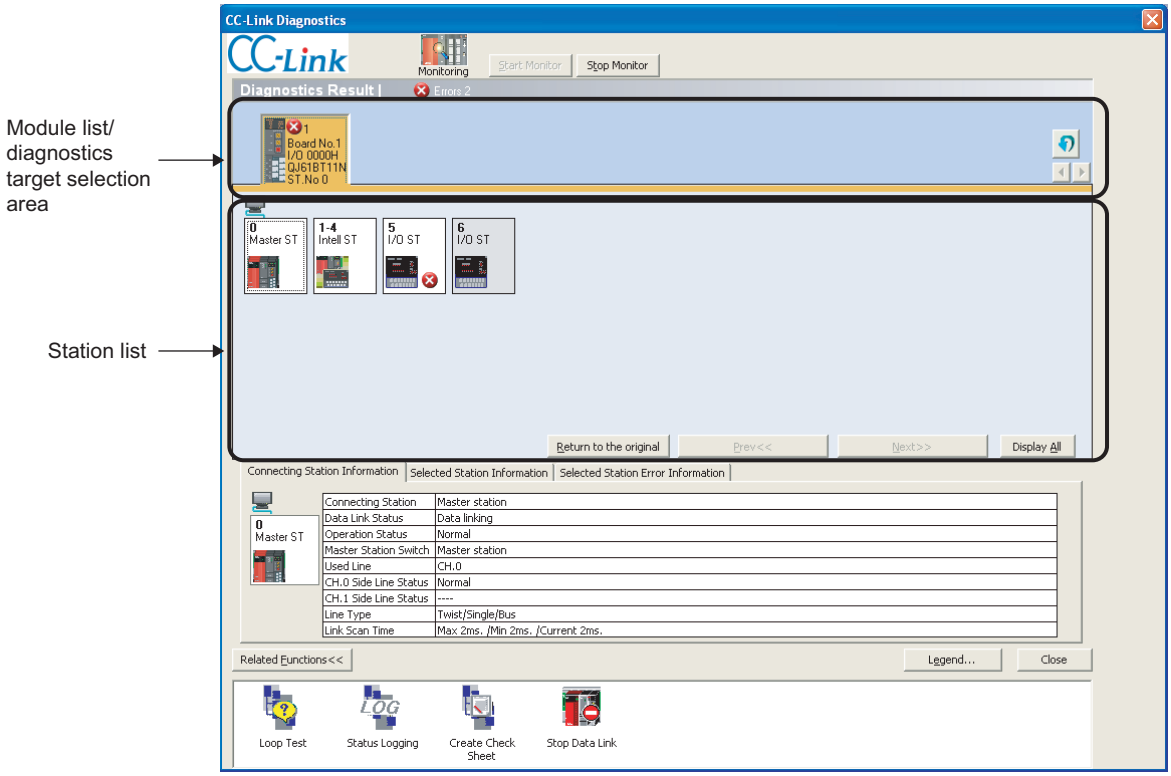
11.4.1 Monitoring the host station/other stations

Data link status of the host station (station to which a programming tool is connected) and other stations (stations other than the host station) can be monitored.

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

[Diagnostics] ⇨ [CC-Link Diagnostics]

2. Refer to the subsequent descriptions for operation.



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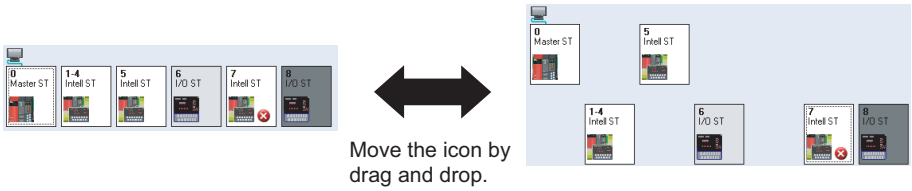
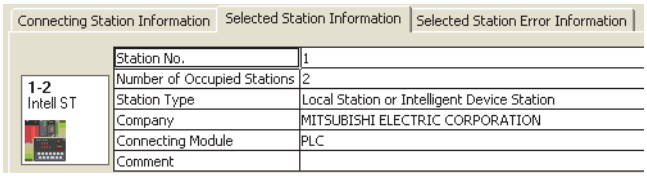
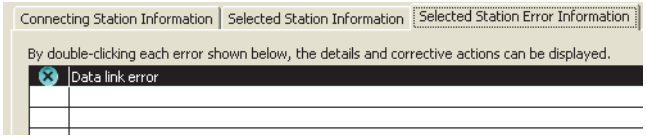
(1) Display contents of the "CC-Link Diagnostics" window

Item	Description
Diagnostics Result	Displays the number of errors and warnings that occur in the master/local module.
Module list/diagnostics target selection area	Lists master/local modules. The number of errors and warnings is also displayed. The diagnostics target can be changed by clicking a module icon. : Updates the list. : Switches the displayed modules in units of eight modules.
Station list	Lists the icons of stations that configure a CC-Link system. In the "Detail Display" mode, the 24th or later stations are displayed by clicking the Next>> button. The display status can be switched by clicking the Display All and Detail Display buttons. In the "Display All" mode, information on all stations can be viewed in one window. The icons can be freely located by drag and drop. To display the icons in the order of station number, click the Return to the original button. 
Connecting Station Information	Displays the station number of the connected station (host station).
Selected Station Information	Displays the information, such as a station number, of the station selected in the station list area (another station). 
Selected Station Error Information	Displays error information of the station selected in the station list area. 
Related Functions>>	Displays or hides the related function icons. For details on the related functions, refer to the following. • "Loop Test" (☞ Page 86, Section 6.5.1 (1), Page 90, Section 6.5.2 (1)) • "Status Logging" (☞ Page 315, Section 11.4.3) • "Create Check Sheet" (☞ Page 318, Section 11.4.4) • "Start Data Link"/"Stop Data Link" (☞ Page 320, Section 11.4.5)

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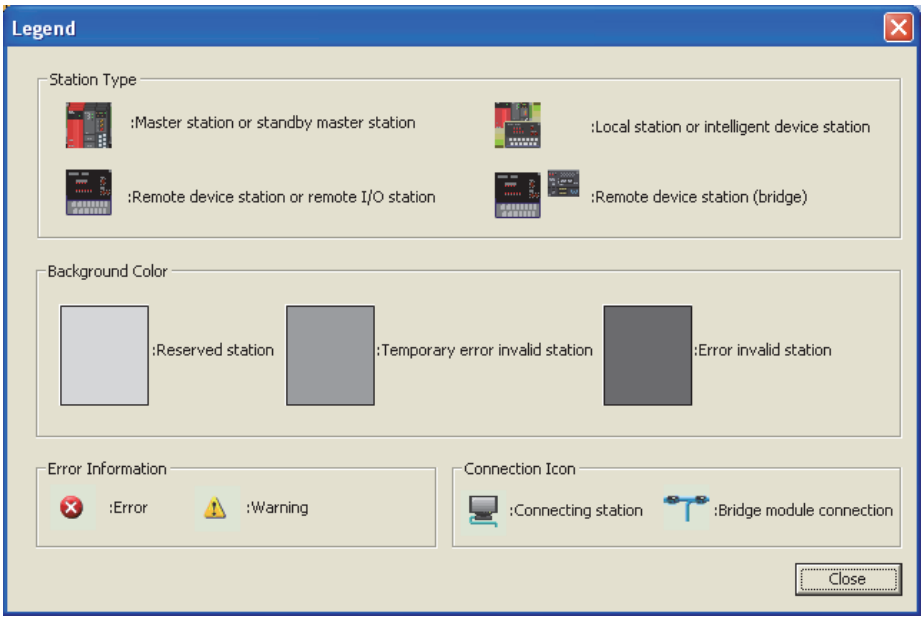
Item	Description
Legend...	Displays the explanation of icons on the diagnostics window. 

Point

- Update of the number of errors/warnings in "Diagnostics Result"
  Only the number of errors/warnings that occur in the system of the module selected in the module list/diagnostics target selection area is updated during monitoring.

  To view the latest number of errors/warnings of other modules, click the button to update the module list.

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11.4.2 Executing the line test/obtaining the transmission speed setting

For how to execute the line test and obtain the transmission speed setting, refer to the following.

- Line test (☞Page 86, Section 6.5.1)
- Obtaining the transmission speed setting (☞Page 90, Section 6.5.2)

Downloaded from Arrow.com.

11.4.3 Status logging

Data link status of all stations is logged. If multiple stations repeatedly fail and recover or stations following a specific station do so, the location of the error cause, such as poor cable connection and noise, can be easily identified.
With "RAM + Flash ROM" selected, the first 45 logs after logging start are stored on the flash ROM. Logs stored on the flash ROM can be checked even after the system is powered off and on or the CPU module is reset.

(1) Operating procedure

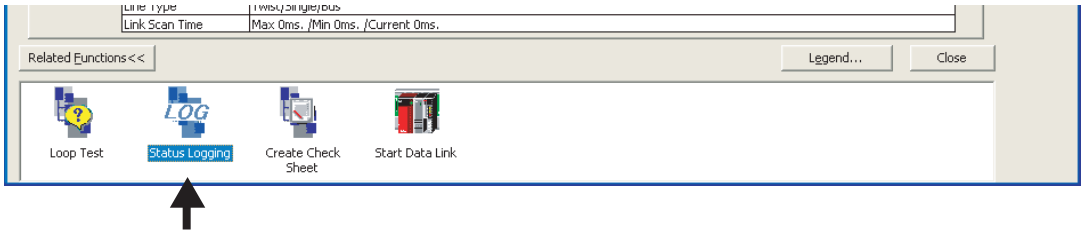
(a) Starting the status logging

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

[Diagnostics] ⇨ [CC-Link Diagnostics]

2. Double-click "Status Logging" on the bottom of the window.

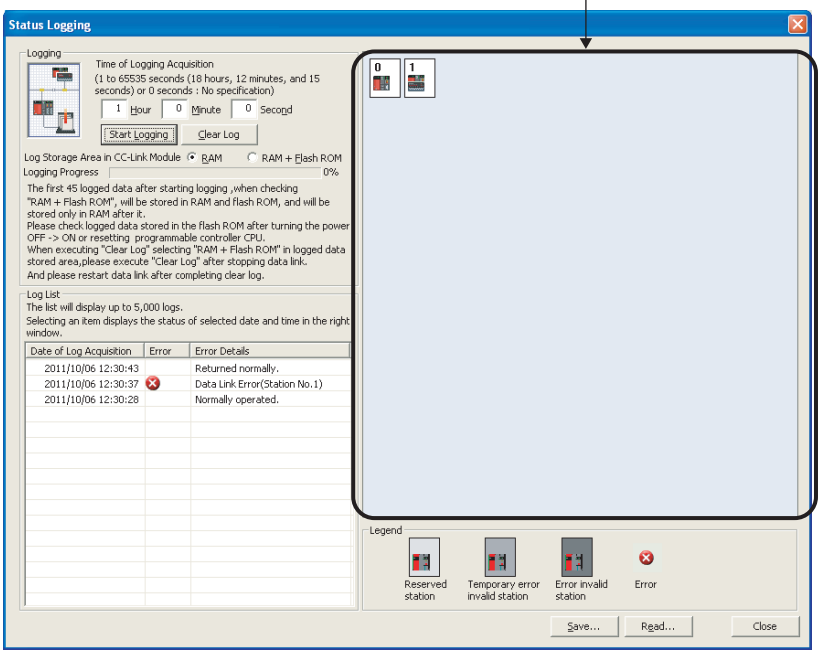
If "Status Logging" is not displayed on the bottom of the window, click the Related Functions>> button on the bottom left corner of the window.



Double-click the icon.

3. The "Status Logging" window appears.

Log display part



Downloaded from Arrow.com.

4. **Set "Time of Logging Acquisition".**

Enter the period during which logging is executed.

When 0 seconds is set, logging will be continued until the [Stop Logging] button is clicked or the number of logs reaches to 5000.

5. **Select either "RAM" or "RAM + Flash ROM" in "Log Storage Area in CC-Link Module".**

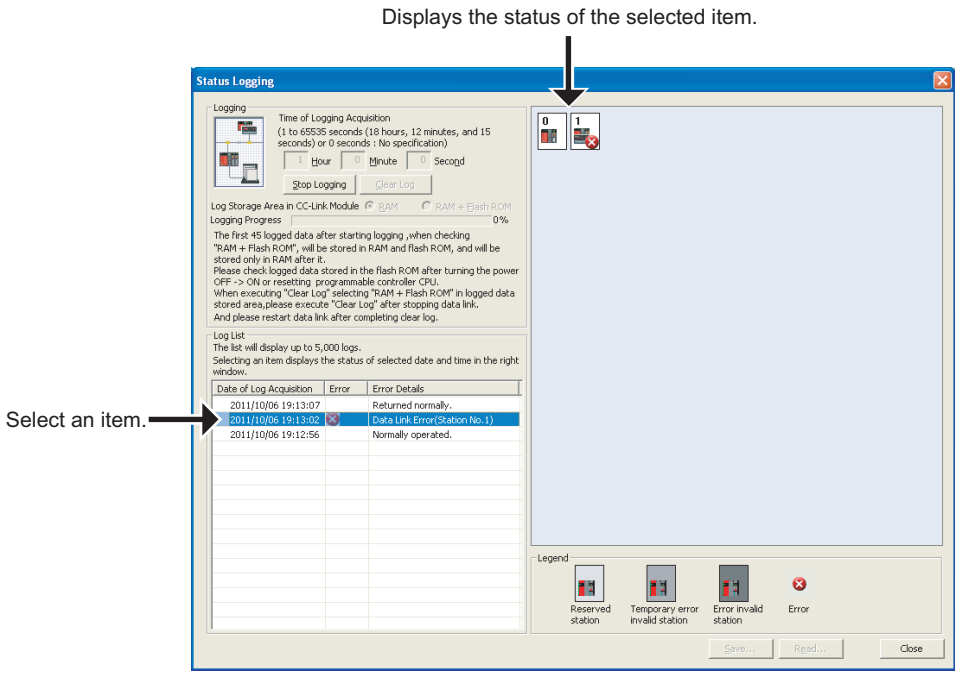
- When GX Works is not connected at all times
  Select "RAM + Flash ROM". To check the logs stored on the flash ROM (maximum: 45 logs), connect GX Works2.
- When GX Works2 is always connected
  Up to 5000 logs can be stored regardless of the selected option ("RAM" or "RAM + Flash ROM").

6. **Click the [Start Logging] button.**

Logging will be executed for the specified period.

However, if the [Stop Logging] button is clicked, or the number of logs reaches to 5000, the logging will stop.

7. **When an item is selected under "Log List", the status of the selected item is displayed in the log display part.**



Downloaded from Arrow.com.

(b) Saving logs in a CSV file and reading the saved logs

To save the information displayed under "Log List" in a CSV file, click the [Save...] button.

To read the saved CSV log file and display the contents under "Log List", click the [Read...] button.

(c) Deleting logs

1. To delete logs in a master/local module, click the [Clear Log] button.

If the [Clear Log] button is clicked with "RAM + Flash ROM" selected, the logs stored on the flash ROM will also be deleted. While the logs on the flash ROM are being deleted, do not power off the master/local module.

(2) Precautions

(a) Starting logging

Logging will not start in the following cases:

- Logs stored on the flash ROM have not yet been fully deleted (error code: B323).
- "RAM + Flash ROM" has been selected and 45 logs have already been stored on the flash ROM (error code: B324).
- The cumulative number of times that logs are stored on the flash ROM has exceeded 100,000 times (error code: B325).

(b) Log storage areas and the number of storable logs

The following log storage areas are available:

- RAM area (equipped in the module): Up to 95 logs
- Flash ROM area (equipped in the module): Up to 45 logs
- Hard disk on GX Works2 (personal computer): Up to 5000 logs

To store 96 or more logs (maximum 5000 logs), keep GX Works2 connected even after logging is started. If the number of logs stored in the RAM area has exceeded 95 with GX Works disconnected, the stored log will be overwritten from the oldest one.

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11.4.4 Creating a check sheet

A check sheet, which is useful for performing troubleshooting, is created through a wizard and with reference to the Open Field Network CC-Link Troubleshooting Guide.

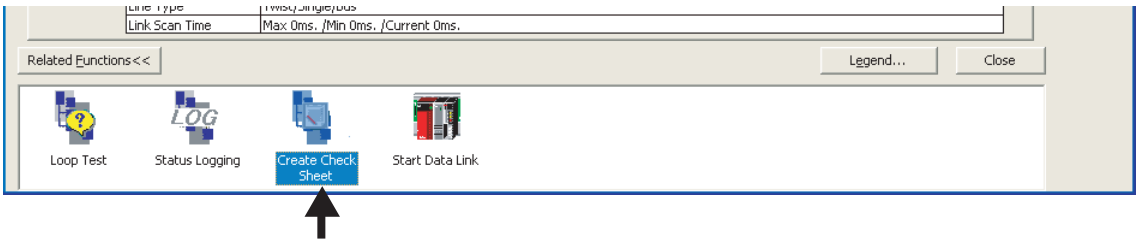
(1) Operating procedure

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

[Diagnostics] ⇨ [CC-Link Diagnostics]

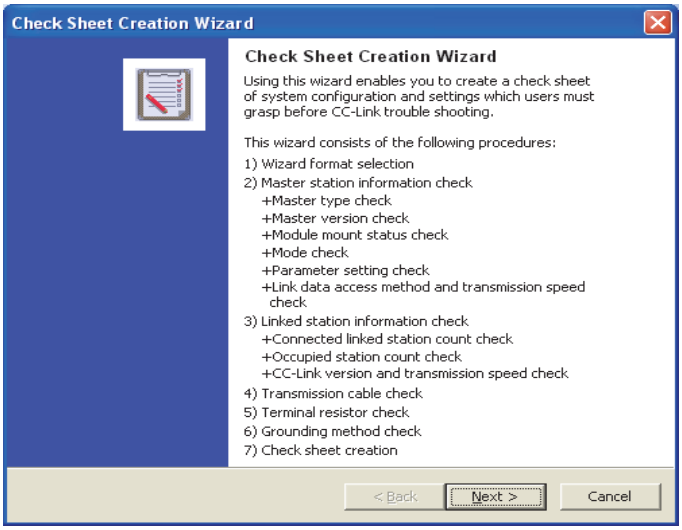
2. Double-click "Create Check Sheet" on the bottom of the window.

If "Create Check Sheet" is not displayed on the bottom of the window, click the Related Functions>> button on the bottom left corner of the window.



Double-click the icon.

3. The "Check Sheet Creation Wizard" window appears.



4. Configure settings with answering a series of questions displayed on the windows.

The created check sheet is saved in Excel.

5. Perform troubleshooting with reference to the Open Field Network CC-Link Troubleshooting Guide.

Point

- Precautions when a transmission speed is checked
  Do not obtain (check) the transmission speed setting using GX Works 2 and a program or other peripherals at the same time. Doing so may fail the acquisition of the transmission speed setting.
- Check sheet
  When Microsoft® Excel 2000 or later has been installed on the personal computer, the system configuration figure is output.

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(2) Example of a check sheet

The following is an example of a check sheet when it is created on the personal computer where Microsoft® Excel 2000 or later has been installed.

	Confirmation Item		Contents	
1.	Master Station	[1]Master Type	Programmable Controller P	Q20UDEHCPU
			Master Module	QJ61BT11N
		[2]Master Version	Programmable Controller P	120820000000000B
			Master Module	100320000000000B
		[3]Module Mount Status	I/O Address:	0000H
		[4]Other Network Module	Other Network Module:	QJ61BT11
		[5]Mode	Mode Setting:	[*]Remote Net Mode([*]Ver.1/ [ ]Additional /[ ]Ver.2) / [ ]Remote I/O Net Mode
			Scan Mode:	[ ]Synchronous/[*]Asynchronous Mode
			Module Mode:	[ ]I/O mode / [ ]intelligent mode (SW8:A Series Only)
		[6]Parameter	Checking the parameter matching status between the specification and PLC	
			Parameter	Setting
			Number of PLCs	1Count
			Standby Master Station Se	None
			PLC Down Drive Specificat	[*]Stop/[ ]Continue
			Reserved Station	None
			Error Invalid Station	None
			Station Information	Written in the system configuration
		[7]Parameter Setting	[*]GX WORKS2/ [ ]Dedicated Instruction/ [ ]FROM/TO Instruction	
		[8]Link Start Method	[ ]Startup by Buffer Memory:Y6 / [ ]Startup by E2PROM:Y8 (Only QnA, A, FX Series)	
		[9]Link Data Access	[*]Auto Refresh/ [ ]Dedicated Instruction/ [ ]FROM/TO Instruction	
		[10]Transmission Speed	[*]10M/ [ ]5M / [ ]2.5M / [ ]625k / [ ]156kbps	
2.	Linked Station	[11]Connected Count	1Count	
	*:The details have been described	[12]Station Type*	Remote I/O Station:0Count, Remote Device Station:0Count, Intelligent Device Station:1Count	
		[13]Number of Occupied S	[*]Number of occupied stations of each station(Please check it when you confirm it.)	
		[14]CC-Link Version*	[*]Ver.1 / [ ]Ver2(Expanded Cyclic Setting:[ ]1Times, [ ]2Times, [ ]4Times, [ ]8Times)	
		[15]Transmission Speed	[*]10M/ [ ]5M / [ ]2.5M / [ ]625k / [ ]156kbps	
3.	Transmission Cable	[16]Cable Type	Cable Model Name:	
		[17]Transmission Distance	Total Extension Distance:	m
		[18]Inter-Station Distance	Distance between Shortest	m
4.	Terminal Resistor	[19]Resistance Value	[*]110ohm / [ ]130ohm / [ ]Not Exist	
		[20]Connected Terminal	[*]Connection between DA-DB of terminal resistor(Please check it when you confirm it.)	
5.	Grounding	[21]FG Terminal	[*]Grounding of FG terminal of each station(Please check it when you confirm it.)	
			Describe the installation status to "6.System Configuration" when it is not set up in each station.	
6.	System Configuration	[22]		
	Station No., Station Type			
	Number of Occupied Stations			
	Length of Cable			

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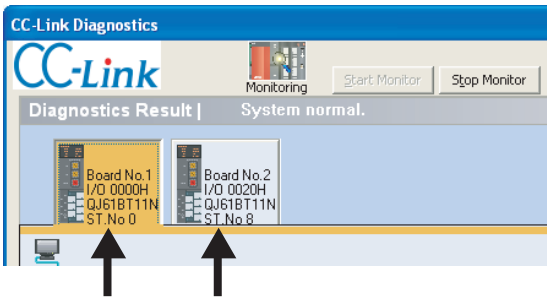
11.4.5 Stopping and restarting data link

How to stop and restart data link of a master/local module is described below.
During a debugging session, the master/local module does not receive data from other stations and does not send data of the host station.

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

[Diagnostics] ⇨ [CC-Link/Diagnostics]

2. Select a master/local module where data link is to be stopped and restarted on the top of the window.



Select the applicable module.

3. Double-click "Stop Data Link" on the bottom of the window.

The data link of the master/local module stops.
If "Stop Data Link" is not displayed on the bottom of the window, click the Related Functions>> button on the bottom left corner of the window.

Double-click the icon.

4. When the step 3. is performed while the data link of the selected module has been stopped, the data link will restart.

Point

When stopping or restarting data link, do not write data to the buffer memory area (buffer memory address: $5E0_H$).

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11.4.6 Setting and canceling a temporary error invalid station

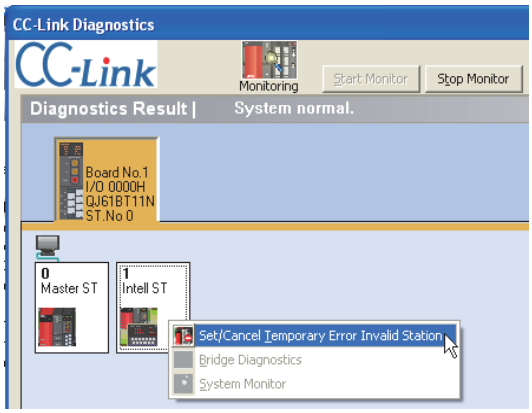
Even if a data link error occurs in a slave station, the station is not detected as a faulty station in the master station and local station. This setting can be configured even during data link, unlike the error invalid station setting function.
This function is used to exchange slave stations during data link for maintenance or for other purposes.

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

[Diagnostics] ⇨ [CC-Link Diagnostics]

2. Right-click the target slave station icon of the temporary error invalid station setting and select "Set/Cancel Temporary Error Invalid Station".

The selected station will be a temporary error invalid station.



3. When the step 2. is performed while the selected station has been set as a temporary error invalid station, the temporary error invalid station setting is canceled.

Point

When configuring the temporary error invalid station setting, do not write data to the buffer memory areas (buffer memory addresses: $5E0_H$ and 603_H to 607_H).

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11.4.7 Hardware information

The operating status and setting status of the master/local module are displayed.

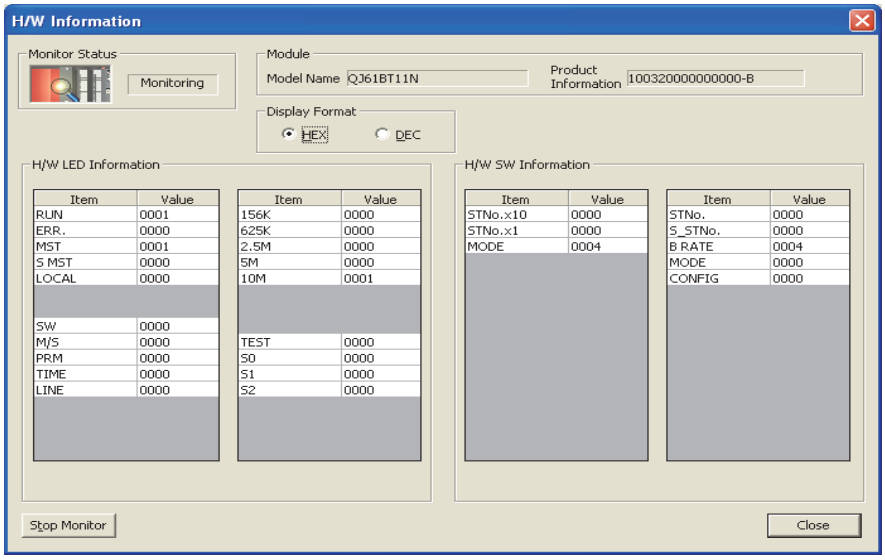
(1) Operating procedure

1. Open the "System Monitor" window.

[Diagnostics] ⇨ [System Monitor]

2. Select a master/local module in the "System Monitor" window.

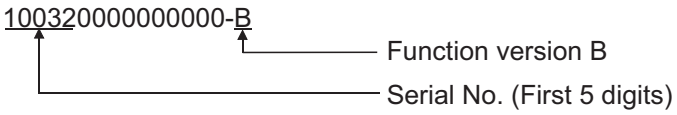
3. Click the H/W Information **button.**



(2) Display contents

(a) Product Information

The function version and serial number of the module are displayed as shown below.



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(b) H/W LED Information

The following table lists data link status displayed under "H/W LED Information".

Item	Description
RUN	1: Operating normally 0: A hardware failure or a watchdog timer error has occurred.
ERR.	1: A communication failure has occurred in all stations. Changes between 0 and 1: A communication failure has occurred in a station.
MST	1: The master/local module is operating as a master station.
S MST	1: The master/local module is operating as a standby master station (in standby status).
LOCAL	1: The master/local module is operating as a local station.
SW(ERR.)	1: Switch setting error
M/S(ERR.)	1: A master station has already existed in the same line.
PRM(ERR.)	1: Parameter data error
TIME(ERR.)	1: The data link monitoring timer has timed out.
LINE(ERR.)	1: A cable is disconnected or the transmission path has been affected by noise.
156K	1: The transmission speed is 156kbps.
625K	1: The transmission speed is 625kbps.
2.5M	1: The transmission speed is 2.5Mbps.
5M	1: The transmission speed is 5Mbps.
10M	1: The transmission speed is 10Mbps.
TEST	1: The offline test is being executed.
S0	Not used
S1	Not used
S2	Not used

(3) H/W SW Information

The following table lists information displayed under "H/W SW Information".

Item	Description
STNo. × 10	The value set using the station number setting switch (× 10)
STNo. × 1	The value set using the station number setting switch (× 1)
MODE	The value set using the transmission speed/mode setting switch
STNo.	The station number of the module
S_STNo.	The standby master station number set in the parameter (0: no standby master station specified)
B RATE	Transmission speed setting
MODE	Mode setting status
CONFIG	Module operating status (SW0062)

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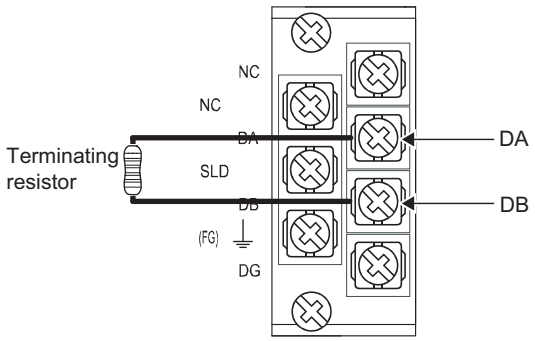
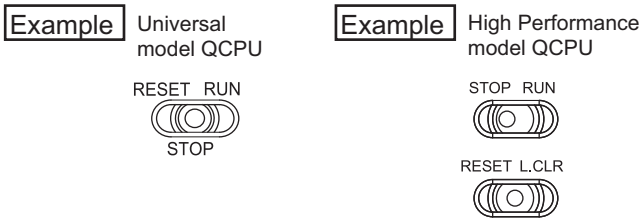
11.5 Hardware Test

A master/local module is individually tested to check whether it normally operates.

(1) Performing the hardware test

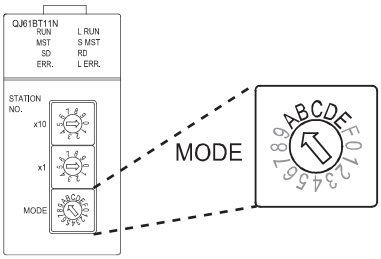


1. Connect the terminating resistor provided with the master/local module between the DA and DB terminals on the terminal block of the master/local module.



2. Before power-on, check the following.

- Module mounting status
- Input power supply voltage
- The CPU module is set to STOP.
- The CPU module is not set to RESET.



3. Set the transmission speed/mode setting switch on the master/local module to any of A to E.

When setting the switch from A to E, set the same transmission speed as that of during system operation.

(☞ Page 21, CHAPTER 2)

4. Reset the CPU module or power off and on the system.

(To the next page)

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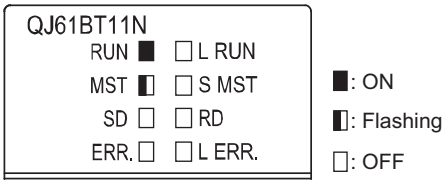
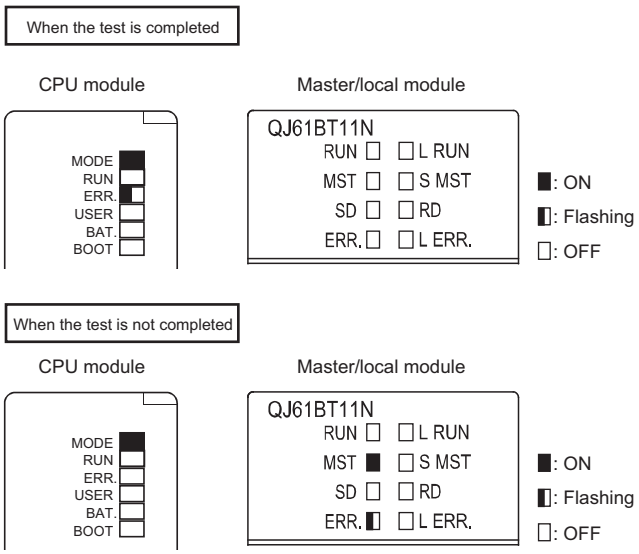


5. **The hardware test starts. During the test, the MST LED on the master/local module is flashing.**

The test is completed in about 30 seconds.



6. **When the hardware test is completed, the MST LED on the master/local module turns off or on.**

- When the test is completed
  MST LED on the master/local module: OFF
  ERR. LED on the CPU module: Flashing (for operation check of the watchdog timer function)
- When the test is not completed
  MST LED on the master/local module: ON
  ERR. LED on the master/local module: Flashing

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

(2) Precautions

(a) Cable connection

Perform a hardware test to a master/local module alone with cables disconnected. Failure to do so may result in a failure of the test.

(b) CPU module switch

Before performing a hardware test, check that the CPU module is set to STOP.
For operation check of the watchdog timer function, when the hardware test is performed, an error (SP.UNIT DOWN) occurs and the CPU module stops.

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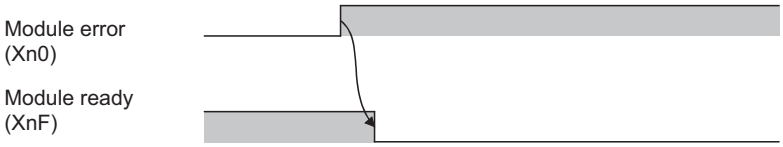
APPENDICES

Appendix 1 Description of I/O Signals

This appendix describes on/off timing and conditions of I/O signals.

(1) Module error: Xn0

This signal indicates whether the module is normal or faulty.
OFF: Module normal
ON: Module error



(2) Host data link status: Xn1

This signal indicates the data link status of the host station.
Host station operation status (SB006E) has the same functionality. Use either of Xn1 or SB006E for programming.
Note that the on/off conditions of Xn1 are the opposite to those of SB006E. The conditions of Xn1 are as follows:
OFF: Data link stopped
ON: During data link

(3) Other station data link status: Xn3

This signal indicates the data link status of other stations (remote station, local station, intelligent device station, and standby master station).
Other station data link status (SB0080) has the same functionality. Use either of Xn3 or SB0080 for programming.
OFF: All stations normal
ON: A faulty station exists. (The status of the faulty station is stored in SW0080 to SW0083.)

Point

It takes maximum of six seconds for Other station data link status (Xn3) 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.

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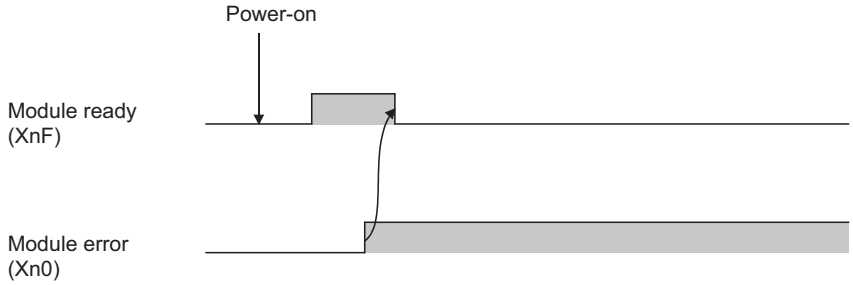
(4) Module ready: XnF

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

This signal turns off under either condition.

- An error has been detected in the switch setting of the module.
- Module error (Xn0) turns on.



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Appendix 2 Buffer Memory Areas

This appendix describes buffer memory areas.

(1) Parameter information area

This area stores parameter settings.

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

Address		Item	Description
Hexadecimal	Decimal		
0_H	0	(Use prohibited)	—
1_H	1	Total number of connected stations	The number of slave stations (including a reserved station) connected to the master station is stored. Default: 64 (stations) Range: 1 to 64 (station)
2_H	2	Number of retries	The number of retries to a station where a communication failure has occurred is stored. Default: 3 (times) Range: 1 to 7 (time)
3_H	3	Number of automatic return stations	The number of slave stations that return to system operation by one link scan is stored. Default: 1 (station) Range: 1 to 10 (station)
4_H	4	Standby master station specification	The standby master station number is stored. Default: 0 (0: no standby master station specified) Range: 0 to 64 (0: no standby master station specified)
5_H	5	(Use prohibited)	—
6_H	6	Operation specification when CPU is down	The specified data link status if a programmable controller CPU error occurs in the mater station is stored. Default: 0 (Stop) Range: 0 (Stop) 1 (Continued)
7_H	7	Scan mode setting	Whether to synchronize a link scan with a sequence scan is stored. Default: 0 (Asynchronous) Range: 0 (Asynchronous) 1 (Synchronous)
8_H	8	Delay time setting	Delay time is stored. (Set 0.)
10_H to 13_H	16 to 19	Reserved station specification	Reserved station specification status is stored. Default: 0 (Not set) Range: The bit corresponding to the station number turns on.
14_H to 17_H	20 to 23	Error invalid station specification	Error invalid station specification status is stored. Default: 0 (Not set) Range: The bit corresponding to the station number turns on.

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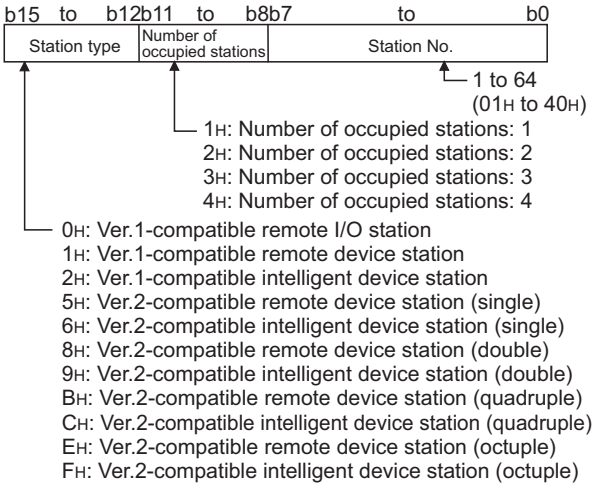
Address		Item	Description
Hexadecimal	Decimal		
18_H to $1F_H$	24 to 31	(Use prohibited)	—
20_H (First station) to $5F_H$ (64th station)	32 (First station) to 95 (64th station)	Station information	The setting status of the station type, the number of occupied stations, and expanded cyclic setting of the connected slave stations is stored. Default: 0101_H (Ver.1-compatible remote I/O station, one station occupied, and station number 1) to 0140_H (Ver.1-compatible remote I/O station, one station occupied, and station number 64) Range: Refer to the following. 
60_H to $7F_H$	96 to 127	(Use prohibited)	—
80H (Send buffer) 81H (Receive buffer) 82H (Automatic update buffer) } The first intelligent device to CBH (Send buffer) CCH (Receive buffer) CDH (Automatic update buffer) } The 26th intelligent device	128 (Send buffer) 129 (Receive buffer) 130 (Automatic update buffer) } The first intelligent device to 203 (Send buffer) 204 (Receive buffer) 205 (Automatic update buffer) } The 26th intelligent device	Assignment of communication buffer and automatic update buffer	The buffer memory sizes assigned for a local station, intelligent device station, and standby master station during transient transmission are stored. Default Send buffer size: 40_H (64) (word) Receive buffer size: 40_H (64) (word) Automatic update buffer size: 80_H (128) (word) Range • Communication buffer: 0_H (0) (word) (not set) or 40_H (64) (word) to 1000_H (4096) (word) Note that the total size of the communication buffer must be within 1000_H (4096) (word). • Automatic update buffer: 0_H (0) (word) (not set) or 80_H (128) (word) to 1000_H (4096) (word) Note that the total size of the automatic update buffer must be within 1000_H (4096) (word).
CE_H, CF_H	206, 207	(Use prohibited)	—
$D0_H$ to $D3_H$	208 to 211	8-point remote I/O station setting	The station number of the remote I/O station where eight points have been set in the remote I/O station points setting is stored.*1 *2 Default: 0 (Not set) Range: The bit corresponding to the station number turns on.

A

Appendix 2 Buffer Memory Areas

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Address		Item	Description
Hexadecimal	Decimal		
$D4_H$ to $D7_H$	212 to 215	16-point remote I/O station setting	The station number of the remote I/O station where 16 points have been set in the remote I/O station points setting is stored.*1 *2 Default: 0 (Not set) Range: The bit corresponding to the station number turns on.
$D8_H$ to DB_H	216 to 219	0-point reserved station setting	The station number of the reserved station where 0 points have been set is stored.*1 Default: 0 (Not set) Range: The bit corresponding to the station number turns on.
DC_H to DF_H	220 to 223	(Use prohibited)	—

*1 This buffer memory area is used in the remote net Ver.2 mode.

*2 When "8 Points+8 Points(Reserved)" has been set, the station number is stored in both eight-point remote I/O station setting and 16-point remote I/O station setting.

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

This area is used when the remote net Ver.1 mode, remote net additional mode, or remote I/O net mode is selected.

- In the remote net Ver.1 mode, data are stored in the remote input (RX) and remote output (RY). (☞Page 47, Section 3.6.3 (3))
- In the remote net additional mode, data are stored in the remote input (RX) and remote output (RY) in the Ver.1-compatible slave station. (☞Page 54, Section 3.6.5 (3))
- In the remote I/O net mode, data are stored in the remote input (RX) and remote output (RY). (☞Page 56, Section 3.6.6 (3))

(a) Remote input (RX)

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	$E0_H$ and $E1_H$ (224 and 225)	14	FA_H and FB_H (250 and 251)	27	114_H and 115_H (276 and 277)	40	$12E_H$ and $12F_H$ (302 and 303)	53	148_H and 149_H (328 and 329)
2	$E2_H$ and $E3_H$ (226 and 227)	15	FC_H and FD_H (252 and 253)	28	116_H and 117_H (278 and 279)	41	130_H and 131_H (304 and 305)	54	$14A_H$ and $14B_H$ (330 and 331)
3	$E4_H$ and $E5_H$ (228 and 229)	16	FE_H and FF_H (254 and 255)	29	118_H and 119_H (280 and 281)	42	132_H and 133_H (306 and 307)	55	$14C_H$ and 14DH (332 and 333)
4	$E6_H$ and $E7_H$ (230 and 231)	17	100_H and 101_H (256 and 257)	30	$11A_H$ and $11B_H$ (282 and 283)	43	134_H and 135_H (308 and 309)	56	$14E_H$ and $14F_H$ (334 and 335)
5	$E8_H$ and $E9_H$ (232 and 233)	18	102_H and 103_H (258 and 259)	31	$11C_H$ and $11D_H$ (284 and 285)	44	136_H and 137_H (310 and 311)	57	150_H and 151_H (336 and 337)
6	EA_H and EB_H (234 and 235)	19	104_H and 105_H (260 and 261)	32	$11E_H$ and $11F_H$ (286 and 287)	45	138_H and 139_H (312 and 313)	58	152_H and 153_H (338 and 339)
7	EC_H and ED_H (236 and 237)	20	106_H and 107_H (262 and 263)	33	120_H and 121_H (288 and 289)	46	$13A_H$ and $13B_H$ (314 and 315)	59	154_H and 155H (340 and 341)
8	EE_H and EF_H (238 and 239)	21	108_H and 109_H (264 and 265)	34	122_H and 123H (290 and 291)	47	$13C_H$ and $13D_H$ (316 and 317)	60	156_H and 157_H (342 and 343)
9	$F0_H$ and $F1_H$ (240 and 241)	22	$10A_H$ and $10B_H$ (266 and 267)	35	124_H and 125_H (292 and 293)	48	$13E_H$ and $13F_H$ (318 and 319)	61	158_H and 159_H (344 and 345)
10	$F2_H$ and $F3_H$ (242 and 243)	23	$10C_H$ and $10D_H$ (268 and 269)	36	126_H and 127_H (294 and 295)	49	140_H and 141_H (320 and 321)	62	$15A_H$ and $15B_H$ (346 and 347)
11	$F4_H$ and $F5_H$ (244 and 245)	24	$10E_H$ and $10F_H$ (270 and 271)	37	128_H and 129_H (296 and 297)	50	142_H and 143_H (322 and 323)	63	$15C_H$ and $15D_H$ (348 and 349)
12	$F6_H$ and $F7_H$ (246 and 247)	25	110_H and 111_H (272 and 273)	38	$12A_H$ and $12B_H$ (298 and 299)	51	144_H and 145_H (324 and 325)	64	$15E_H$ and $15F_H$ (350 and 351)
13	$F8_H$ and $F9_H$ (248 and 249)	26	112_H and 113_H (274 and 275)	39	$12C_H$ and $12D_H$ (300 and 301)	52	146_H and 147_H (326 and 327)	—	—

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(b) Remote output (RY)

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	160_H and 161_H (352 and 353)	14	$17A_H$ and $17B_H$ (378 and 379)	27	194_H and 195_H (404 and 405)	40	$1AE_H$ and $1AF_H$ (430 and 431)	53	$1C8_H$ and $1C9_H$ (456 and 457)
2	162_H and 163_H (354 and 355)	15	$17C_H$ and $17D_H$ (380 and 381)	28	196_H and 197_H (406 and 407)	41	$1B0_H$ and $1B1_H$ (432 and 433)	54	$1CA_H$ and $1CB_H$ (458 and 459)
3	164_H and 165_H (356 and 357)	16	$17E_H$ and $17F_H$ (382 and 383)	29	198_H and 199_H (408 and 409)	42	$1B2_H$ and $1B3_H$ (434 and 435)	55	$1CC_H$ and $1CD_H$ (460 and 461)
4	166_H and 167_H (358 and 359)	17	180_H and 181_H (384 and 385)	30	$19A_H$ and $19B_H$ (410 and 411)	43	$1B4_H$ and $1B5_H$ (436 and 437)	56	$1CE_H$ and $1CF_H$ (462 and 463)
5	168_H and 169_H (360 and 361)	18	182_H and 183_H (386 and 387)	31	$19C_H$ and $19D_H$ (412 and 413)	44	$1B6_H$ and $1B7_H$ (438 and 439)	57	$1D0_H$ and $1D1_H$ (464 and 465)
6	$16A_H$ and $16B_H$ (362 and 363)	19	184_H and 185_H (388 and 389)	32	$19E_H$ and $19F_H$ (414 and 415)	45	$1B8_H$ and $1B9_H$ (440 and 441)	58	$1D2_H$ and $1D3_H$ (466 and 467)
7	$16C_H$ and $16D_H$ (364 and 365)	20	186_H and 187_H (390 and 391)	33	$1A0_H$ and $1A1_H$ (416 and 417)	46	$1BA_H$ and $1BB_H$ (442 and 443)	59	$1D4_H$ and $1D5_H$ (468 and 469)
8	$16E_H$ and $16F_H$ (366 and 367)	21	188_H and 189_H (392 and 393)	34	$1A2_H$ and $1A3_H$ (418 and 419)	47	$1BC_H$ and $1BD_H$ (444 and 445)	60	$1D6_H$ and $1D7_H$ (470 and 471)
9	170_H and 171_H (368 and 369)	22	$18A_H$ and $18B_H$ (394 and 395)	35	$1A4_H$ and $1A5_H$ (420 and 421)	48	$1BE_H$ and $1BF_H$ (446 and 447)	61	$1D8_H$ and $1D9_H$ (472 and 473)
10	172_H and 173_H (370 and 371)	23	$18C_H$ and $18D_H$ (396 and 397)	36	$1A6_H$ and $1A7_H$ (422 and 423)	49	$1C0_H$ and $1C1_H$ (448 and 449)	62	$1DA_H$ and $1DB_H$ (474 and 475)
11	174_H and 175_H (372 and 373)	24	$18E_H$ and $18F_H$ (398 and 399)	37	$1A8_H$ and $1A9_H$ (424 and 425)	50	$1C2_H$ and $1C3_H$ (450 and 451)	63	$1DC_H$ and $1DD_H$ (476 and 477)
12	176_H and 177_H (374 and 375)	25	190_H and 191_H (400 and 401)	38	$1AA_H$ and $1AB_H$ (426 and 427)	51	$1C4_H$ and $1C5_H$ (452 and 453)	64	$1DE_H$ and $1DF_H$ (478 and 479)
13	178_H and 179_H (376 and 377)	26	192_H and 193_H (402 and 403)	39	$1AC_H$ and $1AD_H$ (428 and 429)	52	$1C6_H$ and $1C7_H$ (454 and 455)	—	—

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(3) Remote register (RWw) and remote register (RWr)

This area is used when the remote net Ver.1 mode or remote net additional mode is selected.

- In the remote net Ver.1 mode, data are stored in the remote register (RWr/RWw). (☞Page 47, Section 3.6.3 (3))
- In the remote net additional mode, data are stored in the remote register (RWr/RWw) in a Ver.1-compatible slave station. (☞Page 54, Section 3.6.5 (3))

(a) Remote register (RWr)

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	$2E0_H$ to $2E3_H$ (736 to 739)	14	314_H to 317_H (788 to 791)	27	348_H to $34B_H$ (840 to 843)	40	37CH to $37F_H$ (892 to 895)	53	$3B0_H$ to $3B3_H$ (944 to 947)
2	$2E4_H$ to $2E7_H$ (740 to 743)	15	318_H to $31B_H$ (792 to 795)	28	$34C_H$ to $34F_H$ (844 to 847)	41	380_H to 383_H (896 to 899)	54	$3B4_H$ to $3B7_H$ (948 to 951)
3	$2E8_H$ to $2EB_H$ (744 to 747)	16	$31C_H$ to $31F_H$ (796 to 799)	29	350_H to 353_H (848 to 851)	42	384_H to 387_H (900 to 903)	55	$3B8_H$ to $3BB_H$ (952 to 955)
4	$2EC_H$ to $2EF_H$ (748 to 751)	17	320_H to 323_H (800 to 803)	30	354_H to 357_H (852 to 855)	43	388_H to $38B_H$ (904 to 907)	56	$3BC_H$ to $3BF_H$ (956 to 959)
5	$2F0_H$ to $2F3_H$ (752 to 755)	18	324_H to 327_H (804 to 807)	31	358_H to $35B_H$ (856 to 859)	44	$38C_H$ to $38F_H$ (908 to 911)	57	$3C0_H$ to $3C3_H$ (960 to 963)
6	$2F4_H$ to $2F7_H$ (756 to 759)	19	328_H to $32B_H$ (808 to 811)	32	$35C_H$ to $35F_H$ (860 to 863)	45	390_H to 393_H (912 to 915)	58	$3C4_H$ to $3C7_H$ (964 to 967)
7	$2F8_H$ to $2FB_H$ (760 to 763)	20	$32C_H$ to $32F_H$ (812 to 815)	33	360_H to 363_H (864 to 867)	46	394_H to 397_H (916 to 919)	59	$3C8_H$ to $3CB_H$ (968 to 971)
8	$2FC_H$ to $2FF_H$ (764 to 767)	21	330_H to 333_H (816 to 819)	34	364_H to 367_H (868 to 871)	47	398_H to $39B_H$ (920 to 923)	60	$3CC_H$ to $3CF_H$ (972 to 975)
9	300_H to 303_H (768 to 771)	22	334_H to 337_H (820 to 823)	35	368_H to $36B_H$ (872 to 875)	48	$39C_H$ to $39F_H$ (924 to 927)	61	$3D0_H$ to $3D3_H$ (976 to 979)
10	304_H to 307_H (772 to 775)	23	338_H to $33B_H$ (824 to 827)	36	$36C_H$ to $36F_H$ (876 to 879)	49	$3A0_H$ to $3A3_H$ (928 to 931)	62	$3D4_H$ to $3D7_H$ (980 to 983)
11	308_H to $30B_H$ (776 to 779)	24	$33C_H$ to $33F_H$ (828 to 831)	37	370_H to 373_H (880 to 883)	50	$3A4_H$ to $3A7_H$ (932 to 935)	63	$3D8_H$ to $3DB_H$ (984 to 987)
12	$30C_H$ to $30F_H$ (780 to 783)	25	340_H to 343_H (832 to 835)	38	374_H to 377_H (884 to 887)	51	$3A8_H$ to $3AB_H$ (936 to 939)	64	$3DC_H$ to $3DF_H$ (988 to 991)
13	310_H to 313_H (784 to 787)	26	344_H to 347_H (836 to 839)	39	378_H to $37B_H$ (888 to 891)	52	$3AC_H$ to $3AF_H$ (940 to 943)	—	—

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(b) Remote register (RWw)

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	$1E0_H$ to $1E3_H$ (480 to 483)	14	214_H to 217_H (532 to 535)	27	248_H to $24B_H$ (584 to 587)	40	$27C_H$ to $27F_H$ (636 to 639)	53	$2B0_H$ to $2B3_H$ (688 to 691)
2	$1E4_H$ to $1E7_H$ (484 to 487)	15	218_H to $21B_H$ (536 to 539)	28	$24C_H$ to $24F_H$ (588 to 591)	41	280_H to 283_H (640 to 643)	54	$2B4_H$ to $2B7_H$ (692 to 695)
3	$1E8_H$ to $1EB_H$ (488 to 491)	16	$21C_H$ to $21F_H$ (540 to 543)	29	250_H to 253_H (592 to 595)	42	284_H to 287_H (644 to 647)	55	$2B8_H$ to $2BB_H$ (696 to 699)
4	$1EC_H$ to $1EF_H$ (492 to 495)	17	220_H to 223_H (544 to 547)	30	254_H to 257_H (596 to 599)	43	288_H to $28B_H$ (648 to 651)	56	$2BC_H$ to $2BF_H$ (700 to 703)
5	$1F0_H$ to $1F3_H$ (496 to 499)	18	224_H to 227_H (548 to 551)	31	258_H to $25B_H$ (600 to 603)	44	$28C_H$ to $28F_H$ (652 to 655)	57	$2C0_H$ to $2C3_H$ (704 to 707)
6	$1F4_H$ to $1F7_H$ (500 to 503)	19	228_H to $22B_H$ (552 to 555)	32	$25C_H$ to $25F_H$ (604 to 607)	45	290_H to 293_H (656 to 659)	58	$2C4_H$ to $2C7_H$ (708 to 711)
7	$1F8_H$ to $1FB_H$ (504 to 507)	20	$22C_H$ to $22F_H$ (556 to 559)	33	260_H to 263_H (608 to 611)	46	294_H to 297_H (660 to 663)	59	$2C8_H$ to $2CB_H$ (712 to 715)
8	$1FC_H$ to $1FF_H$ (508 to 511)	21	230_H to 233_H (560 to 563)	34	264_H to 267_H (612 to 615)	47	298_H to $29B_H$ (664 to 667)	60	$2CC_H$ to $2CF_H$ (716 to 719)
9	200_H to 203_H (512 to 515)	22	234_H to 237_H (564 to 567)	35	268_H to $26B_H$ (616 to 619)	48	$29C_H$ to $29F_H$ (668 to 671)	61	$2D0_H$ to $2D3_H$ (720 to 723)
10	204_H to 207_H (516 to 519)	23	238_H to $23B_H$ (568 to 571)	36	$26C_H$ to $26F_H$ (620 to 623)	49	$2A0_H$ to $2A3_H$ (672 to 675)	62	$2D4_H$ to $2D7_H$ (724 to 727)
11	208_H to $20B_H$ (520 to 523)	24	$23C_H$ to $23F_H$ (572 to 575)	37	270_H to 273_H (624 to 627)	50	$2A4_H$ to $2A7_H$ (676 to 679)	63	$2D8_H$ to $2DB_H$ (728 to 731)
12	$20C_H$ to $20F_H$ (524 to 527)	25	240_H to 243_H (576 to 579)	38	274_H to 277_H (628 to 631)	51	$2A8_H$ to $2AB_H$ (680 to 683)	64	$2DC_H$ to $2DF_H$ (732 to 735)
13	210_H to 213_H (528 to 531)	26	244_H to 247_H (580 to 583)	39	278_H to $27B_H$ (632 to 635)	52	$2AC_H$ to $2AF_H$ (684 to 687)	—	—

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(4) Slave station offset, size information

In the remote net Ver.2 mode and remote net additional mode, the assignment of RX/RY/RWw/RWr for each station differs depending on the expanded cyclic setting and the remote I/O station points setting.

(a) Offset

This area stores the start buffer memory addresses of RX/RY/RWw/RWr assigned for each station.
When two or more stations are occupied, a value is stored only in the start buffer memory address of the first station.
For example, when the station number 1 occupies two stations, values are stored only in the RX/RY/RWw/RWr offset, size information of the station number 1 and those for the station number 2 remain the default.

(b) Size

This area stores the sizes of RX/RY/RWw/RWr assigned for each station (unit: word).
When the size is less than one word, the storage value is rounded up; therefore, 1 is stored.
When eight points are set in the remote I/O station points setting, 1 is stored. For the remote I/O station points setting, refer to Page 170, Section 8.3.9.
If the target station is a reserved station, 0000_H is stored.

The following table lists the relationship between RX/RY/RWw/RWr offset, size information and buffer memory addresses for each station.

Buffer memory address		Item	Default (hexadecimal)
Hexadecimal	Decimal		
$3E0_H$	992	Station No.1 RX offset	0000_H
$3E1_H$	993	Station No.1 RX size	0000_H
to	to	to	—
$45E_H$	1118	Station No.64 RX offset	0000_H
$45F_H$	1119	Station No.64 RX size	0000_H
460_H	1120	Station No.1 RY offset	0000_H
461_H	1121	Station No.1 RY size	0000_H
to	to	to	—
$4DE_H$	1246	Station No.64 RY offset	0000_H
$4DF_H$	1247	Station No.64 RY size	0000_H
$4E0_H$	1248	Station No.1 RWw offset	0000_H
$4E1_H$	1249	Station No.1 RWw size	0000v
to	to	to	—
$55E_H$	1374	Station No.64 RWw offset	0000_H
$55F_H$	1375	Station No.64 RWw size	0000_H
560_H	1376	Station No.1 RWr offset	0000_H
561_H	1377	Station No.1 RWr size	0000_H
to	to	to	—
$5DE_H$	1502	Station No.64 RWr offset	0000_H
$5DF_H$	1503	Station No.64 RWr size	0000_H

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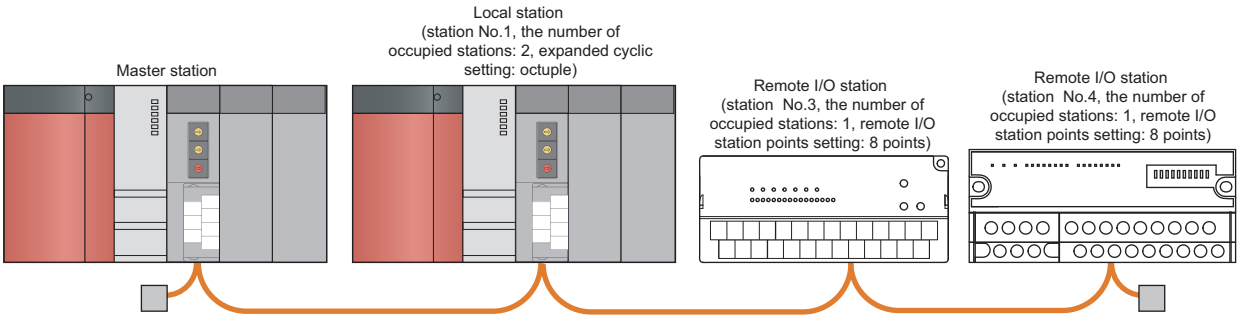
Ex. When connecting the local station with the expanded cyclic setting and remote I/O stations with the remote I/O station points setting



Buffer memory area	Value	Description
Station No.1 RX offset	4000_H	Start buffer memory address of RX in the station number 1
Station No.1 RX size	24 (18_H)	384 (number of points of RX) ÷ 16 = 24 words
Station No.2 RX offset	4000_H	Because the station occupies two stations, check the area in the station number 1.
Station No.2 RX size	0 (Default)	Because the station occupies two stations, check the area in the station number 1.
Station No.3 RX offset	4018_H	Start buffer memory address of RX in the station number 3
Station No.3 RX size	1 (1_H)	The lower eight bits of the area (buffer memory address: 4018_H) are the corresponding size of RX in the station number 3; however, 1 is stored, because a value less than one word is rounded up.
Station No.4 RX offset	4018_H	Start buffer memory address of RX in the station number 4
Station No.4 RX size	1 (1_H)	The upper eight bits of the area (buffer memory address: 4018_H) are the corresponding size of RX in the station number 4; however, 1 is stored, because a value less than one word is rounded up.
Station No.1 RY offset	4200_H	Start buffer memory address of RY in the station number 1
Station No.1 RY size	24 (18_H)	384 (number of points of RY) ÷ 16 = 24 words
Station No.2 RY offset	4200_H	Because the station occupies two stations, check the area in the station number 1.
Station No.2 RY size	0 (Default)	Because the station occupies two stations, check the area in the station number 1.
Station No.3 RY offset	4218_H	Start buffer memory address of RY in the station number 3
Station No.3 RY size	1 (1_H)	The lower eight bits of the area (buffer memory address: 4018_H) are the corresponding size of RY in the station number 3; however, 1 is stored, because a value less than one word is rounded up.
Station No.4 RY offset	4218_H	Start buffer memory address of RY in the station number 4
Station No.4 RY size	1 (18_H)	The upper eight bits of the area (buffer memory address: 4018_H) are the corresponding size of RY in the station number 4; however, 1 is stored, because a value less than one word is rounded up.
Station No.1 RWw offset	4400_H	Start buffer memory address of RWw in the station number 1
Station No.1 RWw size	64 (40_H)	2 (number of occupied stations) × 32 (expanded cyclic setting) = 64
Station No.2 RWw offset	4400_H	Because the station occupies two stations, check the area in the station number 1.
Station No.2 RWw size	0 (Default)	Because the station occupies two stations, check the area in the station number 1.
Station No.3 RWw offset	4440_H	Start buffer memory address of RWw in the station number 3
Station No.3 RWw size	0 (Default)	Buffer memory area size of RWw in the station number 3
Station No.4 RWw offset	4440_H	Start buffer memory address of RWw in the station number 4
Station No.4 RWw size	0 (Default)	Buffer memory area size of RWw in the station number 4
Station No.1 RWr offset	$4C00_H$	Start buffer memory address of RWr in the station number 1

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Buffer memory area	Value	Description
Station No.1 RWr size	64 (40_H)	2 (number of occupied stations) × 32 (expanded cyclic setting) = 64
Station No.2 RWr offset	$4C00_H$	Because the station occupies two stations, check the area in the station number 1.
Station No.2 RWr size	0 (Default)	Because the station occupies two stations, check the area in the station number 1.
Station No.3 RWr offset	$4C40_H$	Start buffer memory address of RWr in the station number 3
Station No.3 RWr size	0 (Default)	Buffer memory area size of RWr in the station number 3
Station No.4 RWr offset	$4C40_H$	Start buffer memory address of RWr in the station number 4
Station No.4 RWr size	0 (Default)	Buffer memory area size of RWr in the station number 4

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(5) Link special relay (SB)

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

Buffer memory addresses $5E0_H$ to $5FF_H$ correspond to link special relays SB0000 to SB01FF. (☞ Page 343, Appendix 3.1)

The following table lists the relationship between buffer memory addresses $5E0_H$ to $5FF_H$ and link special relays SB0000 to SB01FF.

Address	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
$5E0_H$ (1504)	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
$5E1_H$ (1505)	1F	1E	1D	1C	1B	1A	19	18	17	16	15	14	13	12	11	10
$5E2_H$ (1506)	2F	2E	2D	2C	2B	2A	29	28	27	26	25	24	23	22	21	20
$5E3_H$ (1507)	3F	3E	3D	3C	3B	3A	39	38	37	36	35	34	33	32	31	30
$5E4_H$ (1508)	4F	4E	4D	4C	4B	4A	49	48	47	46	45	44	43	42	41	40
$5E5_H$ (1509)	5F	5E	5D	5C	5B	5A	59	58	57	56	55	54	53	52	51	50
$5E6_H$ (1510)	6F	6E	6D	6C	6B	6A	69	68	67	66	65	64	63	62	61	60
5E7H (1511)	7F	7E	7D	7C	7B	7A	79	78	77	76	75	74	73	72	71	70
$5E8_H$ (1512)	8F	8E	8D	8C	8B	8A	89	88	87	86	85	84	83	82	81	80
$5E9_H$ (1513)	9F	9E	9D	9C	9B	9A	99	98	97	96	95	94	93	92	91	90
$5EA_H$ (1514)	AF	AE	AD	AC	AB	AA	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
$5EB_H$ (1515)	BF	BE	BD	BC	BB	BA	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
$5EC_H$ (1516)	CF	CE	CD	CC	CB	CA	C9	C8	C7	C6	C5	C4	C3	C2	C1	C0
5EDH (1517)	DF	DE	DD	DC	DB	DA	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
$5EE_H$ (1518)	EF	EE	ED	EC	EB	EA	E9	E8	E7	E6	E5	E4	E3	E2	E1	E0
$5EF_H$ (1519)	FF	FE	FD	FC	FB	FA	F9	F8	F7	F6	F5	F4	F3	F2	F1	F0
$5F0_H$ (1520)	10F	10E	10D	10C	10B	10A	109	108	107	106	105	104	103	102	101	100
$5F1_H$ (1521)	11F	11E	11D	11C	11B	11A	119	118	117	116	115	114	113	112	111	110
$5F2_H$ (1522)	12F	12E	12D	12C	12B	12A	129	128	127	126	125	124	123	122	121	120
$5F3_H$ (1523)	13F	13E	13D	13C	13B	13A	139	138	137	136	135	134	133	132	131	130
$5F4_H$ (1524)	14F	14E	14D	14C	14B	14A	149	148	147	146	145	144	143	142	141	140
5F5H (1525)	15F	15E	15D	15C	15B	15A	159	158	157	156	155	154	153	152	151	150
5F6H (1526)	16F	16E	16D	16C	16B	16A	169	168	167	166	165	164	163	162	161	160
5F7H (1527)	17F	17E	17D	17C	17B	17A	179	178	177	176	175	174	173	172	171	170
5F8H (1528)	18F	18E	18D	18C	18B	18A	189	188	187	186	185	184	183	182	181	180
5F9H (1529)	19F	19E	19D	19C	19B	19A	199	198	197	196	195	194	193	192	191	190
5FAH (1530)	1AF	1AE	1AD	1AC	1AB	1AA	1A9	1A8	1A7	1A6	1A5	1A4	1A3	1A2	1A1	1A0
$5FB_H$ (1531)	1BF	1BE	1BD	1BC	1BB	1BA	1B9	1B8	1B7	1B6	1B5	1B4	1B3	1B2	1B1	1B0
$5FC_H$ (1532)	1CF	1CE	1CD	1CC	1CB	1CA	1C9	1C8	1C7	1C6	1C5	1C4	1C3	1C2	1C1	1C0
$5FD_H$ (1533)	1DF	1DE	1DD	1DC	1DB	1DA	1D9	1D8	1D7	1D6	1D5	1D4	1D3	1D2	1D1	1D0
$5FE_H$ (1534)	1EF	1EE	1ED	1EC	1EB	1EA	1E9	1E8	1E7	1E6	1E5	1E4	1E3	1E2	1E1	1E0
$5FF_H$ (1535)	1FF	1FE	1FD	1FC	1FB	1FA	1F9	1F8	1F7	1F6	1F5	1F4	1F3	1F2	1F1	1F0

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(6) Link special register (SW)

This area stores word data indicating the data link status.

Buffer memory addresses 600_H to $7FF_H$ correspond to link special registers SW0000 to SW01FF. (☞ Page 351, Appendix 3.2)

(7) Random access buffer

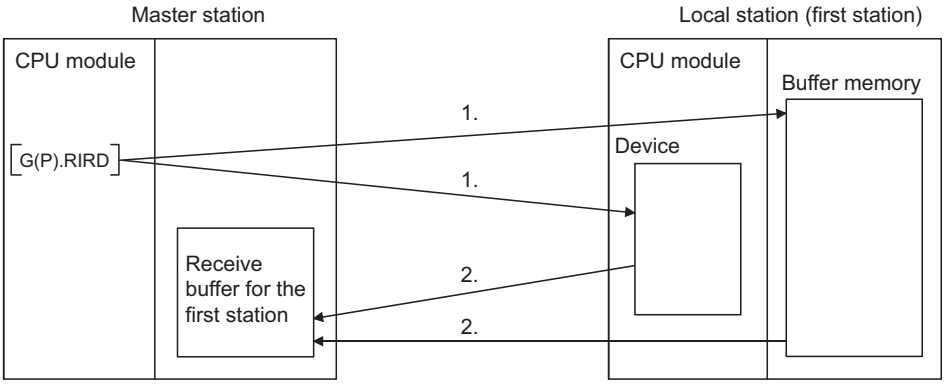
This area stores data to be sent to other stations. The data are read and written by transient transmission.

(8) Communication buffer

This area stores sending/receiving data when transient transmission (communications using a communication buffer) is performed with a local station, standby master station, and intelligent device station.

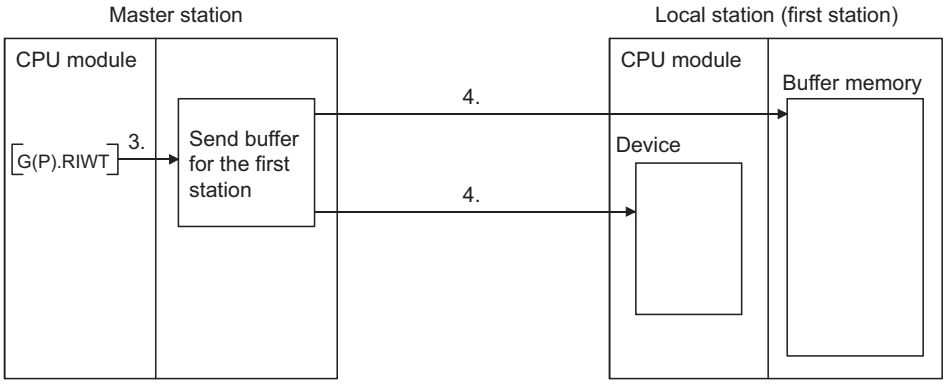
The communication buffer sizes of these stations are set using the network parameter. (☞ Page 102, Section 7.3.2 (2))

Ex. Communications using the communication buffer



1. **The buffer memory in the local station or the device in the CPU module is accessed.**

2. **The data specified in the control data is stored in the receive buffer for the first station.**



3. **The data to be written to the buffer memory in the local station or to the device in the CPU module is stored in the send buffer for the first station.**

4. **The buffer memory in the local station or the device in the CPU module is accessed.**

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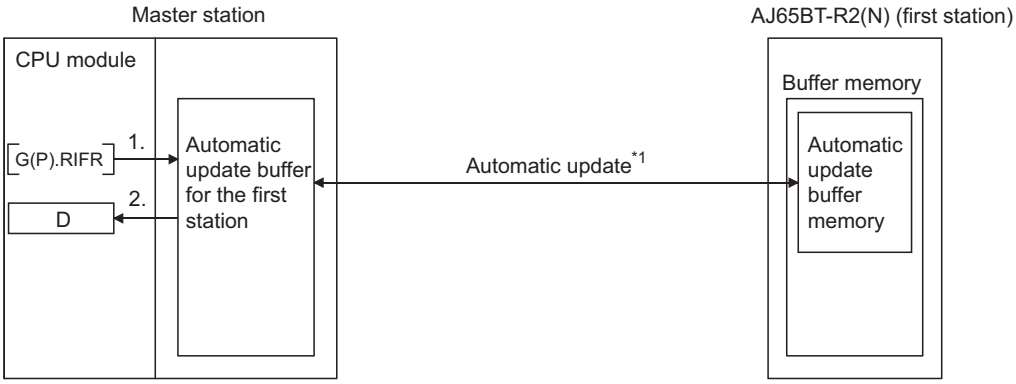
(9) Automatic update buffer

This area stores data automatically updated when transient transmission (communications using the automatic update buffer) is performed with an AJ65BT-R2(N). The automatic update buffer size of the AJ65BT-R2(N) is set using the network parameter. (☞ Page 102, Section 7.3.2 (2))

Ex. Communications using the automatic update buffer



1. **The automatic update buffer for the first station is accessed.**

2. **The data specified in the control data is stored in the device of the CPU module.**

*1 For timing of the automatic update, refer to the manual for the AJ65BT-R2(N). (CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode))

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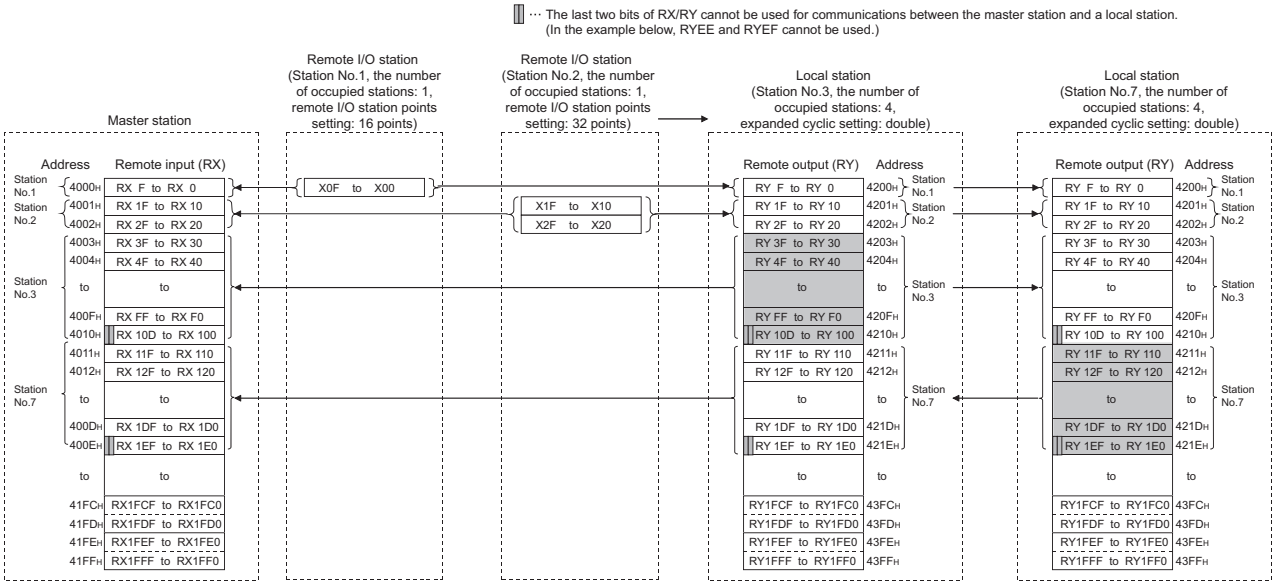
(10)Ver.2-compatible remote input (RX) and Ver.2-compatible remote output (RY)

These areas are used when the remote net Ver.2 mode or remote net additional mode is selected.

- In the remote net Ver.2 mode, data are stored in the remote input (RX) and remote output (RY) in all slave stations (including Ver.1-compatible slave stations). (☞ Page 50, Section 3.6.4 (3))
- In the remote net additional mode, data are stored in the remote input (RX) and remote output (RY) in the Ver.2-compatible slave station. (☞ Page 54, Section 3.6.5 (3))

(a) Storage location for each station

The storage locations change depending on the number of occupied stations and expanded cyclic setting in slave stations. The storage locations for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))



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

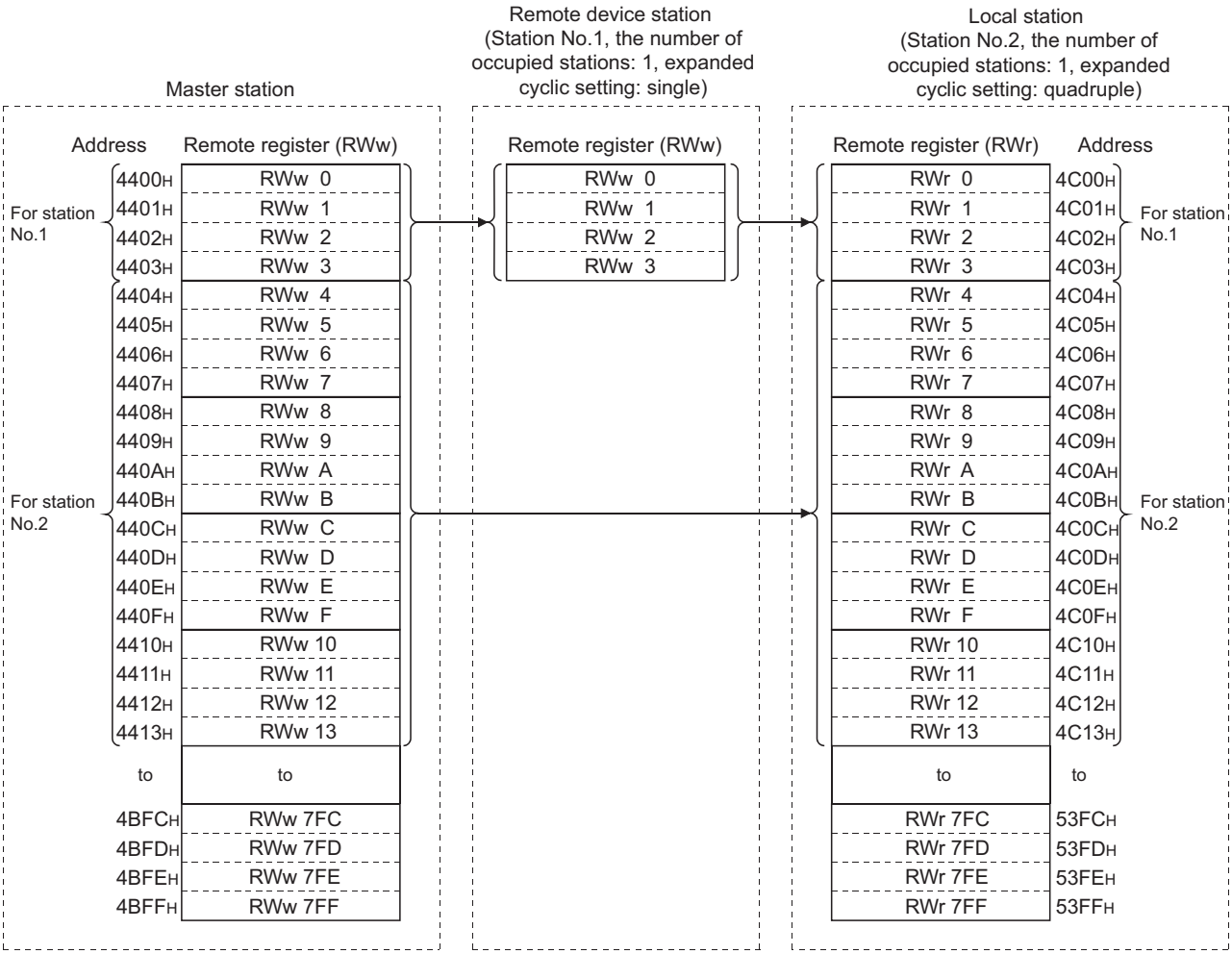
These areas are used when the remote net Ver.2 mode or remote net additional mode is selected.

- In the remote net Ver.2 mode, data are stored in the remote register (RWr/RWw) of all slave stations (including a Ver.1-compatible slave station). (☞Page 50, Section 3.6.4 (3))
- In the remote net additional mode, data are stored in the remote register (RWr/RWw) in a Ver.2-compatible slave station. (☞Page 54, Section 3.6.5 (3))

(a) Storage location for each station

The storage locations change depending on the number of occupied stations and expanded cyclic setting in slave stations. The storage locations for each station can be checked using Slave station offset, size information (Un\G992 to Un\G1503). (☞Page 335, Appendix 2 (4))

Ex.



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Appendix 3 Link Special Relays (SBs) and Link Special Registers (SWs)

Data link status is indicated by bit data (link special relays (SBs)) and word data (link special registers (SWs)).
The link special relays (SBs) and link special registers (SWs) represent information stored in the buffer memory areas of a master/local module for smooth operation. They are read to devices set as refresh devices in the network parameter for use.

- Link special relays (SBs) ••• Buffer memory addresses: $5E0_H$ to $5FF_H$
- Link special registers (SWs) ••• Buffer memory addresses: 600_H to $7FF_H$

Appendix 3.1 Link special relays (SBs)

SB0000 to SB001F are turned on/off using a program, whereas SB0020 to SB01FF are automatically turned on/off.
Values in parentheses are buffer memory addresses. (☞ Page 338, Appendix 2 (5))
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

Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0000 ($5E0_H$, b0)	Data link restart	Restart the data link that has been stopped by SB0002. OFF: Not instructed ON: Instructed	○	○	×
SB0001 ($5E0_H$, b1)	Refresh instruction at standby master switching	Refresh cyclic data after data link control is transferred to the standby master station. OFF: Not instructed ON: Instructed	○	×	×
SB0002 ($5E0_H$, b2)	Data link stop	Stop the data link of the host station. Note that if this relay is instructed to the master station, the entire system will stop. OFF: Not instructed ON: Instructed	○	○	×
SB0003 ($5E0_H$, b3)	Refresh instruction when changing parameters by the dedicated instruction	Refresh cyclic data after parameter setting is changed by the G(P).RLPASET instruction. OFF: Not instructed (refresh stopped) ON: Instructed (refresh started/continued)	○	○	×
SB0004 ($5E0_H$, b4)	Temporary error invalid request	Determine the stations specified by SW0003 to SW0007 as a temporary error invalid station. OFF: Not requested ON: Requested	○	×	×
SB0005 ($5E0_H$, b5)	Temporary error invalid canceling request	Cancel the temporary error invalid station setting configured for the stations specified by SW0003 to SW0007. OFF: Not requested ON: Requested	○	×	×

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0007 ($5E0_H$, b7)	Master station duplication error canceling request	Clear a master station duplication error. OFF: Not instructed ON: Instructed	○	×	×
SB0008 ($5E0_H$, b8)	Line test request	Execute a line test to the station specified by SW0008. OFF: Not requested ON: Requested	○	×	×
SB000B ($5E0_H$, b11)	Transmission speed test request	Execute a transmission speed test. OFF: Not requested ON: Requested	○	×	×
SB000C ($5E0_H$, b12)	Forced master switching	Forcibly transfer 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	○ (Standby master station only)	×	×
SB000D ($5E0_H$, b13)	Remote device station initialization procedure registration instruction	Perform an initial process using the information registered by the initialization procedure registration using a programming tool. While SB000D is on, the remote I/O and remote registers are stopped to be refreshed. OFF: Not instructed ON: Instructed	○	×	×
SB0020 ($5E2_H$, b0)	Module status	The status of communications between the master/local module and CPU module is stored. OFF: Normal ON: Error	○	○	○
SB0040 ($5E4_H$, b0)	Data link restart acceptance	Whether the data link restart instruction has been accepted is stored. OFF: Not accepted ON: Accepted	○	○	×
SB0041 ($5E4_H$, b1)	Data link restart complete	Whether the data link restart instruction has been completed is stored. OFF: Not completed ON: Started	○	○	×
SB0042 ($5E4_H$, b2)	Refresh instruction acknowledgement status at standby master switching	Whether the refresh instruction at standby master switching has been accepted is stored. OFF: Not executed ON: Accepted	○	×	×
SB0043 ($5E4_H$, b3)	Refresh instruction complete status at standby master switching	Whether the refresh instruction at standby master switching has been completed is stored. OFF: Not executed ON: Switched	○	×	×
SB0044 ($5E4_H$, b4)	Data link stop acceptance	Whether the data link stop instruction has been accepted is stored. OFF: Not accepted ON: Accepted	○	○	×
SB0045 ($5E4_H$, b5)	Data link stop complete	Whether the data link stop instruction has been completed is stored. OFF: Not completed ON: Stopped	○	○	×

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0046 ($5E4_H$, b6)	Forced master switching executable status	Whether Forced master switching (SB000C) can be executed is stored. OFF: Cannot be executed ON: Can be executed	○ (Standby master station only)	×	×
SB0048 ($5E4_H$, b8)	Temporary error invalid acceptance status	Whether the temporary error invalid instruction has been accepted is stored. OFF: Not executed ON: Accepted	○	×	×
SB0049 ($5E4_H$, b9)	Temporary error invalid complete status	Whether the temporary error invalid instruction has been completed is stored. OFF: Not executed ON: A temporary error invalid station determined/specified station number invalid	○	×	×
SB004A ($5E4_H$, b10)	Temporary error invalid canceling acknowledgement status	Whether the temporary error invalid cancel instruction has been accepted is stored. OFF: Not executed ON: Accepted	○	×	×
SB004B ($5E4_H$, b11)	Temporary error invalid canceling complete status	Whether the temporary error invalid canceling instruction has been completed is stored. OFF: Not executed ON: Temporary error invalid station setting canceled	○	×	×
SB004C ($5E4_H$, b12)	Line test acceptance status	Whether a line test request has been accepted is stored. OFF: Not executed ON: Accepted	○	×	×
SB004D ($5E4_H$, b13)	Line test complete status	Whether a line test has been completed is stored. OFF: Not executed ON: Completed	○	×	×
SB0050 ($5E5_H$, b0)	Offline test status	Whether an offline test is being executed is stored. OFF: Not executed ON: In process	×	×	○
SB0057 ($5E5_H$, b7)	Master station duplication error canceling acknowledgement	Whether a master station duplication error canceling request has been accepted is stored. OFF: Not accepted ON: Accepted	○	×	×
SB0058 ($5E5_H$, b8)	Master station duplication error canceling complete	Whether a master station duplication error canceling request has been completed is stored. OFF: Not completed ON: Completed	○	×	×
SB005A ($5E5_H$, b10)	Master switching request acknowledgement	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 is stored. OFF: Not accepted ON: Accepted	×	○ (Standby master station only)	×
SB005B ($5E5_H$, b11)	Master switching request complete	Whether the standby master station has been switched as a master station is stored. OFF: Not completed ON: Completed	×	○ (Standby master station only)	×

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SB005C
($5E5_H$, b12)</td><td>Forced master switching request acknowledgement</td><td>Whether a forced master switching request has been accepted is stored.
OFF: Not accepted
ON: Accepted</td><td>○
(Standby master station only)</td><td>×</td><td>×</td></tr>
<tr><td>SB005D
($5E5_H$, b13)</td><td>Forced master switching request complete</td><td>Whether a forced master switching request has been completed is stored.
OFF: Not completed
ON: Completed</td><td>○
(Standby master station only)</td><td>○
(Standby master station only)</td><td>×</td></tr>
<tr><td>SB005E
($5E5_H$, b14)</td><td>Execution status of remote device station initialization procedure</td><td>Whether the initialization procedure is being performed is stored.
OFF: Not performed
ON: In process</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB005F
($5E5_H$, b15)</td><td>Completion status of remote device station initialization procedure</td><td>Whether the initialization procedure has been completed is stored.
OFF: Not completed
ON: Completed</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB0060
($5E6_H$, b0)</td><td>Host mode</td><td>The setting status of the transmission speed/mode setting switch on the host station is stored.
OFF: Online
ON: Mode other than online</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SB0061
($5E6_H$, b1)</td><td>Host type</td><td>The station type of the host station is stored.
OFF: Master station (station number: 0)
ON: Local station (station number: 1 to 64)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0062
($5E6_H$, b2)</td><td>Host standby master station setting information</td><td>Whether the host station has been set as a standby master station is stored.
OFF: Not set
ON: Set</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SB0065
($5E6_H$, b5)</td><td>Input data status of host data link faulty station</td><td>The status of the data link faulty station setting configured for the host station is stored.
OFF: Clear
ON: Hold</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0066
($5E6_H$, b6)

SB0067
($5E6_H$, b7)</td><td>Number of host occupied stations</td><td>The number of occupied stations of the host station is stored.
<table>
<tr><th>Number of occupied stations</th><th>SB0066</th><th>SB0067</th></tr>
<tr><td>1</td><td>OFF</td><td>OFF</td></tr>
<tr><td>2</td><td>OFF</td><td>ON</td></tr>
<tr><td>3</td><td>ON</td><td>ON</td></tr>
<tr><td>4</td><td>ON</td><td>OFF</td></tr>
</table></td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SB006A
($5E6_H$, b10)</td><td>Switch setting status</td><td>Whether the switch has been correctly set is stored.
OFF: Correct
ON: Setting incorrect (An error code is stored in SW006A.)</td><td>○</td><td>○</td><td>○</td></tr>
</table>

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB006D ($5E6_H$, b13)	Parameter setting status	Whether the parameters have been correctly set is stored. OFF: Correct ON: Setting incorrect (An error code is stored in SW0068.)	○ (For the station number 0 only)	×	×
SB006E ($5E6_H$, b14)	Host station operating status	Whether data link with other stations is being performed is stored. OFF: In process ON: Not performed	○	○	×
SB006F ($5E6_H$, b15)	Setting status of block guarantee of cyclic data per station	Whether the block guarantee of cyclic data per station has been set to the host station is stored. OFF: Not set ON: Set	○	○	×
SB0070 ($5E7_H$, b0)	Master station information	Data link status is stored. OFF: Data link control by the master station ON: Data link control by the standby master station	○	○	×
SB0071 ($5E7_H$, b1)	Standby master station information	Whether a standby master station exists is stored. OFF: Absence ON: Present	○	○	×
SB0072 ($5E7_H$, b2)	Scan mode setting information	The setting status of the scan mode is stored. OFF: Asynchronous mode ON: Synchronous mode	○	×	×
SB0073 ($5E7_H$, b3)	Operation specification when CPU is down status	The parameter setting status of the operation specification when CPU is down is stored. OFF: Stopped ON: Continued	○	○	×
SB0074 ($5E7_H$, b4)	Reserved station specified status	Whether a reserved station has been specified by the parameter is stored. 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 specified status (SW0074 to SW0077).	○	○	×
SB0075 ($5E7_H$, b5)	Error invalid station specified status	Whether an error invalid station has been specified using the parameter is stored. 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 specified status (SW0078 to SW007B).	○	○	×

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0076 ($5E7_H$, b6)	Temporary error invalid station setting information	Whether a temporary error invalid station has been set is stored. 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 ($5E7_H$, b7)	Parameter receive status	Whether parameters have been received from the master station is stored. OFF: Received ON: Not received	×	○	×
SB0078 ($5E7_H$, b8)	Host station switch change detection	Whether the setting of setting switches of the host station during data link has been changed is detected. OFF: No change ON: Changed	○	○	×
SB0079 ($5E7_H$, b9)	Master station return specification information	Whether "Master Station" or "Master Station (Duplex Function)" has been set in "Type" in the network parameter window is stored. OFF: Master station ON: Master station (duplex function)	○	×	×
SB007A ($5E7_H$, b10)	Host standby master station operation history	Whether the host station has operated as a standby master station is indicated. OFF: Not operated as a standby master station ON: Operated as a standby master station	○	×	×
SB007B ($5E7_H$, b11)	Host master/standby master operation status	Whether the host station is operating as a master station or standby master station is stored. OFF: The host station is operating as a master station (during data link control). ON: The host station is operating as a standby master station (standby status).	○	○	×
SB007C ($5E7_H$, b12)	Slave station refresh/compulsory clear setting status in case of programmable controller CPU STOP	The parameter setting status of the slave station refresh/compulsory clear setting in case of programmable controller CPU STOP is stored. OFF: Refreshed ON: Forcibly cleared	○	○	×
SB007D ($5E7_H$, b13)	Automatic detection of connected devices	The setting status of the automatic detection of connected devices is stored. OFF: Do not read the model name of the slave stations ON: Read the model name of the slave stations	○	×	×

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0080 ($5E8_H$, b0)	Other station data link status	Whether communications are being normally performed with a remote station, local station, intelligent device station, and standby master station is stored. OFF: All stations normal ON: A faulty station exists. (The faulty station number is stored in SW0080 to SW0083.) It takes maximum of six seconds for Other station data link status (SB0080) to turn on after a slave station connected to the master station or local station becomes faulty.	○	○	×
SB0081 ($5E8_H$, b1)	Other station watchdog timer error status	Whether a watchdog timer error has occurred in other stations is stored. 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 Other station watchdog timer error occurrence status (SW0084 to SW0087).	○	○	×
SB0082 ($5E8_H$, b2)	Other station fuse blown status	Whether a fuse blown error has occurred in other stations is stored (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 Other station fuse blown status (SW0088 to SW008B).	○	○	×
SB0083 ($5E8_H$, b3)	Other station switch change status	Whether the setting of setting switches of other stations during data link has been changed is detected. 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 Other station switch change status (SW008C to SW008F).	○	○	×
SB0090 ($5E9_H$, b0)	Host line status	Whether the line to the host station is normally operating is stored. OFF: Normal ON: Error (disconnected)	×	○	×

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0094 ($5E9_H$, b4)	Other stations transient transmission status	Whether a transient transmission error has occurred in other stations is stored. OFF: No error ON: Error (SW0094 to SW0097) Even when the transient transmission is retried using a dedicated instruction, the error will be detected. Depending on the link refresh timing, SB0094 may be updated with the time difference of one sequence scan from the update of Other stations transient transmission status (SW0094 to SW0097).	○	○	×
SB0095 ($5E9_H$, b5)	Master station transient transmission status	Whether the master station is normally performing transient transmission is stored. OFF: Normal ON: Error	×	○	×
SB00B4 ($5EB_H$, b4)	Standby master station test result	The result of the line test 1 or line test 2 is stored. OFF: Normal ON: Error	○	×	○
SB0160 ($5F6_H$, b0)	Remote register use prohibited status	The use prohibited status of the remote register is stored. OFF: Usable ON: Use prohibited (The status information is stored in SW0160 to SW0163.) Depending on the link refresh timing, SB0160 may be updated with the time difference of one sequence scan from the update of Remote register use prohibited status (SW0160 to SW0163).	○	×	×
SB0184 ($5F8_H$, b4)	Transmission speed test result for standby master station	The result of the transmission speed test to the standby master station is stored. 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 ($5F8_H$, b5)	Transmission speed test accept status	Whether Transmission speed test request (SB000B) has been accepted is stored. OFF: Not accepted ON: Accepted	○	×	×
SB0186 ($5F8_H$, b6)	Transmission speed test completion status	Whether a transmission speed test has been completed is stored. OFF: Not completed ON: Completed	○	×	×

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Appendix 3.2 Link special registers (SWs)

Data are stored in SW0000 to SW001F using a program, whereas data are automatically stored in SW0020 to SW01FF.
Values in parentheses are 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

Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SW0003 (603_H)	Multiple temporary error invalid station specification	Select 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 (604_H) SW0005 (605_H) SW0006 (606_H) SW0007 (607_H)	Temporary error invalid station specification	Specify a temporary error invalid station. 0: Temporary error invalid station not specified 1: Temporary error invalid station specified 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. The stations need not be set by the number of occupied stations. Error invalid stations, reserved stations, station with the last station number, and stations later than that are excepted.	○	×	×
SW0008 (608_H)	Line test station setting	Set a station number where the line test is executed. 0: Entire system (executed to all stations) 01 to 64: Target station number Default: 0	○	×	×
SW0009 (609_H)	Monitoring time setting	Set monitoring time when dedicated instructions are used. Default: 10 (seconds) Range: 0 to 360 (second) 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 or retries + 1) × monitoring time	○	○	×
SW000A ($60A_H$)	CPU monitoring time setting	Set monitoring time between a dedicated instruction executed to the CPU module and the CPU module responding to it. Default: 90 (seconds) Range: 0 to 3600 (second) If a value outside the range is set, the monitoring time will be 3600 seconds.	○	○	×

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW000B
($60B_H$)</td><td>Dedicated instruction retry count setting</td><td>Set the number of retries of when dedicated instructions are used.
Default: 0 (No retry)
Range: 0 to 7 (time)
If a value outside the range is set, the number of times will be 7.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0014
(614_H)

SW0015
(615_H)

SW0016
(616_H)

SW0017
(617_H)</td><td>Specification of remote device station to be initialized</td><td>Specify a station where an initial process is performed using the information registered by the initialization procedure registration using a programming tool.
0: Initial process not performed
1: Initial process performed

<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0014</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0015</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0016</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0017</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>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 last station number, and stations later than that are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0020
(620_H)</td><td>Module status</td><td>The status of communications between the master/local module and CPU module is stored.
0: Normal completion
Values other than 0: Error code of the CPU module (User's manual for the CPU module used)</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW0041
(641_H)</td><td>Data link restart result</td><td>Whether the data link restart instruction using SB0000 has been normally completed is stored.
0: Normal completion
Values other than 0: Error code (Page 293, Section 11.3.2)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0043
(643_H)</td><td>Refresh instruction at standby master switching result</td><td>Whether the refresh instruction at standby master switching has been normally completed is stored.
0: Normal completion
Values other than 0: Error code (Page 293, Section 11.3.2)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0045
(645_H)</td><td>Data link stop result</td><td>Whether the data link stop instruction using SB0002 has been normally completed is stored.
0: Normal completion
Values other than 0: Error code (Page 293, Section 11.3.2)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0049
(649_H)</td><td>Temporary error invalid station specification result</td><td>Whether the temporary error invalid station specification has been normally completed is stored.
0: Normal completion
Values other than 0: Error code (Page 293, Section 11.3.2)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW004B
($64B_H$)</td><td>Temporary error invalid station specification cancel result</td><td>Whether the temporary error invalid station setting has been normally canceled is stored.
0: Normal completion
Values other than 0: Error code (Page 293, Section 11.3.2)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW004D
($64D_H$)</td><td>Line test result</td><td>The result of a line test is stored.
0: Normal
Values other than 0: Error code (Page 293, Section 11.3.2)</td><td>○</td><td>×</td><td>×</td></tr>
</table>

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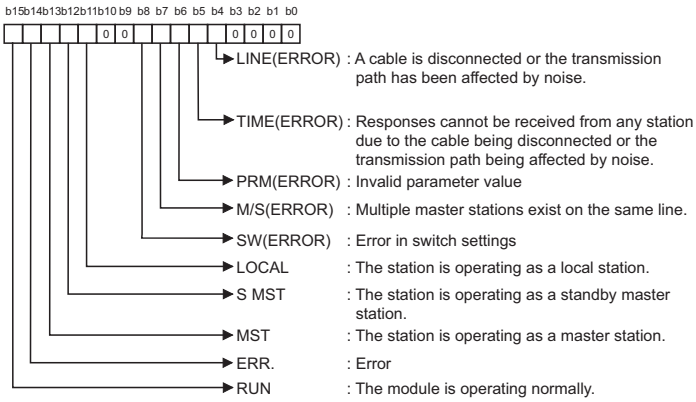
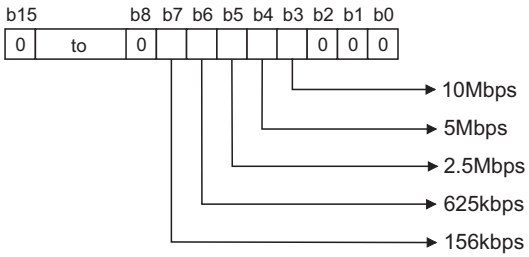
Number	Name	Description	Availability (○: Yes, ×: No) Online: Master station	Online: Local station	Offline
SW0052 (652_H)	Automatic CC-Link startup execution result	The result of system configuration check when a station has been added to a system and the system has started using the automatic CC-Link startup is stored. 0: Normal Values other than 0: Error code (☞ Page 293, Section 11.3.2)	○	×	×
SW0057 (657_H)	Master station duplication error canceling result	Whether a master station duplication error canceling request has been normally completed is stored. 0: Normal completion Values other than 0: Error code (☞ Page 293, Section 11.3.2)	○	×	×
SW0058 (658_H)	Detailed LED display status	The details of the LED display status are stored. 0: OFF 1: ON  	○	○	○
SW0059 (659_H)	Transmission speed setting	Transmission speed setting status is stored. 0: Cleared 1: Set  10Mbps 5Mbps 2.5Mbps 625kbps 156kbps	○	○	○
SW005D ($65D_H$)	Forced master switching instruction result	Whether the forced master switching instruction using SB000C has been normally completed is stored. 0: Normal completion Values other than 0: Error code (☞ Page 293, Section 11.3.2)	○ (Standby master station only)	×	×
SW005F ($65F_H$)	Remote device station initialization procedure registration instruction result	Whether the initialization procedure registration instruction using SB000D has been normally completed is stored. 0: Normal completion Values other than 0: Error code (☞ Page 293, Section 11.3.2)	○	×	×

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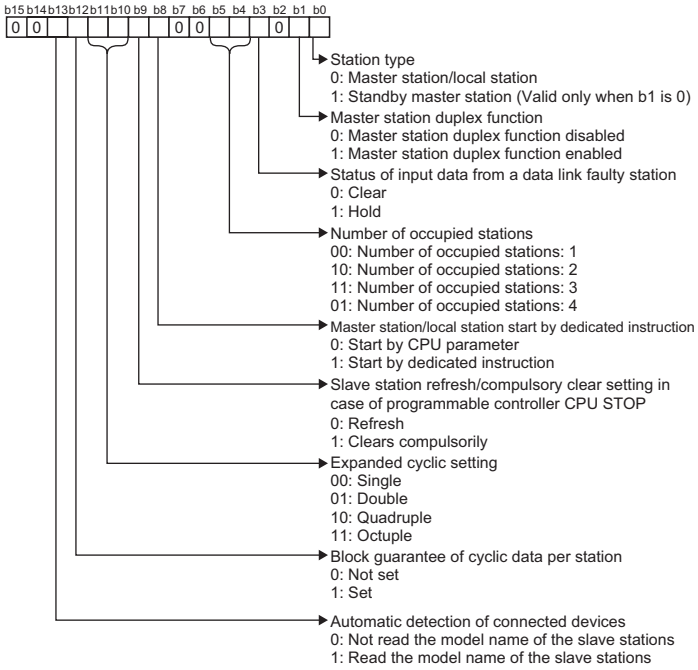
Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SW0060 (660_H)	Mode setting status	Mode setting status is stored. 0: Online (remote net mode) 1: Online (remote I/O net mode) 2: Offline 3: Line test 1 4: Line test 2 6: Hardware test	○	○	○
SW0061 (661_H)	Host station number	The current host station number is stored. 0: Master station 1 to 64: Local station	○	○	○
SW0062 (662_H)	Module operating status	The operation setting configured using the parameter is stored.  	○	○	○
SW0064 (664_H)	No. of retries information	The set number of retries upon an error response is stored. 1 to 7 (time)	○	×	×
SW0065 (665_H)	No. of automatic return stations	The set number of automatic return stations in one link scan is stored. 1 to 10 (station)	○	×	×
SW0066 (666_H)	Delay timer information	The set delay time is stored.	○	×	×
SW0067 (667_H)	Parameter information	The parameter setting used is stored. 0_H: Parameter written to the CPU module 3_H: Parameter setting and data link start using the dedicated instruction (G(P).RLPASET) D_H: Default parameter (automatic CC-Link startup)	○	×	○
SW0068 (668_H)	Host parameter status	Whether the parameters have been correctly set is stored. 0: Correct Values other than 0: Error code (☞ Page 293, Section 11.3.2)	○	×	×

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0069
(669_H)</td><td>Loading status</td><td>Whether unique station numbers have been assigned for modules and whether parameter settings match with connected module status are stored.
0: Normal
Values other than 0:
Error code (☞ Page 293, Section 11.3.2)
Error details are stored in SW0098 to SW009B and SW009C to SW009F.

This item is checked, and the result is stored only upon link start.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW006A
($66A_H$)</td><td>Switch setting status</td><td>Whether the switch has been correctly set is stored.
0: Correct
Values other than 0: Error code (☞ Page 293, Section 11.3.2)</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW006D
($66D_H$)</td><td>Max. link scan time</td><td>The maximum link scan time is stored (unit: 1ms).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006E
($66E_H$)</td><td>Current link scan time</td><td>The current link scan time is stored (unit: 1ms).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006F
($66F_H$)</td><td>Min. link scan time</td><td>The minimum link scan time is stored (unit: 1ms).</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0070
(670_H)</td><td>Total number of stations</td><td>The last station number set using the parameter is stored.
1 to 64 (station)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0071
(671_H)</td><td>Max. communication station number</td><td>The maximum station number during data link (station number set using the station number switches) is stored.
1 to 64 (station)
Reserved stations are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0072
(672_H)</td><td>Number of connected modules</td><td>The number of modules performing data link is stored.
Reserved stations are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0073
(673_H)</td><td>Standby master station number</td><td>The standby master station number is stored.
1 to 64 (station)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0074
(674_H)

SW0075
(675_H)

SW0076
(676_H)

SW0077
(677_H)</td><td>Reserved station specified status</td><td>Whether a station has been set as a reserved station is stored.
0: A station other than a reserved station
1: Reserved station

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0074</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0075</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0076</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0077</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
1 to 64 in the table indicate station numbers.

Only the bit corresponding to the start station number turns on.
The station with the last station number and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

A

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0078
(678_H)

SW0079
(679_H)

SW007A
($67A_H$)

SW007B
($67B_H$)</td><td>Error invalid station specified status</td><td>Whether a station has been set as an error invalid station is stored.
0: A station other than an error invalid station
1: Error invalid station

<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0078</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0079</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>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 last station number, and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW007C
($67C_H$)

SW007D
($67D_H$)

SW007E
($67E_H$)

SW007F
($67F_H$)</td><td>Temporary error invalid status</td><td>Whether a station is in the temporary error invalid status is stored.
0: Normal
1: Temporary error invalid status

<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW007C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW007D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>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 last station number, and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0080
(680_H)

SW0081
(681_H)

SW0082
(682_H)

SW0083
(683_H)</td><td>Other station data link status</td><td>Data link status of each station is stored.
0: Normal
1: Data link error

<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0080</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0081</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0082</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0083</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>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 register turns on differs depending on the system configuration and error status.
• Temporary error invalid stations, error invalid stations, reserved stations, station with the last station number, and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0084
(684$_H$)

SW0085
(685$_H$)

SW0086
(686$_H$)

SW0087
(687$_H$)</td><td>Other station watchdog timer error occurrence status</td><td>Whether a watchdog timer error has occurred is stored.
0: No watchdog timer error
1: Watchdog timer error

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0084</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0085</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0086</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0087</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
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 last station number, and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0088
(688$_H$)

SW0089
(689$_H$)

SW008A
(68A$_H$)

SW008B
(68B$_H$)</td><td>Other station fuse blown status</td><td>Whether a fuse blown error has occurred is stored.
0: Normal
1: Error

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
1 to 64 in the table indicate station numbers.

The bits turn on by the number of occupied stations.
Reserved stations, station with the last station number, and stations later than that are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW008C
(68C$_H$)

SW008D
(68D$_H$)

SW008E
(68E$_H$)

SW008F
(68F$_H$)</td><td>Other station switch change status</td><td>Whether the setting of switches of other stations during data link has been changed is stored.
0: No change
1: Changed

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW008C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW008D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW008E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW008F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
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 last station number, and stations later than that are excepted.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0090
(690$_H$)</td><td>Line status</td><td>Line status is stored.
0: Normal
1: Data link disabled (disconnected)</td><td>×</td><td>○</td><td>×</td></tr>
</table>

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0094
(694_H)

SW0095
(695_H)

SW0096
(696_H)

SW0097
(697_H)</td><td>Other stations transient transmission status</td><td>Whether a transient transmission error has occurred in other stations is stored.
0: No transient transmission error
1: Transient transmission error

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0094</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0095</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW0096</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW0097</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
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 last station number, and stations later than that are excepted.
Even when the transient transmission is retried using a dedicated instruction, the error will be detected.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0098
(698_H)

SW0099
(699_H)

SW009A
($69A_H$)

SW009B
($69B_H$)</td><td>Station number overlap status</td><td>Whether station numbers are unique when the start station numbers of modules are different is stored.
0: Normal
1: Station number in use (start station number only)

<table>
<tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr>
<tr><td>SW0098</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>SW0099</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr>
<tr><td>SW009A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr>
<tr><td>SW009B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr>
</table>
1 to 64 in the table indicate station numbers.
• Reserved stations, station with the last 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 update 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.</td><td>○</td><td>×</td><td>×</td></tr>
</table>

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW009C
(69C$_H$)

SW009D
(69D$_H$)

SW009E
(69E$_H$)

SW009F
(69F$_H$)</td><td>Loading/parameter consistency status</td><td>Whether the connected module status matches with parameter settings is stored.
A mismatch error will occur in the following cases.
1) The station types do not match.*1
2) The number of occupied stations do not match.
3) The expanded cyclic settings do not match.*1
4) The CC-Link compatible versions do not match.
*1 When the number of connected modules is smaller than or equal to the number of modules set using the parameter, a mismatch error will not occur. (When a remote device station is actually connected and an intelligent device station has been set using the parameter, for example, a mismatch error will not occur.)
0: Normal
1: Mismatch error
Example of a mismatch error
<table><tr><th>Installation</th><th>Parameter</th></tr><tr><td>Remote device station</td><td>Remote I/O station</td></tr><tr><td rowspan="2">Intelligent device station</td><td>Remote I/O station</td></tr><tr><td>Remote device station</td></tr></table><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW009C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW009D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.
• Reserved stations, station with the last 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 update of a parameter.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW00B4
(6B4$_H$)

SW00B5
(6B5$_H$)

SW00B6
(6B6$_H$)

SW00B7
(6B7$_H$)</td><td>Line test 1 result</td><td>The result of the line test 1 is stored.
0: Normal
1: Error
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00B4</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00B5</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00B6</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00B7</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.
The bits turn on by the number of occupied stations.</td><td>○</td><td>×</td><td>○</td></tr>
<tr><td>SW00B8
(6B8$_H$)</td><td>Line test result</td><td>The result of the line test 1 or line test 2 is stored.
0: Normal
Values other than 0: Error code (☞ Page 293, Section 11.3.2)</td><td>×</td><td>×</td><td>○</td></tr>
</table>

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SW0110 (710_H)	Remote device station initialization procedure registration execution individual information (target 1)	The execution progress of the initialization procedure registration is stored. Upper bit: Next execution procedure number (Upon completion, FF_H is stored.) Lower bit: Target station number	○	×	×
SW0111 (711_H)	Remote device station initialization procedure registration execution individual information (target 2)				
SW0112 (712_H)	Remote device station initialization procedure registration execution individual information (target 3)				
SW0113 (713_H)	Remote device station initialization procedure registration execution individual information (target 4)				
SW0114 (714_H)	Remote device station initialization procedure registration execution individual information (target 5)				

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SW0115 (715_H)	Remote device station initialization procedure registration execution individual information (target 6)	The execution progress of the initialization procedure registration is stored. Upper bit: Next execution procedure number (Upon completion, FF_H is stored.) Lower bit: Target station number	○	×	×
SW0116 (716_H)	Remote device station initialization procedure registration execution individual information (target 7)				
SW0117 (717_H)	Remote device station initialization procedure registration execution individual information (target 8)				
SW0118 (718_H)	Remote device station initialization procedure registration execution individual information (target 9)				
SW0119 (719_H)	Remote device station initialization procedure registration execution individual information (target 10)				

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Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SW011A ($71A_H$)	Remote device station initialization procedure registration execution individual information (target 11)	The execution progress of the initialization procedure registration is stored. Upper bit: Next execution procedure number (Upon completion, FF_H is stored.) Lower bit: Target station number	○	×	×
SW011B ($71B_H$)	Remote device station initialization procedure registration execution individual information (target 12)				
SW011C ($71C_H$)	Remote device station initialization procedure registration execution individual information (target 13)				
SW011D ($71D_H$)	Remote device station initialization procedure registration execution individual information (target 14)				
SW011E ($71E_H$)	Remote device station initialization procedure registration execution individual information (target 15)				

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW011F
($71F_H$)</td><td>Remote device station initialization procedure registration execution individual information (target 16)</td><td>The execution progress of the initialization procedure registration is stored.
Upper bit: Next execution procedure number (Upon completion, FF_H is stored.)
Lower bit: Target station number</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0140
(740_H)

SW0141
(741_H)

SW0142
(742_H)

SW0143
(743_H)</td><td>Compatible CC-Link ver. information</td><td>A slave station that supports the CC-Link Ver.2 mode is stored.
0: Ver.1-compatible slave station
1: Ver.2-compatible slave station

<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0140</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0141</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0142</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0143</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.

The bits turn on by the number of occupied stations.
Reserved stations, station with the last station number, and stations later than that are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0144
(744_H)

SW0145
(745_H)

SW0146
(746_H)

SW0147
(747_H)</td><td>CC-Link ver. installation/parameter matching status</td><td>Whether a CC-Link version matches between the parameter settings and the modules on slave stations is stored.
0: Normal
1: Mismatch error
Example of a mismatch error

<table><tr><th>Installation</th><th>Parameter</th></tr><tr><td>Ver.2-compatible remote device station</td><td>Ver.1-compatible remote device station</td></tr><tr><td>Ver.1-compatible remote device station</td><td>Ver.2-compatible remote device station</td></tr></table>
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0144</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0145</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0146</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0147</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.

The bits turn on by the number of occupied stations.
Reserved stations, station with the last station number, and stations later than that are excepted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0148
(748_H)</td><td>Parameter mode</td><td>The mode set to a system is stored.
0: Remote net Ver.1 mode
1: Remote net additional mode
2: Remote net Ver.2 mode</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0149
(749_H)</td><td>Host parameter mode</td><td>The mode set to the host station is stored.
0: Remote net Ver.1 mode
1: Remote net additional mode
2: Remote net Ver.2 mode</td><td>○</td><td>○</td><td>○</td></tr>
</table>

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<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Yes, ×: No)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0160
(760_H)
SW0161
(761_H)
SW0162
(762_H)
SW0163
(763_H)</td><td>Remote register use prohibited status</td><td>The use prohibited status of the remote register is stored.
0: Usable
1: Use prohibited
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0160</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0161</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0162</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0163</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.
Only the bit for the first station number is turned on.
Reserved stations and final station number onwards are not targeted.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0183
(783_H)</td><td>Transmission speed test result</td><td>The result of a transmission speed test is stored.
0: Normal
Values other than 0: Error code (☞ Page 293, Section 11.3.2)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0184
(784_H)
SW0185
(785_H)
SW0186
(786_H)
SW0187
(787_H)</td><td>Transmission speed test result for each station</td><td>The result of the transmission speed test for each station is stored.
0: Normal (same transmission speed as the master station) or no response from the module
1: Error (different transmission speed from the master station)
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0184</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0185</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0186</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0187</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>1 to 64 in the table indicate station numbers.
Only the bit corresponding to the start station number turns on.</td><td>○</td><td>×</td><td>×</td></tr>
</table>

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The timing of when data in link special registers (SWs) 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 SW009F	
SW006D		SW00B4 to SW00B7	
SW006E		SW00B8	
SW006F		——	——
SW0070			

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Appendix 4 Data Link Processing Time

This appendix describes data link processing time such as link scan time and transmission delay time.
When all the stations in a CC-Link system are normally performing data link, the retry processing time (RT) and return processing time (F) that are included in the formulas are not required to be added.

Appendix 4.1 Link scan time

This section describes the scan time of a CC-Link system. How to calculate the link scan time of when a master/local module is in the remote net mode and remote I/O net mode is explained.

(1) In the remote net mode

LS = BT{27 + (NI × 4.8) + (NW × 9.6) + (N × 30) + (ni × 4.8) + (nw × 9.6) + TR} + ST + EX + RT + F [μs]

BT: Constant (transmission speed)

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BT	51.2	12.8	3.2	1.6	0.8

NI: Last station number in A, B, and C (The number of occupied stations is included, but a reserved station is excluded. The value should be multiples of 8.)

- A: Last station number in a remote I/O station
- B: Last station number in a remote device station (The number of occupied stations is included.)
- C: Last station number in local stations, standby master stations, and intelligent device stations (The number of occupied stations is included.)

NW: Last station number in B and C (The number of occupied stations is included, but a reserved station is excluded. The value should be multiples of 8.)

Last station No.	1 to 8	9 to 16	17 to 24	25 to 32	33 to 40	41 to 48	49 to 56	57 to 64
NI, NW	8	16	24	32	40	48	56	64

N: Number of connected modules (A reserved station is excluded.)

ni: a + b + c (A reserved station is excluded.)

- a: Total number of stations occupied by a remote I/O station
- b: Total number of stations occupied by a remote device station
- c: Total number of stations occupied by local stations, standby master stations, and intelligent device stations

nw: b + c (A reserved station is excluded.)

TR: Transient processing time (only when a transient request is issued)

- When a master station issues a transient request
  180
- When a local station issues a transient request
  40.8 × number of stations that issued a transient request

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ST: Constant

(The largest value in the results of 1) to 3) below. When B is 0, the result of 2) is ignored. When C is 0, the result of 3) is ignored.

1) 800 + (A × 15)
2) 900 + (B × 50)
3) C ≤ 26: 1200 + (C × 100)
   C > 26: 3700 + {(C - 26) × 25}

EX: Constant (only when a master/local module is used in the remote net Ver.2 mode and remote net additional mode)

50 + total numbers found as listed in the table below

Expanded Cyclic Setting	Number of Occupied Stations			
	Occupied Station 1	Occupied Station 2	Occupied Station 3	Occupied Station 4
Single	0	0	0	0
Double	70 × number of stations	80 × number of stations	90 × number of stations	100 × number of stations
Quadruple	90 × number of stations	110 × number of stations	130 × number of stations	150 × number of stations
Octuple	110 × number of stations	160 × number of stations	210 × number of stations	260 × number of stations

RT: Retry processing time (Only the link scan with a faulty slave station where data link is being performed is added.)

α + β × (number of detected faulty stations -1)

α: Retry processing time of the first station

BT × {(200 + R) × retry count setting value + 178.5}

- With a transient request
  R: 13.2 + (NI × 4.8) + (NW × 9.6) + 180
- Without a transient request
  R: 13.2 + (NI × 4.8) + (NW × 9.6)

β: Retry processing time of the second and subsequent stations

BT × {(200 + P) × retry count setting value + 178.5}

P: 10.8

F: Return processing time (added only when there is a faulty station)

BT × {243.1 + 210.8 × (number of automatic return modules -1)} + ST

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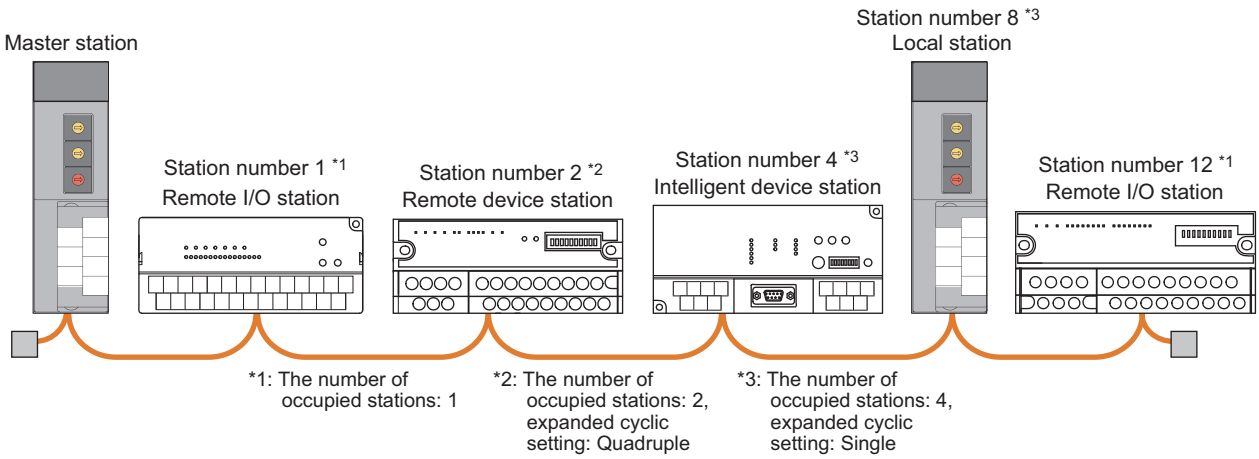
Ex. When the transmission speed is 10Mbps in the following system configuration (It is assumed that there is no faulty station, transient transmission, and retry in this example.)



BT = 0.8

NI = 12 → 16

NW = 11 → 16

N = 5

ni = 12

nw = 10

ST = 2300

1) 800 + (12 × 15) = 980

2) 900 + (3 × 50) = 1050

3) 1200 + (11 × 100) = 2300

A = 12, B = 3, C = 11

EX = 50 + 110 × 1 = 160

LS = 0.8{27 + (16 × 4.8) + (16 × 9.6) + (5 × 30) + (12 × 4.8) + (10 × 9.6)} + 2300 + 160

= 2908.8μs

= 2.91ms

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(2) In the remote I/O net mode

LS = BT{27 + (NI × 4.8) + (N × 30) + (ni × 4.8)} + ST + RT + F [μs]

BT: Constant (transmission speed)

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BT	51.2	12.8	3.2	1.6	0.8

NI: Last station number (The value should be multiples of 8.)

Last station No.	1 to 8	9 to 16	17 to 24	25 to 32	33 to 40	41 to 48	49 to 56	57 to 64
NI	8	16	24	32	40	48	56	64

N: Number of connected modules

ni: Total number of occupied stations

ST: Constant

250 + (ni × 10)

RT: Retry processing time (Only the link scan with a faulty slave station where data link is being performed is added.)

$\alpha + \beta \times$ (number of detected faulty stations -1)

α: Retry processing time of the first station

BT × (778.5 + R × 3)

R: 13.2 + (NI × 4.8)

β: Retry processing time of the second and subsequent stations

BT × (778.5 + P × 3)

P: 10.8

F: Return processing time (added only when there is a faulty station)

BT × 243.1 + ST

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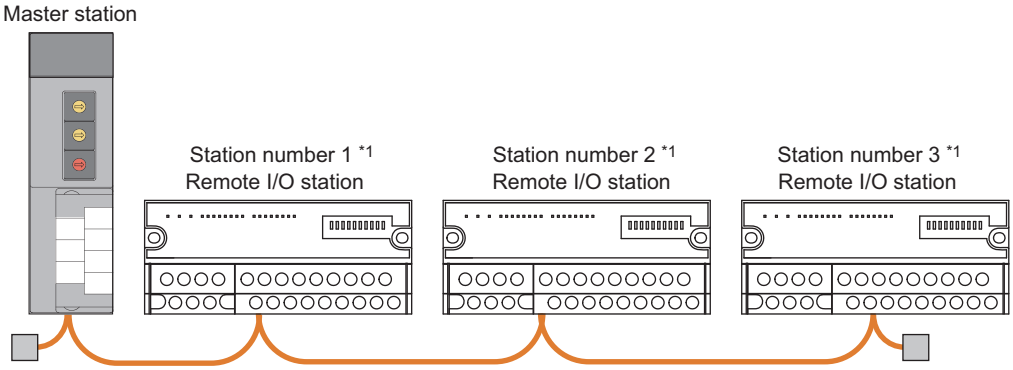
Ex. When the transmission speed is 10Mbps in the following system configuration (It is assumed that there is no faulty station and retry in this example.)



*1: The number of occupied stations: 1

BT = 0.8

NI = 3 → 8

N = 3

ni = 3

nw = 10

ST = 250 + (ni × 10)

250 + (3 × 10)

280

LS = 0.8{27 + (8 × 4.8) + (3 × 30) + (3 × 4.8)} + 280

= 415.84μs

= 0.42ms

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Appendix 4.2 Transmission delay time

This section describes transmission delay time (time until data is transmitted).

(1) Master station ↔ remote I/O station

(a) Master station (RX) ← remote I/O station (input)

This is the time between a signal input to a remote I/O station and the device of a CPU module turning on (off).

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
n: LS ÷ SM (The decimal point is rounded up.)
Rio: Remote I/O response time

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + (LS × 1) + Rio	{(SM × n) × 1} + Rio	SM + (LS × 1) + Rio	{(SM × n) × 1} + Rio
Max. value	(SM × n) + (LS × 2) + Rio	{(SM × n) × 2} + Rio	SM + (LS × 2) + Rio	{(SM × n) × 2} + Rio

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and remote I/O response time is 1.5ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + (3 × 1) + 1.5 = 24.5ms	{(20 × 1) × 1} + 1.5 = 21.5ms	20 + (3 × 1) + 1.5 = 24.5ms	{(20 × 1) × 1} + 1.5 = 21.5ms
Max. value	(20 × 1) + (3 × 2) + 1.5 = 27.5ms	{(20 × 1) × 2} + 1.5 = 41.5ms	20 + (3 × 2) + 1.5 = 27.5ms	{(20 × 1) × 2} + 1.5 = 41.5ms

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(b) Master station (RY) → remote I/O station (output)

This is the time between the device of a CPU module turning on (off) and the output of a remote I/O station turning on (off).

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
n: LS ÷ SM (The decimal point is rounded up.)
Rio: Remote I/O response time

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + (LS × 1) + Rio	(SM × n) + (LS × 1) + Rio	SM + (LS × 1) + Rio	(SM × n) + (LS × 1) + Rio
Max. value	(SM × n) + (LS × 2) + Rio	(SM × n) + (LS × 2) + Rio	SM + (LS × 2) + Rio	(SM × n) + (LS × 2) + Rio

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and remote I/O response time is 1.5ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + (3 × 1) + 1.5 = 24.5ms	(20 × 1) + (3 × 1) + 1.5 = 24.5ms	20 + (3 × 1) + 1.5 = 24.5ms	(20 × 1) + (3 × 1) + 1.5 = 24.5ms
Max. value	(20 × 1) + (3 × 2) + 1.5 = 27.5ms	(20 × 1) + (3 × 2) + 1.5 = 27.5ms	20 + (3 × 2) + 1.5 = 27.5ms	(20 × 1) + (3 × 2) + 1.5 = 27.5ms

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(2) Master station ↔ remote device station (Ver.1-compatible slave station)

(a) Master station (RX) ← remote device station (RX) (RWr)

This is the time between a signal input to a remote device station and the device of a CPU module turning on (off) or the time until the data in the device of a CPU module is changed.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
n: LS ÷ SM (The decimal point is rounded up.)
Rd: Remote device station processing time

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + (LS × 1) + Rd	{(SM × n) × 1} + Rd	SM + (LS × 1) + Rd	{(SM × n) × 1} + Rd
Max. value	(SM × n) + (LS × 2) + Rd	{(SM × n) × 2} + Rd	SM + (LS × 2) + Rd	{(SM × n) × 2} + Rd

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and remote device station processing time is 1.5ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + (3 × 1) + 1.5 = 24.5ms	{(20 × 1) × 1} + 1.5 = 21.5ms	20 + (3 × 1) + 1.5 = 24.5ms	{(20 × 1) × 1} + 1.5 = 21.5ms
Max. value	(20 × 1) + (3 × 2) + 1.5 = 27.5ms	{(20 × 1) × 2} + 1.5 = 41.5ms	20 + (3 × 2) + 1.5 = 27.5ms	{(20 × 1) × 2} + 1.5 = 41.5ms

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(b) Master station (RY) → remote device station (RY) (RWr)

This is the time between the device of a CPU module turning on (off) and the output of a remote device station turning on (off) or between data set in the device of a CPU module and the data in a remote device station changed.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
n: LS ÷ SM (The decimal point is rounded up.)
Rd: Remote device station processing time

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + (LS × 1) + Rd	(SM × n) + (LS × 1) + Rd	SM + (LS × 1) + Rd	(SM × n) + (LS × 1) + Rd
Max. value	(SM × n) + (LS × 2) + Rd	(SM × n) + (LS × 2) + Rd	SM + (LS × 2) + Rd	(SM × n) + (LS × 2) + Rd

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and remote device station processing time is 1.5ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + (3 × 1) + 1.5 = 24.5ms	(20 × 1) + (3 × 1) + 1.5 = 24.5ms	20 + (3 × 1) + 1.5 = 24.5ms	(20 × 1) + (3 × 1) + 1.5 = 24.5ms
Max. value	(20 × 1) + (3 × 2) + 1.5 = 27.5ms	(20 × 1) + (3 × 2) + 1.5 = 27.5ms	20 + (3 × 2) + 1.5 = 27.5ms	(20 × 1) + (3 × 2) + 1.5 = 27.5ms

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(3) Master station ↔ remote device station (Ver.2-compatible slave station)

(a) Master station (RX) ← remote device station (RX) (RWr)

This is the time between a signal input to a remote device station and the device of a CPU module turning on (off) or the time until the data in the device of a CPU module is changed.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
n: LS ÷ SM (The decimal point is rounded up.)
t: LS × m ÷ SM (The decimal point is rounded up.)
Rd: Remote device station processing time
m: Constant according to the extended cyclic setting

Expanded Cyclic Setting	Single	Double	Quadruple	Octuple
m	1	3	7	15

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + (LS × 1 × m) + Rd	{(SM × t) × 1} + Rd	SM + (LS × 1 × m) + Rd	{(SM × t) × 1} + Rd
Max. value	(SM × n) + (LS × 2 × m) + Rd	{(SM × t) × 2} + Rd	SM + (LS × 2 × m) + Rd	{(SM × t) × 2} + Rd

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and the expanded cyclic setting is "Double"

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + (3 × 1 × 3) + 1.5 = 30.5ms	{(20 × 1) × 1} + 1.5 = 21.5ms	20 + (3 × 1 × 3) + 1.5 = 30.5ms	{(20 × 1) × 1} + 1.5 = 21.5ms
Max. value	(20 × 1) + (3 × 2 × 3) + 1.5 = 39.5ms	{(20 × 1) × 2} + 1.5 = 41.5ms	20 + (3 × 2 × 3) + 1.5 = 39.5ms	{(20 × 1) × 2} + 1.5 = 41.5ms

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(b) Master station (RY) → remote device station (RY) (RWr)

This is the time between the device of a CPU module turning on (off) and the output of a remote device station turning on (off) or between data set in the device of a CPU module and the data in a remote device station changed.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
n: LS ÷ SM (The decimal point is rounded up.)
t: LS × m ÷ SM (The decimal point is rounded up.)
Rd: Remote device station processing time
m: Constant according to the extended cyclic setting

Expanded Cyclic Setting	Single	Double	Quadruple	Octuple
m	1	3	7	15

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + [LS × {(1 × m) + 1}] + Rd	(SM × t) + (LS × m) + Rd	SM + [LS × {(1 × m) + 1}] + Rd	(SM × t) + (LS × m) + Rd
Max. value	(SM × n) + [LS × {(2 × m) + 1}] + Rd	(SM × t) + (LS × m) + Rd	SM + [LS × {(2 × m) + 1}] + Rd	(SM × t) + (LS × m) + Rd

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and the expanded cyclic setting is "Double"

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + [3 × {(1 × 3) + 1}] + 1.5 = 33.5ms	(20 × 1) + (3 × 3) + 1.5 = 30.5ms	20 + [3 × {(1 × 3) + 1}] + 1.5 = 33.5ms	(20 × 1) + (3 × 3) + 1.5 = 30.5ms
Max. value	(20 × 1) + [3 × {(2 × 3)+ 1}] + 1.5 = 42.5ms	(20 × 1) + (3 × 3) + 1.5 = 30.5ms	20 + [3 × {(2 × 3) + 1}] + 1.5 = 42.5ms	(20 × 1) + (3 × 3) + 1.5 = 30.5ms

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(4) Master station ↔ local station (Ver.1-compatible slave station)

(a) Master station (RX) ← local station (RY), master station (RWr) ← local station (RWw)

This is the time between the device of the CPU module in a local station turning on (off) and the device of the CPU module in a master station turning on (off).

This is also the time between data set in the device of the CPU module in a local station and the data stored into the device of the CPU module in a master station.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
SL: Local station sequence scan time
n: LS ÷ SM (The decimal point is rounded up.)
k: LS ÷ SL (The decimal point is rounded up.)

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + (LS × 2) + {SL × (k + 1)}	{(SM × n) × 2} + LS + {SL × (k + 1)}	SM + (LS × 2) + SL	{(SM × n) × 2} + LS + SL
Max. value	(SM × n) + (LS × 3) + {SL × (k + 1)}	{(SM × n) × 3} + LS + {SL × (k + 1)}	SM + (LS × 3) + SL	{(SM × n) × 3} + LS + SL

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and local station sequence scan time is 10ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + (3 × 2) + {10 × (1 + 1)} = 46ms	{(20 × 1) × 2} + 3 + {10 × (1 + 1)} = 63ms	20 + (3 × 2) + 10 = 36ms	{(20 × 1) × 2} + 3 + 10 = 53ms
Max. value	(20 × 1) + (3 × 3) + {10 × (1 + 1)} = 49ms	{(20 × 1) × 3} + 3 + {10 × (1 + 1)} = 83ms	20 + (3 × 3) + 10 = 39ms	{(20 × 1) × 3} + 3 + 10 = 73ms

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(b) Master station (RY) → local station (RX), master station (RWw) → local station (RWr)

This is the time between the device of the CPU module in a master station turning on (off) and the device of the CPU module in a local station turning on (off).

This is also the time between data set in the device of the CPU module in a master station and the data stored into the device of the CPU module in a local station.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
SL: Local station sequence scan time
n: LS ÷ SM (The decimal point is rounded up.)
k: LS ÷ SL (The decimal point is rounded up.)

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + (LS × 2) + {SL × (k + 1)}	(SM × n) + (LS × 2) + {SL × (k + 1)}	SM + (LS × 2) + SL	(SM × n) + (LS × 2) + SL
Max. value	(SM × n) + (LS × 3) + {SL × (k + 1)}	(SM × n) + (LS × 2) + {SL × (k + 1)}	SM + (LS × 3) + SL	(SM × n) + (LS × 2) + SL

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, and local station sequence scan time is 10ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + (3 × 2) + {10 × (1 + 1)} = 46ms	(20 × 1) + (3 × 2) + {10 × (1 + 1)} = 46ms	20 + (3 × 2) + 10 = 36ms	(20 × 1) + (3 × 2) + 10 = 36ms
Max. value	(20 × 1) + (3 × 3) + {10 × (1 + 1)} = 49ms	(20 × 1) + (3 × 2) + {10 × (1 + 1)} = 46ms	20 + (3 × 3) + 10 = 39ms	(20 × 1) + (3 × 2) + 10 = 36ms

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(5) Master station ↔ local station (Ver.2-compatible slave station)

(a) Master station (RX) ← local station (RY), master station (RWr) ← local station (RWw)

This is the time between the device of the CPU module in a local station turning on (off) and the device of the CPU module in a master station turning on (off).

This is also the time between data set in the device of the CPU module in a local station and the data stored into the device of the CPU module in a master station.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
SL: Local station sequence scan time
n: LS ÷ SM (The decimal point is rounded up.)
t: LS × m ÷ SM (The decimal point is rounded up.)
k: LS ÷ SL (The decimal point is rounded up.)
m: Constant according to the extended cyclic setting

Expanded Cyclic Setting	Single	Double	Quadruple	Octuple
m	1	3	7	15

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + [LS × {(1 × m) + 1}] + {SL × (k + 1)}	{(SM × t) × 2} + {SL × (k + 1)}	SM + [LS × {(1 × m) + 1}] + SL	(SM × t) × 2
Max. value	(SM × n) + [LS × {(2 × m) + 1}] + {SL × (k + 1)}	{(SM × t) × 3} + {SL × (k + 1)}	SM + [LS × {(2 × m) + 1}] + SL	(SM × t) × 3

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, the expanded cyclic setting is "Double", and local station sequence scan time is 10ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + [3 × {(1 × 3) + 1}] + {10 × (1 + 1)} = 52ms	{(20 × 1) × 2} + {10 × (1 + 1)} = 60ms	20 + [3 × {(1 × 3) + 1}] + 10 = 42ms	(20 × 1) × 2 = 40ms
Max. value	(20 × 1) + [3 × {(2 × 3) + 1}] + {10 × (1 + 1)} = 61ms	{(20 × 1) × 3} + {10 × (1 + 1)} = 80ms	20 + [3 × {(2 × 3) + 1}] + 10 = 51ms	(20 × 1) × 3 = 60ms

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(b) Master station (RY) → local station (RX), master station (RWw) → local station (RWr)

This is the time between the device of the CPU module in a master station turning on (off) and the device of the CPU module in a local station turning on (off).

This is also the time between data set in the device of the CPU module in a master station and the data stored into the device of the CPU module in a local station.

[Formula]

The letters in the table mean as follows.

SM: Master station sequence scan time
LS: Link scan time
SL: Local station sequence scan time
n: LS ÷ SM (The decimal point is rounded up.)
t: LS × m ÷ SM (The decimal point is rounded up.)
k: LS ÷ SL (The decimal point is rounded up.)
m: Constant according to the extended cyclic setting

Expanded Cyclic Setting	Single	Double	Quadruple	Octuple
m	1	3	7	15

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(SM × n) + [LS × {(1 × m) + 1}] + {SL × (k + 1)}	{(SM × t) × 1} + {SL × (k + 1)}	SM + [LS × {(1 × m) + 1}] + SL	{(SM × t) × 1} + SL
Max. value	(SM × n) + [LS × {(2 × m) + 1}] + {SL × (k + 1)}	{(SM × t) × 2} + {SL× (k + 1)}	SM + [LS × {(2 × m) + 1}] + SL	{(SM × t) × 2} + SL

Ex. When master station sequence scan time is 20ms, link scan time is 3ms, the expanded cyclic setting is "Double", and local station sequence scan time is 10ms

Calculation value	With block guarantee of cyclic data per station		Without block guarantee of cyclic data per station	
	Asynchronous mode	Synchronous mode	Asynchronous mode	Synchronous mode
Normal value	(20 × 1) + [3 × {(1 × 3) + 1}] + {10 × (1 + 1)} = 52ms	{(20 × 1) × 1} + {10 × (1 + 1)} = 40ms	20 + [3 × {(1 × 3) + 1}] + 10 = 42ms	{(20 × 1) × 1} + 10 = 30ms
Max. value	(20 × 1) + [3 × {(2 × 3) + 1}] + {10 × (1 + 1)} = 61ms	{(20 × 1) × 2} + {10 × (1 + 1)} = 60ms	20 + [3 × {(2 × 3) + 1}] + 10 = 51ms	{(20 × 1) × 2} + 10 = 50ms

(6) Master station ↔ intelligent device station

Transmission delay time between a master station and an intelligent device station varies depending on the intelligent device station.

Refer to the user's manual for the intelligent device module used.

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Appendix 4.3 Processing time of dedicated instructions

This section describes the processing time of dedicated instructions (time between an instruction issued and a response received).

(1) Master station ↔ local station

(a) Master station → local station

The time between the master station issuing an instruction and it receiving a response from a local station is calculated as follows.

[Formula]

<Maximum value>

- G(P).RIRD instruction

OT + LS × [BC + {(number of read points + 16) ÷ 16}*1 × 1.067] + SL

+ (WT × RT × 1000)*2 ms

OT: Processing time of QCPU dedicated instructions
Basic model QCPU, Q02CPU: 1ms
QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

LS: Link scan time (☞ Page 366, Appendix 4.1)

BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SL: Local station sequence scan time (Apply "0" when buffer memory data in CC-Link is read.)

WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is a Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of read points is 20 words (buffer memory in CC-Link), monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of read points + 16) ÷ 16}*1 × 1.067] + SL + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 16}*1 × 1.067] + 0 + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {3 × 1.067}] + 0

= 76.505

= 76.5ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

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- G(P).RIWT instruction

  OT + LS × [BC + {(number of write points + 16) ÷ 72}*1 × 1.13] + SL

  + (WT × RT × 1000)*2 ms

  OT: Processing time of QCPU dedicated instructions

  Basic model QCPU, Q02CPU: 1ms

  QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

  LS: Link scan time (☞ Page 366, Appendix 4.1)

  BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SL: Local station sequence scan time (Apply "0" when data is written to buffer memory in CC-Link.)

WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is a Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of write points is 20 words (buffer memory in CC-Link), monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of write points + 16) ÷ 72}*1 × 1.13] + SL + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 72}*1 × 1.13] + 0 + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {1 × 1.13}] + 0

= 66.15

= 66.2ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

Downloaded from Arrow.com.

(b) Local station → master station

The time between a local station issuing an instruction and it receiving a response from the master station is calculated as follows.

[Formula]

<Maximum value>

- G(P).RIRD instruction

OT + LS × [BC + {(number of read points + 16) ÷ 72}*1 × 1.13] + SM

+ (WT × RT × 1000)*2 ms

OT: Processing time of QCPU dedicated instructions
Basic model QCPU, Q02CPU: 1ms
QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

LS: Link scan time (☞ Page 366, Appendix 4.1)

BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SM: Master station sequence scan time (Apply "0" when buffer memory data in CC-Link is read.)

WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is a Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of read points is 20 words (buffer memory in CC-Link), monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of read points + 16) ÷ 72}*1 × 1.13] + SM + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 72}*1 × 1.13] + 0 + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {1 × 1.13}] + 0

= 66.15

= 66.2ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

Downloaded from Arrow.com.

- G(P).RIWT instruction

  OT + LS × [BC + {(number of write points + 16) ÷ 16}*1 × 1.067] + SM

  + (WT × RT × 1000)*2 ms

  OT: Processing time of QCPU dedicated instructions

  Basic model QCPU, Q02CPU: 1ms

  QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

  LS: Link scan time (☞ Page 366, Appendix 4.1)

  BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SM: Master station sequence scan time (Apply "0" when data is written to buffer memory in CC-Link.)

WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is a Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of write points is 20 words (buffer memory in CC-Link), monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of write points + 16) ÷ 16}*1 × 1.067] + SM + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 16}*1 × 1.067] + 0 + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {3 × 1.067}] + 0

= 76.505

= 76.5ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

Downloaded from Arrow.com.

(2) Local station ↔ local station

(a) Local station → local station

The time between a local station issuing an instruction and it receiving a response from another local station is calculated as follows.

[Formula]

<Maximum value>

- G(P).RIRD instruction

OT + LS × [BC + {(number of read points + 16) ÷ 16}*1 × 1.067] + SL

+ (WT × RT × 1000)*2 ms

OT: Processing time of QCPU dedicated instructions
Basic model QCPU, Q02CPU: 1ms
QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

LS: Link scan time (☞ Page 366, Appendix 4.1)

BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SL: Target station sequence scan time (Apply "0" when buffer memory data in CC-Link is read.)

WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is a Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of read points is 20 words (buffer memory in CC-Link), monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of read points + 16) ÷ 16}*1 × 1.067] + SL + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 16}*1 × 1.067] + 0 + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {3 × 1.067}] + 0

= 76.505

= 76.5ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

Downloaded from Arrow.com.

- G(P).RIWT instruction

  OT + LS × [BC + {(number of write points + 16) ÷ 16}*1 × 1.067] + SL

  + (WT × RT × 1000)*2 ms

  OT: Processing time of QCPU dedicated instructions

  Basic model QCPU, Q02CPU: 1ms

  QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

  LS: Link scan time (☞ Page 366, Appendix 4.1)

  BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

SL: Target station sequence scan time (Apply "0" when data is written to buffer memory in CC-Link.)

WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is the Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of write points is 20 words (buffer memory in CC-Link), monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of write points + 16) ÷ 16}*1 × 1.067] + SL + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 16}*1 × 1.067] + 0 + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {3 × 1.067}] + 0

= 76.505

= 76.5ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

Downloaded from Arrow.com.

(3) Master station ↔ intelligent device station

(a) Master station → intelligent device station

The time between the master station issuing an instruction and it receiving a response from an intelligent device station is calculated as follows.

[Formula]

<Maximum value>

- G(P).RIRD instruction

OT + LS × [BC + {(number of read points + 16) ÷ 16}*1 × 1.067]

+ (WT × RT × 1000)*2 ms

OT: Processing time of QCPU dedicated instructions
Basic model QCPU, Q02CPU: 1ms
QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

LS: Link scan time (☞ Page 366, Appendix 4.1)

BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is a Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of read points is 20 words, monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of read points + 16) ÷ 16}*1 × 1.067] + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 16}*1 × 1.067] + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {3 × 1.067}] + 0

= 76.505

= 76.5ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

Downloaded from Arrow.com.

- G(P).RIWT instruction

  OT + LS × [BC + {(number of write points + 16) ÷ 72}*1 × 1.13]

  + (WT × RT × 1000)*2 ms

  OT: Processing time of QCPU dedicated instructions

  Basic model QCPU, Q02CPU: 1ms

  QCPU (excluding a Basic model QCPU and Q02CPU): 0.5ms

  LS: Link scan time (☞ Page 366, Appendix 4.1)

  BC: Constant

Transmission speed	156kbps	625kbps	2.5Mbps	5Mbps	10Mbps
BC	6	7	9	11	12

  WT: Monitoring time set in SW0009 (☞ Page 351, Appendix 3.2)

  RT: Number of retries set in SW000B (☞ Page 351, Appendix 3.2)

Ex. When the CPU module is a Q06HCPU, transmission speed is 10Mbps, link scan time is 5ms, the number of write points is 20 words, monitoring time is 10 seconds, and the retry is not set

OT + LS × [BC + {(number of write points + 16) ÷ 72}*1 × 1.13] + (WT × RT × 1000)

= 0.5 + 5 × [12 + {(20 + 16) ÷ 72}*1 × 1.13] + (10 × 0 × 1000)

= 0.5 + 5 × [12 + {1 × 1.13}] + 0

= 66.15

= 66.2ms

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

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Appendix 4.4 Link refresh time

This section describes link refresh time (extended time of the END process in the CPU module).

(1) Master station/local station

The link refresh time of a master station and local station are calculated as follows.

(a) In the remote net Ver.1 mode and remote net Ver.2 mode

[Formula]

$$\alpha T = KM1 + KM2 \times \left(\frac{RX+RY+SB}{16} + RWw + RWr + SW\right) \times \alpha E + (\text{Number of CC-Link modules} - 1) \times KM4 \text{ [ms]}$$

$$\alpha E = KM3 \times \left(\frac{RX+RY+SB}{16} + RWw + RWr + SW\right) \text{ [ms]}$$

αT:	Link refresh time
RX:	Total number of remote input (RX) points refreshed in the master station/local station
RY:	Total number of remote output (RY) points refreshed in the master station/local station
RWw:	Total number of remote register (RWw) points refreshed in the master station/local station
RWr:	Total number of remote register (RWr) points refreshed in the master station/local station
SB:	Total number of link special relay (SB) points refreshed in the master station/local station
SW:	Total number of link special register (SW) points refreshed in the master station/local station
αE:	Time that file register (R, ZR) data on a memory card is transferred (only when used)

Point

Add αE only when refreshing the data to the memory card file register. Addition is not required when refreshing the data to the standard RAM and extended SRAM cassette file registers.

- KM1: Constant
  (Master station)

—: The block guarantee of cyclic data per station function is not supported.

Constant / CPU type	KM1	
	With block guarantee of cyclic data per station	Without block guarantee of cyclic data per station
Q00JCPU	—	0.83
Q00CPU	—	0.68
Q01CPU	—	0.66
Q02CPU	0.58	0.51
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.24	0.22
Q12PRHCPU, Q25PRHCPU	—	0.22
Q00UJCPU, Q00UCPU, Q01UCPU	0.32	0.31
Q02UCPU	0.32	0.31
Universal model QCPU other than those listed above	0.14	0.12

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(Local station)*1

—: The block guarantee of cyclic data per station function is not supported.

Constant / CPU type	KM1	
	With block guarantee of cyclic data per station	Without block guarantee of cyclic data per station
Q00JCPU	—	1.05
Q00CPU	—	0.86
Q01CPU	—	0.79
Q02CPU	0.81	0.74
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.31	0.29
Q00UJCPU, Q00UCPU, Q01UCPU	0.70	0.60
Q02UCPU	0.70	0.60
Universal model QCPU other than those listed above	0.15	0.13

*1 A Q12PRHCPU and Q25PRHCPU cannot be set as a local station.

- KM2, KM3, KM4: Constant
  The value is the same regardless of execution of the block guarantee of cyclic data per station.

(When a master/local module is mounted on a main base unit)

Constant / CPU type	KM2 (× 10^{-3})	KM3 (× 10^{-3})		KM4
		File registers (R, ZR) on a memory card are used.	File registers (R, ZR) on a memory card are not used.	
Q00JCPU	0.91	—		—
Q00CPU	0.83	—		—
Q01CPU	0.79	—		—
Q02CPU	0.48	0.32	—	0.5
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.43	0.14	—	0.2
Q12PRHCPU, Q25PRHCPU	0.43	0.14	—	0.2
Q00UJCPU, Q00UCPU, Q01UCPU	0.39	—		0.2
Q02UCPU	0.39	0.05	—	0.2
Universal model QCPU other than those listed above	0.36	0.03	—	0.14

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(When a master/local module is mounted on an extension base unit)

Constant / CPU type	KM2 (× 10^{-3})	KM3 (× 10^{-3})		KM4
		File registers (R, ZR) on a memory card are used.	File registers (R, ZR) on a memory card are not used.	
Q00JCPU	1.62	—		—
Q00CPU	1.57	—		—
Q01CPU	1.55	—		—
Q02CPU	1.02	0.08	—	0.5
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.98	0.06	—	0.2
Q12PRHCPU, Q25PRHCPU	0.98	0.06	—	0.2
Q00UJCPU, Q00UCPU, Q01UCPU	1.02	—		0.2
Q02UCPU	1.02	0.05	—	0.2
Universal model QCPU other than those listed above	0.90	0.03	—	0.14

Ex. A calculation example under the following conditions is described.

Item	Condition
CPU module	Q06HCPU
Master/local module	The module is mounted on a main base unit and used as a master station.
Number of refresh points	Data (RX: 2048 points, RY: 2048 points, RWw: 256 points, RWr: 256 points, SB: 512 points, SW: 512 points) are refreshed to areas other than a file register.
Block guarantee of cyclic data per station function	Not set

$$KM1 + KM2 \times \left(\frac{RX+RY+SB}{16} + RWw+RWr+SW\right) \times \alpha E + (\text{Number of CC-Link modules}-1) \times KM4$$

$$=0.22+0.00043 \times \left(\frac{2048+2048+512}{16} + 256+256+512\right) + 0 + (1-1) \times 0.2$$

$$=0.78416$$

$$=0.79 \text{ ms}$$

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(b) Remote net additional mode

[Formula]

$$\alpha T = KM1 + KM2 \times \left(\frac{RX+RX2+RY+RY2+SB}{16} + RWw+RWw2+RWr+RWr2+SW \right)$$

$$+ \alpha E + (\text{Number of CC-Link modules-1}) \times KM4 \text{ [ms]}$$

$$\alpha E = KM3 \times \left(\frac{RX+RX2+RY+RY2+SB}{16} + RWw+RWw2+RWr+RWr2+SW \right) \text{ [ms]}$$

αT:	Link refresh time
RX:	Number of remote input (RX) points refreshed in the master station/local station
RX2:	Number of Ver.2 remote input (RX) points refreshed in the master station/local station
RY:	Number of remote output (RY) points refreshed in the master station/local station
RY2:	Number of Ver.2 remote output (RY) points refreshed in the master station/local station
RWw:	Number of remote register (RWw) points refreshed in the master station/local station
RWw2:	Number of Ver.2 remote register (RWw) points refreshed in the master station/local station
RWr:	Number of remote register (RWr) points refreshed in the master station/local station
RWr2:	Number of Ver.2 remote register (RWr) points refreshed in the master station/local station
SB:	Number of link special relay (SB) points refreshed in the master station/local station
SW:	Number of link special register (SW) points refreshed in the master station/local station
αE:	Time that file register (R, ZR) data on a memory card is transferred (only when used)

Point

Add αE only when refreshing the data to the memory card file register. Addition is not required when refreshing the data to the standard RAM and extended SRAM cassette file registers.

- KM1: Constant
  (Master station)

—: The block guarantee of cyclic data per station function is not supported.

Constant / CPU type	KM1	
	With block guarantee of cyclic data per station	Without block guarantee of cyclic data per station
Q00JCPU	—	1.05
Q00CPU	—	0.86
Q01CPU	—	0.80
Q02CPU	0.75	0.68
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.30	0.28
Q12PRHCPU, Q25PRHCPU	—	0.28
Q00UJCPU, Q00UCPU, Q01UCPU	0.88	0.85
Q02UCPU	0.55	0.43
Universal model QCPU other than those listed above	0.18	0.16

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(Local station)*1

—: The block guarantee of cyclic data per station function is not supported.

Constant / CPU type	KM1	
	With block guarantee of cyclic data per station	Without block guarantee of cyclic data per station
Q00JCPU	—	1.27
Q00CPU	—	1.04
Q01CPU	—	0.93
Q02CPU	0.94	0.87
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.40	0.38
Q00UJCPU, Q00UCPU, Q01UCPU	0.91	0.85
Q02UCPU	0.73	0.60
Universal model QCPU other than those listed above	0.19	0.17

*1 A Q12PRHCPU and Q25PRHCPU cannot be set as a local station.

- KM2, KM3, KM4: Constant
  The value is the same regardless of execution of the block guarantee of cyclic data per station.
  (When a master/local module is mounted on a main base unit)

Constant / CPU type	KM2 (× 10^{-3})	KM3 (× 10^{-3})		KM4
		File registers (R, ZR) on a memory card are used.	File registers (R, ZR) on a memory card are not used.	
Q00JCPU	0.91	—		—
Q00CPU	0.83	—		—
Q01CPU	0.79	—		—
Q02CPU	0.48	0.32	—	0.5
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.43	0.14	—	0.2
Q12PRHCPU, Q25PRHCPU	0.43	0.14	—	0.2
Q00UJCPU, Q00UCPU, Q01UCPU	0.33	—		0.2
Q02UCPU	0.33	0.05	—	0.2
Universal model QCPU other than those listed above	0.36	0.04	—	0.14

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(When a master/local module is mounted on an extension base unit)

CPU type \ Constant	KM2 (×10^{-3})	KM3 (×10^{-3})		KM4
		File registers (R, ZR) on a memory card are used.	File registers (R, ZR) on a memory card are not used.	
Q00JCPU	1.62	—		—
Q00CPU	1.57	—		—
Q01CPU	1.55	—		—
Q02CPU	1.02	0.08	—	0.5
Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU	0.98	0.06	—	0.2
Q12PRHCPU, Q25PRHCPU	0.98	0.06	—	0.2
Q00UJCPU, Q00UCPU, Q01UCPU	0.95	—		0.2
Q02UCPU	0.95	0.05	—	0.2
Universal model QCPU other than those listed above	0.90	0.04	—	0.14

Ex. A calculation example under the following conditions is described.

Item	Condition
CPU module	Q06HCPU
Master/local module	The module is mounted on a main base unit and used as a master station.
Number of refresh points	Data (RX: 1024 points, RX2: 896 points, RY: 1024 points, RY2: 896 points, RWw: 128 points, RWw2: 128 points, RWr: 128 points, RWr2: 128 points, SB: 512 points, SW: 512 points) are refreshed to areas other than a file register.
Block guarantee of cyclic data per station function	Not set

$$KM1 + KM2 \times \left(\frac{RX+RX2+RY+RY2+SB}{16} + RWw+RWw2+RWr+RWr2+SW \right)$$

$$+ \alpha E + (\text{Number of CC-Link modules}-1) \times KM4 \text{ [ms]}$$

$$= 0.28+0.00043 \times \left(\frac{1024+896+1024+896+512}{16} + 128+128+128+128+512 \right)$$

$$+0+(1-1) \times 0.2$$

$$=0.83728$$

$$=0.84 \text{ ms}$$

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Appendix 5 Difference from traditional modules

This appendix lists differences from traditional master/local modules.

Appendix 5.1 Precautions when replacing an A(1S)J61BT11/A(1S)J61QBT11 with a QJ61BT11N

(1) Functions

The following table lists the differences between an A(1S)J61BT11/A(1S)J61QBT11 and QJ61BT11N.

Item	A(1S)J61BT11	A(1S)J61QBT11	QJ61BT11N
Starting up method	Yn6, Yn8, and a dedicated instruction are used.	Yn6, Yn8, and the parameters of the CPU module of a master station are used.	The parameters of the CPU module of a master station (Yn6 and Yn8 cannot be used) and a dedicated instruction are used.
Module reset function using a program	Yes	Yes	No
Parameter settings using the FROM/TO instructions	Yes	Yes	No
Parameter settings using dedicated instructions	Yes	No	Yes
Parameter settings using a programming tool	No	Yes	Yes
Standby master function	A failed master station cannot return.	A failed master station cannot return.	A failed master station can return.
Parameter checking test	Yes	Yes	No
E^2PROM	Yes	Yes	No (Parameters of a CPU module)

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(2) Dedicated instructions

(a) A(1S)J61BT11

The following dedicated instructions of an A(1S)J61BT11 cannot be used in a master/local module.

Instruction	Description
RLPA	Set the network parameter.
RRPA	Set the auto refresh parameter.

(b) A(1S)J61QBT11

The following dedicated instructions of an A(1S)J61QBT11 cannot be used in a master/local module.

Instruction	Description
CCL,CCLEND	Register a mail box for dedicated instructions for an intelligent device and remote device.
SPCCLR	Issue an interrupt instruction to the dedicated instructions for an intelligent device.
SPCBUSY	Read the status of a remote station.
SEND	Send data (a message) to a specified station (QnACPU).
RECV	Read data (a message) sent using the SEND instruction.
READ,SREAD	Read word device data of a target station QnACPU into the host station.
WRITE,SWRITE	Write data from the host station to word device data of a target station QnACPU.
REQ	Send a transient request (such as remote RUN/STOP) to other stations for execution.

(3) Condition setting switch

A master/local module does not have a condition setting switch. Configure settings that used to be set using a condition setting switch in the network parameter of a programming tool.

Appendix 5.2 Precautions when replacing a QJ61BT11 with a QJ61BT11N

A QJ61BT11 can be replaced by a QJ61BT11N as is. For the mode names, refer to the following table.

Mode of a QJ61BT11	Mode of a QJ61BT11N
Remote net mode	Remote net Ver.1 mode
Remote I/O net mode	Remote I/O net mode

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Appendix 6 Upgrading the Functions of a Master/Local Module

Before using the functions of a master/local module, check if the master/local module, CPU module, and programming tool support the functions.

(1) Available functions of CPU modules

○: Can be used, ×: Cannot be used

Function		QCPU (excluding a Basic model QCPU)	Basic model QCPU	QJ72LP25-25/ QJ72LP25G/ QJ72LP25GE/ QJ72BR15
Basic applications	Communications with a remote I/O station	○	○	○
	Communications with a remote device station	○	○	○
	Communications with a local station	○	○	○
	Communications with an intelligent device station	○	○	○
	Parameter settings using a programming tool	○	○	○
		○	○	○
	Parameter settings using dedicated instructions	○	○	×
Applications to improve the system reliability	Slave station cutoff function	○	○	○
	Automatic return function	○	○	○
	Setting of the data link status upon an error in the programmable controller CPU of the master station	○	○	○
	Setting of a status input from a data link faulty station	○	○	○
	Setting whether to refresh or compulsorily clear a slave station when the switch on a programmable controller CPU is set to STOP	○	○	○
	Standby master function	○	○	×
	Data link start function using a standby master station	○	○	×
	Block data assurance per station	○*2	×	×

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Function			QCPU (excluding a Basic model QCPU)	Basic model QCPU	QJ72LP25-25/ QJ72LP25G/ QJ72LP25GE/ QJ72BR15
Useful applications	Remote device station initialization procedure registration function		○	○	○
	Event issuance for the interrupt program		○	○*1	×
	Automatic CC-Link startup		○*3	○	○
	Remote net mode		○	○	○
	Remote I/O net mode		○*3	○	×
	Reserved station function		○	○	○
	Error invalid station setting function		○	○	○
	Scan synchronization	Synchronous mode	○	○	×
		Asynchronous mode	○	○	○
	Temporary error invalid station setting function		○	○	○
	Data link stop/restart		○	○	○
	Station number overlap checking function		○	○	○
	Supporting a multiple CPU system		○*4	○*4	×
	Remote I/O station points setting		○	○	○
	Remote net Ver.2 mode		○	○	○
	Remote net additional mode		○*2	○	×
	Master station duplication error canceling function		○	○	○
Performing transient transmission	Transient transmission		○	○	○

*1 A module after a Basic model QCPU with the function Ver.B supports this function.
*2 A Redundant CPU does not support this function.
*3 This function cannot be used when a module is mounted on the main base unit of a Redundant CPU.
*4 A Q00JCPU and Q00UJCPU do not support a multiple CPU system.

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(2) Availability of added functions of a CPU module, master/local module, and programming tool depending on the version

×: Not supported, -: Not subject to the version

Added function	First 5 digits of the serial No. of a master/local module	Applicable programming tool version	
		GX Works2	GX Developer
Remote net Ver.2 mode	-	1.15R or later	8.03D or later*4
Remote net additional mode	-*1		
Refreshing/compulsorily clearing a slave station when the switch on a programmable controller CPU is set to STOP	-		8.03D or later
Remote I/O station points setting	-		8.03D or later
Number of connectable modules: 5 to 8	-*2		8.32J or later*5
Redundant CPU	06052 or later	1.87R or later	8.18U or later
Mounting a module on the extension base unit of a Redundant CPU	06052 or later	1.87R or later	8.45X or later
Standby master station (data link start function using a standby master station)	07112 or later	-	-
Block data assurance per station	08032 or later*3	1.15R or later	8.32J or later
Specification of remote device station to be initialized	08032 or later	-	-
Retry count setting when dedicated instructions are used	08102 or later		
Master station duplication error canceling function	09112 or later		
Transmission speed test (programming tool used)	10032 or later	1.15R or later	×
Transmission speed test (link special relays (SBs) and link special registers (SWs) used)	10032 or later	-	-
Message transmission function (G(P).RDMSG instruction)	10032 or later	-	-
Status logging	10112 or later	1.15R or later	×
Status logging flash ROM storage	12032 or later	1.15R or later	×
Module error history display	11042 or later*6	1.15R or later	×
Station information setting on the CC-Link configuration window	-	1.73B or later	×
Automatic detection of connected devices	iQ Sensor Solution Reference Manual		×
Data backup/restoration	iQ Sensor Solution Reference Manual		×

A

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*1 Use a CPU module with the serial number listed below.

CPU module	First 5 digits of the serial No.
Basic model QCPU	06112 or later
High Performance model QCPU	05032 or later
Process CPU (excluding a Q02PHCPU and Q06PHCPU)	07032 or later

*2 Use a CPU module with the serial number listed below.

CPU module	First 5 digits of the serial No.
High Performance model QCPU	08032 or later
Process CPU	
Redundant CPU	09102 or later

*3 Use a CPU module with a serial number (first five digits) of 08032 or later.
*4 A Process CPU with Version 8.24A or later supports this function.
*5 A Redundant CPU with Version 8.58L or later supports this function.
*6 Use a Universal model QCPU with a serial number (first five digits) of 11043 or later.

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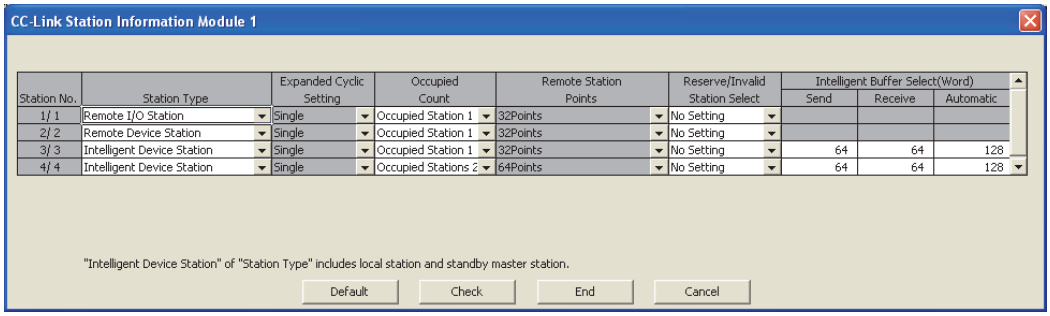
Appendix 7 When using GX Developer

This appendix describes the operations of GX Developer, which are different from those of GX Works2. When GX Developer is used, read this appendix before operation.
The operations that are not described in this appendix are the same as those of GX Works2.

Appendix 7.1 Parameter settings

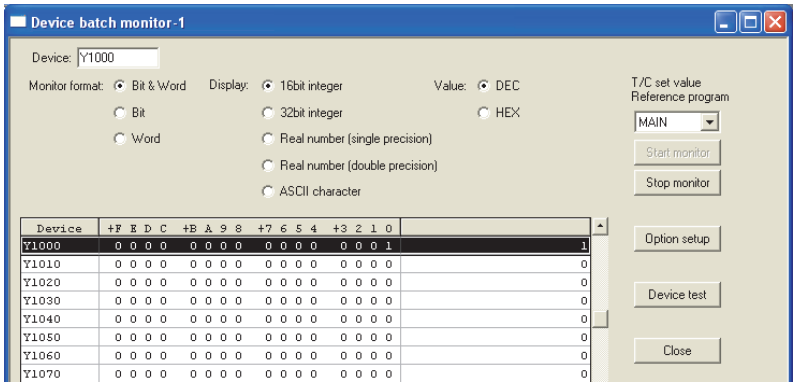
GX Developer does not have the station information setting on the CC-Link configuration window. Set the station information on the "CC-Link Station Information" window. (☞Page 106, Section 7.3.2 (2) (b))



Appendix 7.2 Device test

Execute a device test on the following menu.

[Online] ⇨ [Monitor] ⇨ [Device batch monitor]



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Appendix 7.3 CC-Link diagnostics

The CC-Link diagnostics is operated in a different way from GX Works2. This appendix describes how to operate the CC-Link diagnostics on GX Developer.

(1) Host station monitoring

How to monitor the status of a host station is described below.

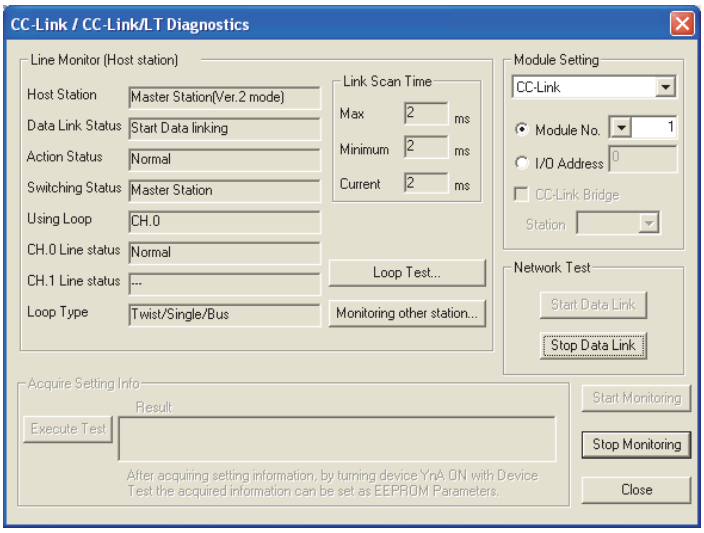
1. Open the "CC-Link/CC-Link/LT Diagnostics" window.

[Diagnostics] ⇨ [CC-Link/CC-Link/LT Diagnostics]

2. In "Module Setting", select "CC-Link". Then select a master/local module to be monitored in "Module No." or "I/O Address".

3. Click the Start Monitoring button.

4. Follow the subsequent instructions for monitoring.



Item		Description
Line Monitor (Host station)	Host Station	Displays the station type and mode of the host station. Note that the mode is not displayed when the master/local module is in the remote net Ver.1 mode.
	Data Link Status	Displays the data link status of the host station.
	Action Status	Displays the operating status of the host station.
	Switching Status	Displays whether the master station or standby master station is controlling data link.
	Using Loop	Displays the line of the master/local module used.
	CH.0 Line status	Displays the line status.
	CH.1 Line status	
	Loop Type	Displays the line type of CC-Link.
	Link Scan Time	Displays the maximum, minimum, and current value of the links can time.
	Loop Test... button	Executes a line test. (☞ Page 404, Appendix 7 (3))
	Monitoring other station... button	Monitors other stations. (☞ Page 403, Appendix 7 (2))
Module Setting		Specifies the master/local module to be monitored on the CC-Link diagnostics. In "Module Setting", select "CC-Link". Then select the module number (what number module) or I/O Address (start I/O number) of the module to be monitored.
Network Test		Stops and restarts data link. (☞ Page 405, Appendix 7 (6))

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(2) Other stations monitoring

How to monitor the status of a slave station is described below.

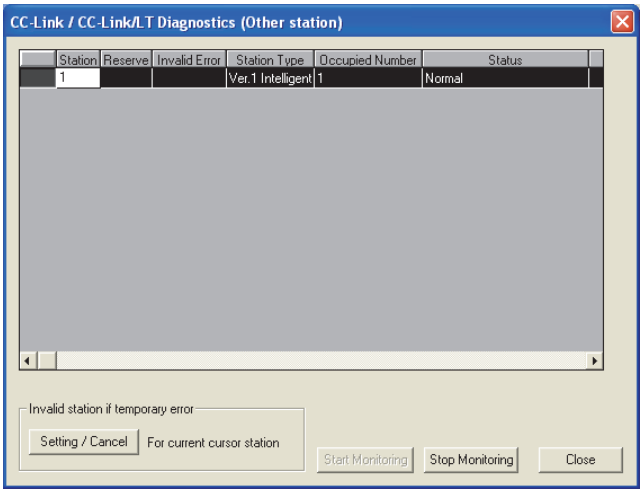
1. Open the "CC-Link/CC-Link/LT Diagnostics" window.

[Diagnostics] ⇨ [CC-Link/CC-Link/LT Diagnostics]

2. In "Module Setting", select "CC-Link". Then select a master/local module to be monitored in "Module No." or "I/O Address".

3. Click the Start Monitoring **button.**

4. Click the Monitoring other station... **button to monitor the status of the slave station.**



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(3) Line test

Whether a CC-Link dedicated cable is properly connected and data link can be performed with slave stations can be checked.

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

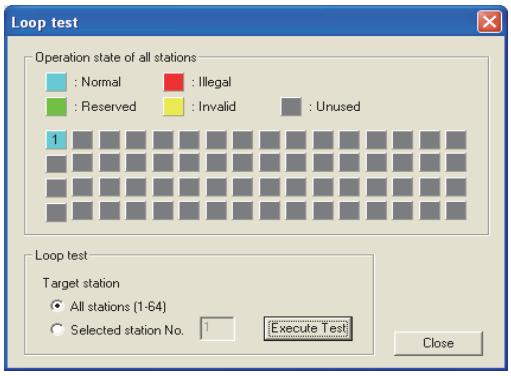
[Diagnostics] ⇨ [CC-Link/CC-Link/LT Diagnostics]

2. In "Module Setting", select "CC-Link". Then select a master station to be monitored in "Module No." or "I/O Address".

3. Click the Start Monitoring **button.**

4. Click the Loop Test... **button.**

The "Loop test" window appears.



5. Specify the station where a line test is executed in "Target station". Then click the Execute Test **button.**

To execute a test in all the stations: Select "All stations (1-64)".

To execute a test in a specified station: Select "Selected station" and enter the station number.

6. The test result is displayed in "Operation state of all stations".

Point

- If the Loop Test... button cannot be clicked, check that the master station has been selected in "Module Setting".
- Do not write data to the buffer memory areas (buffer memory addresses: $5E0_H$ and 608_H) during line test.
- Do not execute a line test using a program and other peripherals at the same time. The line test may not be normally executed.

(4) Transmission speed test

A transmission speed test cannot be executed on the CC-Link diagnostics of GX Developer. Execute a test using link special relays (SBs) and link special registers (SWs). (☞ Page 91, Section 6.5.2 (2))

(5) Status logging

The status logging cannot be performed on the CC-Link diagnostics of GX Developer. Use GX Works2 to perform it.

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(6) Data link stop/restart

How to stop and restart data link of a master/local module is described below.
During a debugging session, the master/local module does not receive data from other stations and does not send data of the host station.

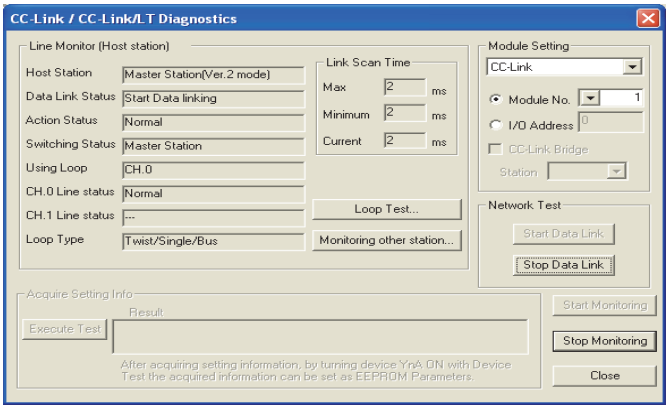
1. Open the "CC-Link/CC-Link/LT Diagnostics" window.

[Diagnostics] ⇨ [CC-Link/CC-Link/LT Diagnostics]

2. In "Module Setting", select "CC-Link". Then select a master/local module to be monitored in "Module No." or "I/O Address".

3. Click the Start Monitoring button.

4. Click the Stop Data Link button or Start Data Link button.



Point

When stopping or restarting data link, do not write data to the buffer memory area (buffer memory address: $5E0_H$).

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(7) Setting and canceling a temporary error invalid station

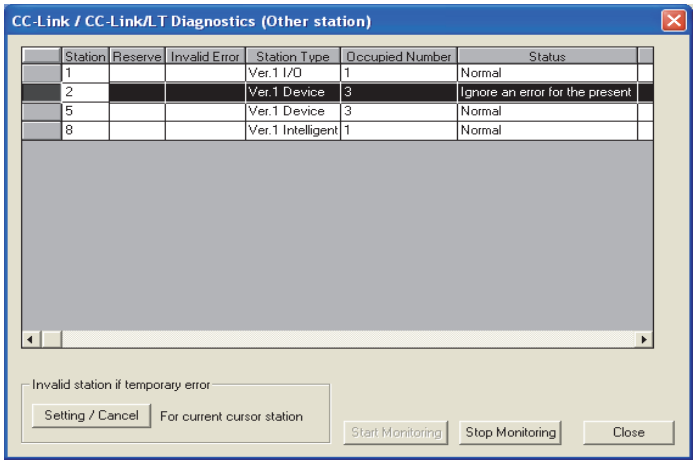
Even if a data link error occurs in a slave station, the station is not detected as a faulty station in the master station and local station. This setting can be configured even during data link, unlike the error invalid station setting function.

This function is used to exchange slave stations during data link for maintenance or for other purposes.

1. **Open the "CC-Link/CC-Link/LT Diagnostics" window.**

   [Diagnostics] ⇨ [CC-Link/CC-Link/LT Diagnostics]

2. **In "Module Setting", select "CC-Link". Then select a master station to be monitored in "Module No." or "I/O Address".**
3. **Click the** Start Monitoring **button.**
4. **Click the** Monitoring other station... **button.**
5. **Select the line of the station where the temporary error invalid station setting is configured or canceled. Then click the** Setting / Cancel **button.**



Point

- If the Setting / Cancel button cannot be clicked, check that the master station has been selected in "Module Setting".
- While configuring the setting, do not write data to the buffer memory areas (buffer memory addresses: $5E0_H$, $5E4_H$, and 603_H to 607_H).
- Do not configure or cancel the temporary error invalid station setting using a program and other peripherals at the same time. The temporary error invalid station setting may not be normally configured or cancelled.

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Appendix 8 Setting sheet

This appendix provides sheets to be used when the parameters of CC-Link are set. Copy the sheets for use.

Appendix 8.1 Assignment sheet

(1) Remote I/O (RX/RY) assignment sheet

For an example of using the assignment sheet, refer to Page 59, Section 4.1 or Page 228, CHAPTER 10.

CPU module	Master station/local station	Slave station		
Device	Buffer memory address	Station No.	Module name	Remote I/O (RX/RY)
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to
to				to

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(2) Remote register (RWr/RWw) assignment sheet

For an example of using the assignment sheet, refer to Page 59, Section 4.1 or Page 228, CHAPTER 10.

CPU module	Master station/local station	Slave station		
Device	Buffer memory address	Station No.	Module name	Remote register (RWr/RWw)

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Appendix 8.2 Network parameter setting sheet

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	
Operation Setting	Data Link Faulty Station Setting	Hold or clear the input data. Default: Clear input data	Hold/Clear
	Case of CPU STOP Setting	Refresh or clear compulsorily. Default: Refresh	Refresh/Clear compulsorily
	Block Data Assurance per Station	Disable or enable the setting. Default: Disable the setting	Disable/Enable
	Number of Occupied Stations	1 to 4 stations occupied Default: Occupied Station 1	
	Expanded Cyclic Setting	Single, Double, Quadruple, Octuple Default: Single	
Type		Master Station Master Station (Duplex Function) Master station (Extension Base) Local Station Standby Master Station Default: Master Station	Master Station Master Station (Duplex Function) Master station (Extension Base) Local Station Standby Master Station
Mode		Remote Net (Ver.1 Mode) Remote Net (Ver.2 Mode) Remote Net (Additional Mode) Remote I/O Net Mode Offline Default: Remote Net (Ver.1 Mode)	Remote Net (Ver.1 Mode) Remote Net (Ver.2 Mode) Remote Net (Additional Mode) Remote I/O Net Mode Offline
Total Module Connected		1 to 64 Default: 64	
Remote Input (RX) refresh device		Device name: Select one from X, M, L, B, D, W, R, and ZR.	
Remote Output (RY) refresh device		Device name: Select one from Y, M, L, B, T, C, ST, D, W, R, and ZR.	
Remote Register (RWr) refresh device		Device name: Select one from M, L, B, D, W, R, and ZR.	
Remote Register (RWw) refresh device		Device name: Select one from M, L, B, T, C, ST, D, W, R, and ZR.	
Ver.2 Remote Input (RX) refresh device		Device name: Select one from X, M, L, B, D, W, R, and ZR.	
Ver.2 Remote Output (RY) refresh device		Device name: Select one from Y, M, L, B, T, C, ST, D, W, R, and ZR.	
Ver.2 Remote Register (RWr) refresh device		Device name: Select one from M, L, B, D, W, R, and ZR.	
Ver.2 Remote Register (RWw) refresh device		Device name: Select one from M, L, B, T, C, ST, D, W, R, and ZR.	
Special Relay(SB) refresh device		Device name: Select one from M, L, B, D, W, R, SB, and ZR.	
Special Register(SW) refresh device		Device name: Select one from M, L, B, D, W, R, SW, and ZR.	

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Item	Setting range	Setting value
Retry Count	1 to 7 Default: 3	
Automatic Reconnection Station Count	1 to 10 Default: 1	
Standby Master Station No.	Blank or 1 to 64 (Blank: no standby master station specified) Default: Blank	
PLC Down Select	Stop/Continue Default: Stop	Stop/Continue
Scan Mode Setting	Asynchronous/Synchronous Default: Asynchronous	Asynchronous/Synchronous
Delay Time Setting	Enter 0.	

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Appendix 8.3 Station information setting sheet

Station No.	Station Type	Expanded Cyclic Setting	Number of Occupied Stations	Remote Station Points	Reserve/ Invalid Station Select	Intelligent Buffer Select (Word)		
						Send	Receive	Automatic
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								

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Station No.	Station Type	Expanded Cyclic Setting	Number of Occupied Stations	Remote Station Points	Reserve/ Invalid Station Select	Intelligent Buffer Select (Word)		
						Send	Receive	Automatic
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
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56								
57								
58								
59								
60								
61								
62								
63								
64								

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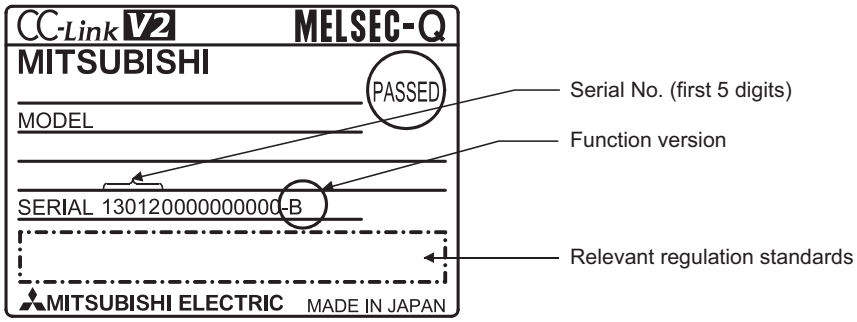
Appendix 9 Checking the Function Version and Serial Number

The serial number and function version of a master/local module can be checked on the rating plate, the front of the module, and the system monitor of a programming tool.

(1) Checking the function version and serial number of a master/local module

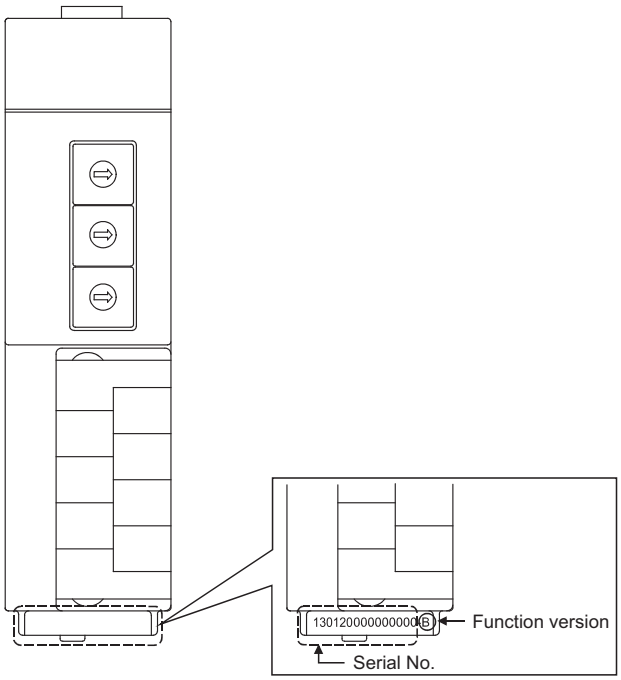
(a) On the rating plate

The rating plate is located on the side of a master/local module.



(b) On the front of a module

The serial number and function version on the rating plate are printed on the front (at the bottom) of the module.



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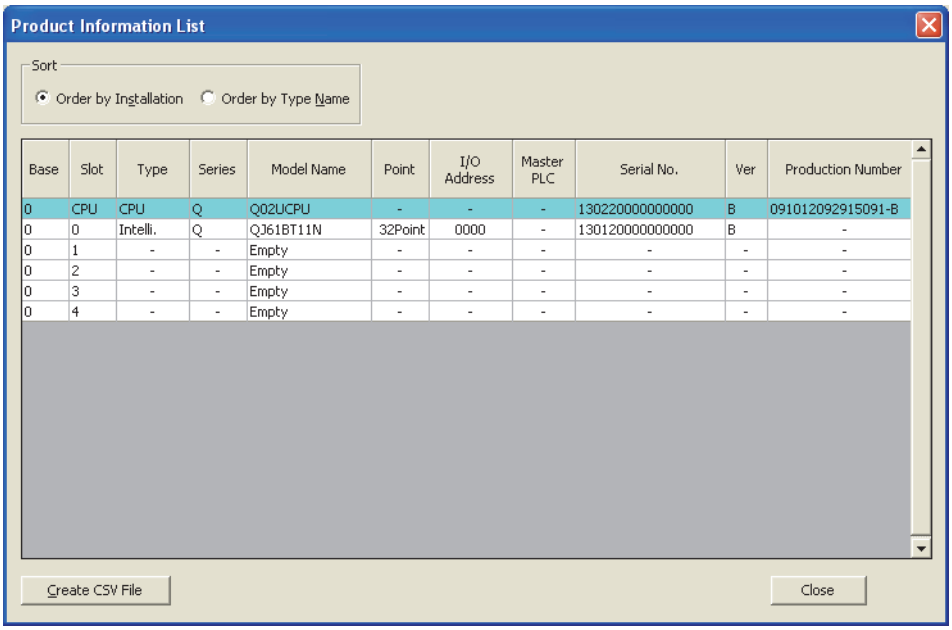
(c) On the system monitor (Product Information List)

In "System Monitor" of "Diagnostics" on a programming took, click the Product Information List button.



Base	Slot	Type	Series	Model Name	Point	I/O Address	Master PLC	Serial No.	Ver	Production Number
0	CPU	CPU	Q	Q02UCPU	-	-	-	130220000000000	B	091012092915091-B
0	0	Intelli.	Q	QJ61BT11N	32Point	0000	-	130120000000000	B	-
0	1	-	-	Empty	-	-	-	-	-	-
0	2	-	-	Empty	-	-	-	-	-	-
0	3	-	-	Empty	-	-	-	-	-	-
0	4	-	-	Empty	-	-	-	-	-	-

- Display of a production number

  Because a master/local module does not support a production number display, a hyphen (-) is displayed.

Point

The serial number on the rating plate and the front of the module may differ from that on the production information list window of a programming tool.

- The serial number on the rating plate and the front of the module indicates the management information of the product.
- The serial number on the production information list window of a programming tool indicates the functional information of the product. The functional information of the product is updated when a new function is added.

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Appendix 10 CC-Link Versions

There are Ver.1 and Ver.2 for CC-Link versions.

(1) Ver.1.00 and Ver.1.10

Ver.1.10 is a standard where restrictions of station-to-station cable lengths in Ver.1.00 have been cleared and the length of all station-to-station cables is 20cm or longer. Ver.1.00 is a traditional standard.

For the maximum overall cable distance of Ver.1.10, refer to Page 29, Section 3.2.2.

The following are conditions where all station-to-station cables have a length of 20cm or longer.

- All the modules in a CC-Link system are Ver.1.10-compatible.
- All the cables are Ver.1.10-compatible CC-Link dedicated cables.

(2) Ver.2

Ver.2-compatible module is a module that supports the cyclic points expansion.

The specifications of a cable are the same as those of Ver.1.10.

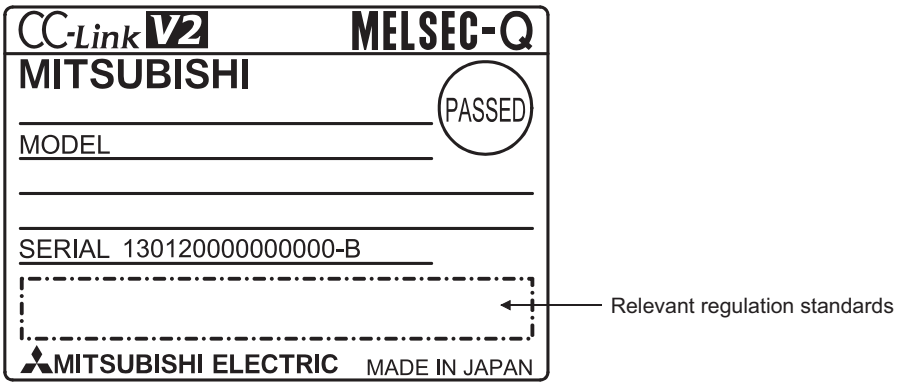
Point

In a system where a Ver.1.00-compatible module is included, the maximum overall cable distance and station-to-station cable length need to meet the specifications of Ver.1.00.
For the maximum overall cable distance and station-to-station cable length of Ver.1.00, refer to Page 30, Section 3.2.3.

(3) How to check the version

On a Ver.1.10-compatible module, the rating plate has a logo "CC-Link".

On a Ver.2-compatible module, the rating plate has a logo "V2".



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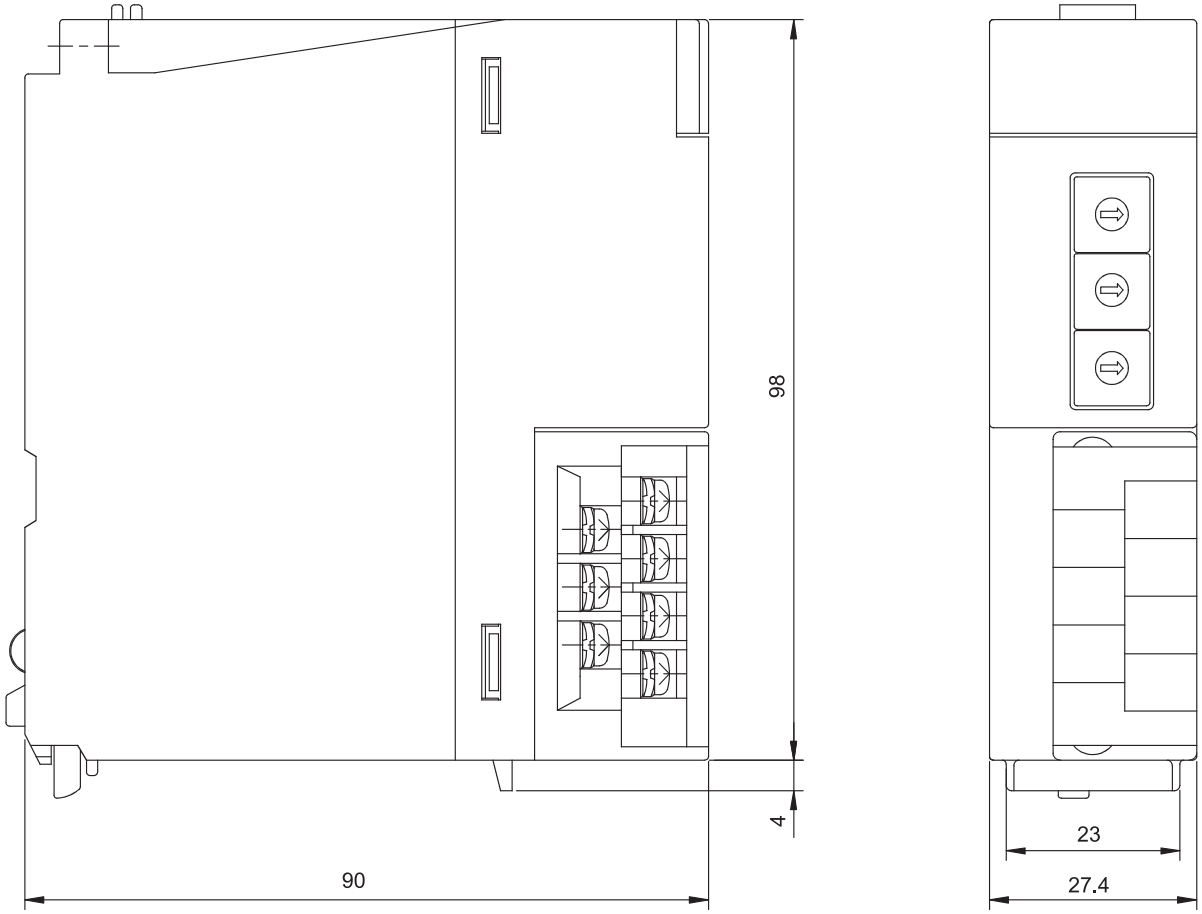
Appendix 11 External Dimension Diagram



Unit: mm

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REVISIONS

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

Print date	*Manual number	Revision
May, 2003	SH (NA)-080394E-A	First edition
May, 2004	SH (NA)-080394E-B	Addition Appendix 6 Partial correction SAFETY PRECAUTIONS, Section 2.2.1, Section 2.2.3, Section 2.2.4, Chapter 4, Section 4.1, Section 4.3.3, Section 4.4.14, Section 7.2.1, Section 8.2.2, Section 8.3.1, Section 8.3.2, Section 8.4.1, Section 8.4.2, Section 13.1, Section 13.3, Appendix 3
Dec., 2004	SH (NA)-080394E-C	Partial correction SAFETY PRECAUTIONS, Chapter 1, Section 2.2.1, Section 3.1, Section 4.4.1, Section 4.4.2, Section 4.4.3, Section 4.4.14, Section 5.4.1, Section 7.3, Section 8.4.2, Section 13.3, Appendix 2, Appendix 2.3, Appendix 2.4, Appendix 2.5, Appendix 2.6, Appendix 2.7
Jul., 2005	SH (NA)-080394E-D	Addition Section 11.1 Partial correction SAFETY PRECAUTIONS, Section 2.2.1, Section 2.2.2, Section 4.4.3, Section 4.4.6, Section 6.2, Section 6.3.1, Section 6.3.2, Section 6.4.1, Section 6.4.2, Section 6.5.1, Section 6.5.2, Section 8.4.1, Section 8.4.2, Section 9.1.2, Section 10.1.2, Section 10.2.2, Section 10.3.2, Section 11.1.2, Section 11.2.3, Section 11.2.4, Section 11.2.5, Section 11.3.2, Section 11.3.3, Section 11.3.4, Section 11.3.5, Section 11.4.2, Section 11.4.3, Section 11.4.4, Section 11.4.5, Section 13.3, Appendix 2.7, Appendix 7.1
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Apr., 2006	SH (NA)-080394E-F	Addition Section 4.3.8, Appendix 2.1 Partial correction Section 1.3, Section 2.2.1, Section 2.2.3, Section 2.2.4, Section 3.1, Section 4.1, Section 5.2, Section 5.4, Section 6.2, Section 6.3.1, Section 6.3.3, Section 6.4.1, Section 6.4.3, Section 6.5.1, Section 6.5.3, Section 6.6.1, Section 7.1, Section 7.5, Section 8.3.2, Section 8.4.1, Section 8.4.2, Section 9.1.2, Section 10.1.2, Section 10.1.3, Section 10.2.2, Section 10.2.3, Section 10.3.2, Section 10.3.3, Section 11.2.2, Section 11.2.3, Section 11.3.2, Section 11.3.3, Section 11.4.2, Section 11.4.3, Section 13.1, Section 13.3, Appendix 2, Appendix 2.2, Appendix 2.3, Appendix 2.4, Appendix 2.5, Appendix 6, Appendix 7
Oct., 2006	SH (NA)-080394E-G	Partial correction Section 2.2.2, Section 4.2.6, Section 4.4.1, Section 4.5.1, Section 5.3.1, Section 5.3.2, Section 5.3.3, Section 6.2, Section 7.5.1, Section 8.4.1, Section 8.4.2, Section 10.3.2, Section 11.2.3, Section 11.3.2, Section 11.3.3, Section 11.4.2, Section 11.4.3, Appendix 2.1, Appendix 7, Appendix 8.1

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Nov., 2007	SH (NA)-080394E-H	Partial correction Section 1.3, Section 2.2.1, Section 4.1, Section 4.2.3, Section 4.2.6, Section 4.4.1, Section 6.2, Section 6.3.2, Section 6.3.4, Section 6.4.2, Section 6.4.4, Section 6.5.2, Section 6.5.4, Section 6.6.2, Section 6.7, Section 7.3, Section 8.4.1, Section 8.4.2, Section 9.1.1, Section 10.1.1, Section 10.2.1, Section 10.3.1, Section 11.2.1, Section 11.3.1, Section 11.4.1, Appendix 1, Appendix 2.1, Appendix 2.2, Appendix 2.3, Appendix 2.4, Appendix 2.5, Appendix 2.6, Appendix 2.7, Appendix 2.8
Apr., 2008	SH (NA)-080394E-I	Change of a term "PLC" was changed to "programmable controller". Addition Section 7.9, Appendix 2.9 Partial correction About the Generic Terms and Abbreviations, Section 2.2.1, Section 4.3.6, Section 4.4.3, Section 5.4.1, Section 7.2.1, Section 7.4, Section 7.7.2, Section 8.1, Section 8.4.1, Section 8.4.2, Section 9.1.2, Section 13.2, Section 13.3, Section 13.4, Appendix 2, Appendix 2.1 to 2.7, Appendix 6, Appendix 7
Jan., 2009	SH (NA)-080394E-J	Partial correction SAFETY PRECAUTIONS, About the Generic Terms and Abbreviations, Section 2.2.1, Section 2.2.3, Section 2.2.4, Section 3.1, Section 5.3.1 to 5.3.3, Section 5.4.1, Section 7.1, Section 7.2, Section 7.2.1, Section 7.3 to 7.6, Section 7.8, Section 7.9, Section 8.2.2, Section 13.3, Appendix 1, Appendix 2.2, Appendix 2.3, Appendix 2.5, Appendix 6
Aug., 2009	SH (NA)-080394E-K	Addition Section 13.3.1 Partial correction Section 2.2.1, 2.2.3, 5.2.3, 8.4.2, 11.4.4, 13.3.2, Appendix 7
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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.
[Gratis Warranty Term]
The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.
[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
    1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
    2. Failure caused by unapproved modifications, etc., to the product by the user.
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    4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
    5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
    6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
    7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
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3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

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Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

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MODEL CODE: 13JR64

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