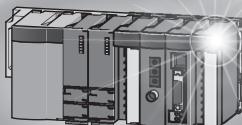


Programmable Controller

MELSEC **Q**
series

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

-QJ61BT11N



●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".



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



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]



- 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.

[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.

[Security Precautions]

WARNING

- To maintain the security (confidentiality, integrity, and availability) of the programmable controller and the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.

[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.

[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.
- When a protective film is attached to the top of the module, remove it before system operation. If not, inadequate heat dissipation of the module may cause a fire, failure, or malfunction.
- 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.

[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.

● CONDITIONS OF USE FOR THE PRODUCT ●

- (1) MELSEC 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 ELECTRIC 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 ELECTRIC USER'S, 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 Electric 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 Electric 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 Electric representative in your region.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric 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 Electric programmable controllers maintain the EMC and Low Voltage Directives or other regulations 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) (SH-080483ENG)
- Safety Guidelines (IB-0800423)

Certification marks on the side of the programmable controller indicate compliance with the relevant regulations.

(2) Additional measures

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

CONTENTS

SAFETY PRECAUTIONS	1
CONDITIONS OF USE FOR THE PRODUCT	6
INTRODUCTION	7
COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES	7
MANUAL PAGE ORGANIZATION	12
TERM	13
PACKING LIST	15

CHAPTER 1 FEATURES	16
--------------------	----

1.1 CC-Link.....	16
1.2 Master/Local Modules.....	17

CHAPTER 2 PART NAMES	21
----------------------	----

CHAPTER 3 SPECIFICATIONS	24
--------------------------	----

3.1 General Specifications	24
3.2 Performance Specifications	24
3.2.1 Maximum number of connected modules	27
3.2.2 Maximum overall cable distance (CC-Link Ver.1.10).....	29
3.2.3 Maximum overall cable distance (CC-Link Ver.1.00).....	30
3.2.4 CC-Link dedicated cables	33
3.3 List of Functions	34
3.4 List of I/O Signals	37
3.5 List of Buffer Memory Areas	38
3.6 Assignment and Modes	41
3.6.1 Assignment	41
3.6.2 Modes	43
3.6.3 Remote net Ver.1 mode	46
3.6.4 Remote net Ver.2 mode	48
3.6.5 Remote net additional mode	51
3.6.6 Remote I/O net mode	55

CHAPTER 4 PROCEDURE BEFORE THE OPERATION	57
--	----

4.1 Operation Example.....	59
-------------------------------	----

CHAPTER 5 SYSTEM CONFIGURATION	69
--------------------------------	----

5.1 CC-Link System Configuration	69
5.2 Configuration of the System Where a Master/Local Module is Mounted	70
5.2.1 Connectable modules and the number of connectable modules.....	70
5.2.2 Applicable programming tools	71
5.3 Precautions for the System Configuration	72

CHAPTER 6 INSTALLATION AND WIRING	75
-----------------------------------	----

6.1 Installing the Module.....	75
-----------------------------------	----

6.2	Wiring	76
6.2.1	Preparation before wiring	76
6.2.2	Wiring procedure	77
6.2.3	T-branch connection	79
6.3	Station Number Setting	82
6.4	Transmission Speed Setting	85
6.5	Test After Wiring	86
6.5.1	Line test	86
6.5.2	Transmission speed test	90

CHAPTER 7 PARAMETER SETTINGS	93
-------------------------------------	-----------

7.1	Parameter Setting Method	93
7.2	Parameter Setting List	94
7.3	Parameter Settings for a Master Station	96
7.3.1	Setting method	96
7.3.2	Setting details	97
7.4	Parameter Settings for a Local Station and Standby Master Station	114
7.4.1	Setting method	114
7.4.2	Setting details	115
7.5	Status Difference Between a Master Station and a Device Station at an Error	121

CHAPTER 8 FUNCTIONS	125
----------------------------	------------

8.1	Basic Applications of the Functions	125
8.1.1	Periodic communications (cyclic transmission)	125
8.1.2	Non-periodic communications (transient transmission)	127
8.2	Improving the System Reliability	128
8.2.1	Device station cut-off and automatic return	128
8.2.2	Setting of the data link status upon an error in the programmable controller CPU of the master station	130
8.2.3	Setting of the status of the input data from a data link faulty station	131
8.2.4	Refreshing/compulsorily clearing a device station when the switch on a programmable controller CPU is set to STOP	133
8.2.5	Standby master function	135
8.2.6	Cyclic data assurance	150
8.3	Useful Applications of the Functions	154
8.3.1	Remote device station initialization procedure registration function	154
8.3.2	Event issuance for the interrupt program	158
8.3.3	Automatic CC-Link startup	159
8.3.4	Reserved station function	162
8.3.5	Scan synchronization specification	163
8.3.6	Error invalid station setting function	167
8.3.7	Temporary error invalid station setting function	168
8.3.8	Data link stop/restart	169
8.3.9	Remote I/O station points setting (remote net Ver.2 mode only)	170
8.3.10	Master station duplication error canceling function	172

CHAPTER 9 DEDICATED INSTRUCTIONS 173

9.1	List of Dedicated Instructions, Applicable Devices, and Precautions	173
9.2	G(P).RIRD	175
9.2.1	Program example	180
9.3	G(P).RIWT	181
9.3.1	Program example	186
9.4	G(P).RIRCV	187
9.4.1	Program example	191
9.5	G(P).RISEND	192
9.5.1	Program example	196
9.6	G(P).RIFR	197
9.6.1	Program example	200
9.7	G(P).RITO	201
9.7.1	Program example	204
9.8	G(P).RLPASET	205
9.8.1	Program example (parameter setting example)	213
9.9	G(P).RDMSG	221
9.9.1	Program example	227

CHAPTER 10 PROGRAMMING 228

10.1	Precautions for Programming	228
10.2	Example of Communications Between a Master Station and a Remote Device Station	232
10.2.1	System configuration	232
10.2.2	Settings for a master station	242
10.2.3	Settings for a remote device station	246
10.2.4	Checking the status of data link	247
10.2.5	Program example	248
10.2.6	Program example (when the initial setting is configured only on a program)	252
10.3	Example of Communications Between a Master Station and a Local Station	255
10.3.1	System configuration	255
10.3.2	Settings for a master station	258
10.3.3	Settings for a local station	260
10.3.4	Checking the status of data link	262
10.3.5	Program example	263
10.3.6	Program example (to assure the integrity of cyclic data in each device station)	265

CHAPTER 11 TROUBLESHOOTING 267

11.1	Troubleshooting Flowcharts	268
11.1.1	Troubleshooting using LEDs	268
11.1.2	Troubleshooting using a programming tool	271
11.2	Lists of Problems	276
11.2.1	Problems due to disconnection of a device station	276
11.2.2	Problems due to cyclic data error	284
11.2.3	Problems due to transient data error	287
11.2.4	Problems due to operation error in the master station	288

11.3	Error Codes	290
11.3.1	How to check error codes	290
11.3.2	Error code list	293
11.4	CC-Link Diagnostics Using GX Works2	311
11.4.1	Monitoring the host station/other stations	311
11.4.2	Executing the line test/obtaining the transmission speed setting.....	314
11.4.3	Status logging	315
11.4.4	Creating a check sheet	318
11.4.5	Stopping and restarting data link	320
11.4.6	Setting and canceling a temporary error invalid station.....	321
11.4.7	Hardware information.....	322
11.5	Hardware Test.....	324

APPENDICES	326
-------------------	------------

Appendix 1	Description of I/O Signals	326
Appendix 2	Buffer Memory Areas	328
Appendix 3	Link Special Relays (SBs) and Link Special Registers (SWs)	343
Appendix 3.1	Link special relays (SBs)	343
Appendix 3.2	Link special registers (SWs).....	351
Appendix 4	Data Link Processing Time	366
Appendix 4.1	Link scan time	366
Appendix 4.2	Transmission delay time	371
Appendix 4.3	Processing time of dedicated instructions	381
Appendix 4.4	Link refresh time	389
Appendix 5	Difference from traditional modules	395
Appendix 5.1	Precautions when replacing an A(1S)J61BT11/A(1S)J61QBT11 with a QJ61BT11N	395
Appendix 5.2	Precautions when replacing a QJ61BT11 with a QJ61BT11N	396
Appendix 6	Upgrading the Functions of a Master/Local Module	397
Appendix 7	When using GX Developer	401
Appendix 7.1	Parameter settings.....	401
Appendix 7.2	Device test	401
Appendix 7.3	CC-Link diagnostics	402
Appendix 8	Setting Sheet.....	407
Appendix 8.1	Assignment sheet	407
Appendix 8.2	Network parameter setting sheet.....	409
Appendix 8.3	Station information setting sheet	411
Appendix 9	Checking the Function Version and Serial Number	413
Appendix 10	CC-Link Versions	415
Appendix 11	External Dimension Diagram	417

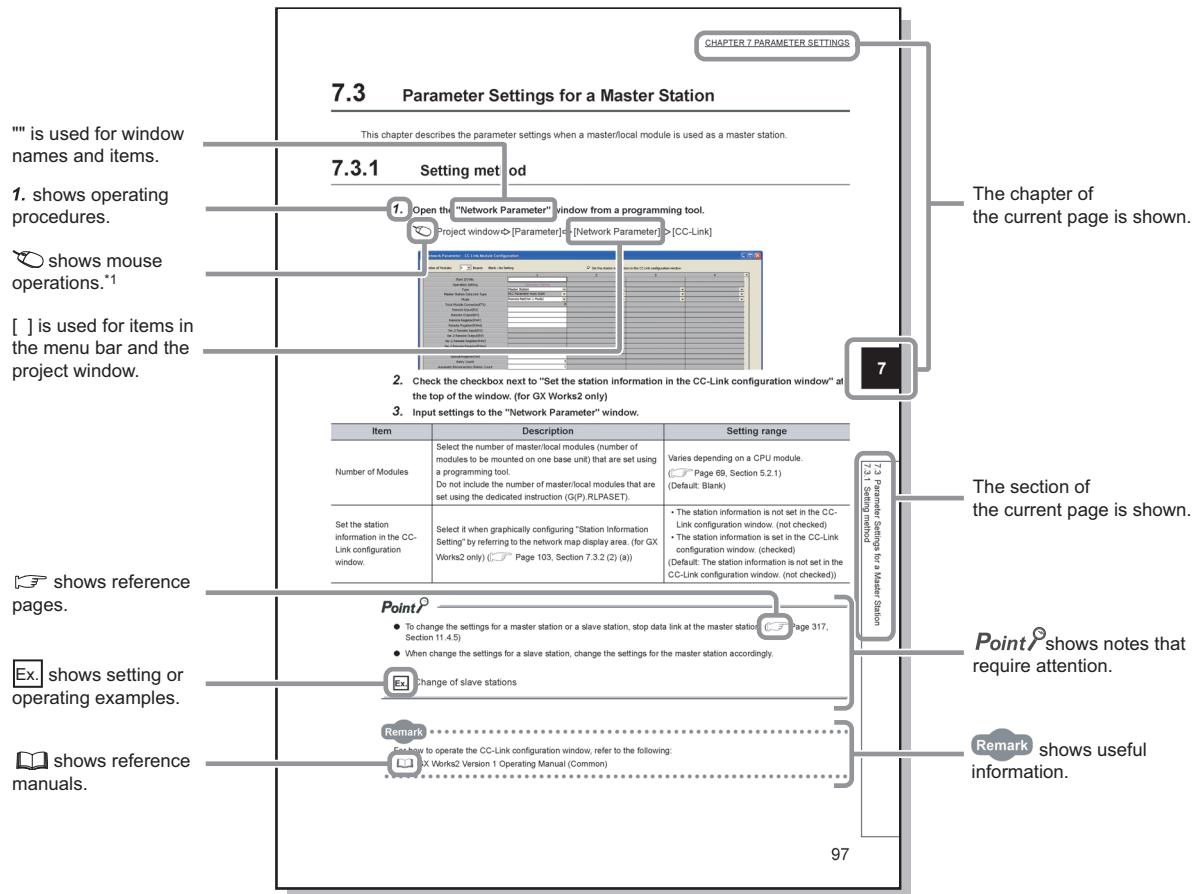
INDEX	418
--------------	------------

REVISIONS	422
WARRANTY	425
TRADEMARKS	426

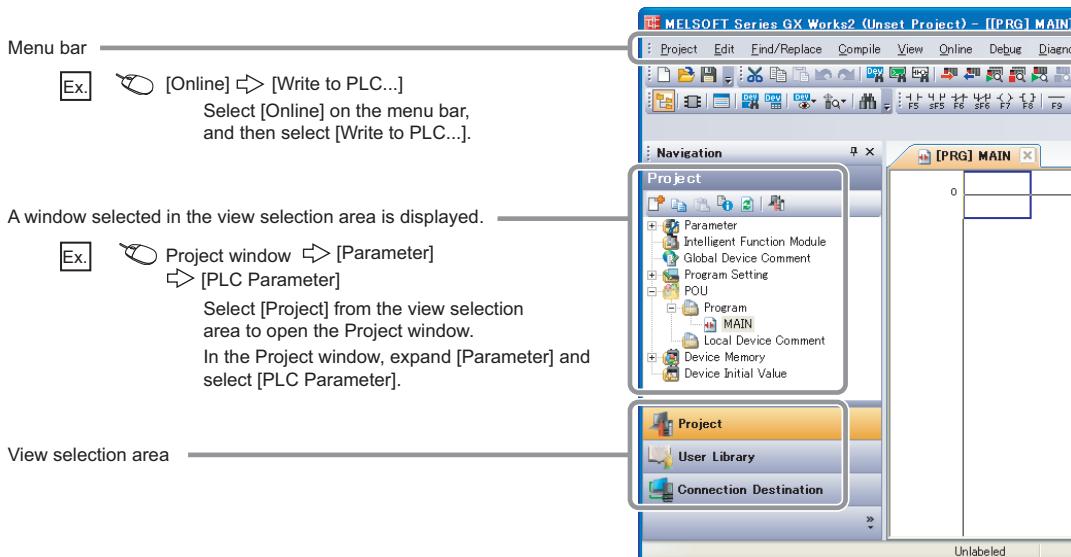
MANUAL PAGE ORGANIZATION

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.



TERM

Unless otherwise specified, this manual uses the following terms.

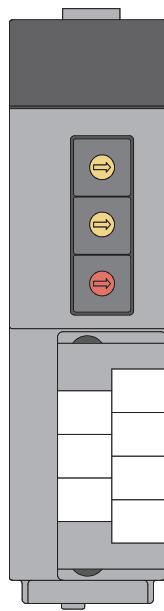
Term	Description
ACPU	A generic term for the following CPU modules: A0J2HCPU, A1SCPU, A1SHCPU, A1SJCPU-S3, A1SJHCPU, A2SCPU, A2SHCPU, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A1NCPU, A2NCPU, A2NCPU-S1, A3NCPU, A2ACPU, A2ACPU-S1, A3ACPU, A2UCPU, A2UCPU-S1, A3UCPU, and A4UCPU
AJ65BT-R2(N)	A generic term for the 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	An abbreviation for Reliability, Availability, and Serviceability. This term refers to usability of automated equipment.
Remote input (RX)	Bit data input from a device 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 device station (For some areas in a local station, data are output in the opposite direction.)
Remote register (RWr)	Word data input from a device 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 device 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 device station	A device station that supports the remote net Ver.1 mode
Ver.2-compatible device station	A device 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	An 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 device stations when the model names of device stations are read, the data are backed up/restored, or the dedicated instructions are requested

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 device station(s) only
Remote net Ver.2 mode	A mode used to configure a CC-Link system containing a Ver.2-compatible device 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 device station to an existing system consisting of Ver.1-compatible device 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 device 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
Device 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

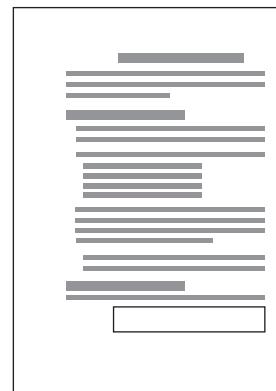
PACKING LIST

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

QJ61BT11N



QJ61BT11N



Before Using the Product

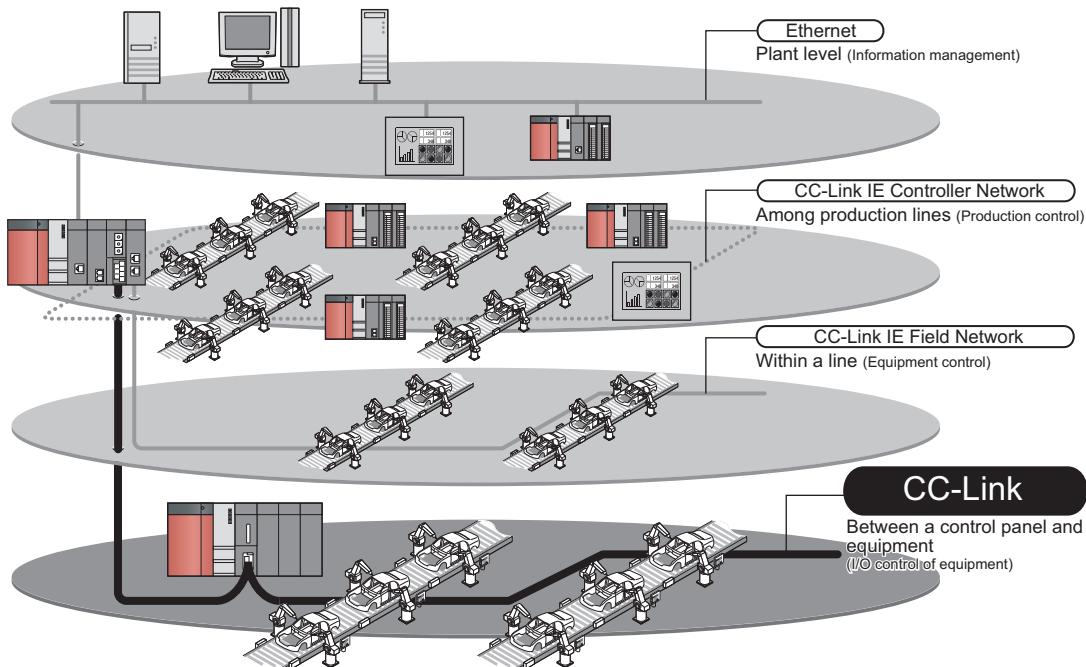


Terminating resistor: 110Ω, 1/2W (Brown-Brown-Brown)×2
(for Ver.1.10-compatible CC-Link dedicated cables or CC-Link dedicated cables (Ver.1.00-compatible))

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.

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.

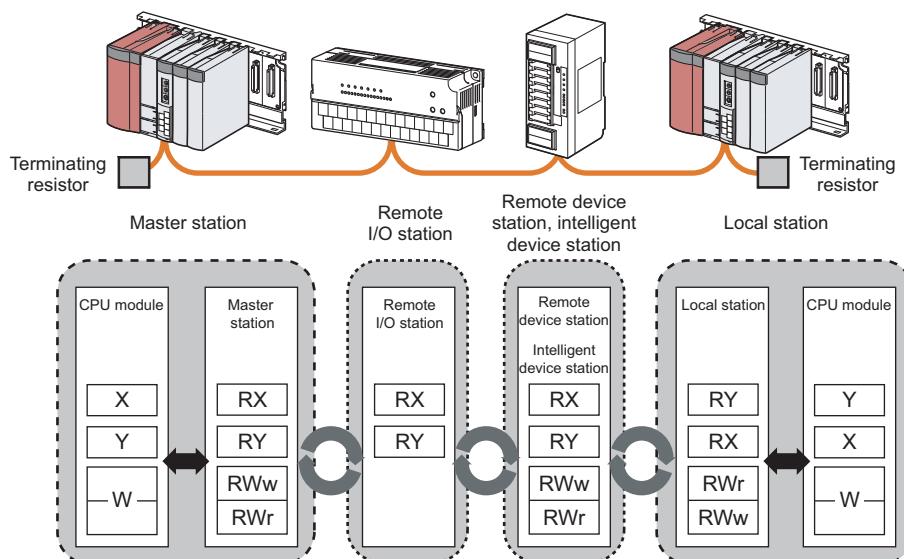
The module works as a master station or a local station in CC-Link.

(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.

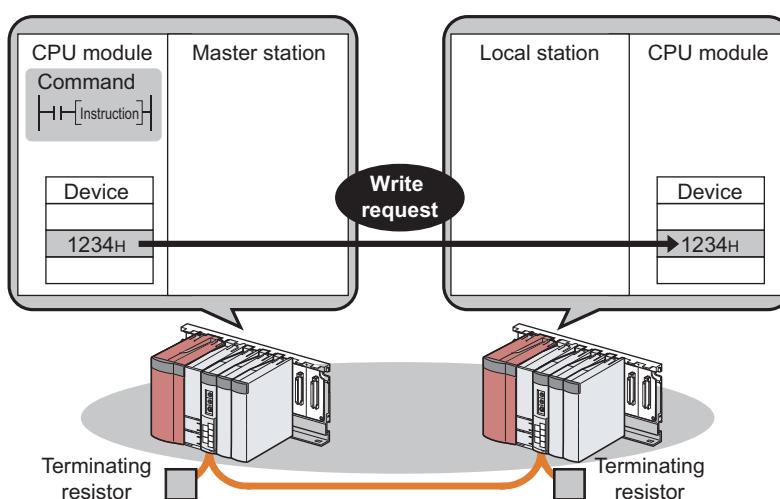


(b) Non-periodic communications (transient transmission)

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.

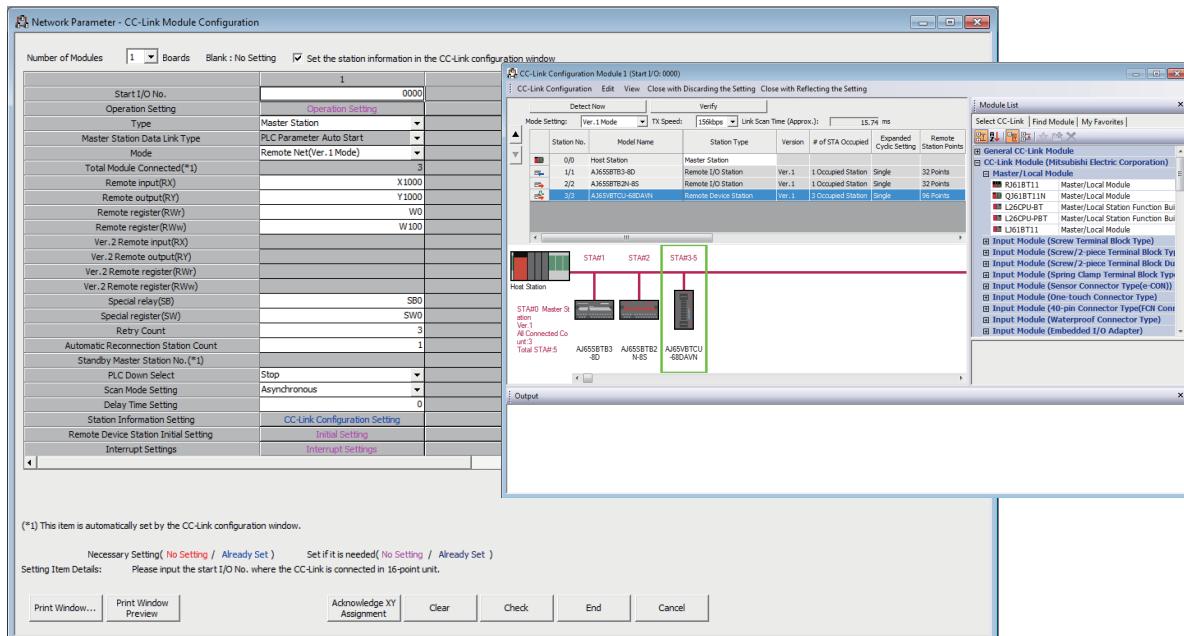
( Page 173, CHAPTER 9)



(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)

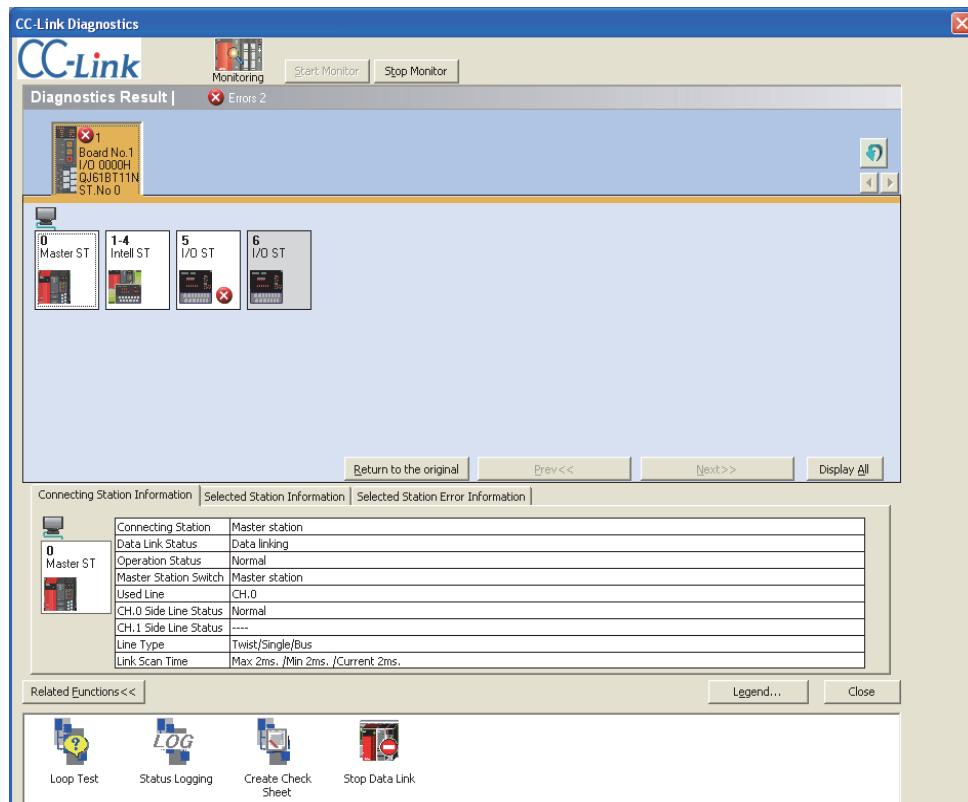


Parameters of a master station can be also set using a program. (☞ Page 205, Section 9.8)

When parameters are set using a program, parameter settings of the master station can be changed without resetting the CPU module.

(b) Diagnostics using a programming tool

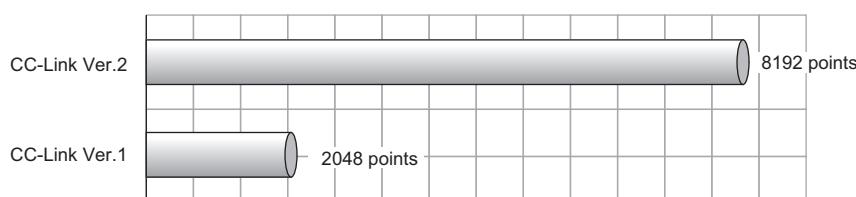
The status of a CC-Link system can be checked using a programming tool. Error locations and error causes are displayed in a programming tool, enabling the user to quickly troubleshoot the problem. ( Page 311, Section 11.4)



(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)



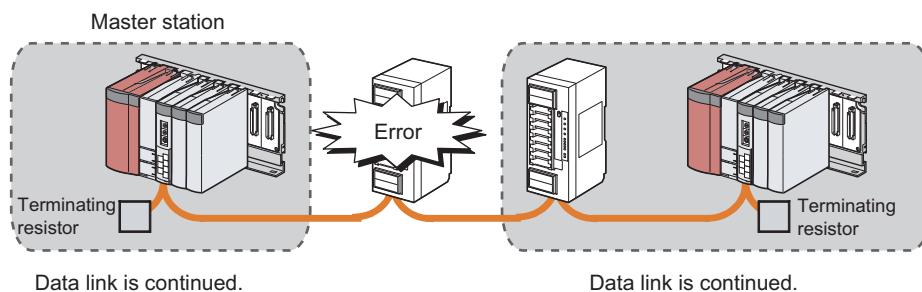
(4) Prevention of a system failure

(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}

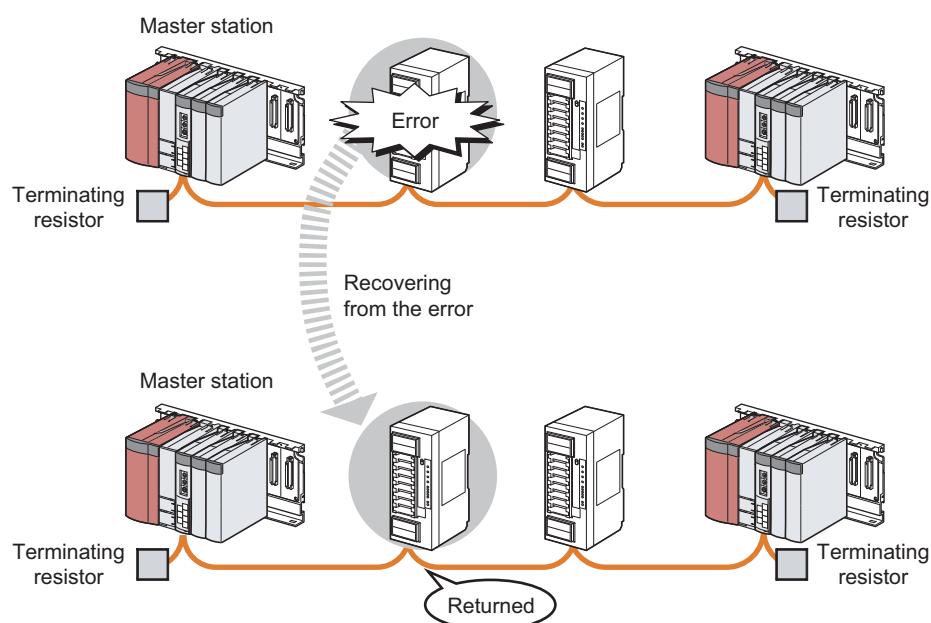
Note that if a cable is disconnected, data link fails among all stations.

- *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.



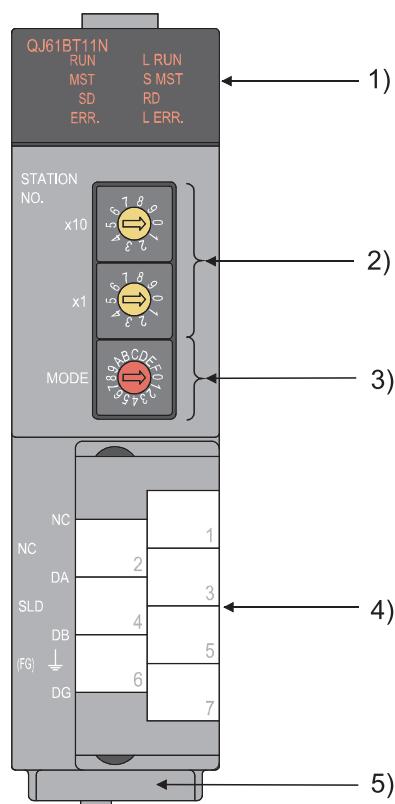
Point

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.

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

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. <ul style="list-style-type: none">• 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. <ul style="list-style-type: none">• 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. <ul style="list-style-type: none">• 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> <ul style="list-style-type: none">• 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.

No.	Name	Application																																								
3) Transmission speed/mode setting switch	<p>Sets the transmission speed and mode of the master/local module. (Default: 0) Set the same value of the transmission speed for all stations.</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Transmission speed setting</th><th>Switch number</th></tr> </thead> <tbody> <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)</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" rowspan="5">Setting not allowed</td><td>F</td></tr> </tbody> </table>	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)	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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Setting not allowed		F																																								
		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.																																								
4)	Terminal block																																									
5)	Serial number display	Indicates the serial number on the rating plate.																																								

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.

CHAPTER 3 SPECIFICATIONS

This chapter describes the specifications, functions, I/O signals, buffer memory, remote I/O (RX and RY) and remote register (RW_r and RW_w) 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

Item	Specifications																										
Transmission speed	Selected from 156kbps, 625kbps, 2.5Mbps, 5Mbps, and 10Mbps.																										
Maximum number of connected modules (master station)	64 (Refer to Page 27, Section 3.2.1)																										
Number of occupied stations (local station)	1 to 4 stations (The number of stations can be changed using a programming tool.)																										
Maximum number of link points per system	CC-Link Ver.1	<ul style="list-style-type: none">Remote I/O (RX, RY): 2048 pointsRemote register (RW_w): 256 points (master station → remote device station/local station/intelligent device station/standby master station)Remote register (RW_r): 256 points (remote device station/local station/intelligent device station/standby master station → master station)																									
	CC-Link Ver.2	<ul style="list-style-type: none">Remote I/O (RX, RY): 8192 pointsRemote register (RW_w): 2048 points (master station → remote device station/local station/intelligent device station/standby master station)Remote register (RW_r): 2048 points (remote device station/local station/intelligent device station/standby master station → master station)																									
Number of link points per remote station/local station/intelligent device station/standby master station*1	CC-Link Ver.1	<ul style="list-style-type: none">Remote I/O (RX, RY): 32 points (30 points for a local station)Remote register (RW_w): 4 points (master station → remote device station/local station/intelligent device station/standby master station)Remote register (RW_r): 4 points (remote device station/local station/intelligent device station/standby master station → master station)																									
	CC-Link Ver.2	<table border="1"><thead><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></thead><tbody><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 (RW_w)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr><tr><td>Remote register (RW_r)</td><td>4 points</td><td>8 points</td><td>16 points</td><td>32 points</td></tr></tbody></table>			Item	Expanded Cyclic Setting				Single	Double	Quadruple	Octuple	Remote I/O (RX, RY)	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 (RW _w)	4 points	8 points	16 points	32 points	Remote register (RW _r)	4 points	8 points	16 points
Item	Expanded Cyclic Setting																										
	Single	Double	Quadruple	Octuple																							
Remote I/O (RX, RY)	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 (RW _w)	4 points	8 points	16 points	32 points																							
Remote register (RW _r)	4 points	8 points	16 points	32 points																							

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	<ul style="list-style-type: none"> • 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) <p>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))</p>
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	<ul style="list-style-type: none"> • Standby master function • Automatic return function • Device 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

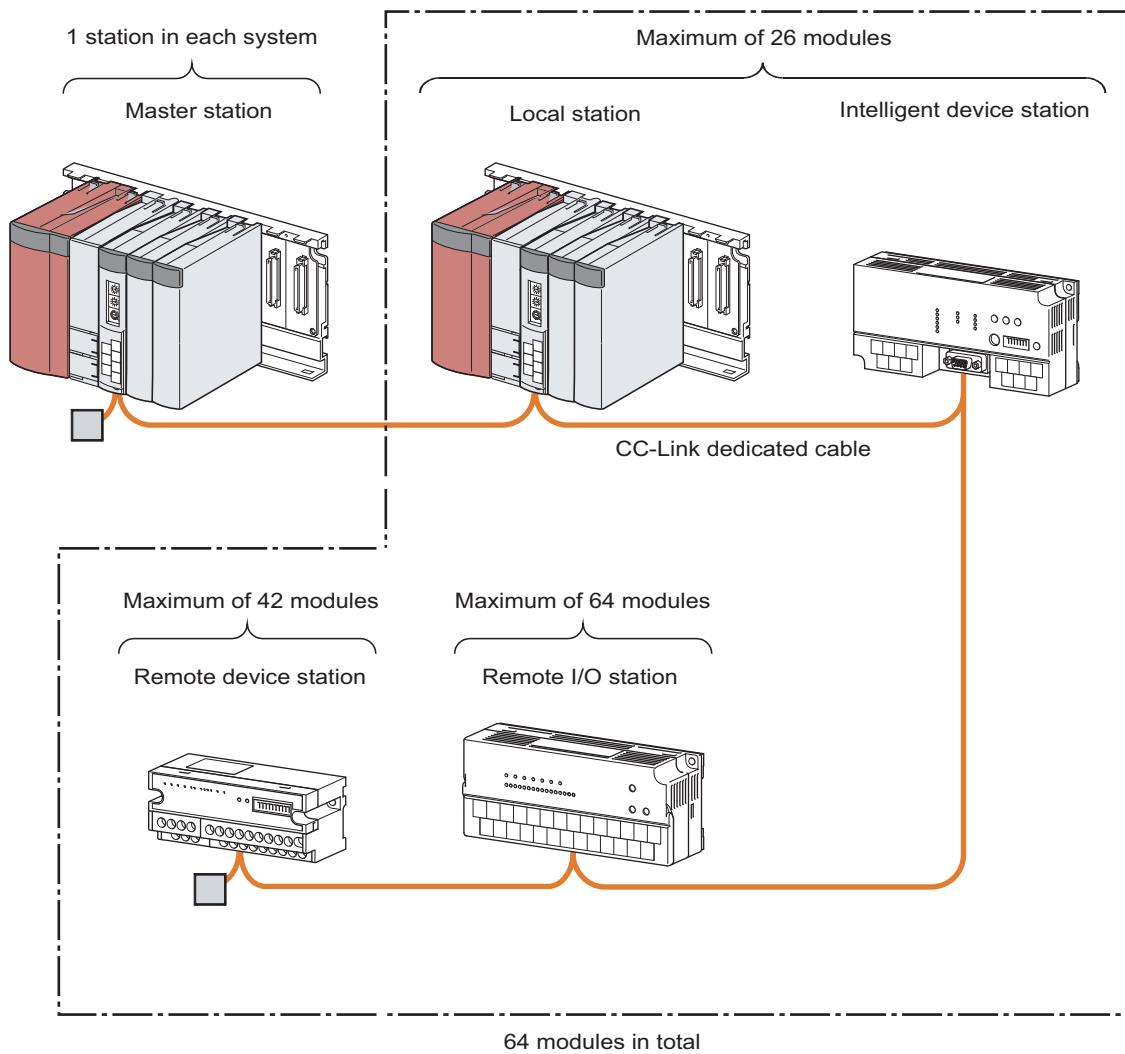
*1 In CC-Link Ver.1, increasing the number of occupied stations can increase the number of link points per station.
 In CC-Link Ver.2, increasing the number of occupied stations and setting the greater value in the expanded cyclic setting can increase the number of link points per station.
 For the points,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

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 (RW _r)	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 (RW _r)	16 points	16 points	32 points	64 points	128 points

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 device 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	$\{(1 \times a) + (2 \times b) + (3 \times c) + (4 \times d)\} \leq 64$	<p>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</p>
Condition 2	$\{(16 \times A) + (54 \times B) + (88 \times C)\} \leq 2304$	<p>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</p>

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

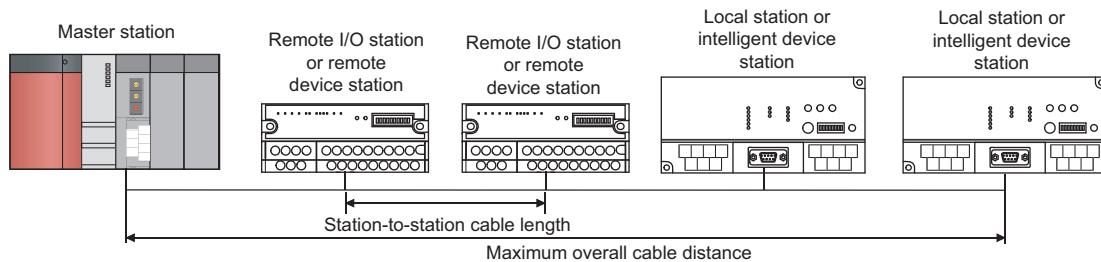
The table below lists the maximum number of connected modules of when a system is configured only with Ver.2-compatible device stations. For the modes, refer to Page 43, Section 3.6.2.

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 $\{(a + a_2 + a_4 + a_8) + (b + b_2 + b_4 + b_8) \times 2 + (c + c_2 + c_4 + c_8) \times 3 + (d + d_2 + d_4 + d_8) \times 4\} \leq 64$	a: Total number of Ver.1-compatible device stations occupying one station and Ver.2-compatible device stations occupying one station with the expanded cyclic setting of "Single" b: Total number of Ver.1-compatible device stations occupying two stations and Ver.2-compatible device stations occupying two stations with the expanded cyclic setting of "Single" c: Total number of Ver.1-compatible device stations occupying three stations and Ver.2-compatible device stations occupying three stations with the expanded cyclic setting of "Single" d: Total number of Ver.1-compatible device stations occupying four stations and Ver.2-compatible device stations occupying four stations with the expanded cyclic setting of "Single"
Condition 2 $\{((a \times 32) + (a_2 \times 32) + a_4 \times 64) + (a_8 \times 128)\} + \{(b \times 64) + (b_2 \times 96) + (b_4 \times 192) + (b_8 \times 384)\} + \{(c \times 96) + (c_2 \times 160) + (c_4 \times 320) + (c_8 \times 640)\} + \{(d \times 128) + (d_2 \times 224) + (d_4 \times 448) + (d_8 \times 896)\} \leq 8192$	a2: Number of Ver.2-compatible device stations occupying one station with the expanded cyclic setting of "Double" b2: Number of Ver.2-compatible device stations occupying two stations with the expanded cyclic setting of "Double" c2: Number of Ver.2-compatible device stations occupying three stations with the expanded cyclic setting of "Double" d2: Number of Ver.2-compatible device stations occupying four stations with the expanded cyclic setting of "Double"
Condition 3 $\{((a \times 4) + (a_2 \times 8) + (a_4 \times 16) + (a_8 \times 32)) + ((b \times 8) + (b_2 \times 16) + (b_4 \times 32) + (b_8 \times 64)) + ((c \times 12) + (c_2 \times 24) + (c_4 \times 48) + (c_8 \times 96)) + ((d \times 16) + (d_2 \times 32) + (d_4 \times 64) + (d_8 \times 128))\} \leq 2048$	a4: Number of Ver.2-compatible device stations occupying one station with the expanded cyclic setting of "Quadruple" b4: Number of Ver.2-compatible device stations occupying two stations with the expanded cyclic setting of "Quadruple" c4: Number of Ver.2-compatible device stations occupying three stations with the expanded cyclic setting of "Quadruple" d4: Number of Ver.2-compatible device stations occupying four stations with the expanded cyclic setting of "Quadruple" a8: Number of Ver.2-compatible device stations occupying one station with the expanded cyclic setting of "Octuple" b8: Number of Ver.2-compatible device stations occupying two stations with the expanded cyclic setting of "Octuple" c8: Number of Ver.2-compatible device stations occupying three stations with the expanded cyclic setting of "Octuple" d8: Number of Ver.2-compatible device stations occupying four stations with the expanded cyclic setting of "Octuple"
Condition 4 $\{(16 \times A) + (54 \times B) + (88 \times C)\} \leq 2304$	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

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.



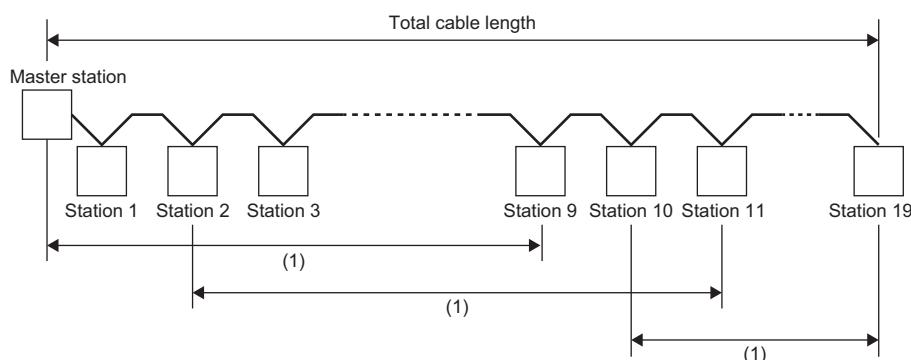
- Ver.1.10-compatible CC-Link dedicated cable (a terminating resistor of 110Ω used)

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 ¹
		80m

*1 When the transmission speed is 10Mbps and the total cable length exceeds 80m, configure the system so that the total length of station-to-station cables connecting 10 consecutive stations is 10m or longer. When the total number of connected stations including a master station is 10 or less, there is no restriction on the total length of station-to-station cables.

[When the transmission speed is 10Mbps and the total cable length exceeds 80m]

For the system configuration example as below, wire the cables so that the total length of station-to-station cables (1) connecting 10 consecutive stations is 10m or longer.



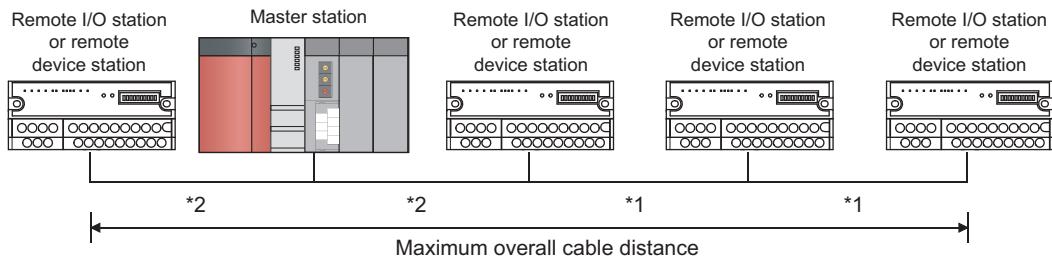
If the wiring change is unavailable, take either of the following actions:

- Change the transmission speed of the system to 5Mbps or less.
- Install a CC-Link system repeater (T-branch) module (AJ65SBT-RPT). This module allows the CC-Link system to be separated into IN-side and OUT-side. When the system is configured so that the total cable length of each of IN-side and OUT-side is 80m or less, it does not fall under the constraint.

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			1200m
625kbps	30cm or longer		600m
2.5Mbps			200m
5Mbps	Between 30cm and 59cm ^{*3}	1m or longer	110m
	60cm or longer		150m
10Mbps	Between 30cm and 59cm ^{*3}	1m or longer	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)^{*4}

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

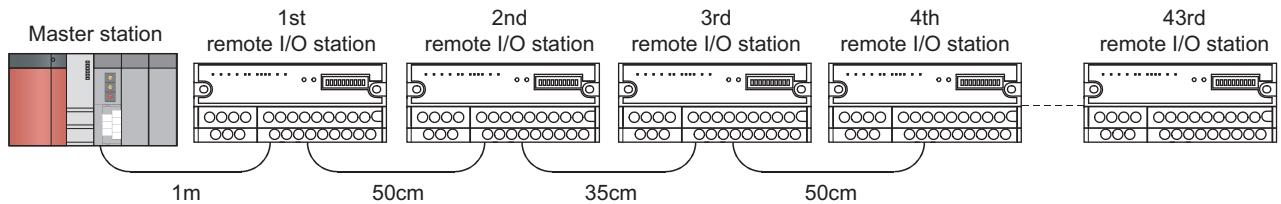
*1 This is a station-to-station cable length between remote I/O stations or remote device stations.

*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.

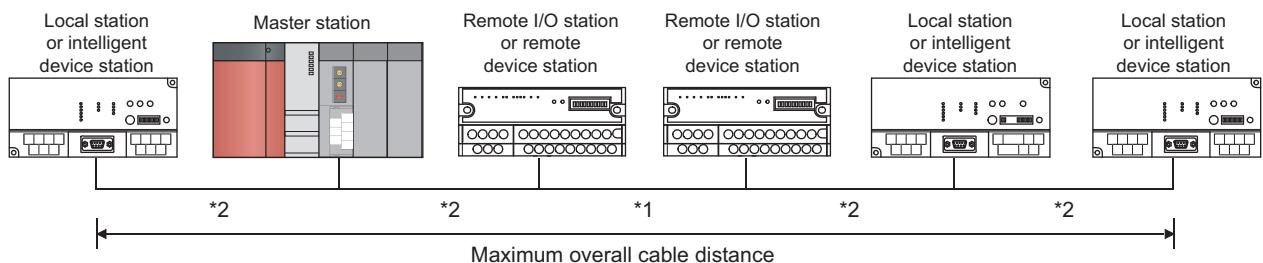
*4 When a new terminating resistor of 130Ω is needed, please consult your local Mitsubishi Electric representative.

- 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.



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

(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}	2m or longer	110m
	60cm or longer		150m
10Mbps	Between 30cm and 59cm ^{*3}	2m or longer	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)^{*4}

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}	2m or longer	110m
	60cm or longer		150m
10Mbps	Between 70cm and 99cm ^{*3}	2m or longer	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.

*4 When a new terminating resistor of 130Ω is needed, please consult your local Mitsubishi Electric representative.

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.

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 device 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 Remote net Ver.2 mode Remote net additional mode Remote I/O net 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 device station to a system with a Ver.1-compatible device station.	Page 46, Section 3.6.3
		Page 48, Section 3.6.4
		Page 51, Section 3.6.5
		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 32-bit data integrity assurance	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)
		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

(3) RAS function

Function	Description	Reference
Device station cutoff function	Data link can be continued in a normal station by disconnecting a device 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 device 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
Device 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 device stations can be checked.	Page 86, Section 6.5.1
Transmission speed test	Whether the transmission speed setting of a device station is the same as that of the master station can be checked. The station number of the device 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

(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	Device 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 device stations that will be connected in future as reserved stations, device 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 device 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 device station, the station is not detected as a faulty station in the master station and local station. This function is used when a device 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 device 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 device 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 device stations.	Page 102, Section 7.3.2 (2)
	The model names of device stations can be read.	 iQ Sensor Solution Reference Manual
Data backup/restoration	The setting data of the device station is backed up into the SD memory card of the CPU module on the master station. The setting data backed up into the SD memory card of the CPU module on the master station is restored into the device module.	 iQ Sensor Solution Reference Manual

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	
Xn1	Host data link status	Yn1	
Xn2	Use prohibited	Yn2	
Xn3	Other station data link status	Yn3	
Xn4		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		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)C		Y(n+1)C	
X(n+1)D		Y(n+1)D	
X(n+1)E		Y(n+1)E	
X(n+1)F		Y(n+1)F	

Use prohibited

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.

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 using a master/local module as a standby master station, 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 device 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 device 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 device stations. Data received from other device 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 device stations.	Write only	○	-	Page 333, Appendix 2 (3)
			(Local station) Stores the send data to the master station and other slave stations. Data received from other device stations are also stored.	Read/write	-	○	

Address		Name	Description	Read/write	Availability		Reference
Hexadecimal	Decimal				Master station	Local station	
$2E0_H$ to $3DF_H$	736 to 991	Remote register (RW _r) ^{*1} • Master station: For data receiving • Local station: For data receiving	(Master station) Stores the data received from device 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	Device station offset, size information	Stores the offset and size of RX/RY/RW _w /RW _r in each device 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 device stations.	Read only	○	-	Page 341, Appendix 2 (10)
			(Local station) Stores the status of the data input from the master station.		-	○	

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 device 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 device 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 device stations.	Write only	○	-	Page 342, Appendix 2 (11)
			(Local station) Stores the send data to the master station and other slave stations. Data received from other device 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 device 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".

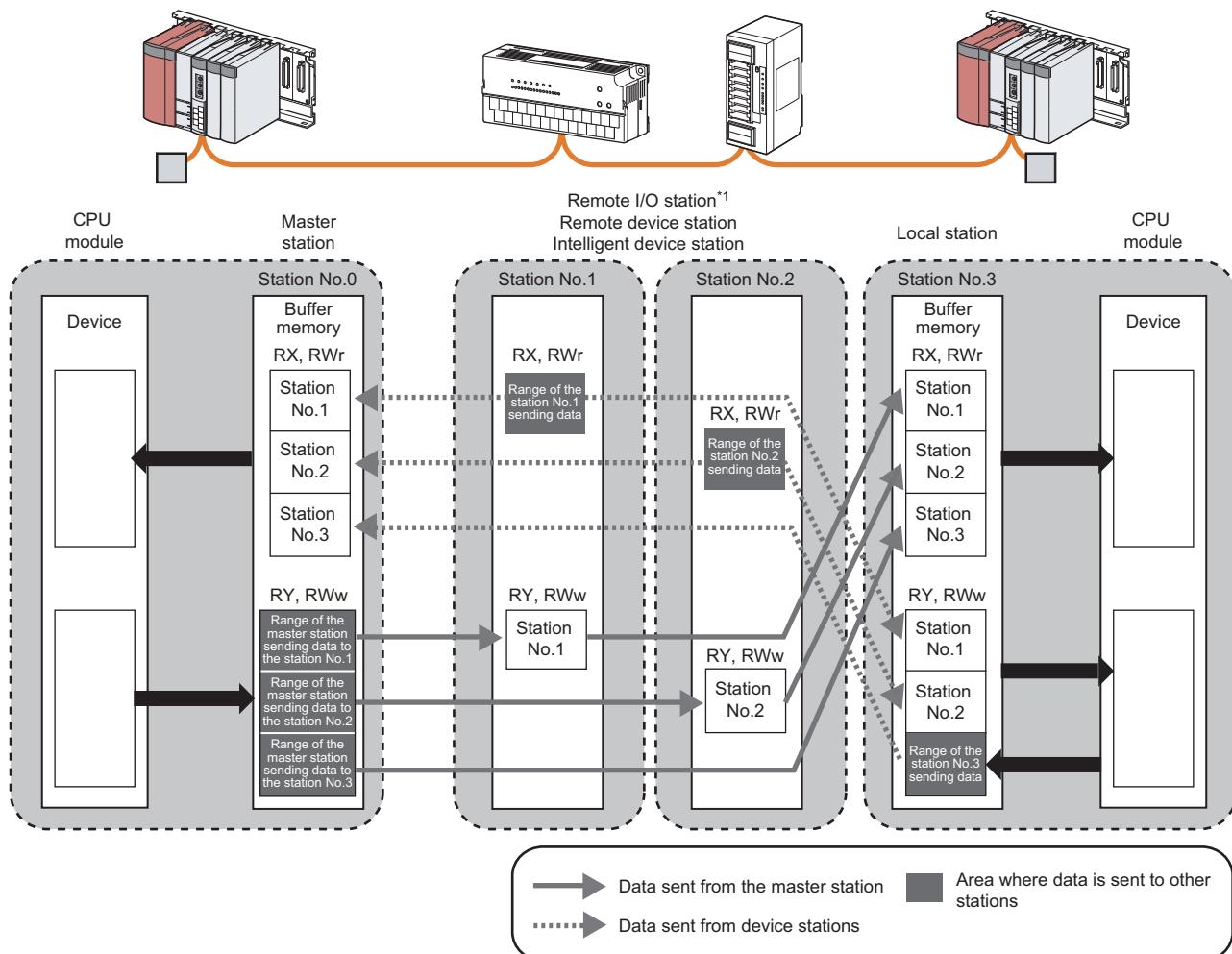
Doing so may cause malfunction in the programmable controller system.

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 device station to a Ver.1-compatible device station. Depending on the mode, the addresses of buffer memory areas to store RX, RY, RW_r, and RW_w vary.

3.6.1 Assignment

In CC-Link, communications are performed between the master station and device stations using RX, RY, RW_r, and RW_w. Data in RX, RY, RW_r, and RW_w 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 RW_r and RW_w 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, RW_r, and RW_w) 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 RW_r of other device stations are stored into RY and RW_w, and data in RY and RW_w of other stations are stored into RX and RW_r. (Areas where data is input and output are reversed.)

(1) Input and output of the master station

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

(a) Data input to the master station

Data in RX and RWr of all device 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 device 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 device 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 device 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.

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.

3

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

(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.

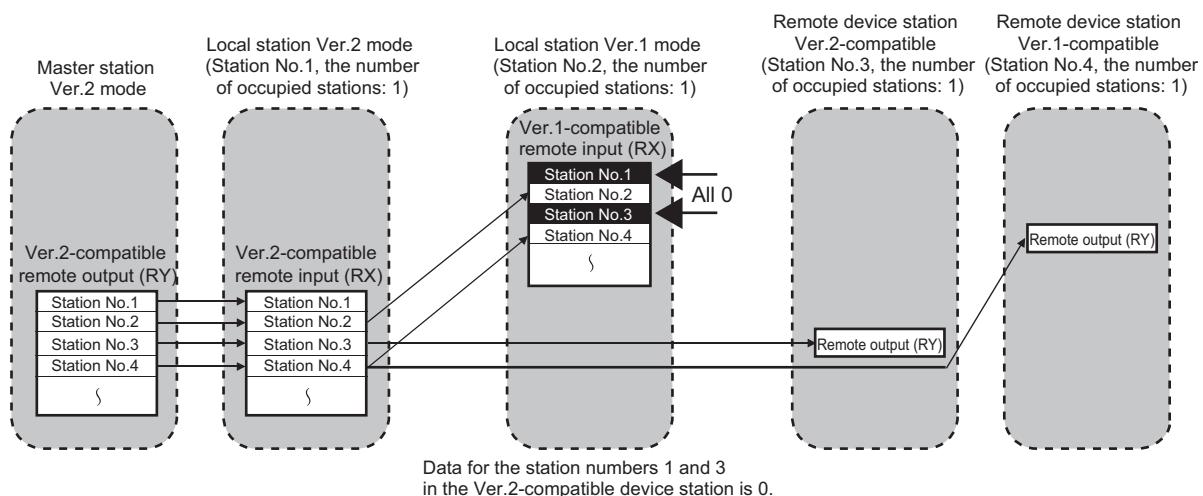
O: Data link can be performed. ×: Data link cannot be performed.

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	O		×
Remote net Ver.2 mode	O ^{*2}	O	×
Remote net additional mode	O ^{*2}	O	O

*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 device station, the status of the Ver.2-compatible device 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 device 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 device 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

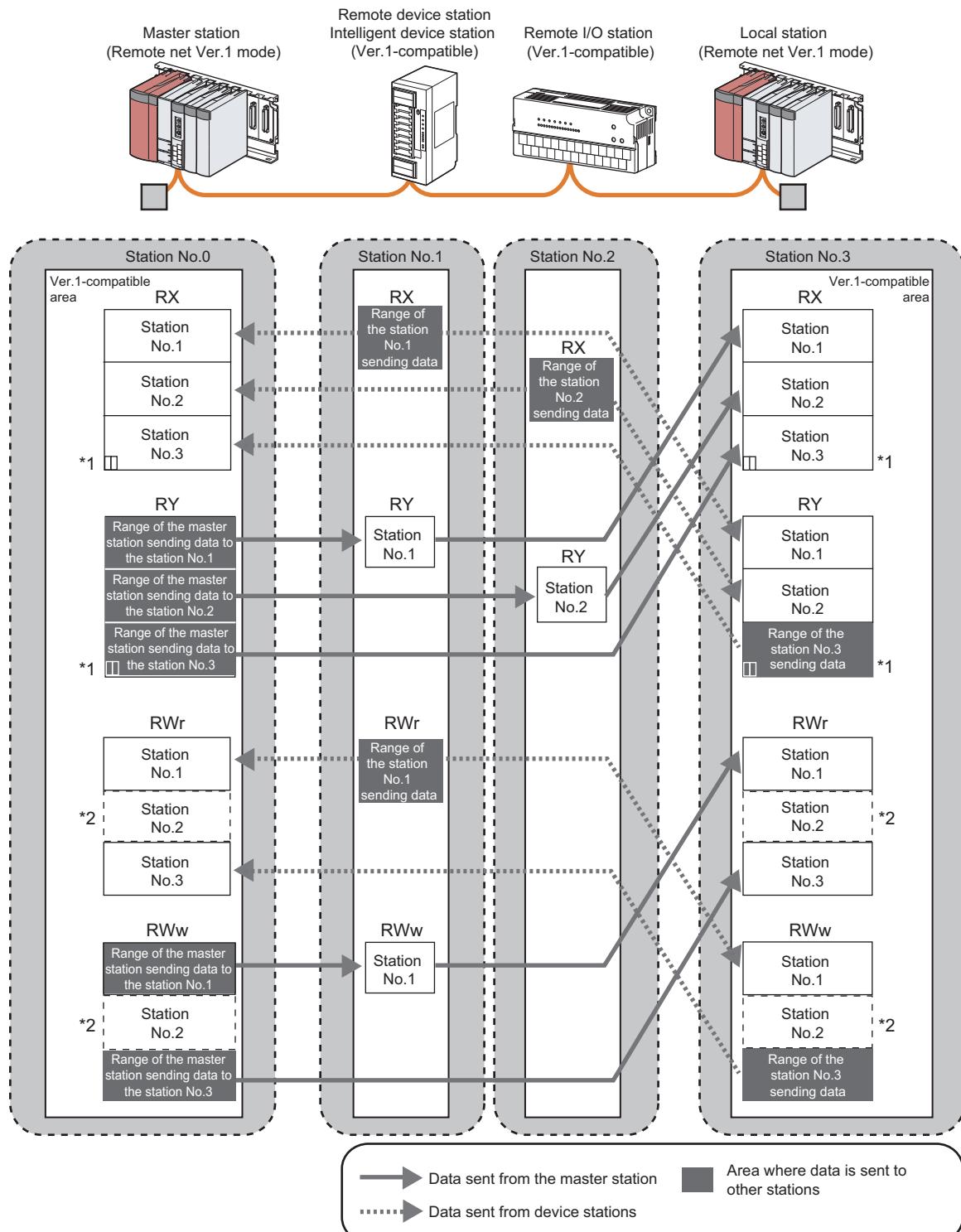
*1 RWr and RWw are not used for the remote I/O net mode.

(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)

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 device 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)

(1) Points per module and per system

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

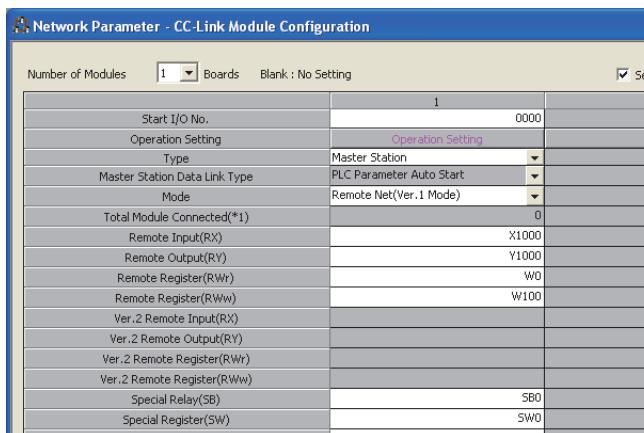
In CC-Link, increasing the number of occupied stations can increase the number of points per module. The number of occupied stations is set for each device station. (☞ Page 102, Section 7.3.2 (2), Page 118, Section 7.4.2 (1))

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 device 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)	
160 _H to 1DF _H	352 to 479	Remote output (RY)	Page 331, Appendix 2 (2)
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

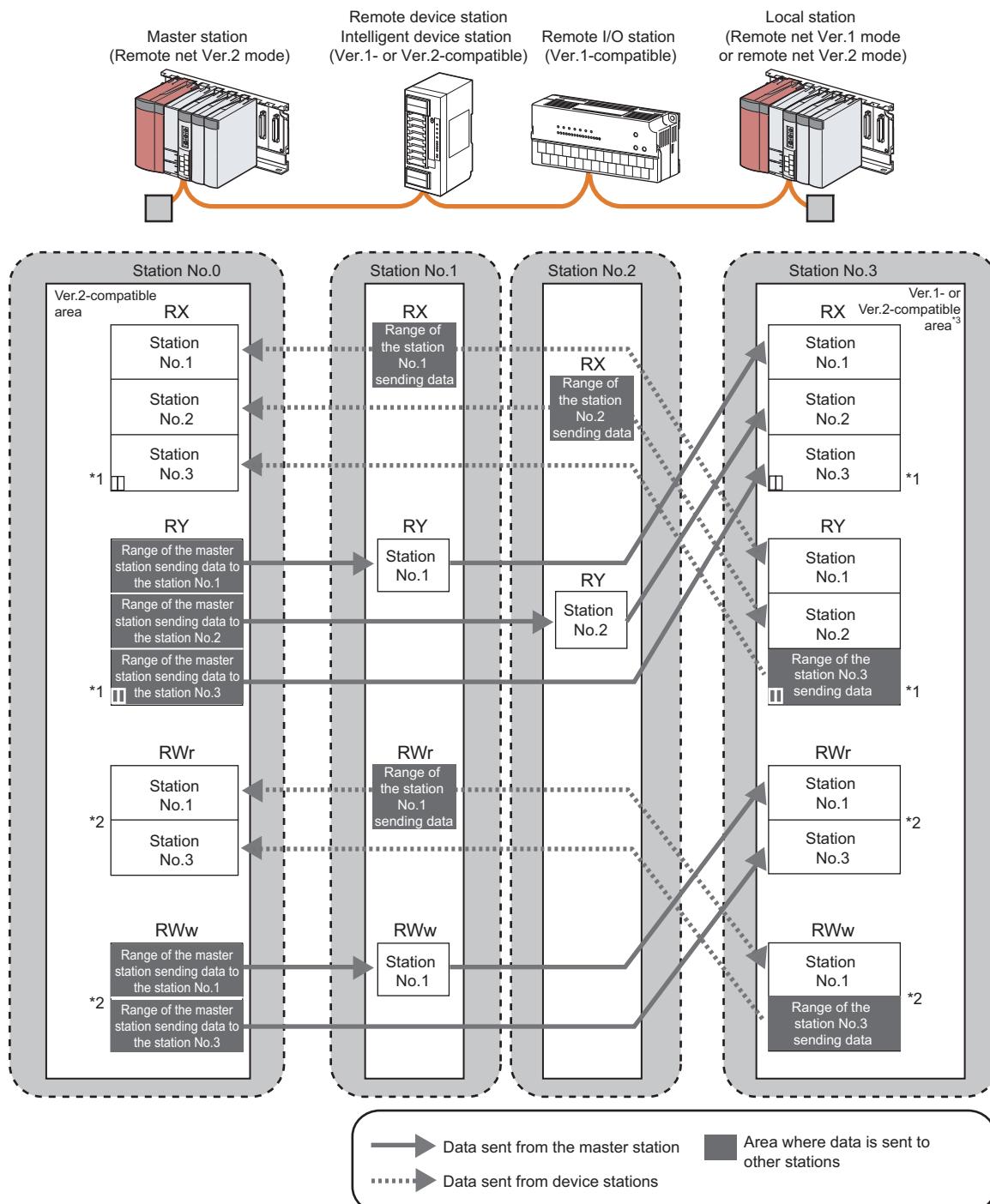
Areas are assigned by 32 points in the order of station number to the remote input (RX) and remote output (RY). To the remote register (RWr and RWw), areas are assigned by four points in the order of station number.

(☞ Page 331, Appendix 2 (2), Page 333, Appendix 2 (3))

3.6.4 Remote net Ver.2 mode

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

(1) Points per module and per system

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

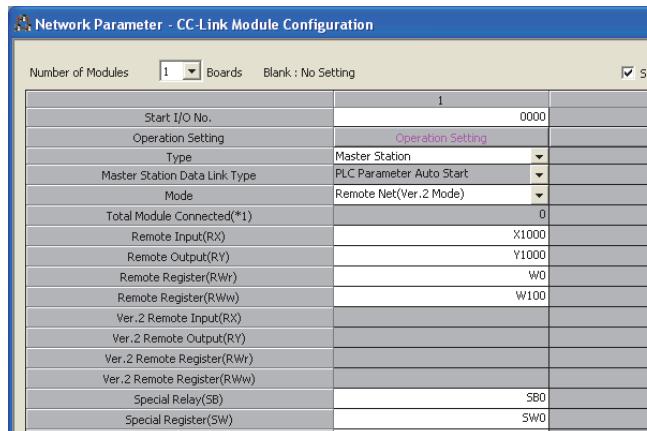
In CC-Link, increasing the number of occupied stations and expanded cyclic setting can increase points per module. Set the number of occupied stations and expanded cyclic setting for each device station. (☞ Page 102, Section 7.3.2 (2), Page 118, Section 7.4.2 (1))

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 device 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 device 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)



3.6 Assignment and Modes
3.6.4 Remote net Ver.2 mode

(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)	

(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 device stations. The storage locations for each station can be checked using Device 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

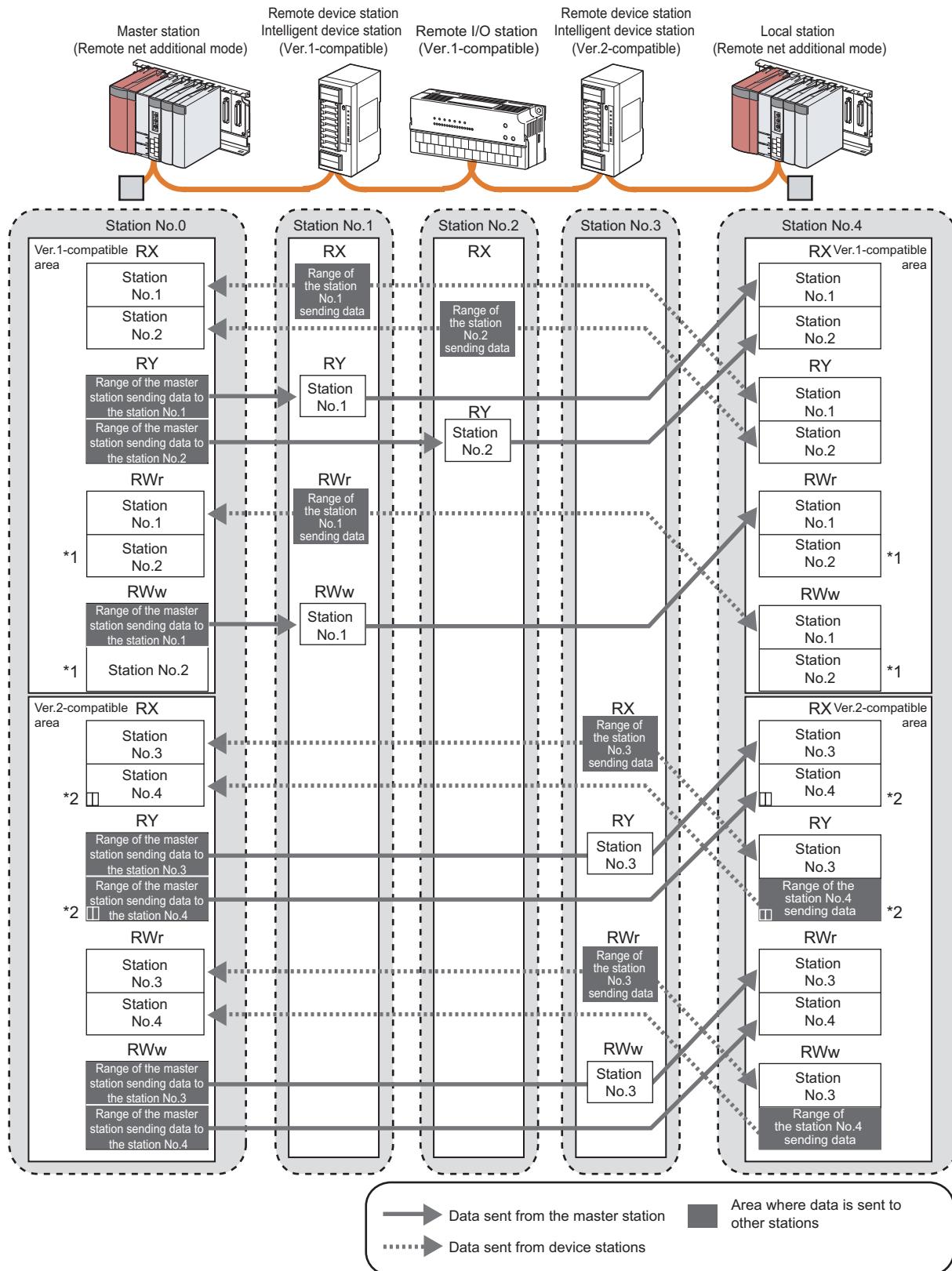
(a) When changed from the remote net Ver.1 mode

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.

3.6.5 Remote net additional mode

This mode is selected when a Ver.2-compatible device 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 device 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.



- *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 device 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 device station (including a local station in the remote net additional mode) to a station number after a Ver.1-compatible device station. When there is a possibility to add a Ver.1-compatible device station in future, set a reserved station at the end of the Ver.1-compatible device station.
To add a station number of a Ver.2-compatible device station between station numbers of a Ver.1-compatible device 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 device station and a Ver.2-compatible device 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 device station. (☞ Page 102, Section 7.3.2 (2), Page 118, Section 7.4.2 (1))

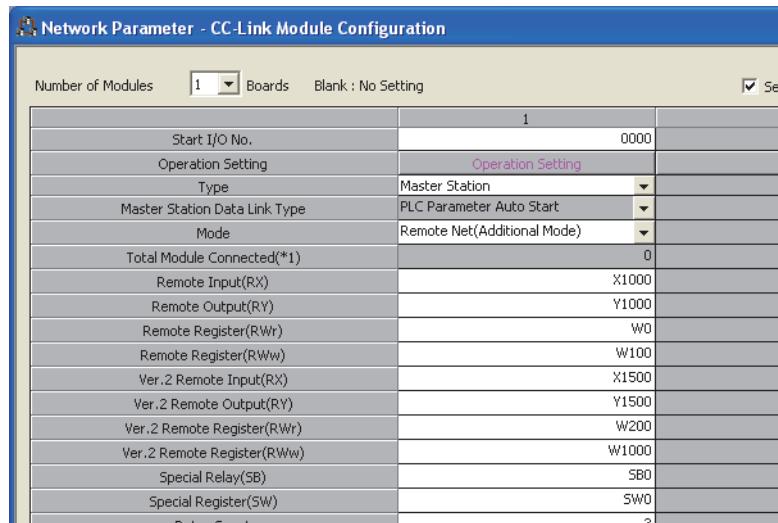
Item	Description
Number of Occupied Stations	<p>The number of points is increased by increasing the station numbers occupied per module.</p> <p>Note that the number of device stations that can be connected to a CC-Link system is decreased because one module occupies the station numbers for multiple modules.</p>
Expanded Cyclic Setting (CC-Link Ver.2 only)	<p>The station numbers occupied by one module are not changed, and only the number of points is increased.</p> <p>Unlike "Number of Occupied Stations", the number of device 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".</p>

(2) Data transfer between RX, RY, RW_r, and RW_w and a device in a CPU module

In the remote net additional mode, data of a Ver.1-compatible device station are stored into a Ver.1-compatible area, and data of a Ver.2-compatible device 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, RW_r, and RW_w 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)	
160 _H to 1DF _H	352 to 479	Remote output (RY)	Page 331, Appendix 2 (2)
1E0 _H to 2DF _H	480 to 735	Remote register (RW _w)	
2E0 _H to 3DF _H	736 to 991	Remote register (RW _r)	Page 333, Appendix 2 (3)

- 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 (RW _w)	Page 342, Appendix 2 (11)
4C00 _H to 53FF _H	19456 to 21503	Ver.2-compatible remote register (RW _r)	

(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 device stations. The storage locations for each station can be checked using Device station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))

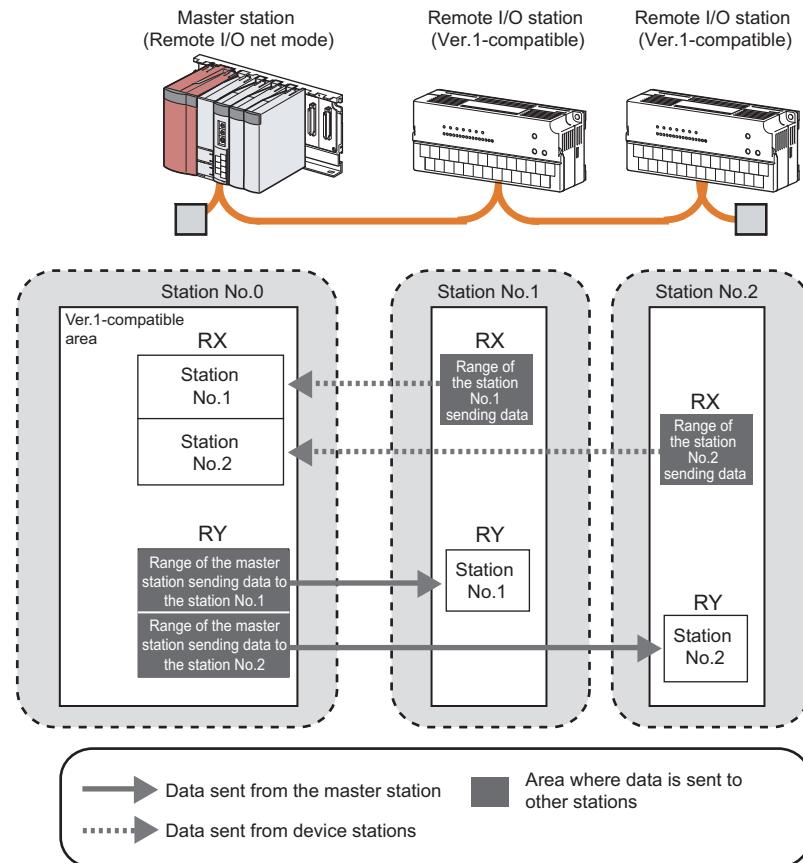
(4) Precautions

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

Set the master station to the remote net additional mode.

3.6.6 Remote I/O net mode

This mode is selected when device 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

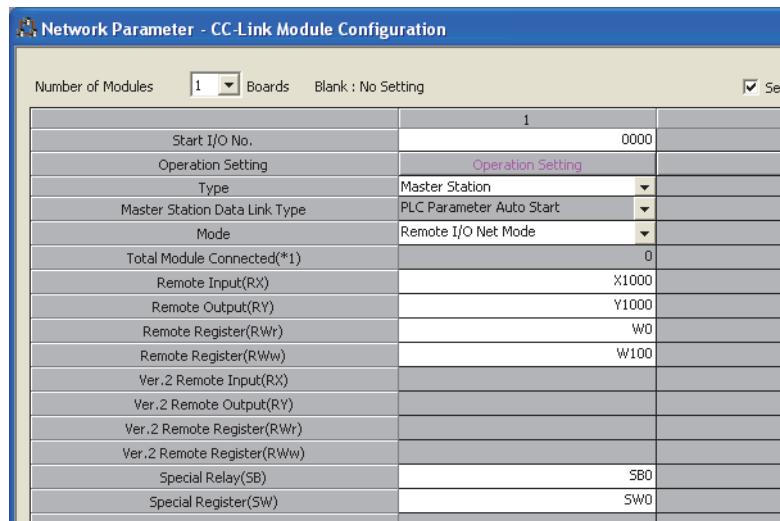
(1) Points per module and per system

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))

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

4



Mounting

Mount the master/local module on the base unit. Connect the device 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 device station as well.



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

To the next page



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

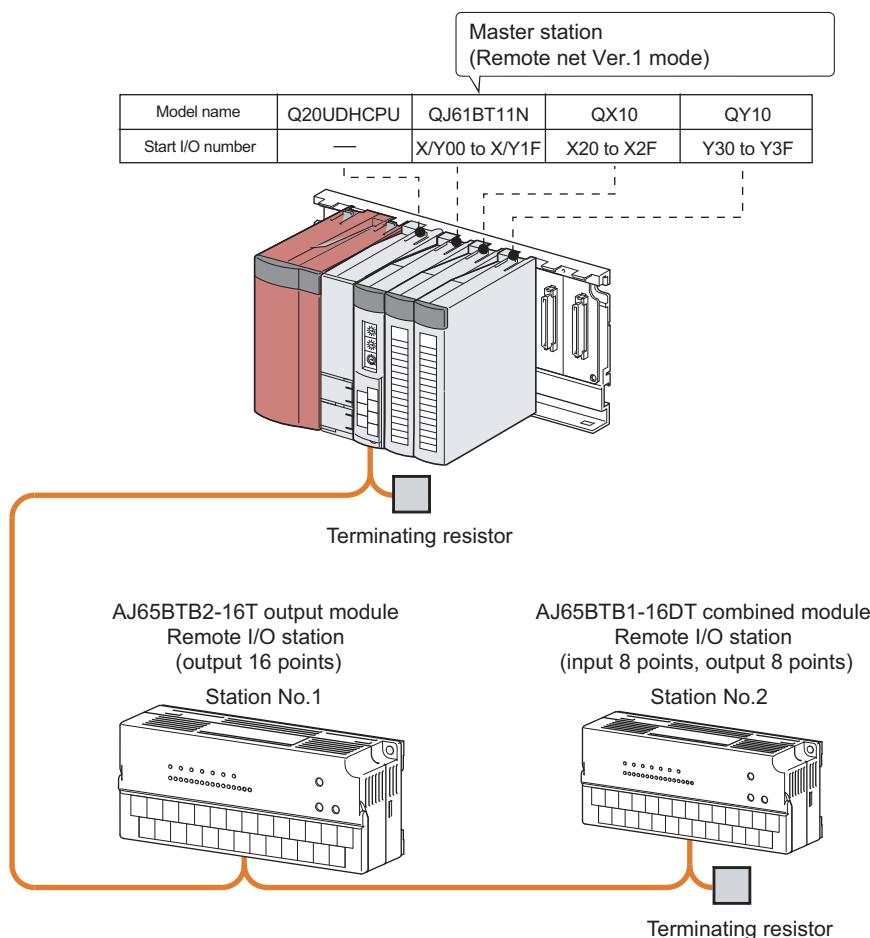
*1 The parameters can be set using dedicated instructions. (☞ Page 205, Section 9.8)

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.



2. Plan the device assignment.

Point

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

[View] → [Docking Window] → [Device Reference]

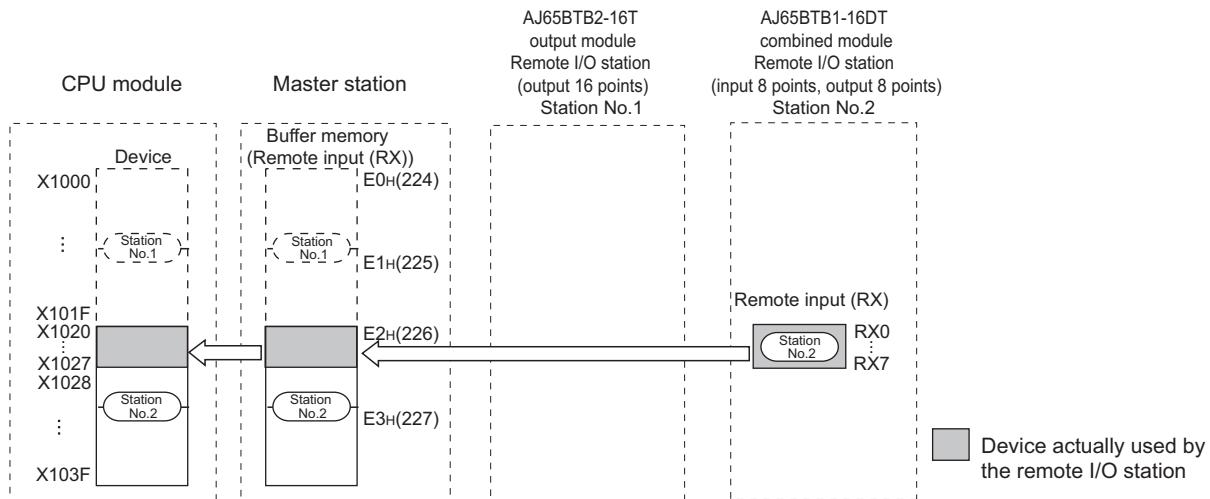
Device Reference(CC-Link) - Master Station Start I/O No.: 0000 Station No.: 0			
Start I/O No:		0000	Display Option...
Device Station List		Link Device List	Display Detailed Information
Host STA	STA#	Link Device	Target STA
X100D	1	X1D	
X101E		X1E	
X101F		X1F	
X1020		X0	RX0
X1021		X1	RX1
X1022		X2	RX2
X1023	2	X3	RX3
X1024		X4	RX4
X1025		X5	RX5
X1026		X6	RX6
X1027		X7	RX7
X1028		X8	RX8
Remote Input(RX)			
Refresh Device	STA#	Link Device	Target STA
Y1000		Y0	RY0
Y1001		Y1	RY1
Y1002		Y2	RY2
Y1003		Y3	RY3
Y1004		Y4	RY4
Y1005	1	Y5	RY5
Y1006		Y6	RY6
Y1007		Y7	RY7
Y1008		Y8	RY8
Y1009		Y9	RY9
Y100A		Y10A	RY10A
Y100B		Y10B	RY10B
Remote Output(RY)			
Refresh Device	STA#	Link Device	Target STA
V0			RVr0
V1			RVr1
V2	1		RVr2
V3			RVr3
V4			RVr4
V5	2		RVr5
V6		<=>	RVr6
V7			RVr7
Remote Register(RV/r)			
Host STA	STA#	Link Device	Target STA
V100			RVv0
V101			RVv1
V102	1		RVv2
V103			RVv3
V104			RVv4
V105	2		RVv5
V106			RVv6
V107			RVv7
Remote Register(RV/r/e)			
Host STA	STA#	Link Device	Target STA
V108			RVv8
V109			RVv9
V10A			RVv10A
V10B			RVv10B

- Remote input (RX)

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

CPU module	Master station		Device station		
	Device	Buffer memory address		Station number	Module name
		Hexadecimal	Decimal		
X1000 to X100F		E0H	224	1	AJ65BTB2-16T
X1010 to X101F		E1H	225		to
X1020 to X102F*1		E2H	226	2	AJ65BTB1-16DT
X103 to X103F		E3H	227		RX0 to RXF*1
					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.



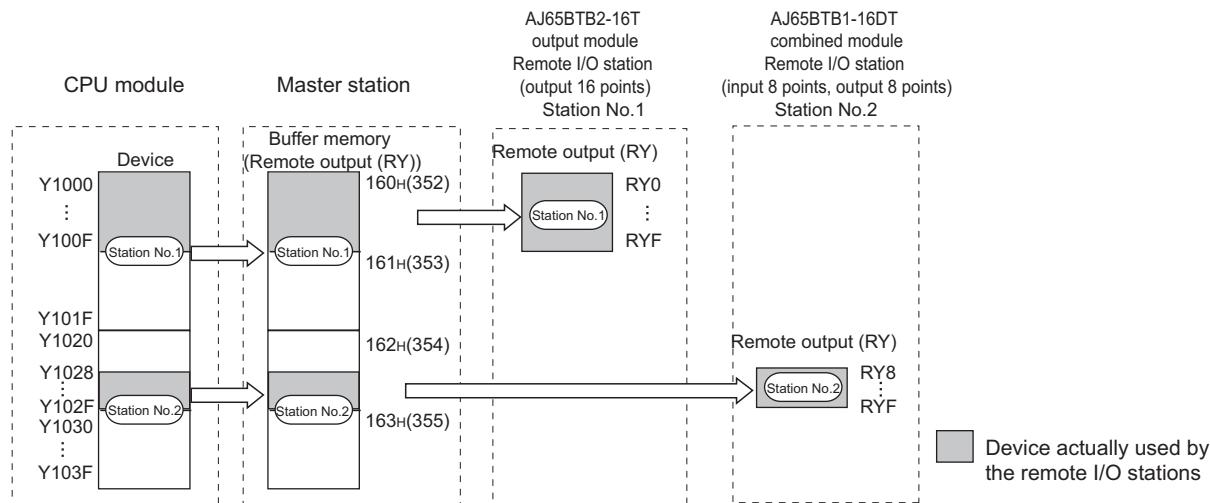
- Remote output (RY)

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

CPU module	Master station		Device station		
	Device	Buffer memory address		Station No.	Module name
		Hexadecimal	Decimal		
Y1000 to Y100F	Y1010 to Y101F	160H	352	1	AJ65BTB2-16T
Y1020 to Y102F		161H	353		
Y1030 to Y103F	Y1028 to Y102F	162H	354	2	AJ65BTB1-16DT
Y1030 to Y103F	Y1028 to Y102F	163H	355		

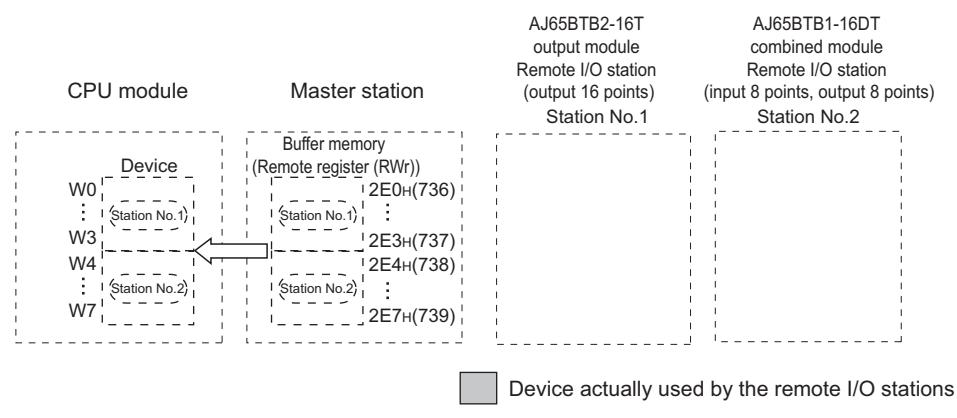
*1 In the AJ65BTB1-16DT, the first eight points are used for input, and the last eight points are used for output. RY8 to RYF are used for output in the AJ65BTB1-16DT. In a CPU module, Y1028 to Y102F are actually used.

4



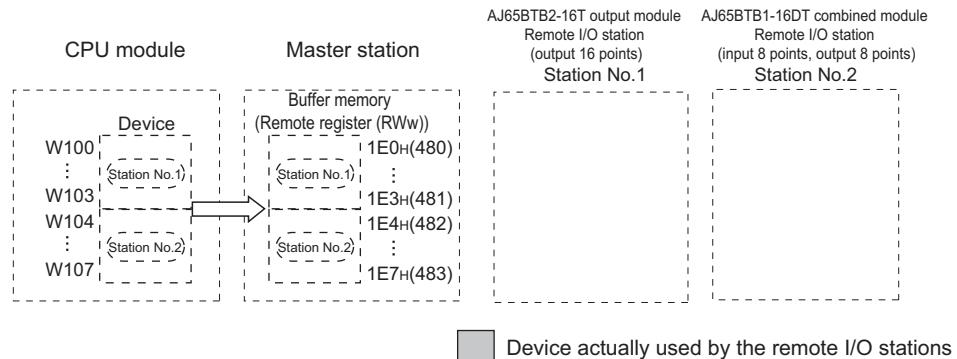
- Remote register (RWr)

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.



- Remote register (RWw)

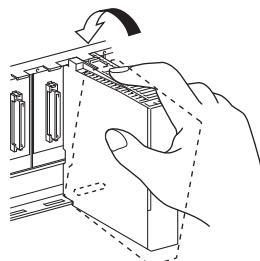
Because an AJ65BTB2-16T and AJ65BTB1-16DT are remote I/O stations, the remote register (RWw) is not used. Note, however, that four points (equivalent to the points for one station) are occupied in the master/local module because the system is in the remote net Ver.1 mode.



Point

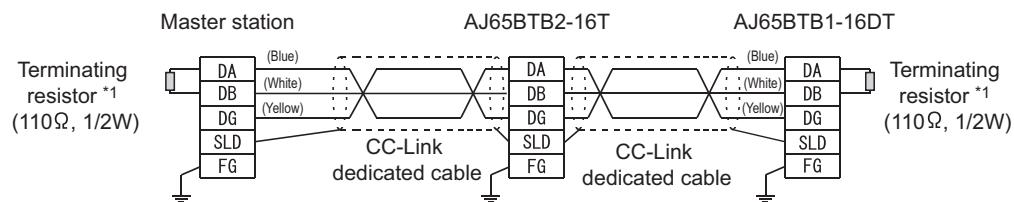
Using the remote net Ver.2 mode can reduce the number of devices by assigning zero points to RWr and RWw in a remote I/O station. (Page 48, Section 3.6.4)

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



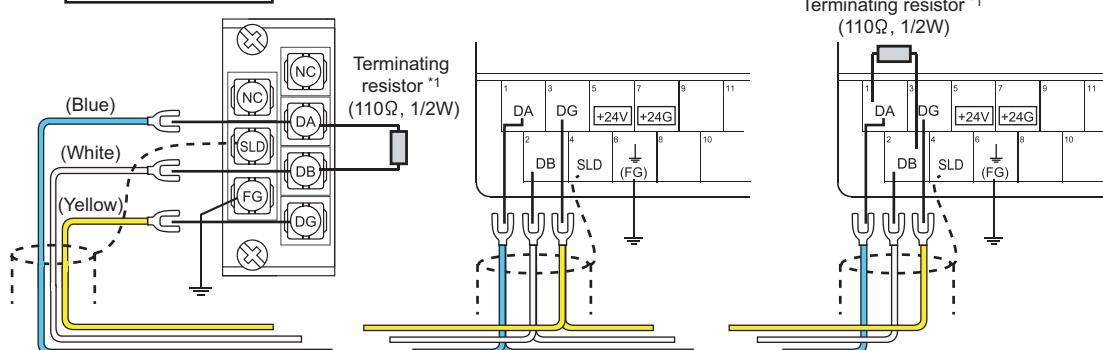
4. Connect a CC-Link dedicated cable to each module. Connect terminating resistors to the modules at both ends. (☞ Page 76, Section 6.2)

Wiring diagram



4

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

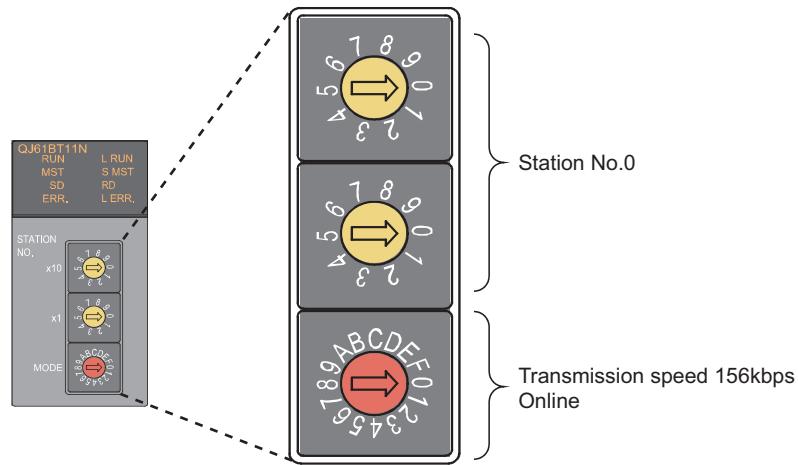
Use terminating resistors supplied with the modules.

When a new terminating resistor of 130Ω is needed, please consult your local Mitsubishi Electric representative.

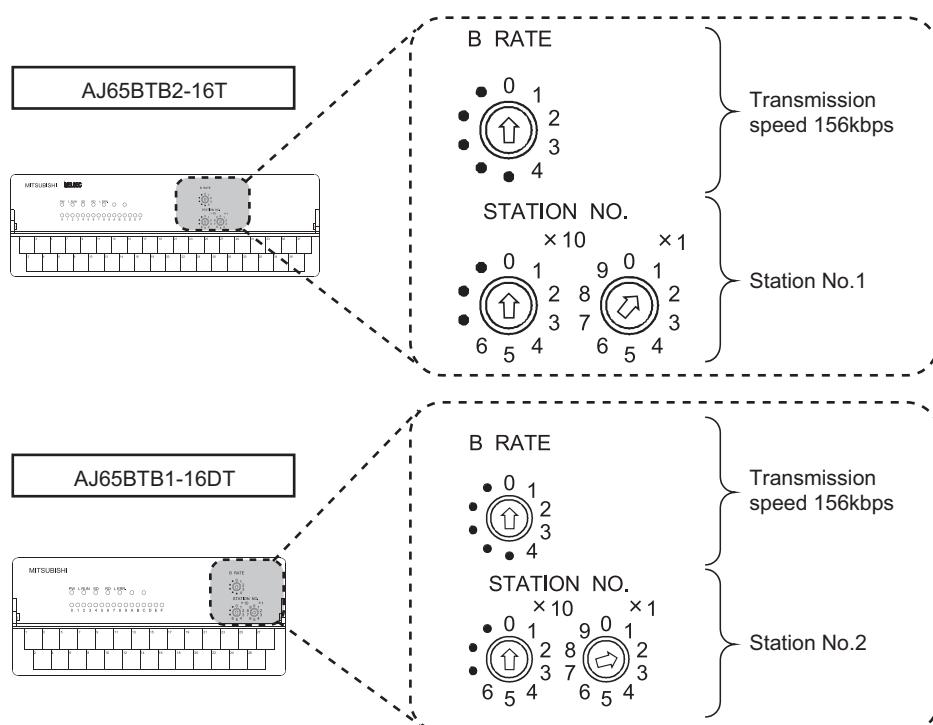
5. Set the station number and transmission speed using the switches on the master/local module.

(☞ 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)

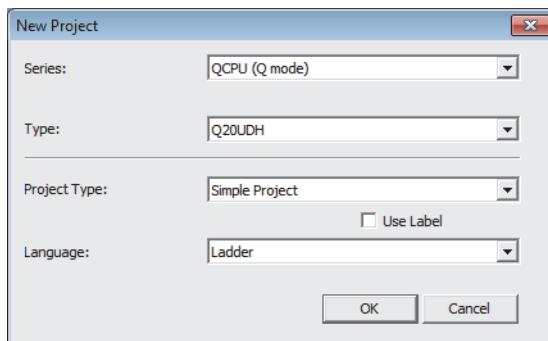
7. Power on the system.

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".

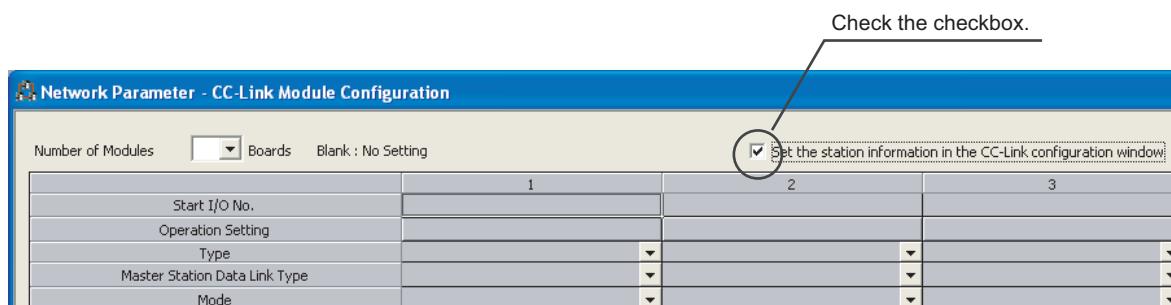
→ [Project] → [New]



4

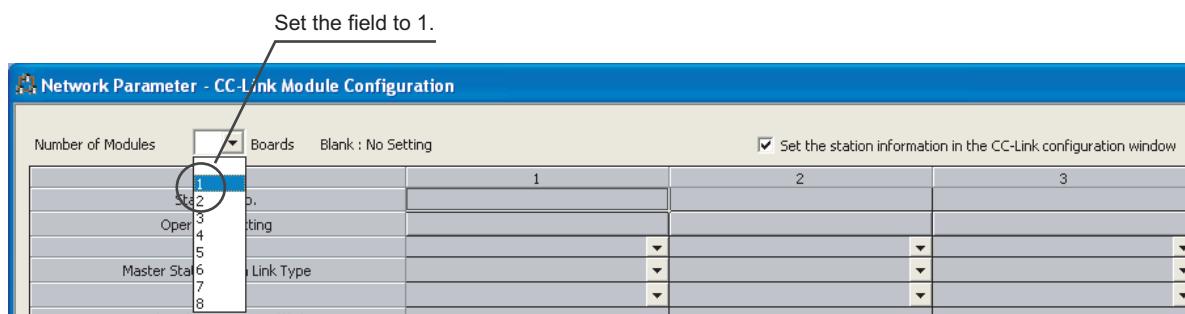
9. Open the "Network Parameter" window and check the checkbox next to "Set the station information in the CC-Link configuration window.". (On GX Works2 only)

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



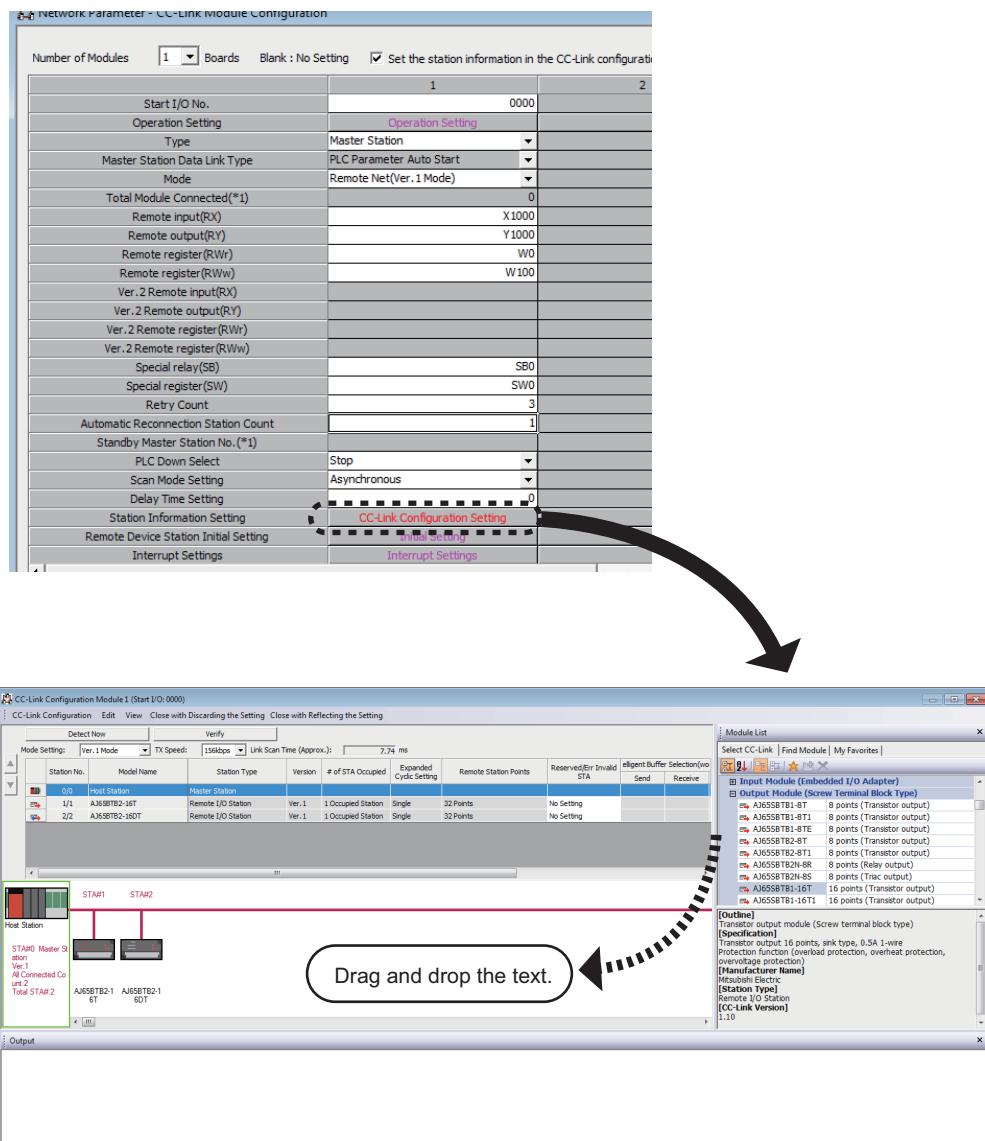
4.1 Operation Example

10. Select 1 for "Number of Modules".



11. Configure the settings as follows.

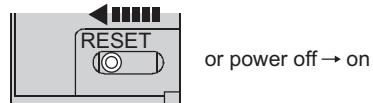
When using GX Developer, refer to the section "When the checkbox next to 'Set the station information in the CC-Link configuration window.' is not checked". (☞ Page 106, Section 7.3.2 (2) (b))



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

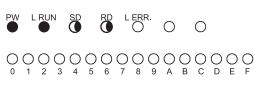
Data link is started.

☞ [Online] ➔ [Write to PLC]



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
QJ61BT11N RUN ■ ■ L RUN MST ■ □ S MST SD ■ □ RD ERR. □ □ L ERR. ■ : ON □ : Flashing *1 □ : OFF	MITSUBISHI MELSEC  ●: ON ○: Flashing *1 □: OFF

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

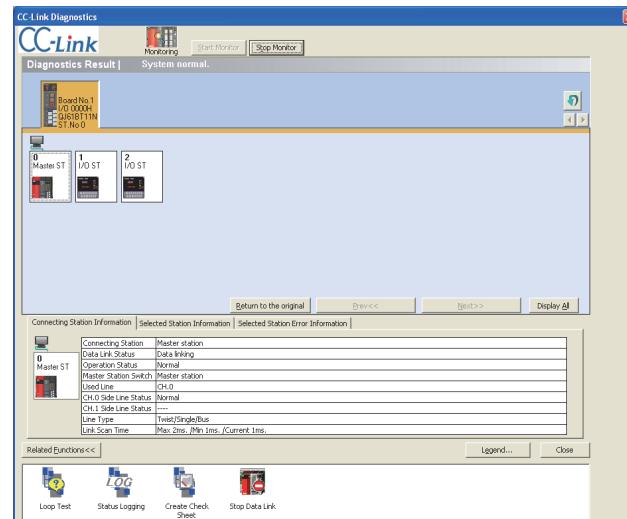
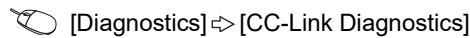
4

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.



Point

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

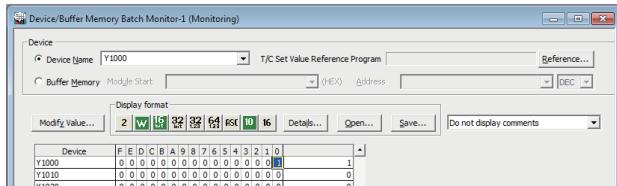
15. Check whether data link is being performed normally.

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).

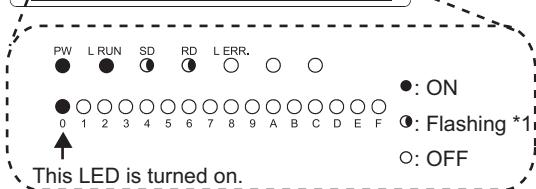
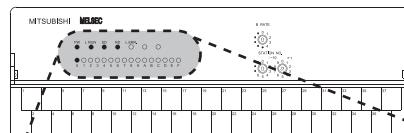
Turning on X0 of the AJ65BTB1-16DT (station number 2) turns on X1020 of the master station.

 [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 device station or the input (X) of the master station, check the RX, RY, RWr, and RWw assignment of the module using Device 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.

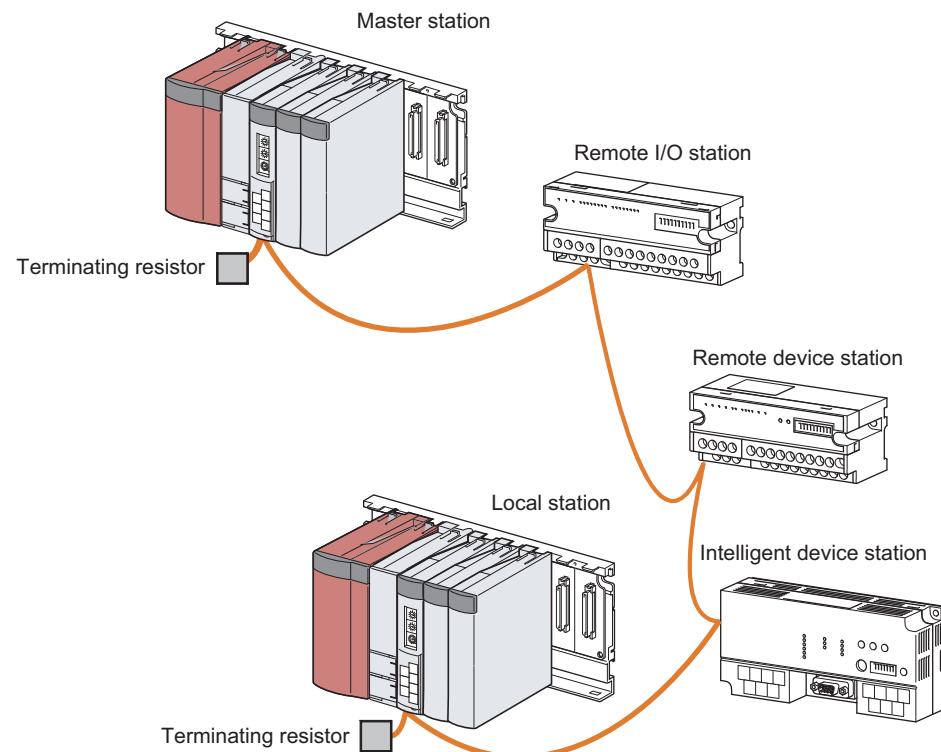
16. When the connection status is normal, create a control program. (Page 228, CHAPTER 10)

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

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 device 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.

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)

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)

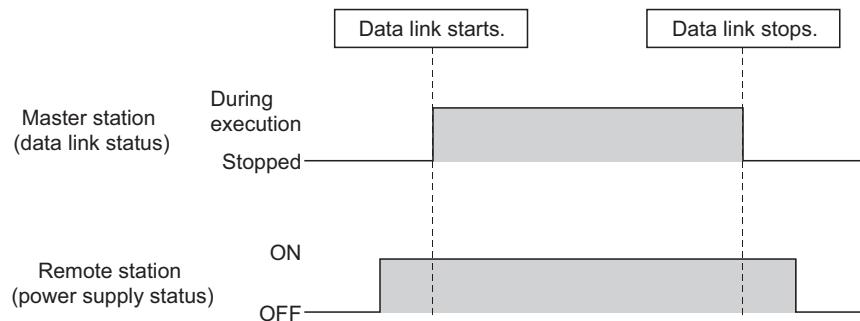
5.3 Precautions for the System Configuration

(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.

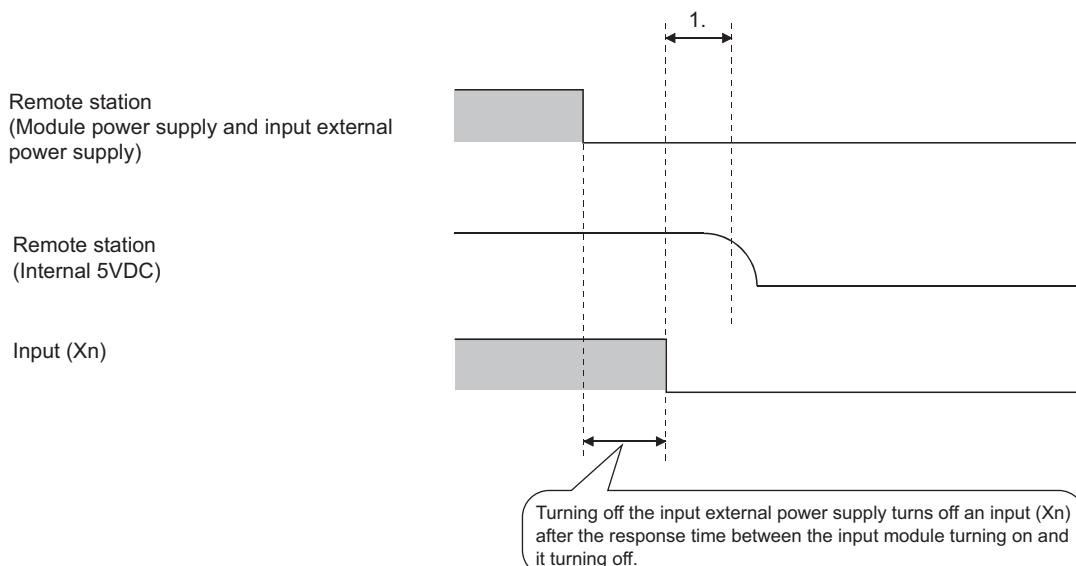


(b) Upon a momentary power failure of a remote station

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

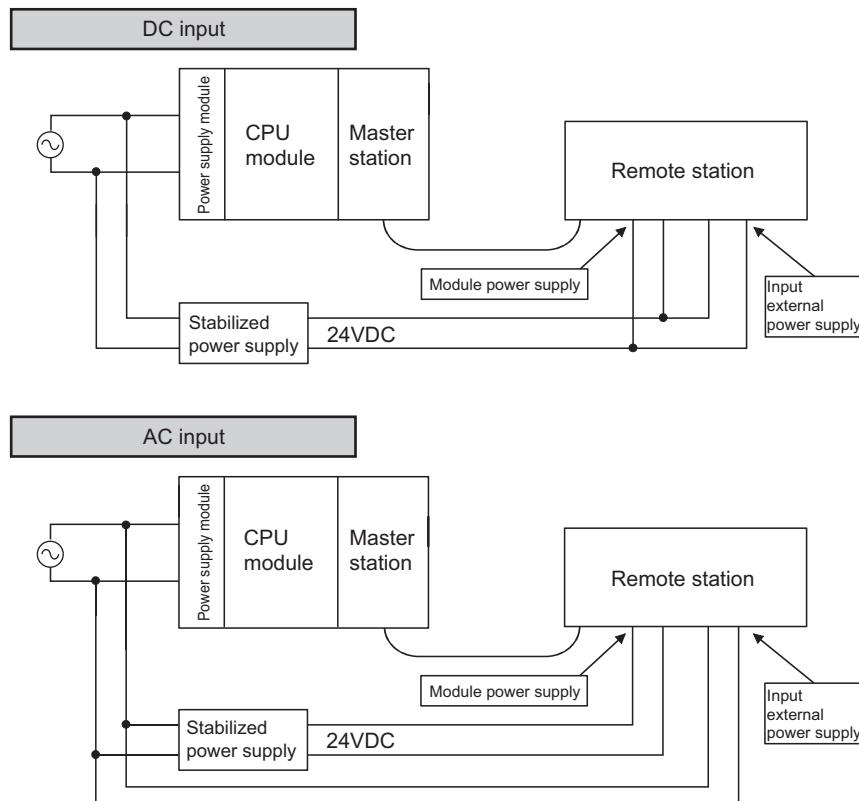
- **Cause of an incorrect input due to a momentary power failure**

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.



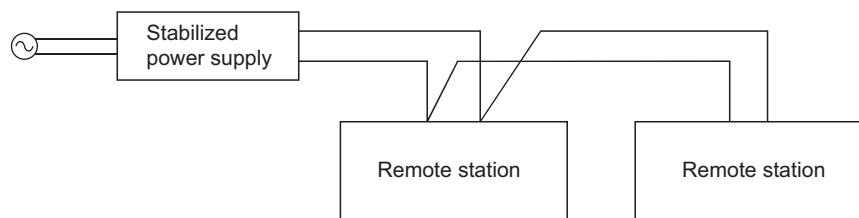
- Countermeasure against an incorrect input**

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.



(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)

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.

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) ^{*1}

^{*1} When a new terminating resistor of 130Ω is needed, please consult your local Mitsubishi Electric representative.

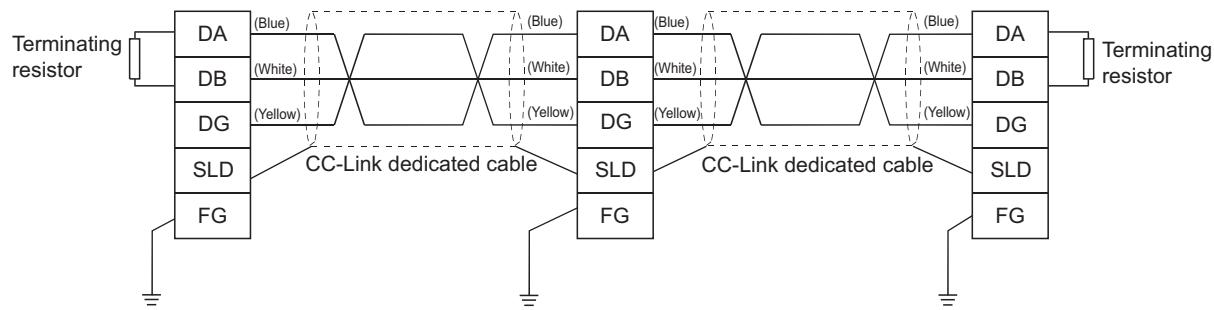
When the A(1S)J61BT11/A(1S)J61QBT11 is used as a master station in a T-branch system configuration, the terminating resistors included with the master/local module cannot be used. (☞ Page 79, Section 6.2.3 (1))

6.2.2 Wiring procedure

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

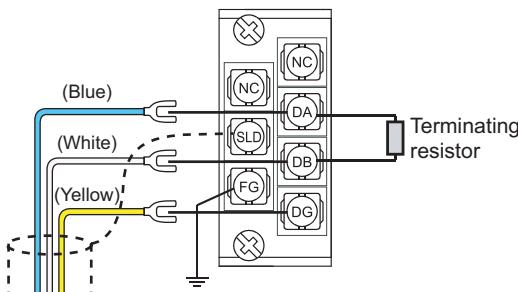
(1) Wiring procedure

(a) Wiring diagram



6

(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)

(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

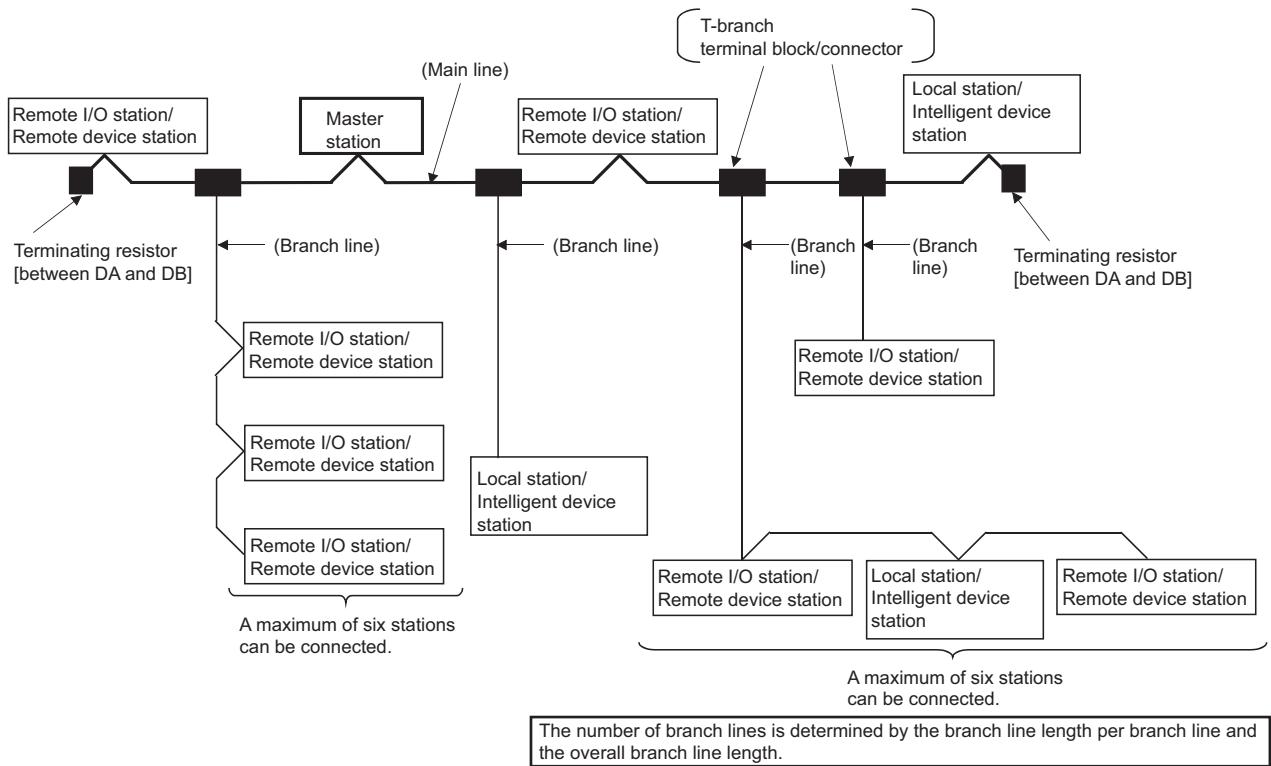
Connect the master station with the device station. Check whether the device station is turned on and off by turning on and off the device of the master station. (☞ Page 59, Section 4.1)

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.

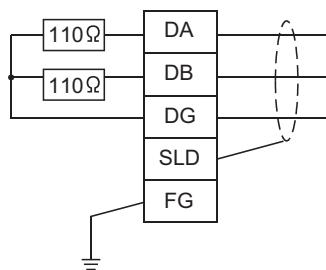


(a) Precautions

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.



$110\Omega \pm 5\%$, 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.

(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)

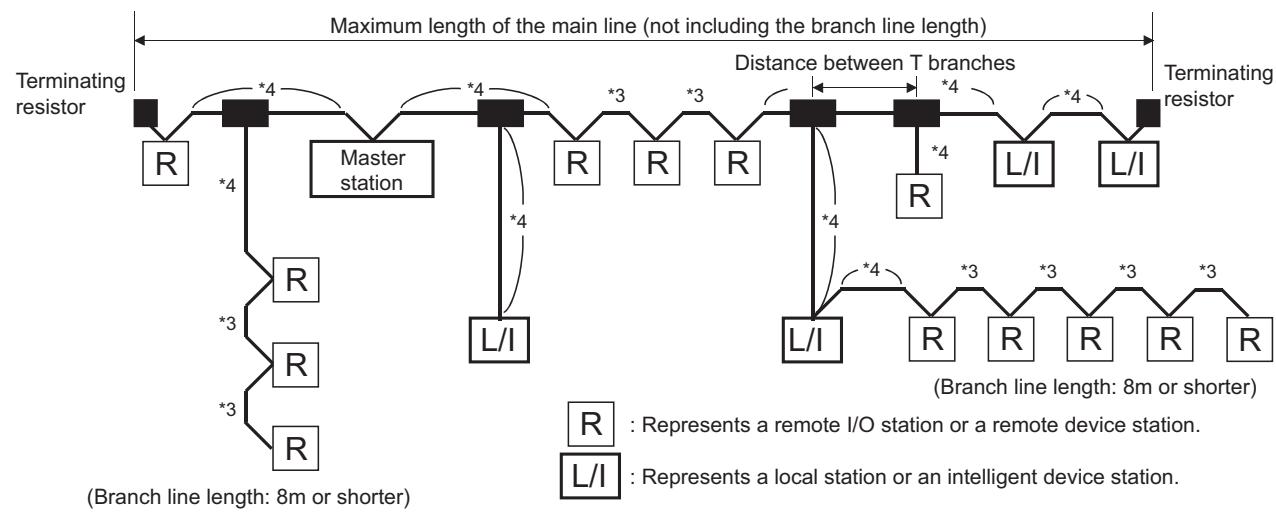
Item	Specifications		Remark
Transmission speed	625kbps	156kbps	10M, 5M, and 2.5Mbps cannot be used.
Maximum length of the main line	100m	500m	A cable length between terminating resistors. The length (branch line length) of a T-branch cable is not included.
Maximum length of the branch line	8m		A total 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	<ul style="list-style-type: none"> • Ver.1.10-compatible CC-Link dedicated cable • CC-Link dedicated cable (Ver.1.00-compatible) 		<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.

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.



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

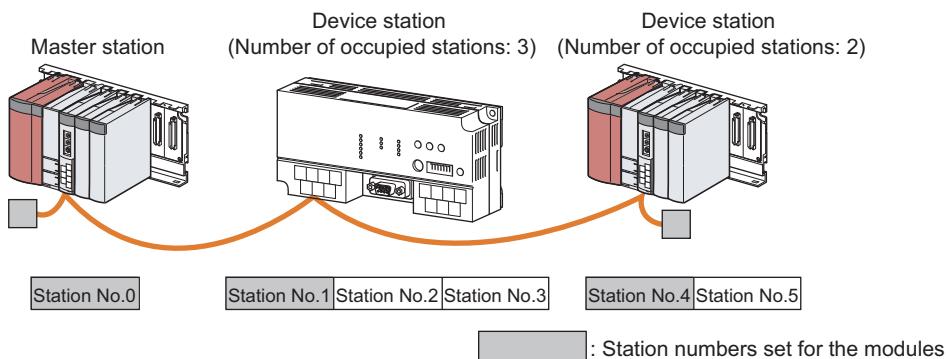
For CC-Link, follow the rules below to set the station numbers.

- 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.

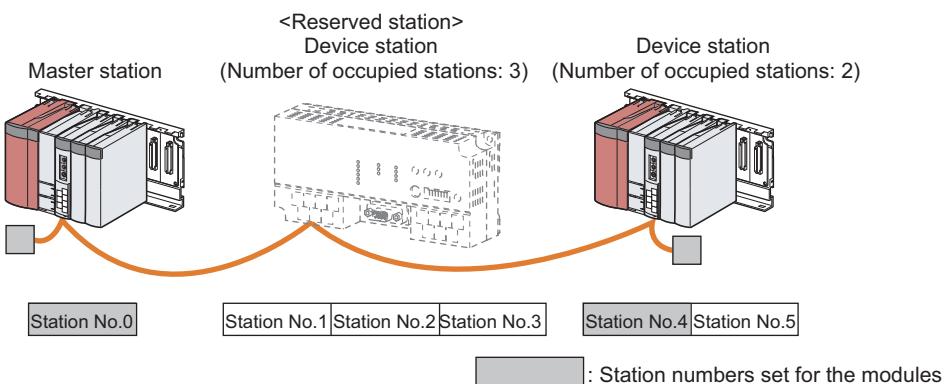
To set empty station numbers for future use, set the stations as reserved stations. Setting the stations as reserved stations prevents the stations from being detected as a faulty station. Set reserved stations in the master station using the network parameter of a programming tool. (☞ Page 102, Section 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

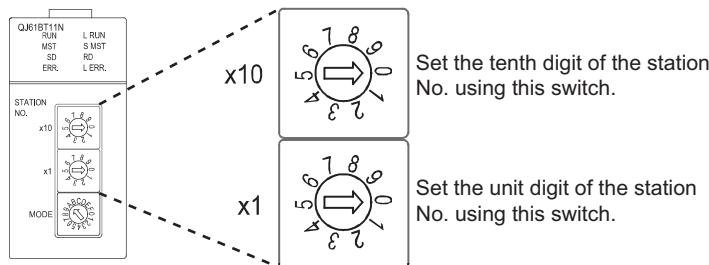


- If an empty station number is set without setting a reserved station, the station is detected as a faulty station in Other station data link status (SW0080 to SW0083).
- The station numbers need to be consecutive, but wiring does not need to be performed in the order of station number.

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

- Set the station number using the station number setting switches on the master/local module.

 Page 21, CHAPTER 2)



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

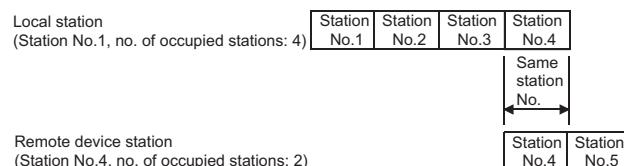
Point

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.

(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.

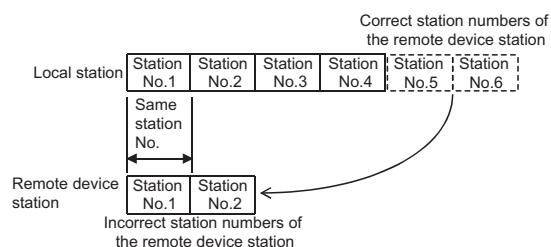


If a start station number is in use, it is not detected. (The station number 0 of the master station is detected if it is in use.)

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.



6.4 Transmission Speed Setting

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

(1) Conditions for transmission speed

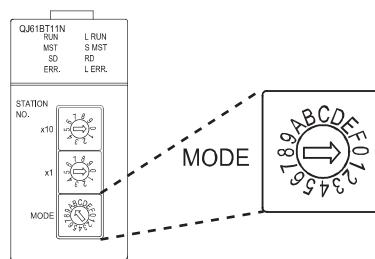
- Set the same transmission speed in all the stations in the CC-Link system. Data link cannot be performed with a device station where the different transmission speed from the master station is set.
- The transmission speed that can be set varies depending on the overall distance. (☞ Page 29, Section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



Whether the transmission speed of the device 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

- 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)	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

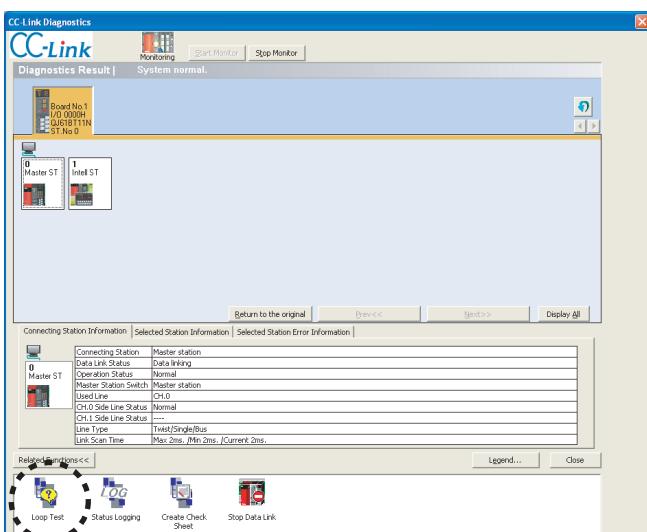
6.5 Test After Wiring

6.5.1 Line test

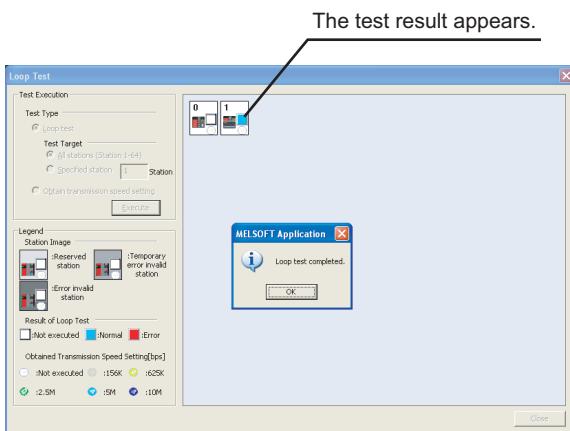
Whether a CC-Link dedicated cable is properly connected and data link can be performed with device stations can be checked.

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] \Rightarrow [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 device 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: $5E0H$ and $608H$) 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.

(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 device station



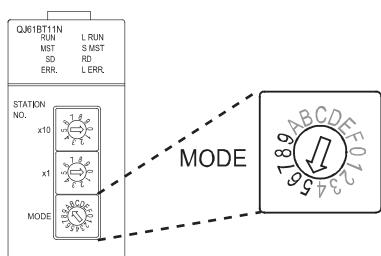
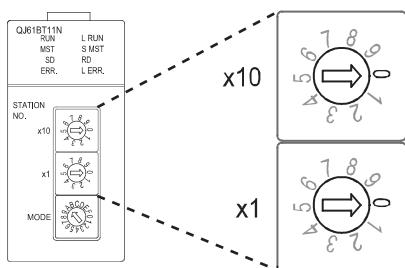
- A line test can be executed when a CC-Link dedicated cable is connected and the station number and transmission speed are set in a device station. No parameter setting is required in the master/local module.
However, to execute a line test 2 for a standby master station, the parameter setting is required 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.

QJ61BT11N	
RUN	<input checked="" type="checkbox"/> L RUN
MST	<input type="checkbox"/> S MST
SD	<input type="checkbox"/> RD
ERR.	<input type="checkbox"/> L ERR.

: ON
: Flashing
: OFF

When the test is completed

QJ61BT11N	
RUN	<input checked="" type="checkbox"/> L RUN
MST	<input type="checkbox"/> S MST
SD	<input type="checkbox"/> RD
ERR.	<input type="checkbox"/> L ERR.

: ON
: Flashing
: OFF

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

QJ61BT11N	
RUN	<input checked="" type="checkbox"/> L RUN
MST	<input checked="" type="checkbox"/> S MST
SD	<input type="checkbox"/> RD
ERR.	<input checked="" type="checkbox"/> L ERR.

: ON
: Flashing
: OFF

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

- 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 device 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).

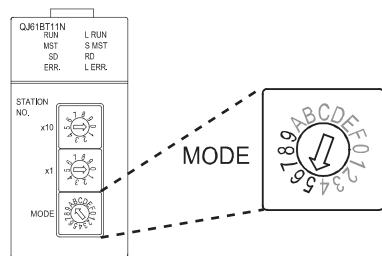
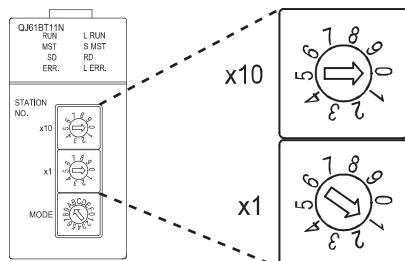
(☞ Page 293, Section 11.3.2)

(b) Line test 2

Example Universal model
QCPU



Example High Performance model
QCPU



QJ61BT11N	
RUN <input checked="" type="checkbox"/>	<input type="checkbox"/> L RUN
MST <input checked="" type="checkbox"/>	<input type="checkbox"/> S MST
SD <input type="checkbox"/>	<input type="checkbox"/> RD
ERR. <input type="checkbox"/>	<input type="checkbox"/> L ERR.

: ON
: Flashing
: OFF

When the test is completed

QJ61BT11N	
RUN <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> L RUN
MST <input checked="" type="checkbox"/>	<input type="checkbox"/> S MST
SD <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> RD
ERR. <input type="checkbox"/>	<input type="checkbox"/> L ERR.

: ON
: Flashing
: OFF

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

QJ61BT11N	
RUN <input checked="" type="checkbox"/>	<input type="checkbox"/> L RUN
MST <input checked="" type="checkbox"/>	<input type="checkbox"/> S MST
SD <input type="checkbox"/>	<input type="checkbox"/> RD
ERR. <input checked="" type="checkbox"/>	<input type="checkbox"/> L ERR.

: ON
: Flashing
: OFF

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 device station where the test is executed.

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

6

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)

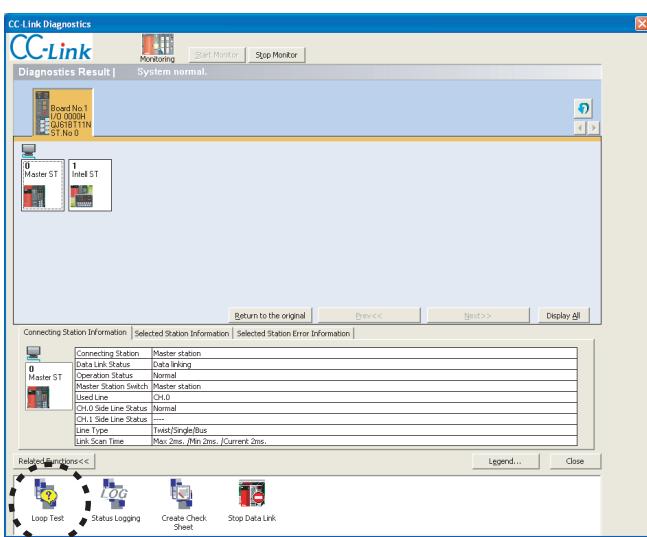
6.5.2 Transmission speed test

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

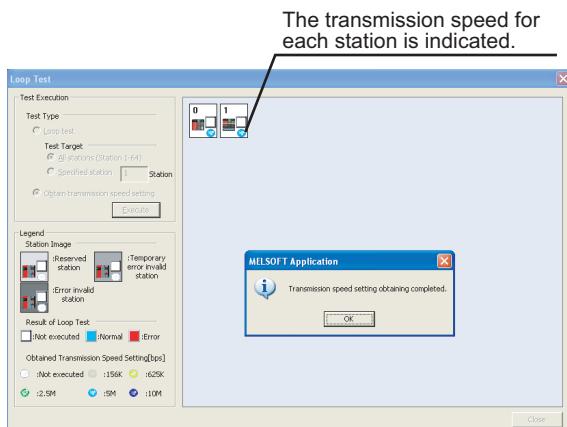


Before using this function, check the versions of the master/local module and programming tool. (☞ Page 399, Appendix 6 (2))

(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.

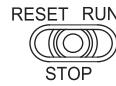
(2) Using link special relays (SBs) and link special registers (SWs)

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

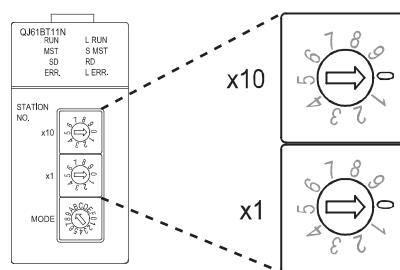
Example Universal model
QCPU



Example High Performance model
QCPU



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

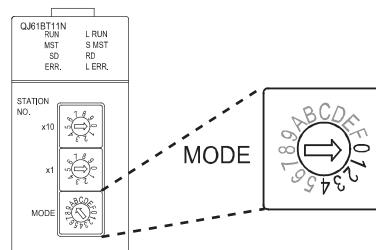


6

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.

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 device 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 device station (excluding a standby master station)

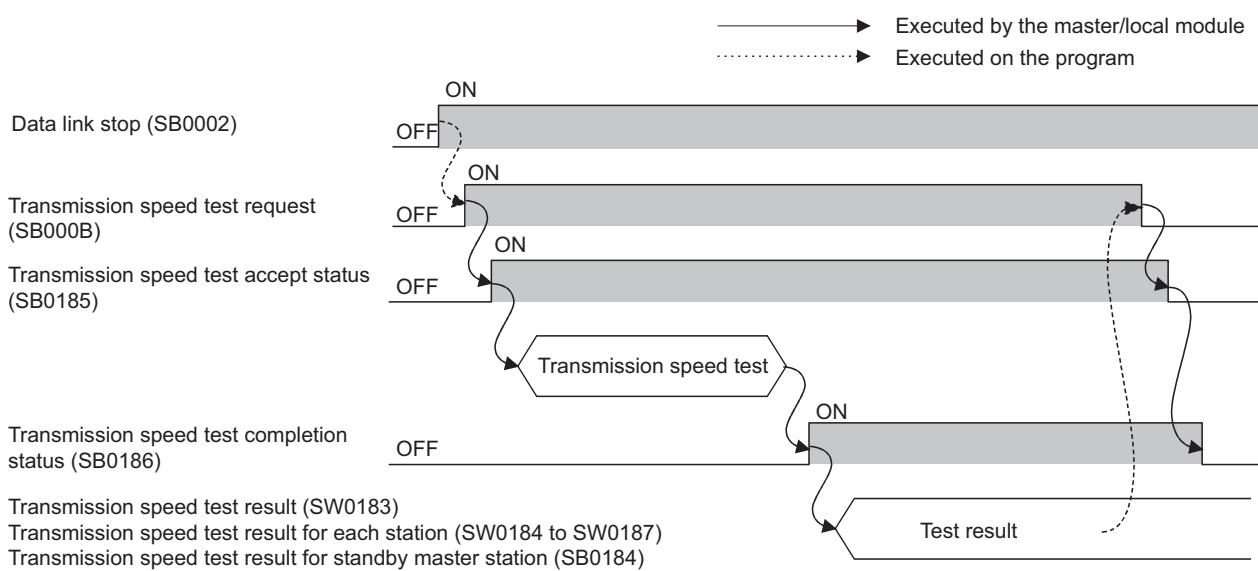
Transmission speed test result for each station (SW0184 to SW0187)

- 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



CHAPTER 7 PARAMETER SETTINGS

For CC-Link, set parameters both for a master station and a device station.

For a master station, set the information about a device station to be connected to a CC-Link system.

For a device station, set the station number of the device station. ( Manual for the device 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. <ul style="list-style-type: none"> • To set parameters on a window in a simply way, without creating program • To transfer data automatically from RX, RY, RW_r, RW_w, 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. <ul style="list-style-type: none"> • 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

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	△	×
	Number of Occupied Stations	×	○
	Expanded Cyclic Setting	×	○
	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	○	×	

Item	Necessity of a setting		Remark
	Master station	Local station, standby master station	
Standby Master Station No.	△	×	<ul style="list-style-type: none"> 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	○	×	—
Station Information Setting	○	×	The settings are not required when "Remote I/O Net Mode" is set to "Mode".
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	△	△	—

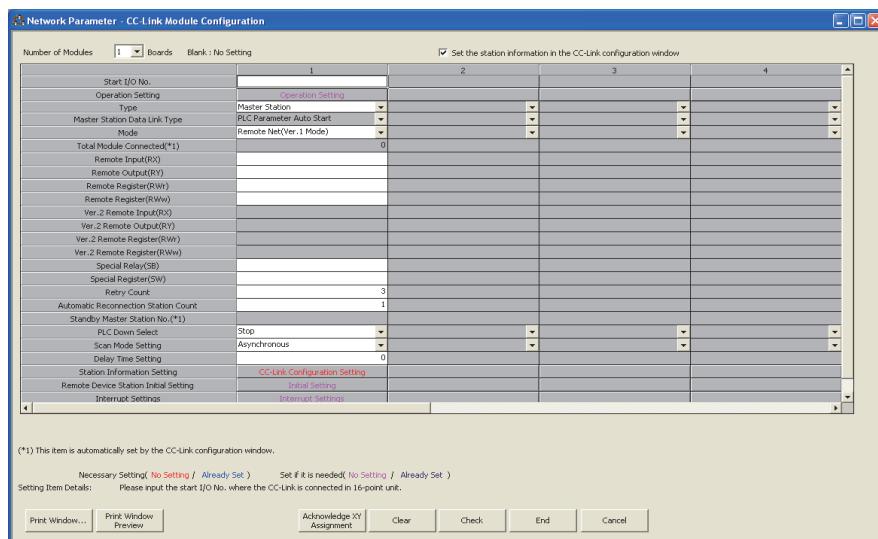
7.3 Parameter Settings for a Master Station

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.

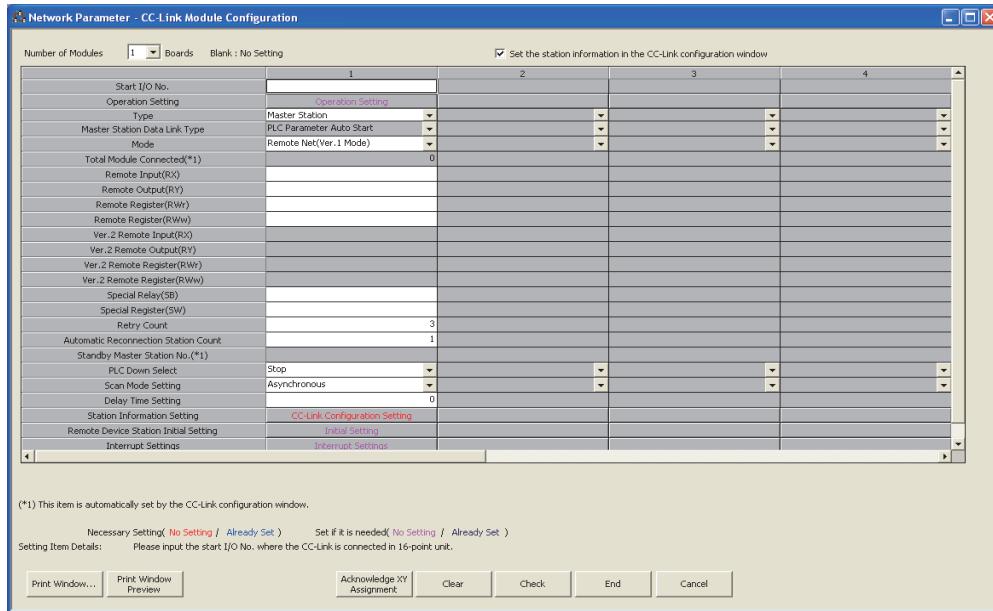
☛ [Online] ➔ [Write to PLC]

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 device station, stop data link at the master station. (☛ Page 320, Section 11.4.5)
- When change the settings for a device station, change the settings for the master station accordingly.

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))	<ul style="list-style-type: none"> 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))	—

Item	Description		Setting range						
Type	<p>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)</p> <table border="1"> <thead> <tr> <th>Operation</th><th>Setting</th></tr> </thead> <tbody> <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> <ul style="list-style-type: none"> 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> </tbody> </table>		Operation	Setting	When a failed master station becomes normal again, it does not return as a standby master station.	Master Station	<ul style="list-style-type: none"> 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. 	Master Station(Duplex Function)	<ul style="list-style-type: none"> Master Station Master Station(Duplex Function) Master station (Extension Base)^{*2} <p>(Default: Master Station)</p>
Operation	Setting								
When a failed master station becomes normal again, it does not return as a standby master station.	Master Station								
<ul style="list-style-type: none"> 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. 	Master Station(Duplex Function)								
Master Station Data Link Type	<p>"PLC Parameter Auto Start" is displayed. (The setting is not required.)</p>		-						
Mode	<p>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.</p>		<ul style="list-style-type: none"> Remote Net(Ver.1 Mode) Remote Net(Ver.2 Mode) Remote Net(Additional Mode) Remote I/O Net Mode Offline <p>(Default: Remote Net(Ver.1 Mode))</p>						
Total Module Connected	<p>Set the number of modules to be connected to a device 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".</p>		1 to 64 (Default: 64)						

Item	Description	Setting range
Remote Input(RX)	<p>Set the start device where RX, RY, RW_r, and RW_w are transferred. By setting these items, RX, RY, RW_r, and RW_w can be automatically transferred to a device in a CPU module without using a program.</p> <p>(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 Device station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))</p> <p>(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))</p> <ul style="list-style-type: none"> 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. <p>(3) Overlaps with other devices Set the devices without overlaps with the following.</p> <ul style="list-style-type: none"> 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 <p>(4) Refresh timing Data are refreshed in the END process of a CPU module.</p>	<p>Blank or the following range</p> <ul style="list-style-type: none"> 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 <p>(Default: Blank)</p>
Remote Output(RY)	<p>Blank or the following range</p> <ul style="list-style-type: none"> 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 <p>(Default: Blank)</p>	
Remote Register(RW _r)	<p>Blank or the following range</p> <ul style="list-style-type: none"> 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 <p>(Default: Blank)</p>	
Remote Register(RW _w)	<p>Blank or the following range</p> <ul style="list-style-type: none"> 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 <p>(Default: Blank)</p>	
Ver.2 Remote Input(RX)	<p>When "Remote Net(Additional Mode)" is set to "Mode", set the start device where RX, RY, RW_r, and RW_w (Ver.2-compatible area) of a master/local module are transferred.</p> <p>(1) Number of refresh points All points for the start station number to last station number of a Ver.2-compatible device 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 Device 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.</p>	Same as "Remote Input(RX)"
Ver.2 Remote Output(RY)		Same as "Remote Output(RY)"
Ver.2 Remote Register(RW _r)		Same as "Remote Register(RW _r)"
Ver.2 Remote Register(RW _w)		Same as "Remote Register(RW _w)"

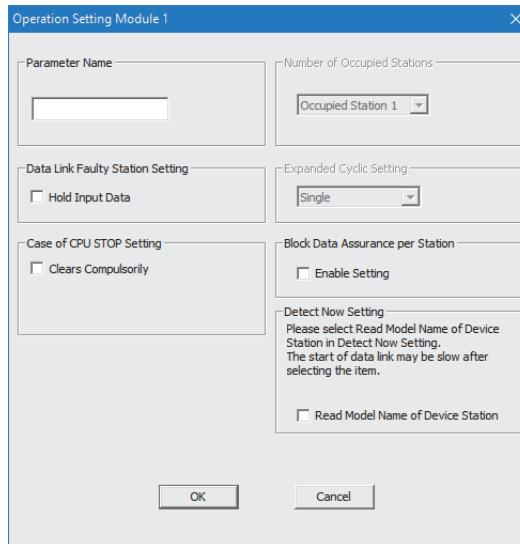
Item	Description	Setting range
Special Relay(SB)	Set the start device where SB and SW are transferred. SB and SW can be automatically transferred to a device in a CPU module without using a program.	Blank or the following range • Device M, L, B, D, W, R, SB, or ZR (M, B, D, W, and SB for a MELSECNET/H 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 device 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 device 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.

(1) Operation Setting

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link] \Rightarrow 



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)	<ul style="list-style-type: none"> 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 device station when the switch on a CPU module is set to STOP. ( Page 121, Section 7.5, Page 133, Section 8.2.4)	<ul style="list-style-type: none"> 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 device stations with the connected device auto-detection function. To read the model name of the device stations with the connected device auto-detection function, refer to the following. <ul style="list-style-type: none">  iQ Sensor Solution Reference Manual 	<ul style="list-style-type: none"> Do not to read the model name of the device stations (not checked) Read the model name of the device stations (checked) (Default: Do not to read the model name of the device 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 device station. ( Page 150, Section 8.2.6 (1))	<ul style="list-style-type: none"> Disable setting (not checked) Enable setting (checked) (Default: Disable setting (not checked))

(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 device stations connected to the master/local module.

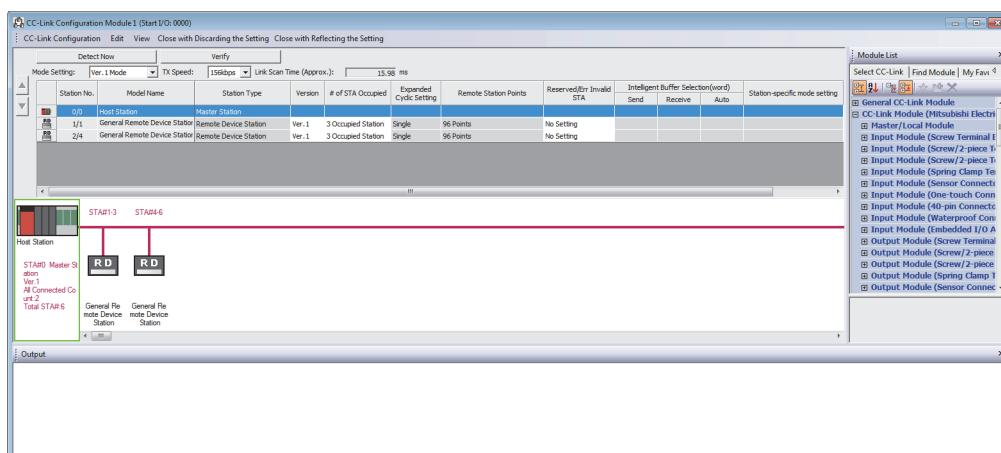
The following lists how to set parameters by automatically detecting the system configuration.

1. Check if the station number of device stations is correctly set.
2. Turn on the device stations first, and turn on a master station.
3. Open the CC-Link configuration window.

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link]
 \Rightarrow button.

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

[CC-Link Configuration] \Rightarrow [Online] \Rightarrow [Detect Now]



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 device 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.

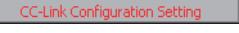
 [CC-Link Configuration] \Rightarrow [Close with Reflecting the Setting]

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 device stations then the master station.

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

1. Open the CC-Link configuration window.

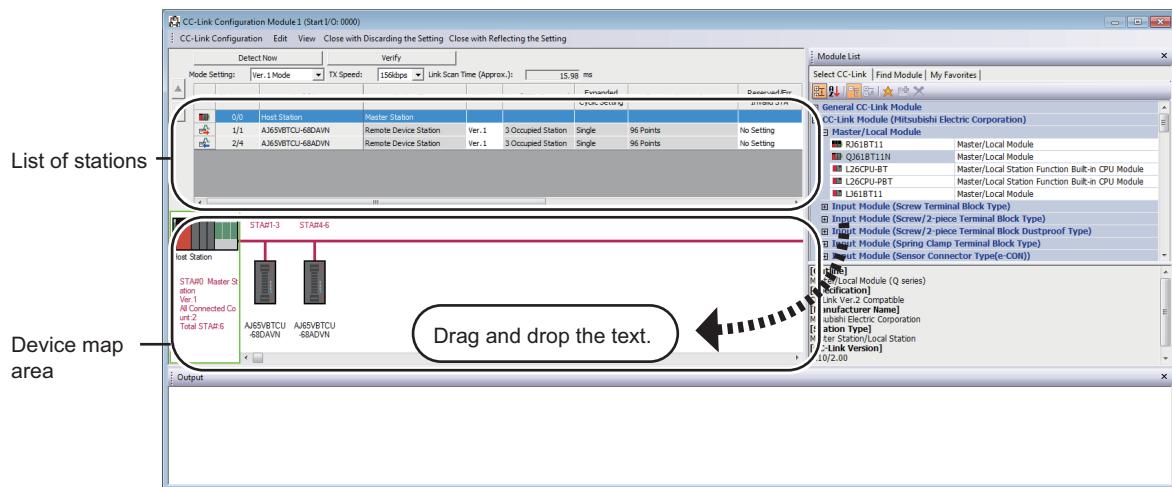
 Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link] \Rightarrow 

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

Device 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] \Rightarrow [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)	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> 156kbps 625kbps 2.5Mbps 5Mbps 10Mbps (Default: 156kbps)
Link Scan Time (Approx.)	The estimate value of link scan time is displayed. For the estimate value of link scan time, refer to following. ( Page 366, Appendix 4.1)	—
Station No.	<ul style="list-style-type: none"> For a master station 0/0 is displayed. For a device station The order of the device station is displayed before the slash. The start station number of the device 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.	—

Item	Description	Setting range
Station Type	Select the station type. Set the station type of the device station actually connected.	Varies depending on the module that was set.
Version	Select CC-Link version of the device station. Select the mode of the master/local module if the device 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 device 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 device station.	Varies depending on the module that was set.
Expanded Cyclic Setting	Select the expanded cyclic setting for the device 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	<p>The number of points of remote I/O (RX, RY) occupied by the device station is displayed.</p> <p>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)</p> <p>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.</p>	<ul style="list-style-type: none"> • 0 Point (Reserved Station) • 8 Points • 8 Points+8 Points(Reserved) • 16 Points • 32 Points <p>(Default: Varies depending on the number of occupied stations)</p>
Reserved/Err Invalid STA	Select whether to set the device station as a reserved station or an error invalid station. (☞ Page 162, Section 8.3.4, Page 167, Section 8.3.6)	<ul style="list-style-type: none"> • No Setting • Reserved Station • Error Invalid Station <p>(Default: No Setting)</p>
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 device stations must be 4096 or less. (Default: 64)
Receive	Set the size of receive buffer to receive data using the G(P).RIRD instruction.	0, 128 to 4096 Note that the total buffer size of "Auto" for all device stations must be 4096 or less. (Default: 128)
Station-specific mode setting	Set the station-specific mode for the device station. This setting can be configured only when the device station supports the station-specific mode.	Varies depending on the module that was set.

Item	Description	Setting range
Module List	The list of device stations is displayed. Information about device 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

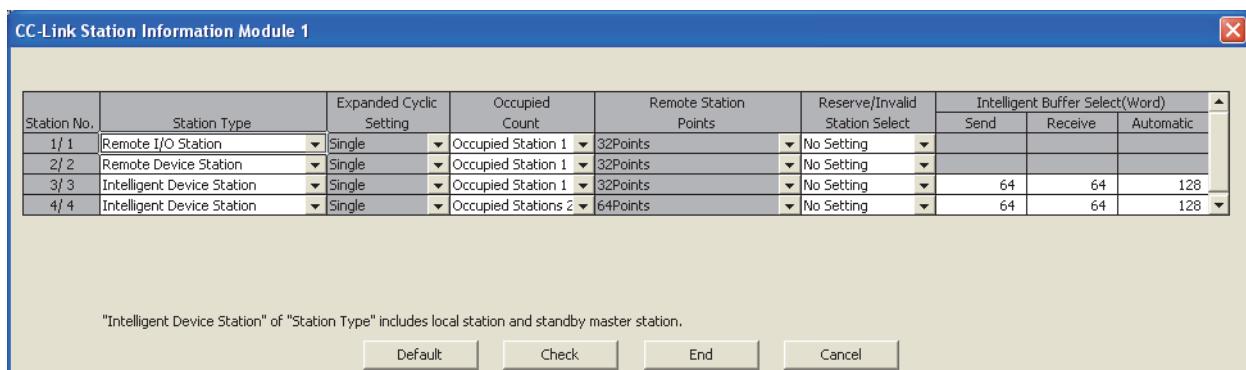
1. Set "Mode" and "Total Module Connected" in the "Network Parameter" window and open "CC-Link Station Information" window.

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

2. Input setting values.

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

→  End button

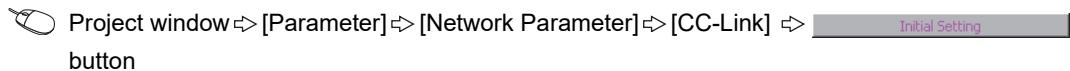


Item	Description	Setting range
Station No.	The order of the device station is displayed before the slash. The start station number of the device station is displayed after the slash.	–
Station Type	Select the station type of the device station. Set the same type of the device station actually connected. 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 device station. The setting can be selected only when "Ver.2 Remote Device Station" or "Ver.2 Intelligent Device Station" is set to "Station Type".	<ul style="list-style-type: none"> • Single • Double • Quadruple • Octuple (Default: Single)

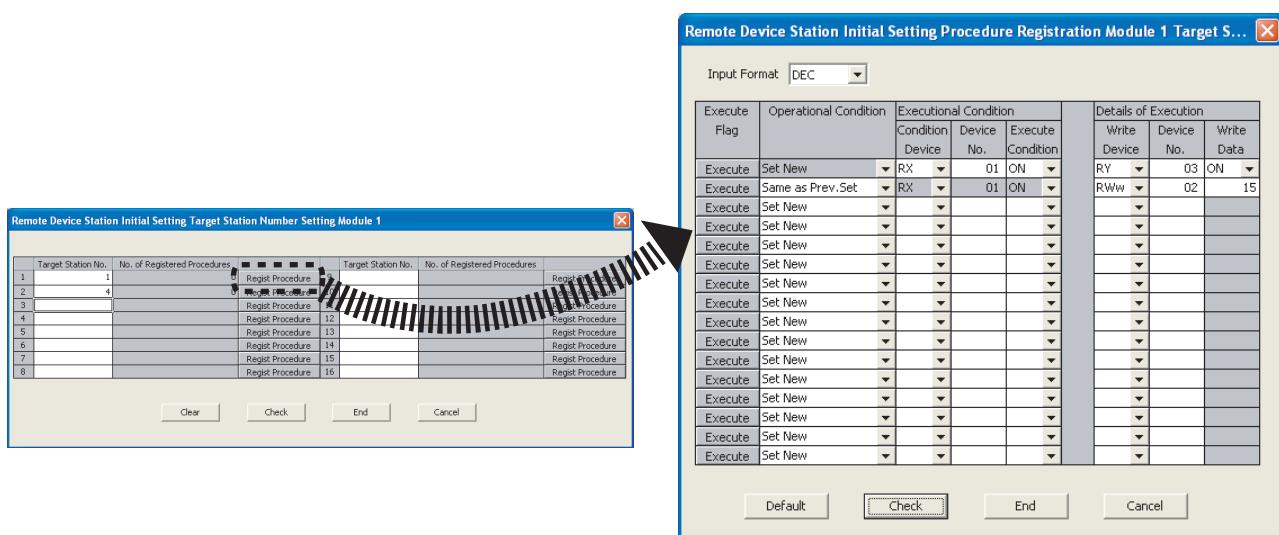
Item	Description	Setting range
Occupied Count	Select the number of occupied stations of the device station. The number of points of remote I/O (RX, RY) occupied by the device station is displayed. The number of points can be changed for a remote I/O station when "Remote Net(Ver.2 Mode)" is set to "Mode 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.	<ul style="list-style-type: none"> • No Setting • Occupied Station 1 • Occupied Station 2 • Occupied Station 3 • Occupied Station 4 <p>(Default: Occupied Station 1)</p>
Remote Station Points		<ul style="list-style-type: none"> • 0 Points(Reserved Station) • 8 Points • 8 Points+8 Points(Reserved) • 16 Points • 32 Points <p>(Default: Varies depending on the "Number of Occupied Stations".)</p>
Reserve/Invalid Station Select	Select whether to set the device station as a reserved station or an error invalid station. (Page 162, Section 8.3.4, Page 167, Section 8.3.6)	<ul style="list-style-type: none"> • No Setting • Reserved Station • Invalid Station <p>(Default: No Setting)</p>
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 device stations must be 4096 or less. (Default: 64)
Receive	Set the size of receive buffer to receive data using the G(P).RIRD instruction.	0, 128 to 4096 Note that the total buffer size of "Automatic" for all device stations must be 4096 or less. (Default: 128)
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 device stations must be 4096 or less. (Default: 128)

(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).



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".	<ul style="list-style-type: none"> • DEC • HEX (Default: DEC)

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.	<ul style="list-style-type: none"> • Execute • Only Set <p>(Default: Execute)</p>
Operational Condition	Select whether to newly set the condition for the initial settings or use the same condition as the above line.	<ul style="list-style-type: none"> • Set New • Same as Prev. Set <p>(Default: Set New)</p>
Execution Condition	Set the condition to execute the initial settings.	-
Condition Device	Select the device to execute the initial settings.	<ul style="list-style-type: none"> • RX • SB <p>(Default: Blank)</p>
Device No.	<p>Set the device number of the device set to "Condition Device". Set 0 to the first device number for each station.</p> <p>Ex. For instance, 0 to 1F can be set to the device number for the station number 4 as shown below.</p>	<ul style="list-style-type: none"> • For RX: 0 to 37H • For SB: 0 to FFH <p>(Default: Blank)</p>
Execute Condition	Select whether to execute the initial settings with ON of the condition device or with OFF of the condition device.	<ul style="list-style-type: none"> • ON • OFF <p>(Default: Blank)</p>

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.

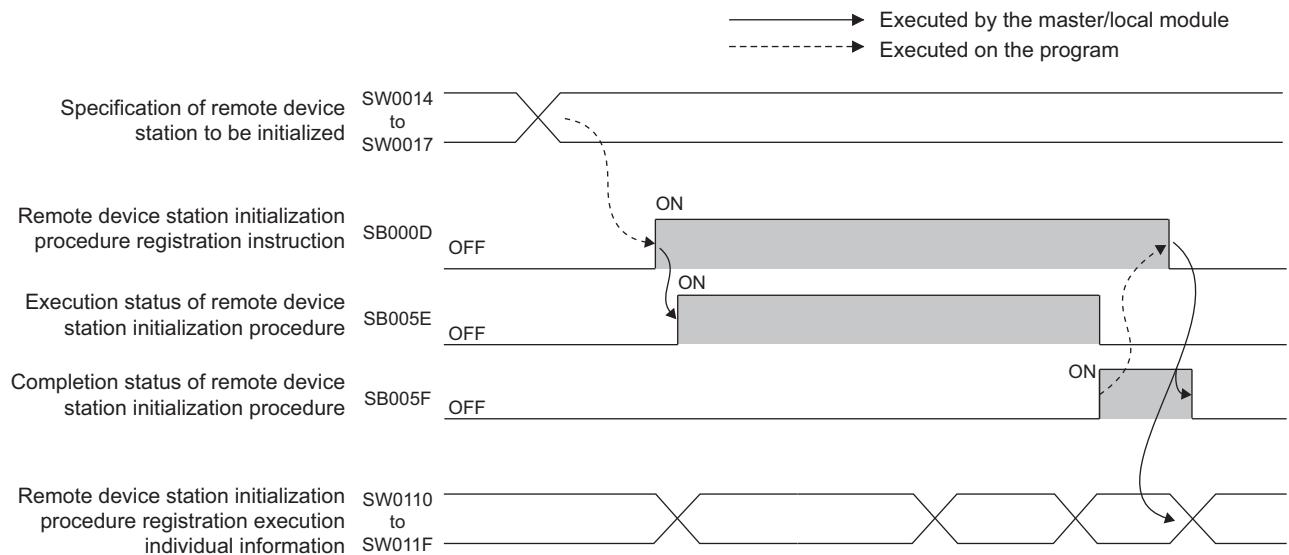
Also the execution results are stored in Remote device station initialization procedure registration instruction result (SW005F).

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.

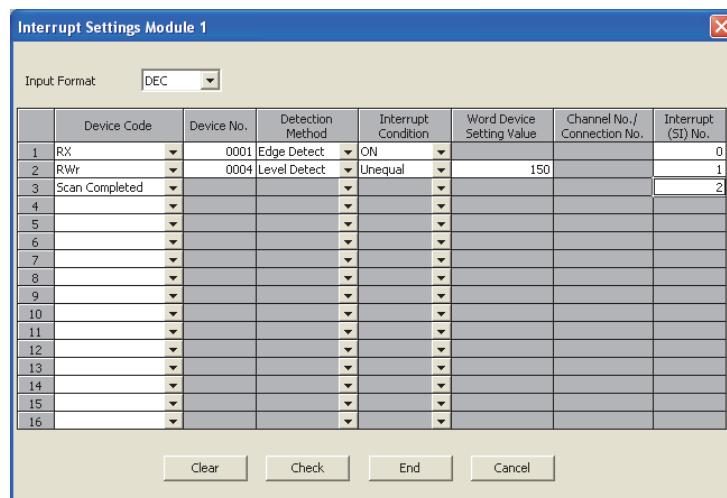
The following figure shows the operations of a link special relay (SB) and link special register (SW) when the remote device station initialization procedure registration is performed.



(4) Interrupt Settings

 Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link] \Rightarrow Interrupt Settings

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".	<ul style="list-style-type: none"> • DEC • HEX (Default: DEC)
Device Code	Set the device for the interrupt condition.	
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.	Refer to the following table.
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.)	



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

(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)	0 to 65535 (0 _H to FFFF _H)	—	—
SW	0 to 01FF _H	Level Detect + Equal: Interrupt when the value is matched Level Detect + Unequal: Interrupt when the value is not matched	—	—	—	—
Scan Completed	—	—	—	—	—	—

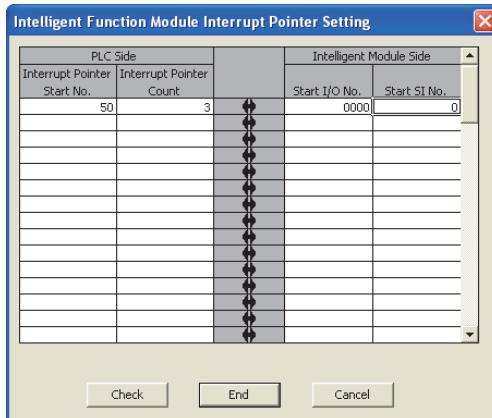
3. When completing the interrupt settings, open the "Intelligent Function Module Interrupt Pointer Setting" window of the PLC parameter.

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.



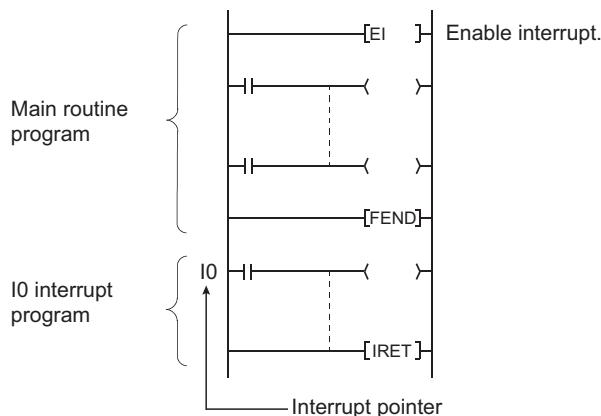
Item		Description	Setting range
PLC Side	Interrupt Pointer Start No.	Set the start number (I□□) of the interrupt pointer.	50 to 255 (Default: Blank)
	Interrupt Pointer Count	Set the number of the interrupt conditions set in the "Interrupt Settings" window of Network Parameter.	1 to 16 (Default: Blank)
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

- 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.



Since change of RX10 may not be read,
this cannot be specified as interrupt condition.

- 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.

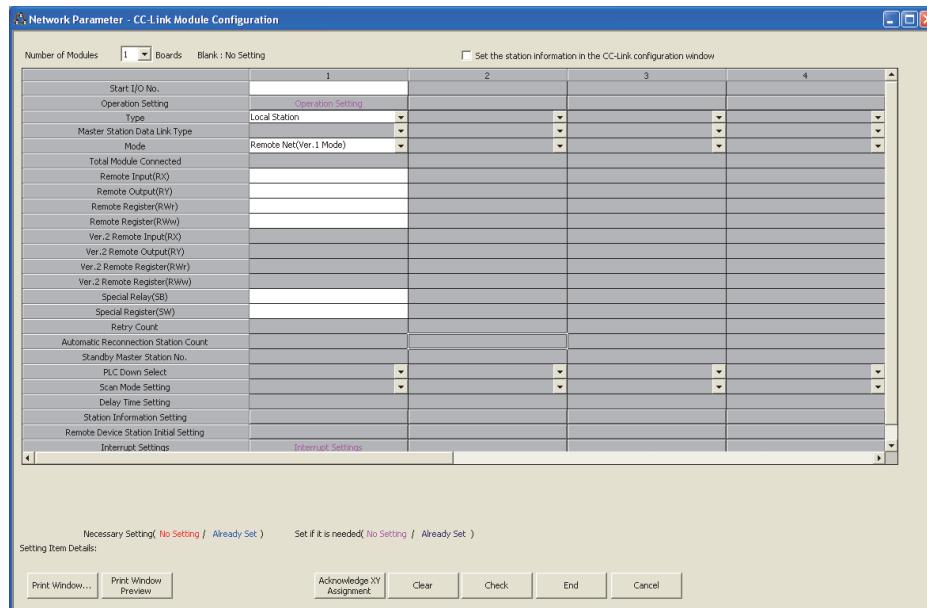
7.4 Parameter Settings for a Local Station and Standby Master Station

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.

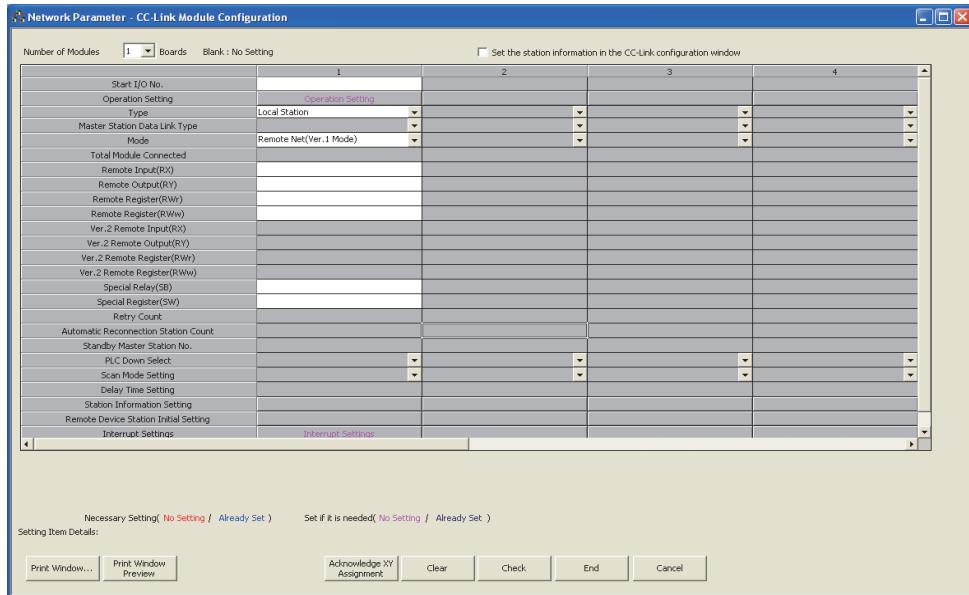
🔗 [Online] ➔ [Write to PLC]

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.

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))	<ul style="list-style-type: none"> • Local Station • Standby Master Station • Master Station(Duplex Function) <p>(Default: Master Station)</p>
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.	-

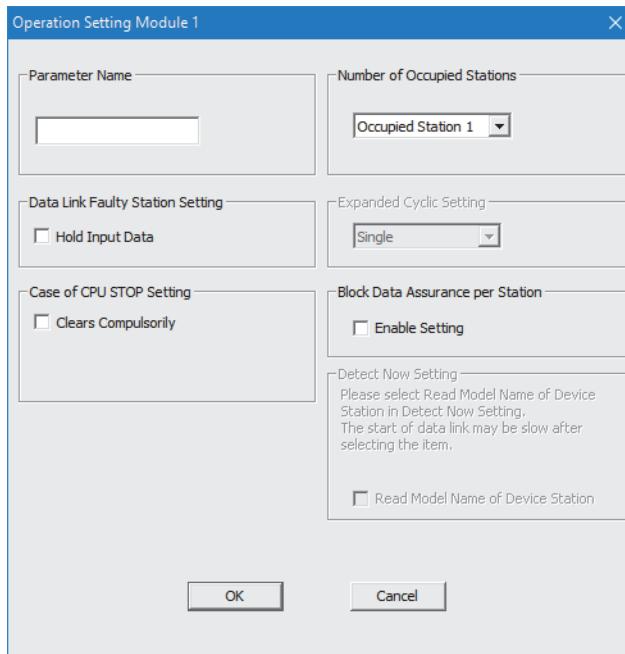
Item	Description	Setting range
Mode	Set the mode for a master/local module. (☞ Page 43, Section 3.6.2 to Page 51, Section 3.6.5) Set the same mode as a master station to use a master/local module as a standby master station.	<ul style="list-style-type: none"> • Remote Net(Ver.1 Mode) • Remote Net(Ver.2 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 Device 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)) <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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) Refresh timing Data are refreshed in the END process of a CPU module.	Blank or the following range <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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)

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, RW _r , and RW _w (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 device 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 Device 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(RW _r)		Same as "Remote Register(RW _r)"
Ver.2 Remote Register(RW _w)		Same as "Remote Register(RW _w)"
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)

(1) Operation setting

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link] \Rightarrow  button

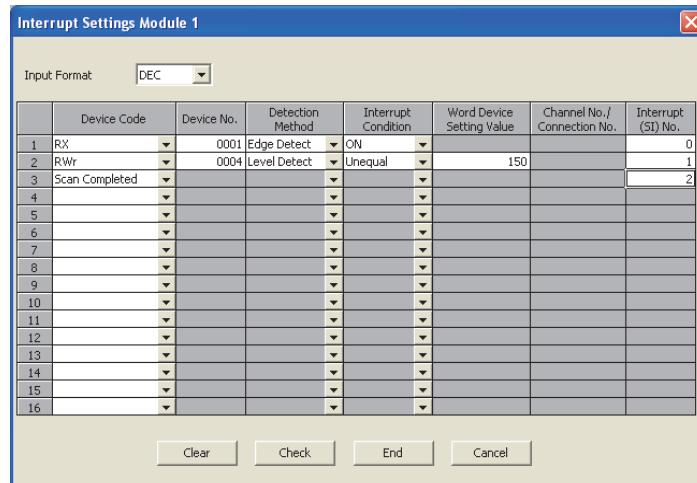


Item	Description	Setting range
Parameter Name	Set the name of the setting if needed. This item is displayed when the setting details of the network parameters are printed using a programming tool.	Eight characters (Default: Blank)
Data Link Faulty Station Setting	Select whether to clear or hold data input from a data link faulty station. ( Page 121, Section 7.5, Page 131, Section 8.2.3)	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • 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".	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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" 	<ul style="list-style-type: none"> • Single • Double • Quadruple • Octuple (Default: Single)
Block Data Assurance per Station	Select whether to assure the integrity of cyclic data for each device station. ( Page 150, Section 8.2.6 (1))	<ul style="list-style-type: none"> • Disable setting (not checked) • Enable setting (checked) (Default: Disable setting (not checked))

(2) Interrupt Settings

 Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link] \Rightarrow Interrupt Settings

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".	<ul style="list-style-type: none"> • DEC • HEX (Default: DEC)
Device Code	Set the device for the interrupt condition.	
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.	Refer to the following table.
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.

(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		—	—	—
SB	0 to 01FF _H	Level Detect + ON: Interrupt at ON Level Detect + OFF: Interrupt at OFF		—	—	—
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)		0 to 65535 (0 _H to FFFF _H)	—	0 to 15
SW	0 to 01FF _H	Level Detect + Equal: Interrupt when the value is matched Level Detect + Unequal: Interrupt when the value is not matched		—	—	—
Scan Completed		—		—	—	—

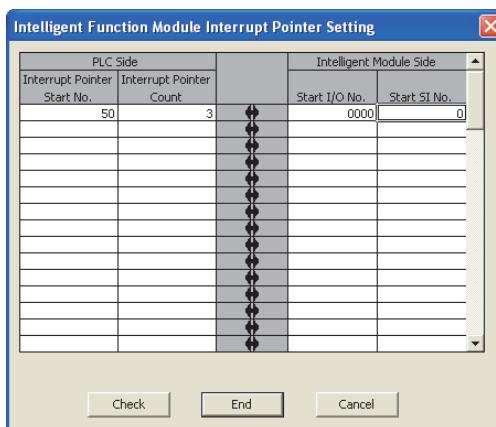
3. When completing the interrupt settings, open the "Intelligent Function Module Interrupt Pointer Setting" window of the PLC parameter.

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))

7.5 Status Difference Between a Master Station and a Device 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 CPU module of the master station is set to STOP at an error (data link continued)				Continue	*1	Continue	Hold	Continue *1
When the CPU module of the local station is set to STOP at an error (data link continued)				*2	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
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)	Hold	Hold					
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 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.					

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 a communication failure (such as power off) occurs in a local station	"Data Link Faulty Station Setting" of a programming tool (for master station setting)	Clear	Clears the receive area from the local station having a communication failure.	Continue	Continue	Holds the receive area from the local station having a communication failure.	Continue (Not affected by the communication status of the local station.)	Continue (Not affected by the communication status of the local station.)
		Hold	Holds the receive area from the local station having a communication failure.					

- *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.

(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 CPU module of the master station is set to STOP at an error (data link continued)		Continue	*1	Continue	Continue	Clear	Continue	Continue	Continue	Continue
When the CPU module of the local station is set to STOP at an error (data link continued)		Continue	Continue	Continue	Continue	Continue	*2	Continue	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.		

- *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.

CHAPTER 8 FUNCTIONS

8.1 Basic Applications of the Functions

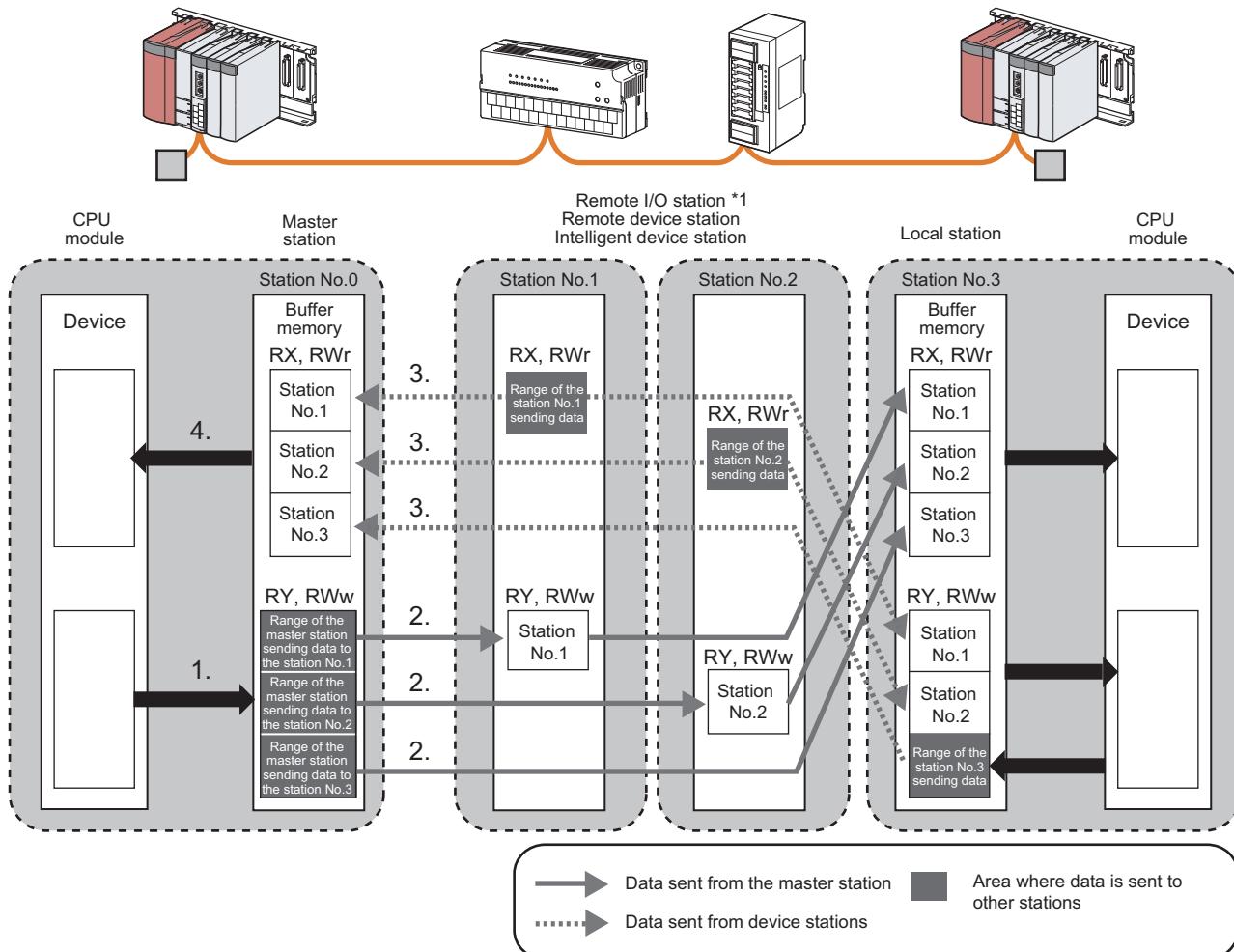
8.1.1 Periodic communications (cyclic transmission)

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 device station.

(1) Overview of communications

In CC-Link, communications are performed between the master station and device 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)

(2) How to start communications

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

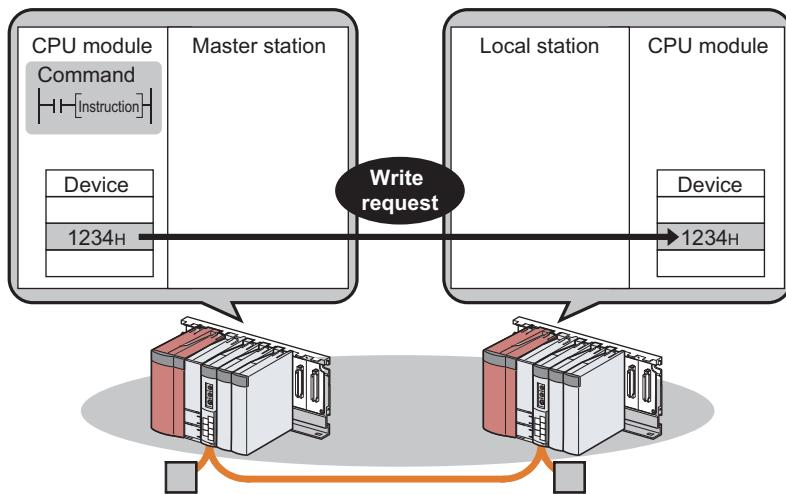
When the parameter settings are reflected, the master/local module starts data link automatically.

- 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.

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)

8.2 Improving the System Reliability

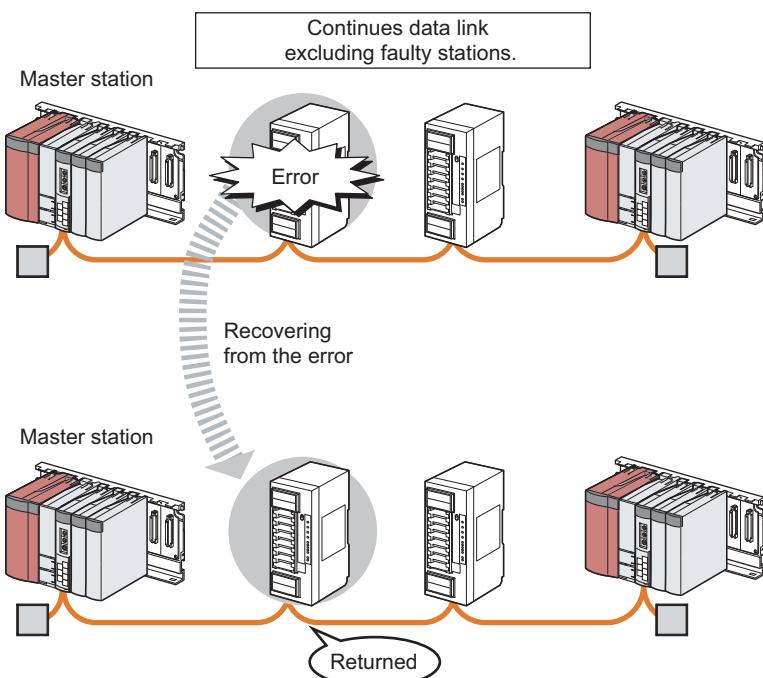
This section describes how to improve the CC-Link system reliability using the functions.

8.2.1 Device station cut-off and automatic return

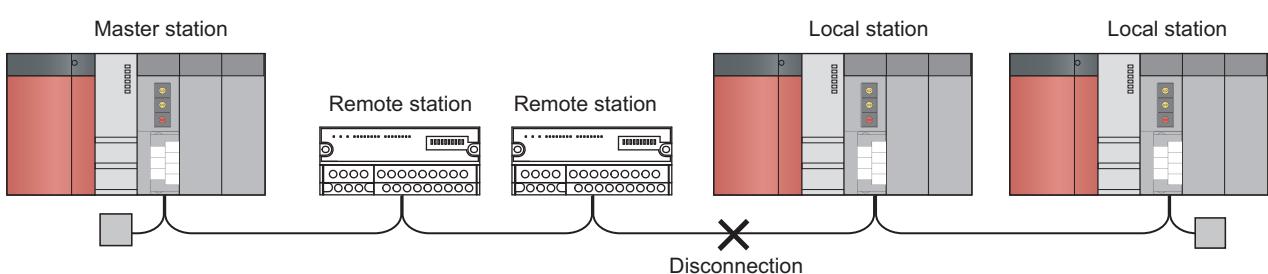
The device-station cut-off function disconnects a device station that cannot perform data link due to reasons such as power-off to continue the data link in a normal station.

The automatic return function allows data link to be automatically performed again when the device 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.



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



(1) Setting method

(a) Setting the device station cut-off function

No setting is required in the master/local module.

(b) Setting the automatic return function

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

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)

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)

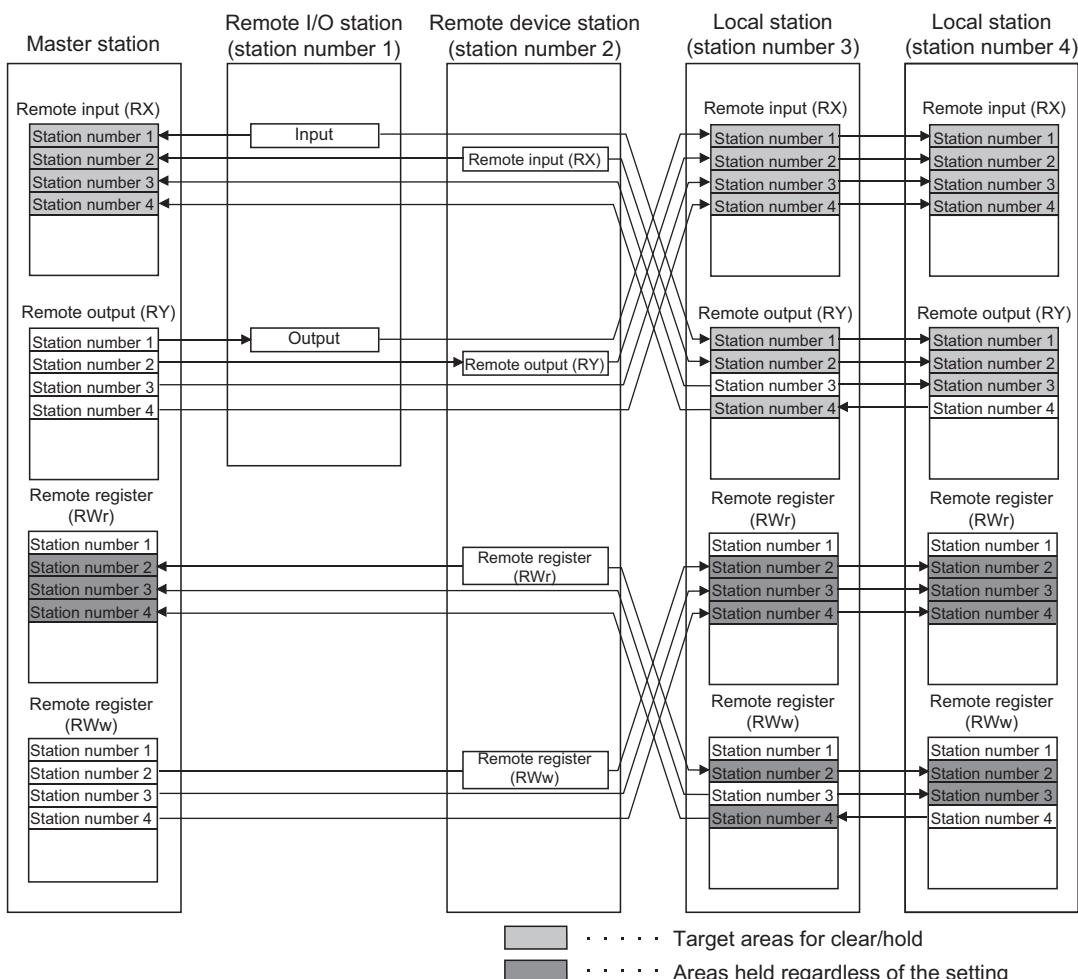
(1) Applicable input (receiving) data

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 (RW_r) of the master station
- Remote register (RW_r) of local stations
- Remote register (RW_w) 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.

(2) Setting method

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

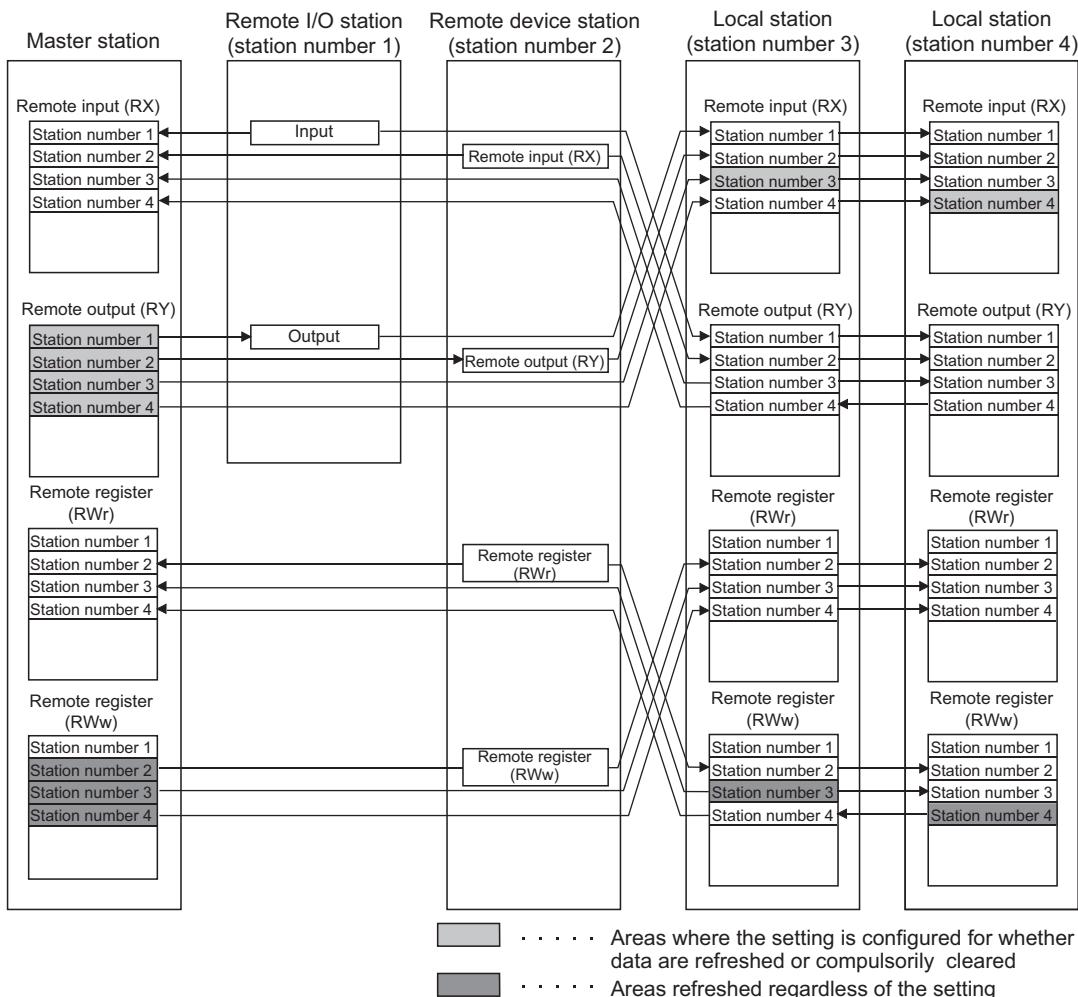
( Page 101, Section 7.3.2 (1) , Page 118, Section 7.4.2 (1))

8.2.4 Refreshing/compulsorily clearing a device 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 (RWw/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 device 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.

(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.

Number of Modules	1	Boards	Blank : No Setting	<input checked="" type="checkbox"/> Set
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)				
Remote Output(RY)	●			When Y is selected, remote output (RY) is compulsorily cleared regardless of parameter setting.
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			

(3) Setting method

Select whether to refresh or clear output (sending) data to a device 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))

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))

8

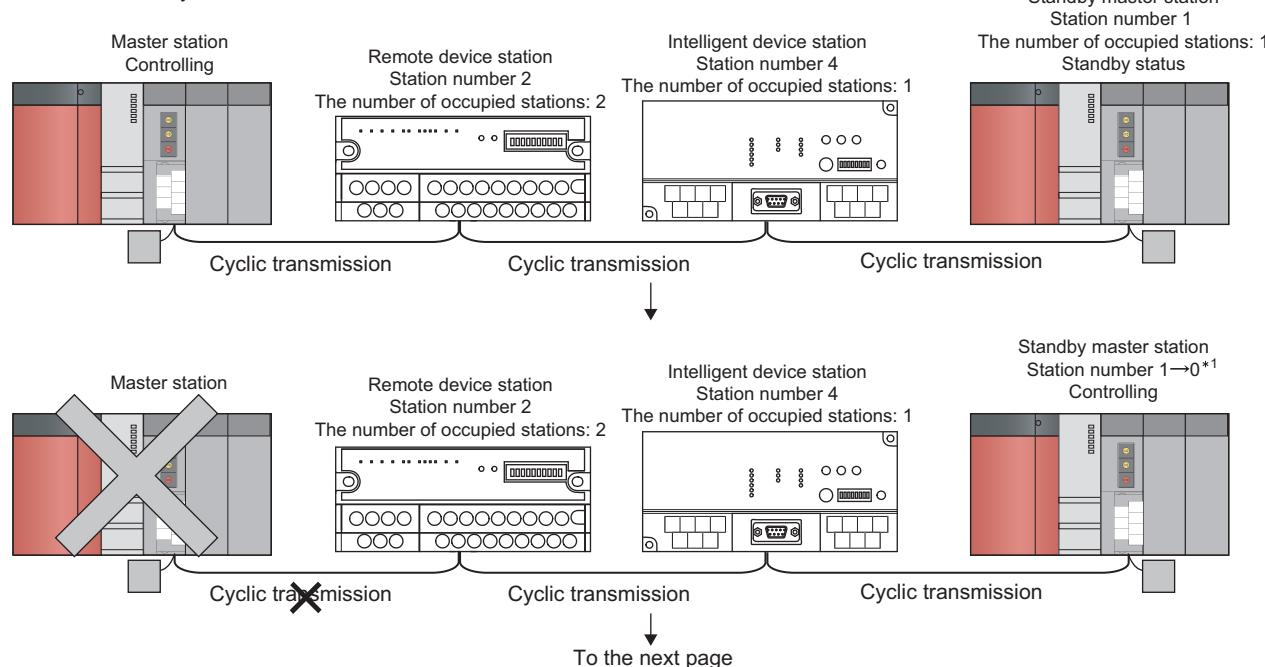
(2) Operation of the standby master function

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.

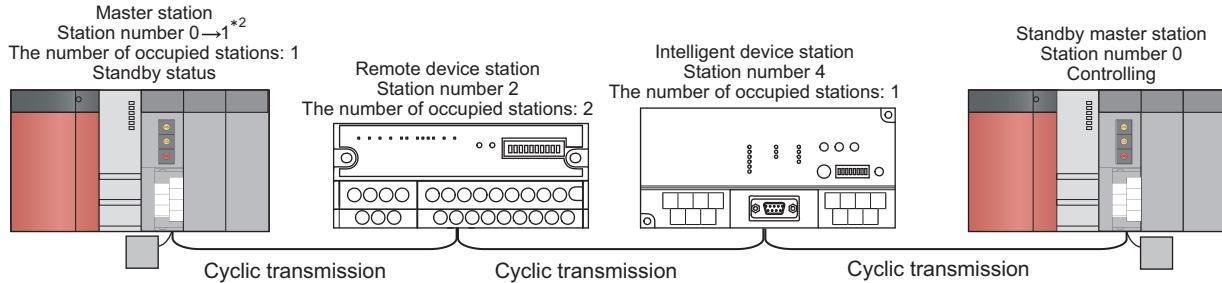
Data link control by the master station



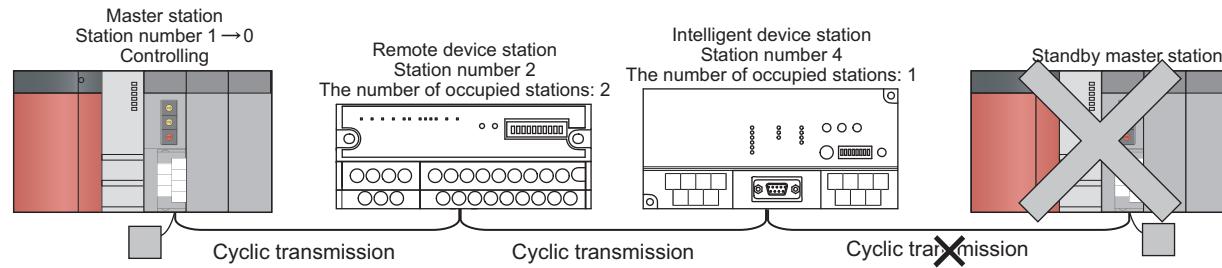
*1 When the master station goes down and the standby master station starts to take in control of data link, the station number of the standby master station becomes 0.

Continued from the previous page

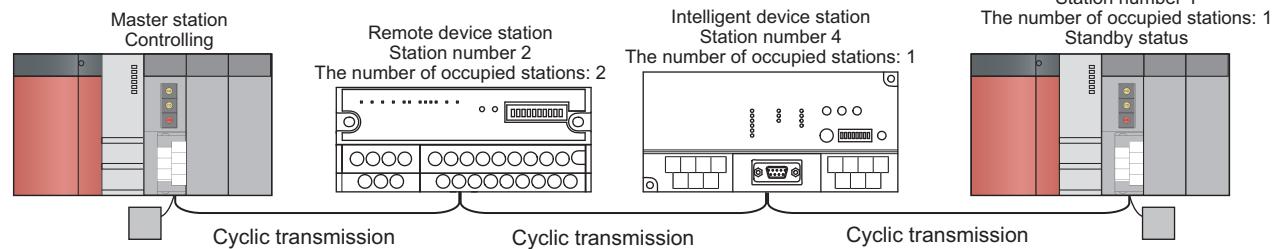
The master station in the normal state returns to the system operation. → The master station is on standby in case of the standby master station failure.



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.



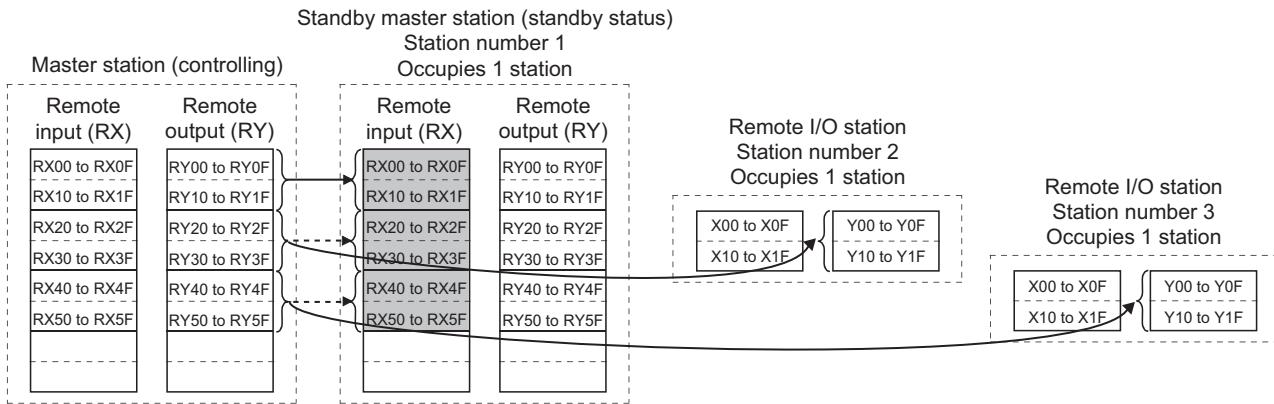
*2 When the master station returns as a standby master station, the station number of the master station becomes the number set in "Standby Master Station No." of the network parameter.

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

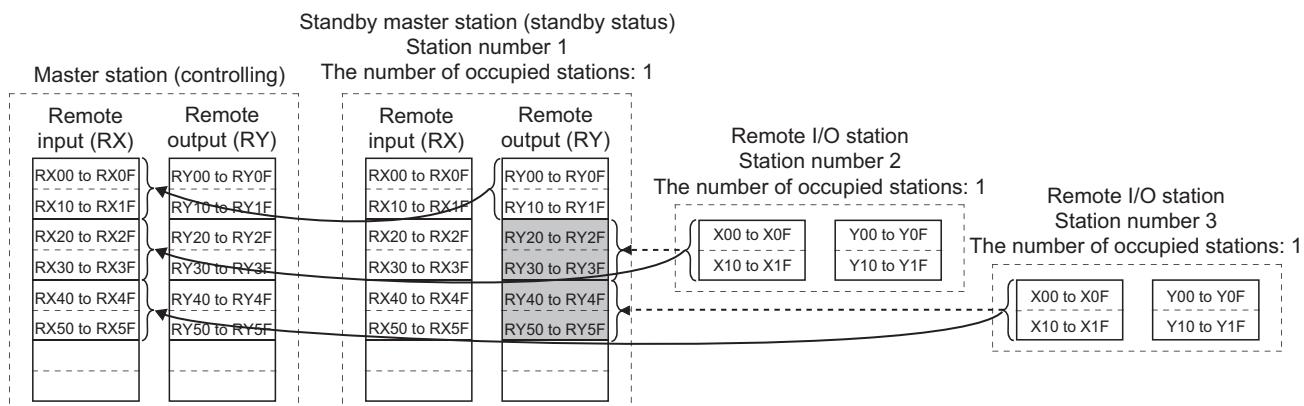
The following is an overview of data transmission of when the standby master function is used.

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

- Output from the master station



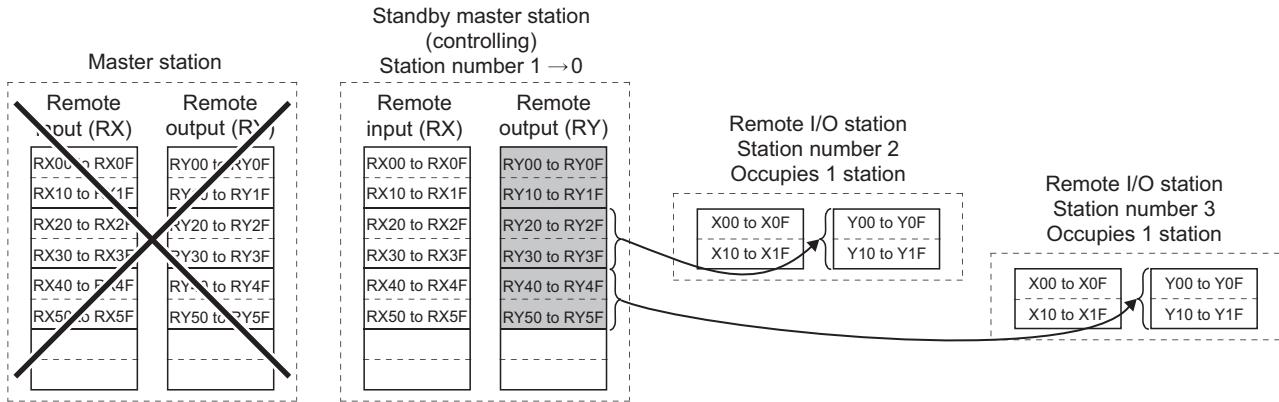
- Input of the master station



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

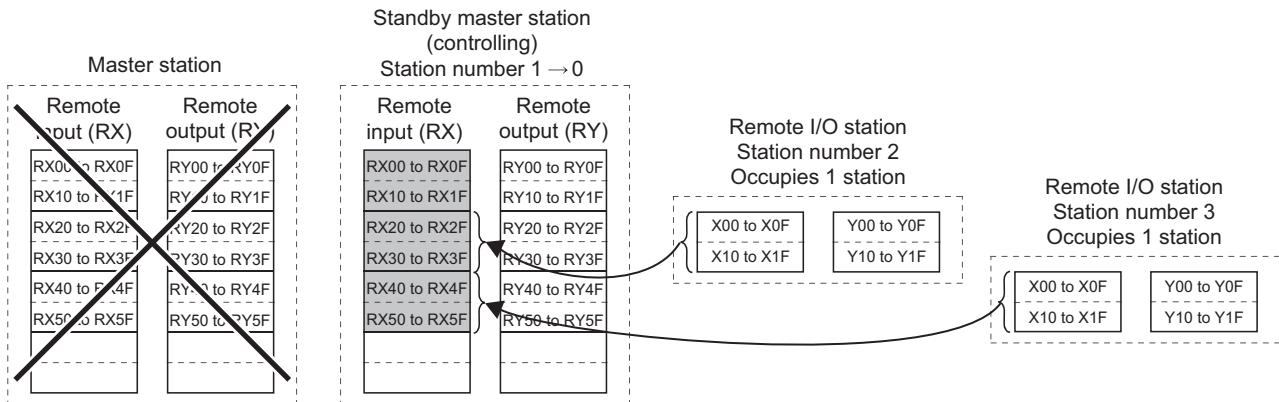
If the master station goes down, the standby master station takes over the control of data link.

- 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 device stations are continued (shaded areas in the figure above). (☞ Page 147, Section 8.2.5 (7))

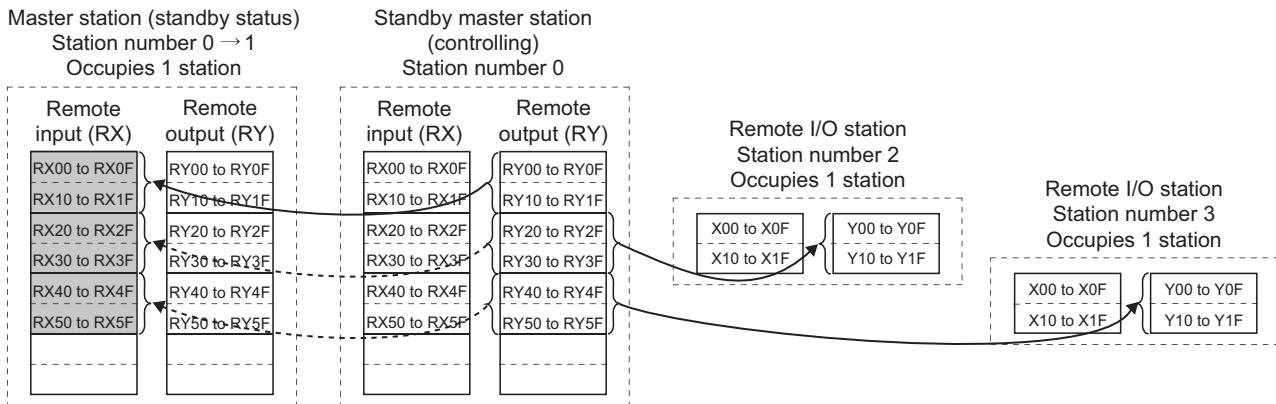
- Input of the standby master station



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 device stations are continued (shaded areas in the figure above). (☞ Page 147, Section 8.2.5 (7))

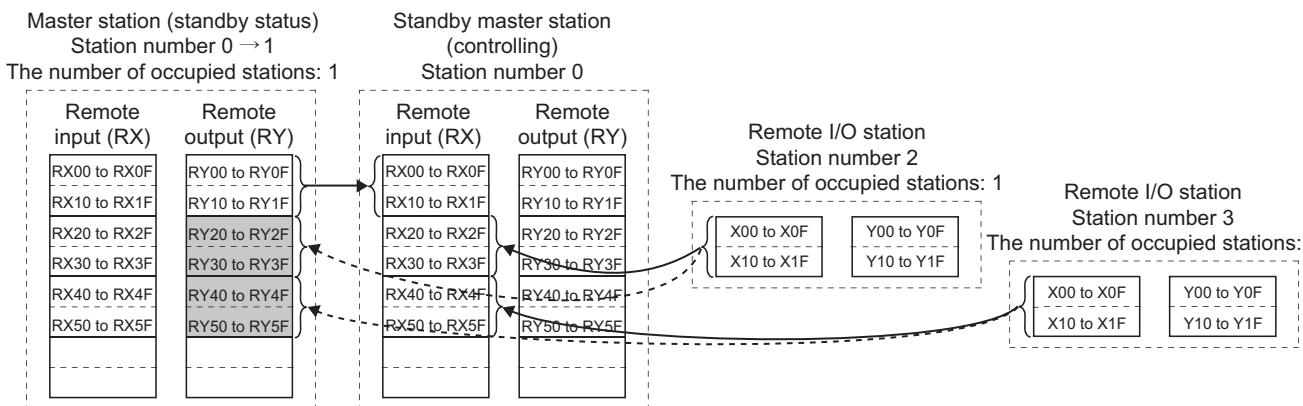
(c) Operation between the master station returning and the standby master station controlling data link

- 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

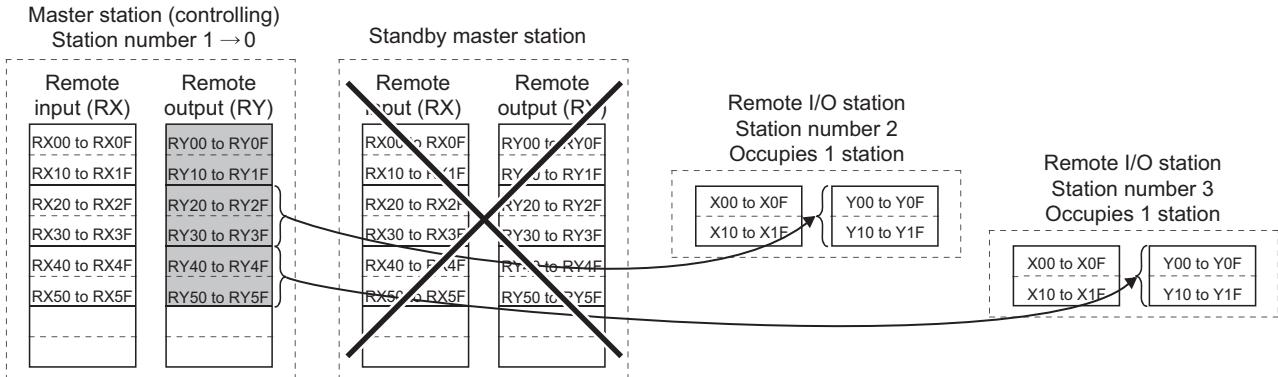


Inputs (RX/RWr) from device stations to the standby master station are stored in outputs (RY/RWw) of the master station (shaded areas in the figure above).

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

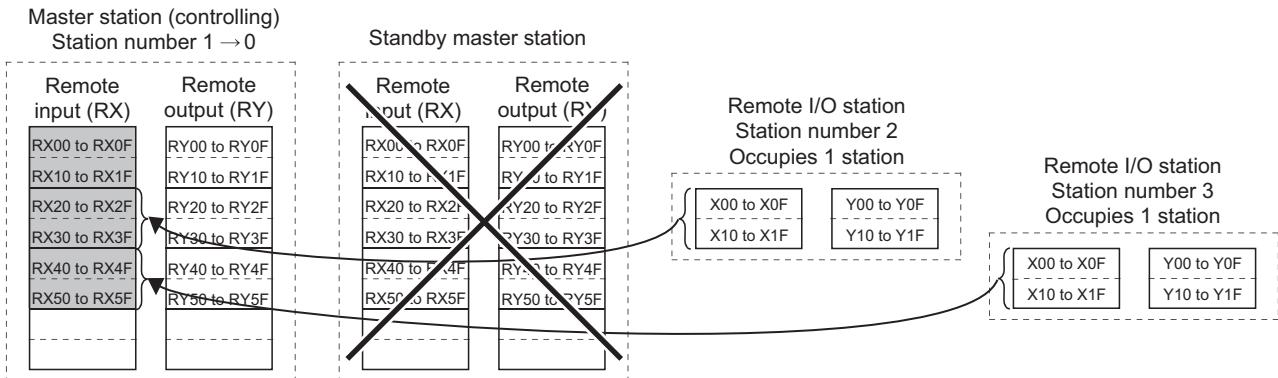
If the standby master station goes down, the master station takes over the control of data link.

- 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 device 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 device stations are continued (shaded areas in the figure above). (☞ Page 147, Section 8.2.5 (7))

(4) Setting method

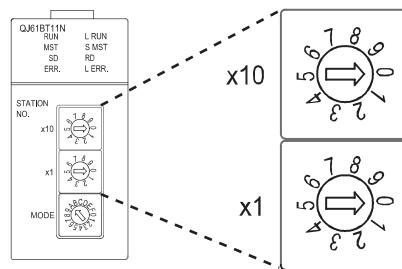
Set the function in the network parameters of a programming tool.

 Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link]

(a) Setting the 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 \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link]

O: Enabled, x: 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	<input checked="" type="radio"/>	x	x	Master Station
Master station duplex function	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	Master Station (Duplex Function)
Data link start function using a standby master station	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Master Station (Duplex Function)

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

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

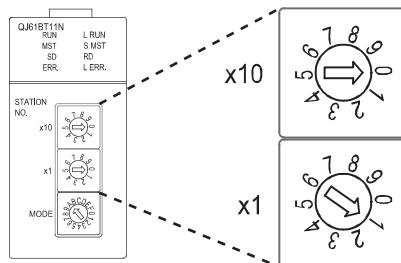
Start I/O No.	1 0000
Operation Setting	<u>Operation Setting</u>
Type	Master Station(Duplex Function)
Master Station Data Link Type	PLC Parameter Auto Start
Mode	Remote Net(Ver.1 Mode)
Total Module Connected(*1)	1
Remote Input(RX)	X1000
Remote Output(RY)	Y1000
Remote Register(R/W)	W0
Remote Register(R/Wn)	W100
Ver.2 Remote Input(RX)	
Ver.2 Remote Output(RY)	
Ver.2 Remote Register(R/W)	
Ver.2 Remote Register(R/Wn)	
Special Relay(SB)	S0
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	<u>CC-Link Configuration Setting</u>
Remote Device Station Initial Setting	Initial Setting
Interrupt Settings	Interrupt Settings

(b) Setting the 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.

- 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.



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

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link]

O: Enabled, \times : 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	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Standby Master Station
Master station duplex function	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Standby Master Station
Data link start function using a standby master station	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Master Station (Duplex Function)

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

- 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"

Start I/O No.	1 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)	S80
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

(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 master 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.)

(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	<ul style="list-style-type: none">• 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)).

(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)

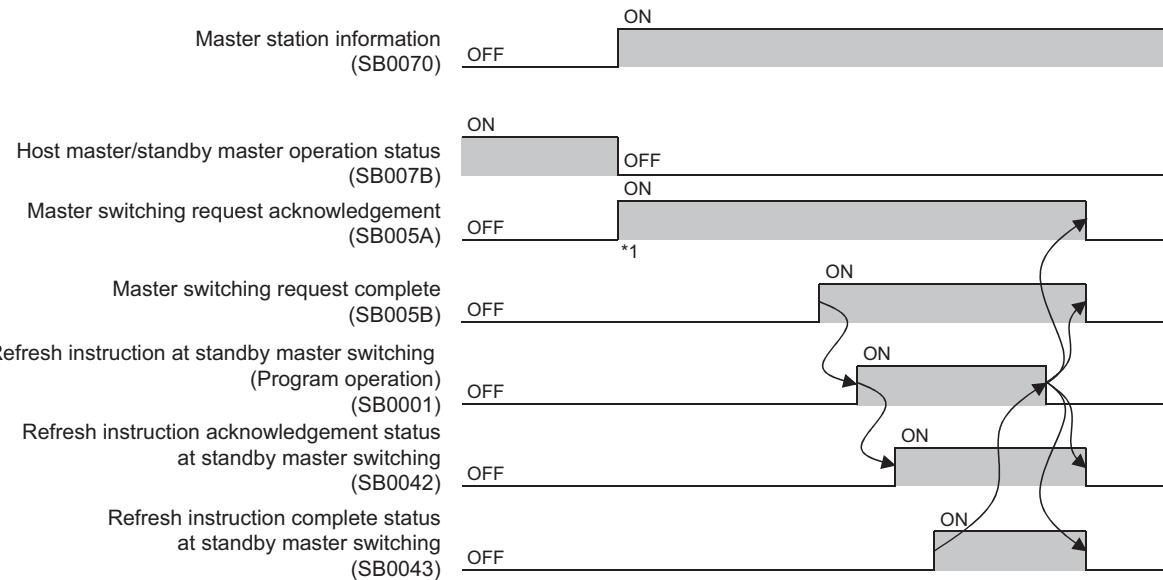
Link special registers (SWs) related to the standby master function are listed below.

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)

(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 set 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 sets 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).

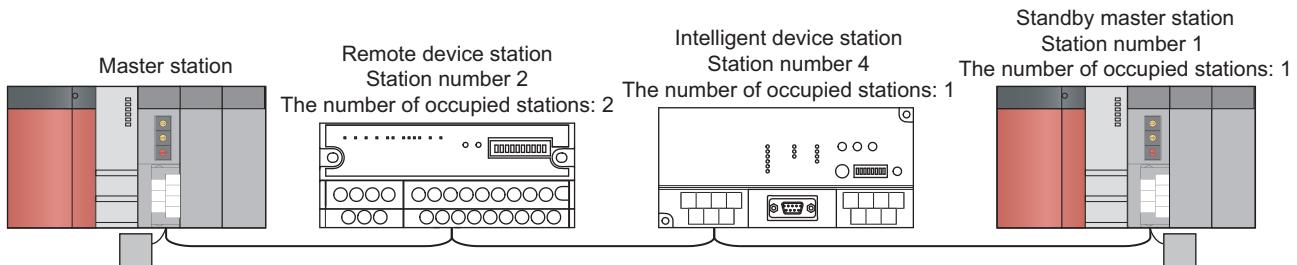
(7) Example of communications when the master station duplex function is used

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

Number of Modules	1	Boards	Blank : No Setting	<input checked="" type="checkbox"/> Set
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)	3			
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)	S80			
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			

The screenshot shows the CC-Link Configuration software interface. On the left, a table lists the connected stations:

Station No.	Model Name	Station Type	Version	# of STA Occupied	Expanded Cyclic Setting
0/0	Host Station	Master Station (Duplex Function)			
2/2	AJ61BT-6-4DAI	Standby Master Station	Ver.1	1 Occupied Station	Single
3/4	AJ65BT-64 DAI	Remote Device Station	Ver.1	2 Occupied Stations	Single
3/4	AJ65BT-64 DAI	Intelligent Device Station	Ver.1	1 Occupied Station	Single

On the right, a schematic diagram shows the station connections:

- Host Station:** STA#0 Master Station Ver.1 All Connected Count:3 Total STA#4
- Standby Master Station:** STA#1 STBY Master
- Remote Device Station:** STA#2-3
- Intelligent Device Station:** STA#4

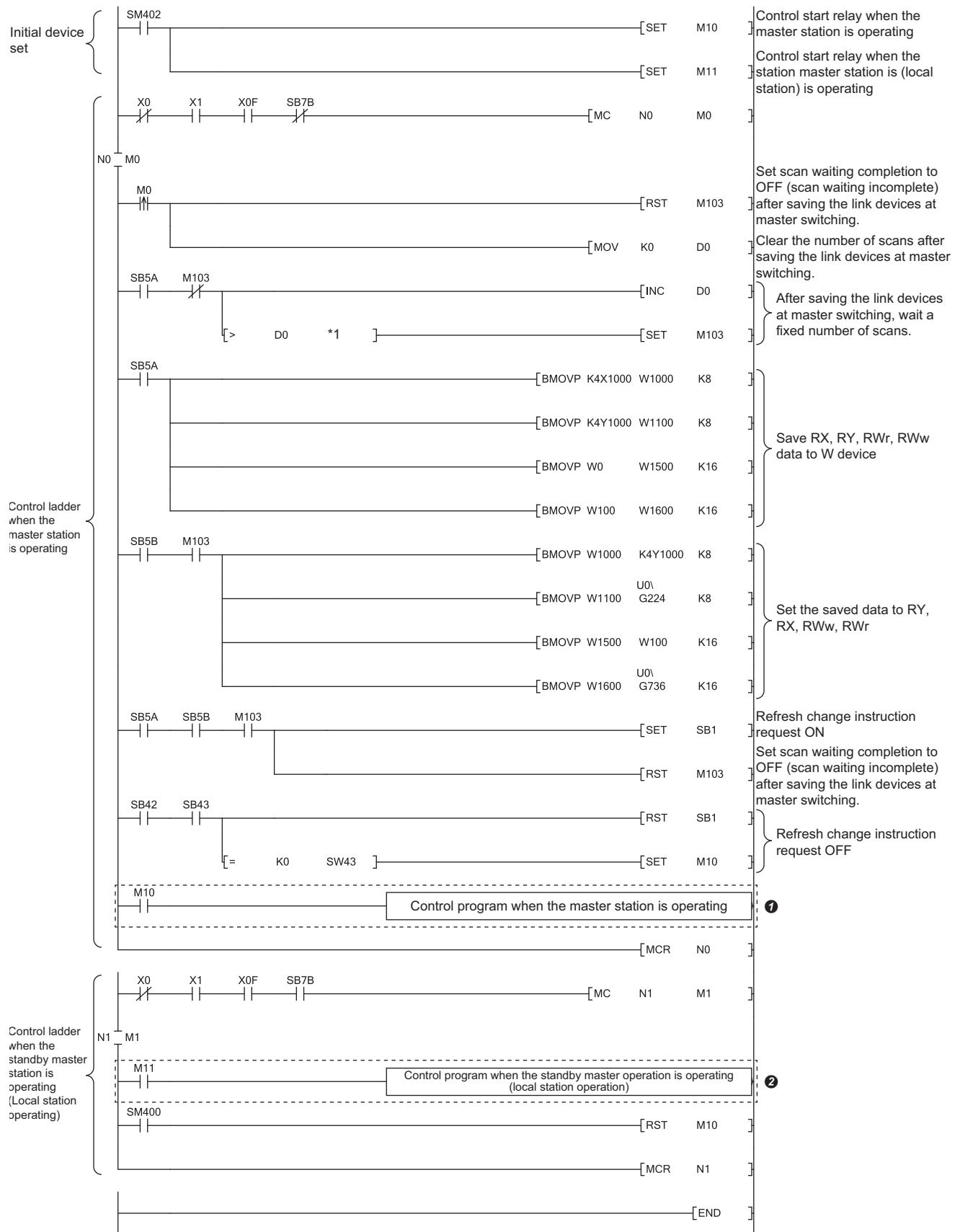
Below the schematic, the module types are listed: QJ61BT11N, AJ65BT-64 DAI, and Gen. Intelligent Device Station.

(c) Parameter settings for a standby master station

Number of Modules	1	Boards	Blank : No Setting	<input type="checkbox"/> Set
Start I/O No.	0000			
Operation Setting	Operation Setting			
Type	Standby Master Station			
Master Station Data Link Type	PLC Parameter Auto Start			
Mode	Remote Net(Ver.1 Mode)			
Total Module Connected				
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)	S80			
Special Register(SW)	SW0			
Retry Count				
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				

(d) Program example

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

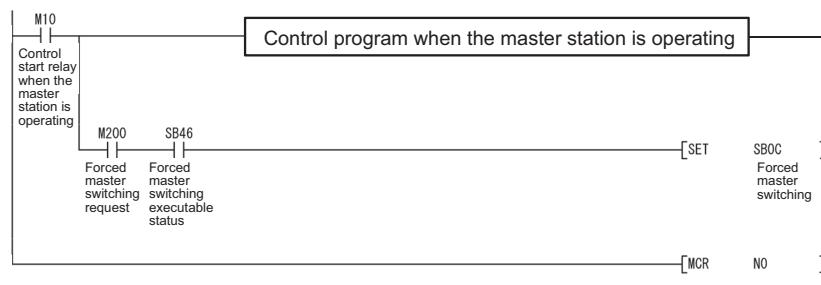


- *1 After saving the link devices, wait a fixed number of scans and execute the processing that sets the link devices saved at master switching and Refresh instruction at standby master switching (SB0001).
 For details, refer to Page 143, Section 8.2.5 (5).

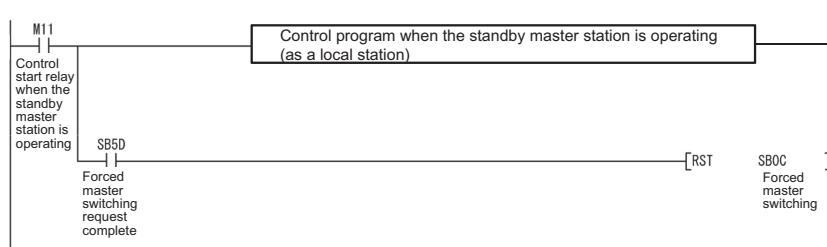
(e) When the right of controlling data link is compulsorily transferred from the standby master station to the master station

In the program example in Page 148, Section 8.2.5 (7) (d), change the sections in the dotted lines ① and ② as follows.

- Program ①



- Program ②



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 device 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

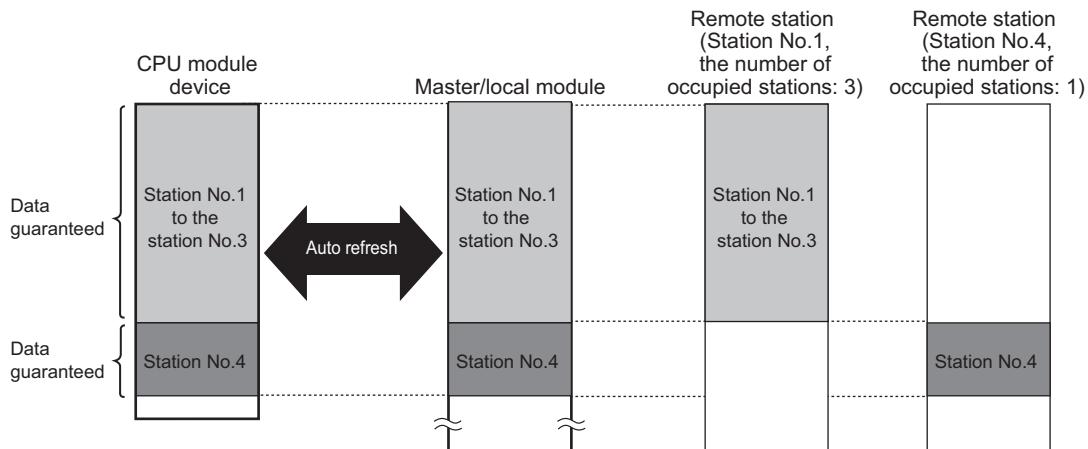
This function is applicable to data automatically transferred to a CPU module (automatic refresh) by setting the refresh device of the network parameter.

Data in RX, RY, RWr, and RWw are assured per device station.

(b) Operation of a data assurance

Identity of data per device station is assured as follows.

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



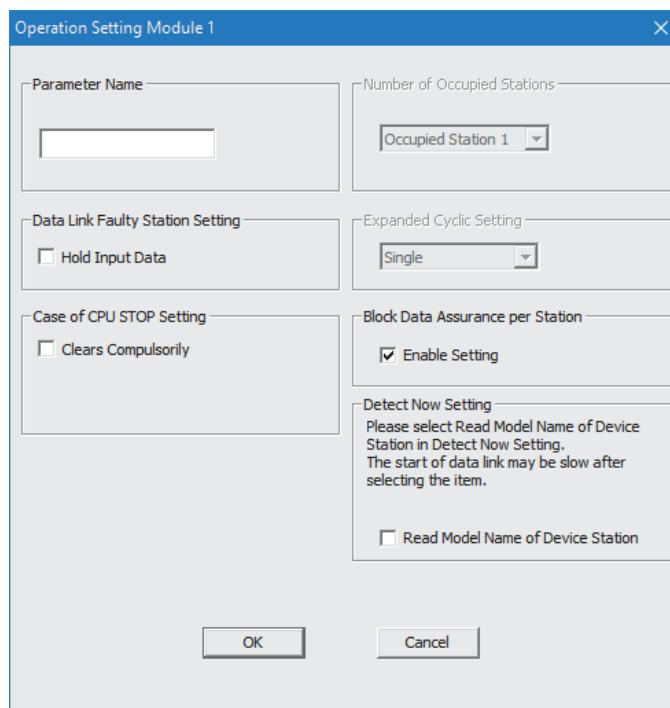
(c) Setting method

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
Start I/O No.	1	0000	2	
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)				
Ver.2 Remote Register(RWr)				

(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 (RW_r, RW_w) of the buffer memory may not be refreshed.

- Assurance of 32-bit data

Integrity of 32-bit data in remote register (RW_r/RW_w) 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)

(2) 32-bit data integrity assurance

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

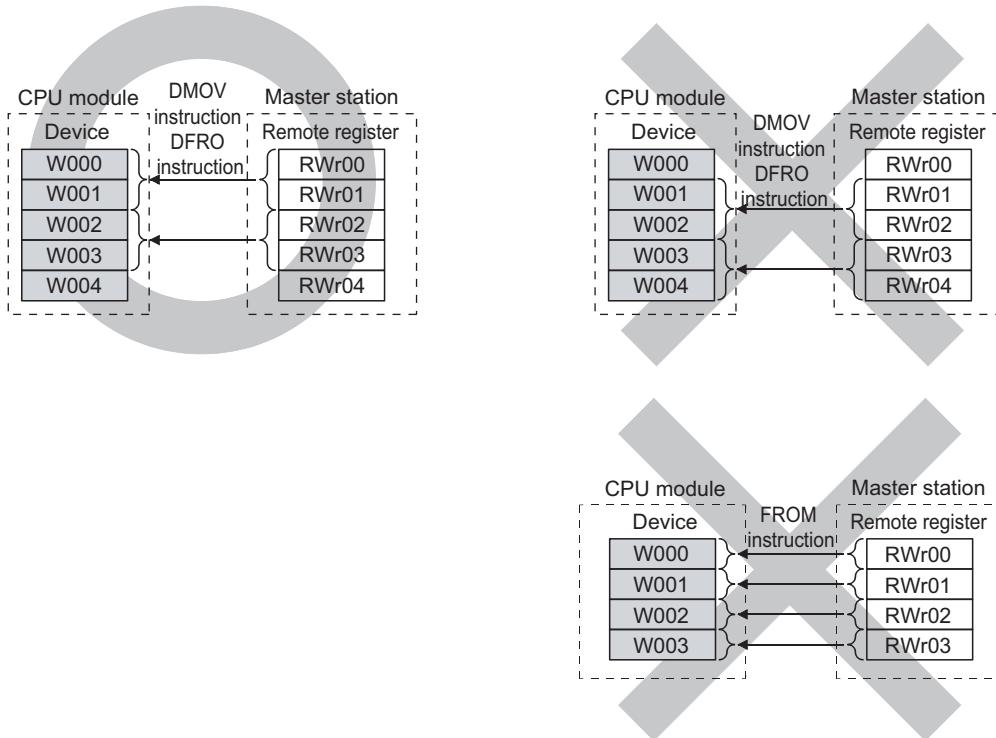
(a) Data to be assured

The data in the remote register (RW_r/RW_w) 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 (RW_r/RW_w) has an even number.
- When accessing the remote register (RW_r/RW_w) using a program, access them with an even number of devices.



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.

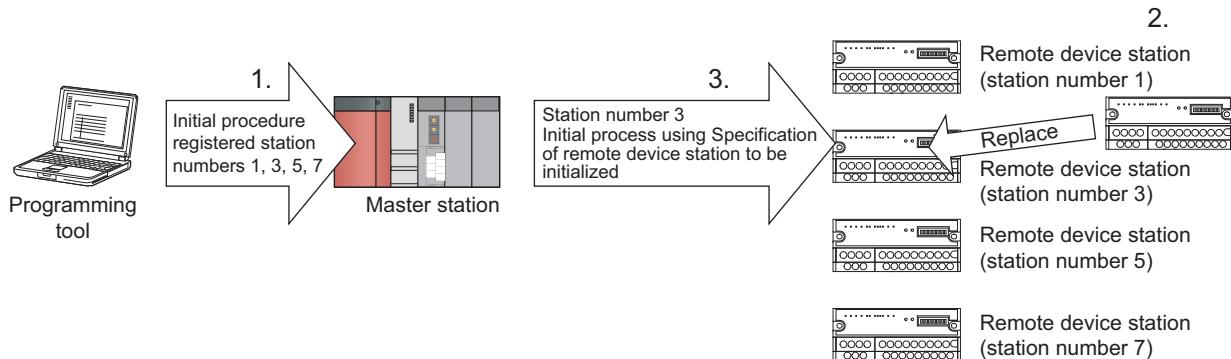
(3) How to configure the initial setting

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)

(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.



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.

(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 (RW_r, RW_w) 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.

(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	<ul style="list-style-type: none"> • 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).

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

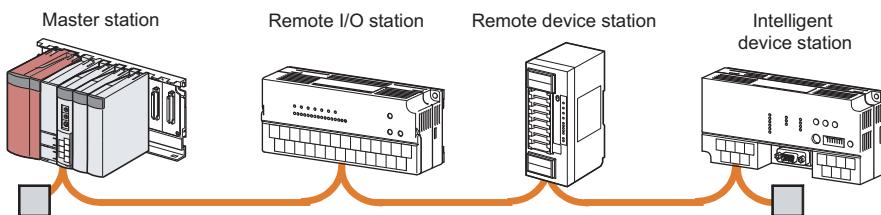
(2) How to configure the interrupt settings

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))

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.

(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.

(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.

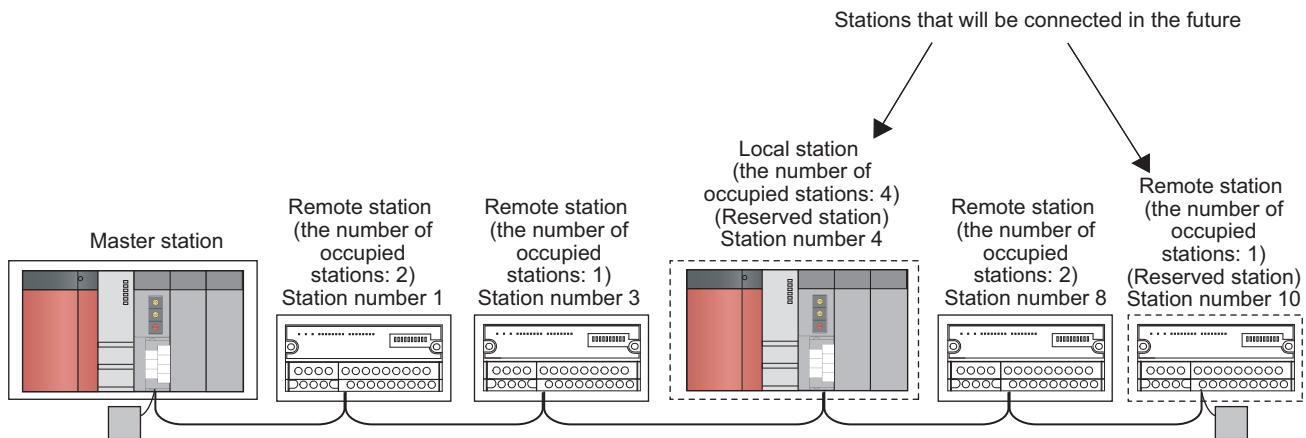
(c) When using a Basic model QCPU

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.

8.3.4 Reserved station function

Device 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 device stations that will be connected in future as reserved stations, device 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 device 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))

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.



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.



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.

(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.

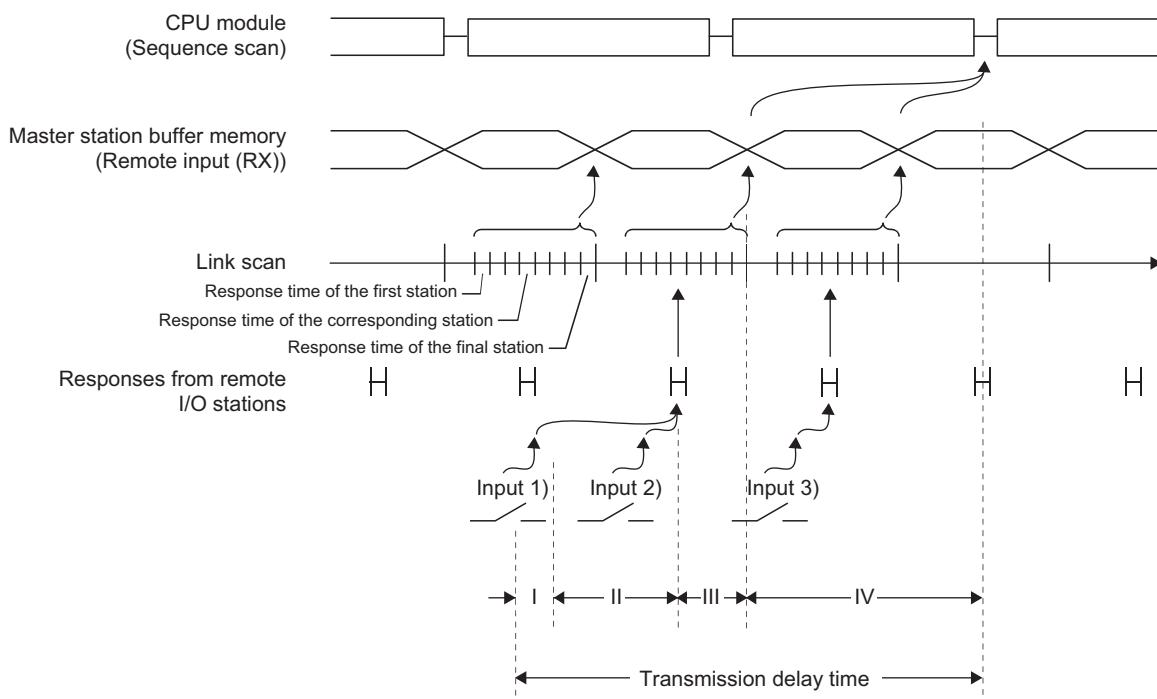
Point

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)	
Extended link register (W) (Universal model QCPU only)	Delete all latch range settings.
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

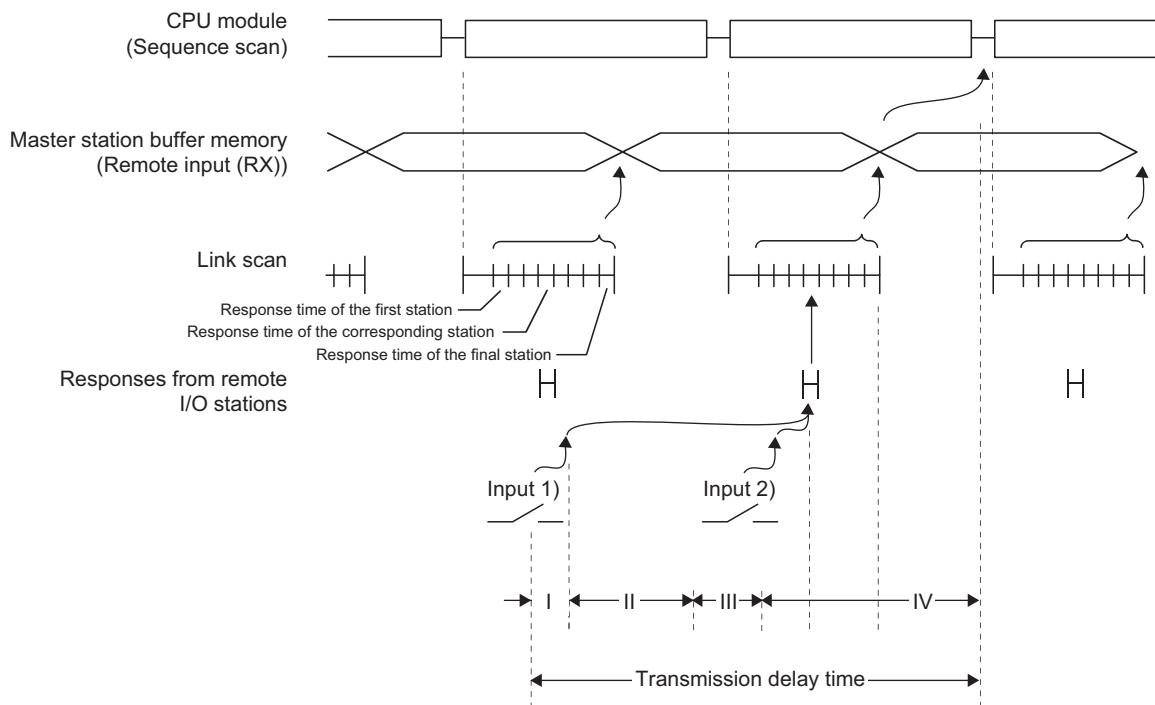
II: Delay time of transmission from the remote I/O station to the master station

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

(b) Data flow in the synchronous mode

- Sequence scan \geq link scan



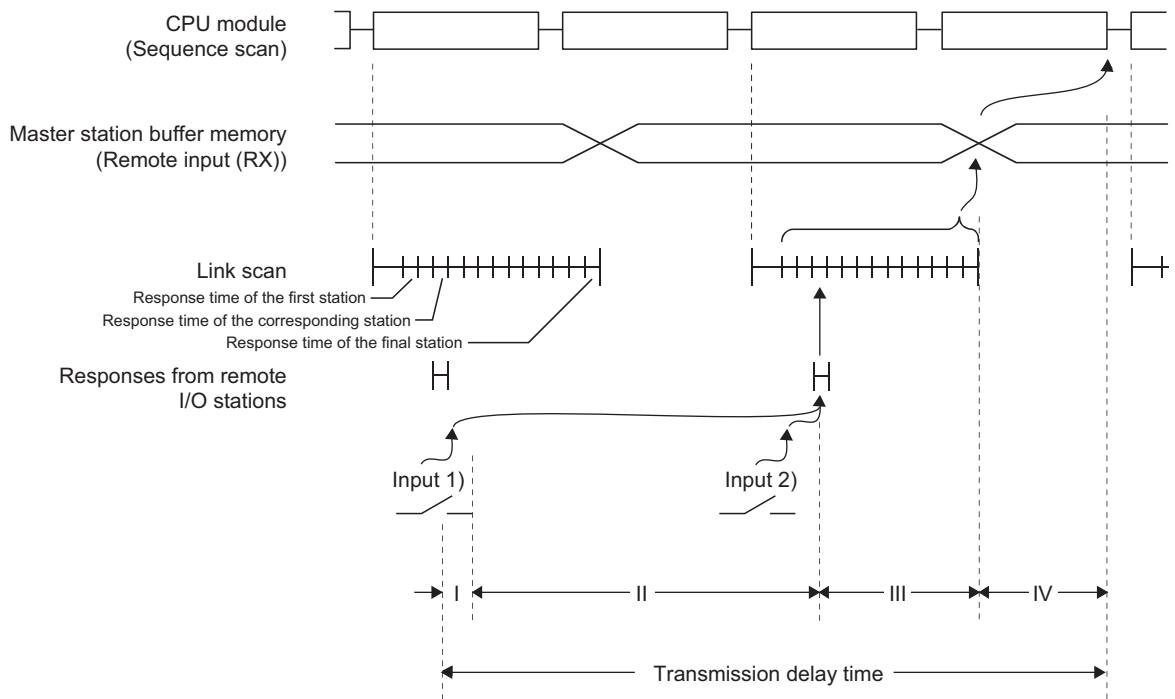
I: Delay time due to response delay of the remote I/O station

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

- Sequence scan < Link scan

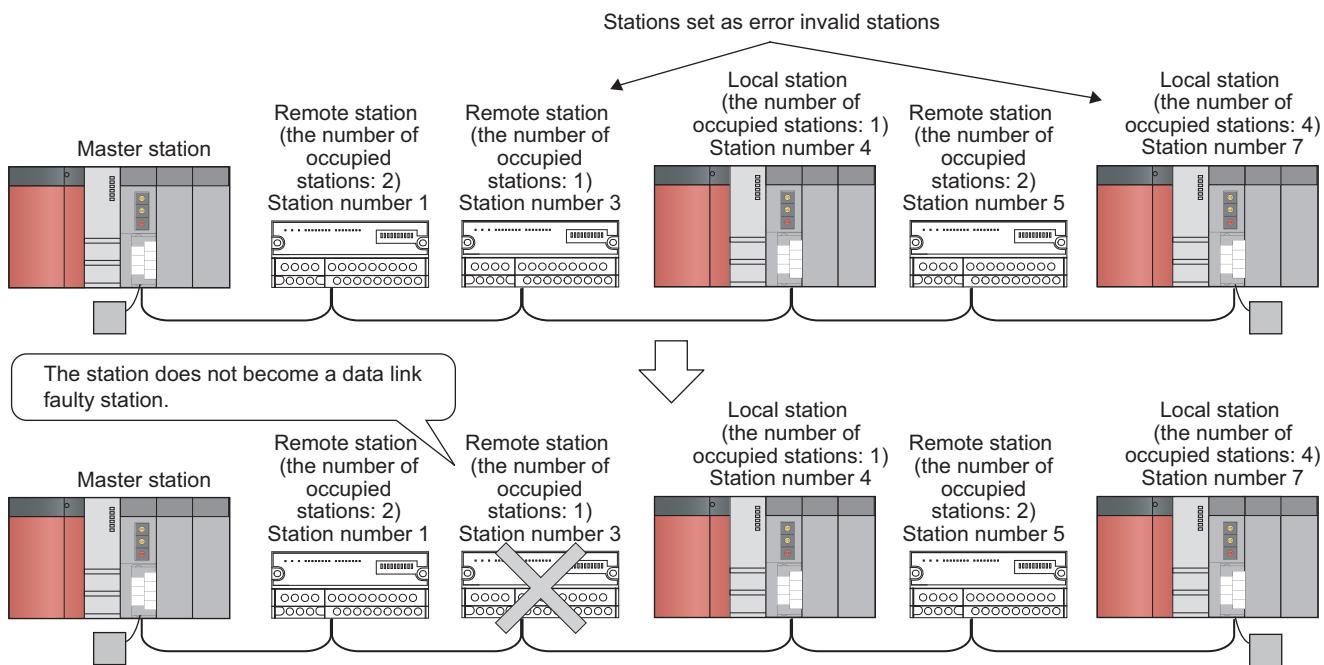


- I: Delay time due to response delay of the remote I/O station
 II: Delay time of transmission from the remote I/O station to the master station
 III: Delay time between the master station receiving data and the data being stored into the buffer memory
 IV: Delay time until information of the master station is refreshed in the CPU module

8.3.6 Error invalid station setting function

Even if a data link error occurs in a device station, the station is not detected as a faulty station in the master station and local station. This function is used when a device 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 device 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 device 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))

8.3.7 Temporary error invalid station setting function

Even if a data link error occurs in a device 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 device stations for maintenance or for other purposes during data link.

Point

- If an error occurs in all the device 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	<ul style="list-style-type: none">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	<ul style="list-style-type: none">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)

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.

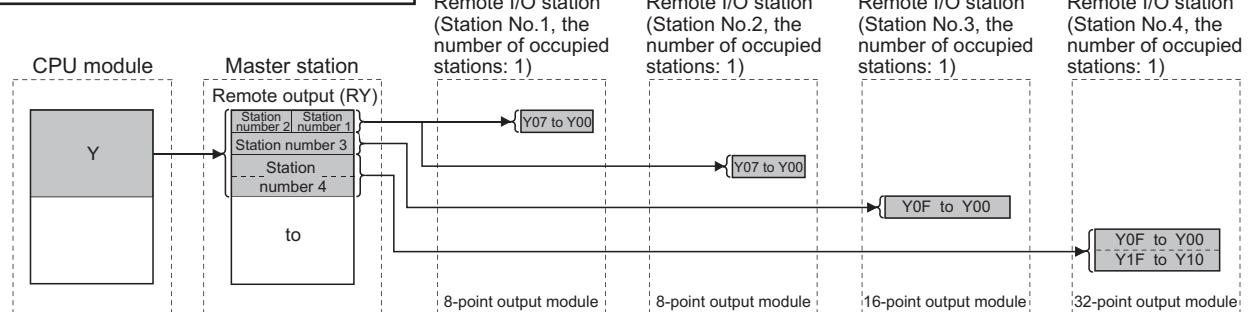
- CC-Link diagnostics (☞ Page 320, Section 11.4.5)
- Link special relays (SBs) or link special registers (SWs)
Values in parentheses are buffer memory addresses and bit numbers.

Item	Link special relay (SB) and link special register (SW) to be used
Data link stop	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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)

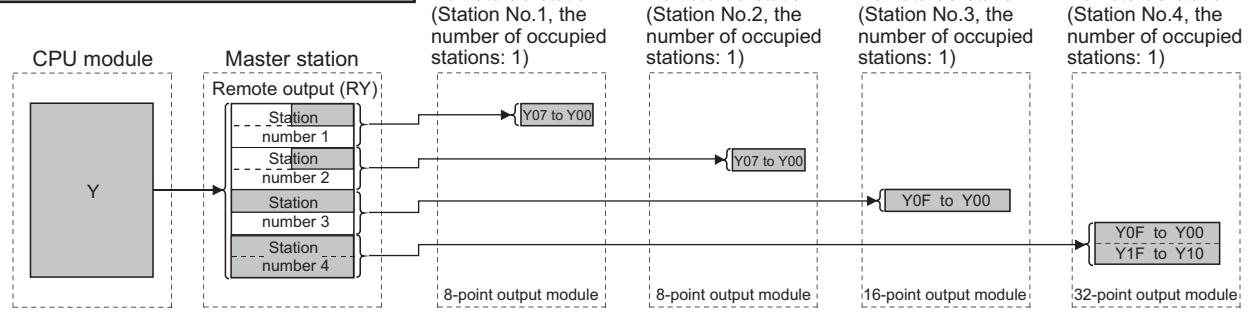
8.3.9 Remote I/O station points setting (remote net Ver.2 mode only)

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.)

The remote I/O station points setting is configured.



The remote I/O station points setting is not configured.



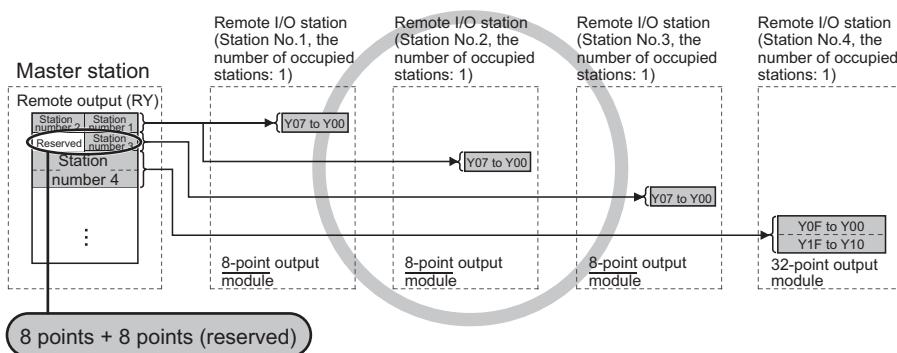
(1) Setting method

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))

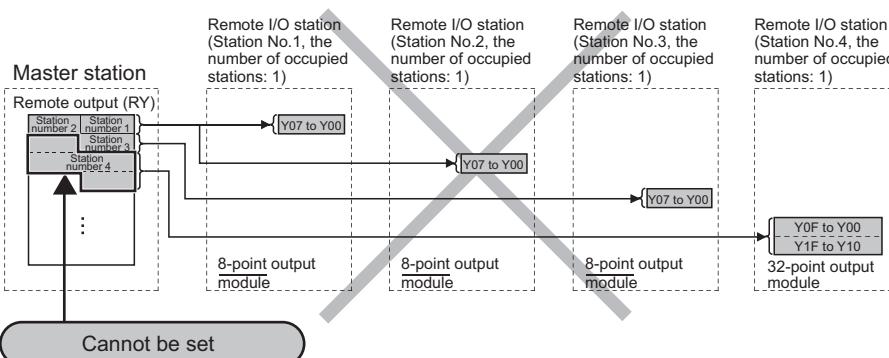
Point

- 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.

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.



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).

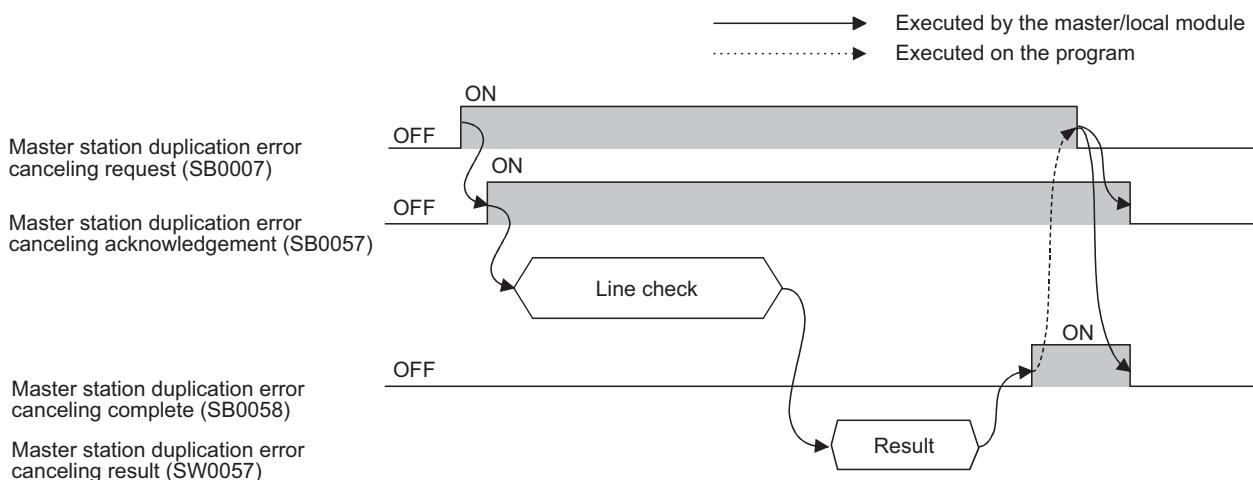
(2) Link special relays (SBs) and a link special register (SW) related to the master station duplication error canceling function

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)



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	Reads/writes parameters from the master station to the remote device station and reads out the status. The instructions can be used with the remote device station, for example NZ2AW1C2AL, that supports 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.

(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, △: Applicable only for SW0009, ×: 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	△	×

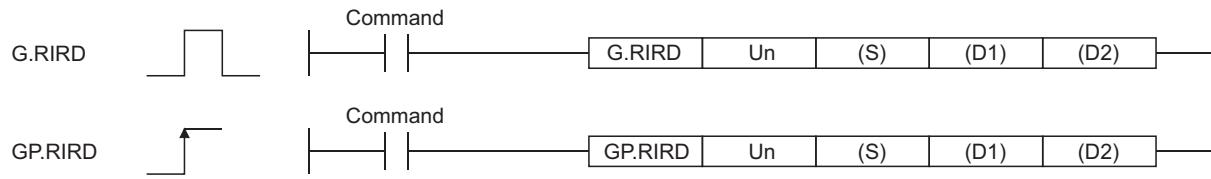
No retry is performed if the target station is disconnected at the execution of the dedicated instruction.

- 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))

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.

[Instruction symbol] [Execution condition]



Setting data	Applicable device								Others	
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		
	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.

(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. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>b15 to b8</td> <td>b7 to b0</td> </tr> <tr> <td>Access code</td> <td>Attribute code</td> </tr> </table>	b15 to b8	b7 to b0	Access code	Attribute code	Refer to (b) and (C).	User
b15 to b8	b7 to b0							
Access code	Attribute code							
(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	
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

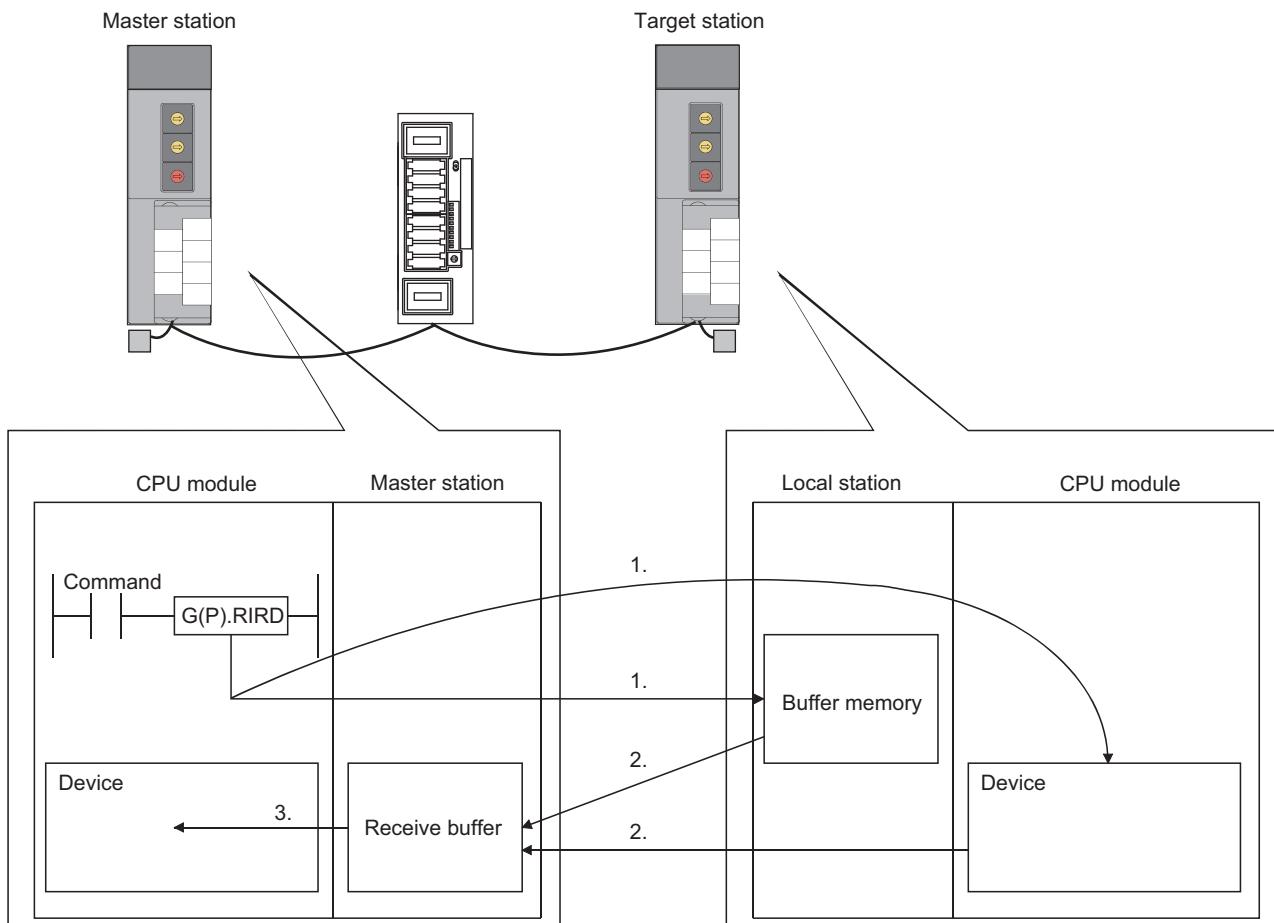
(c) Access code and attribute code (When accessing to the device in a CPU module)

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.

(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, a standby master station, or intelligent device stations from a master station.

However, concurrent execution of the instruction is not allowed to the same station. In addition, concurrent execution of the instruction is not allowed to the different stations from local stations. (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.

(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

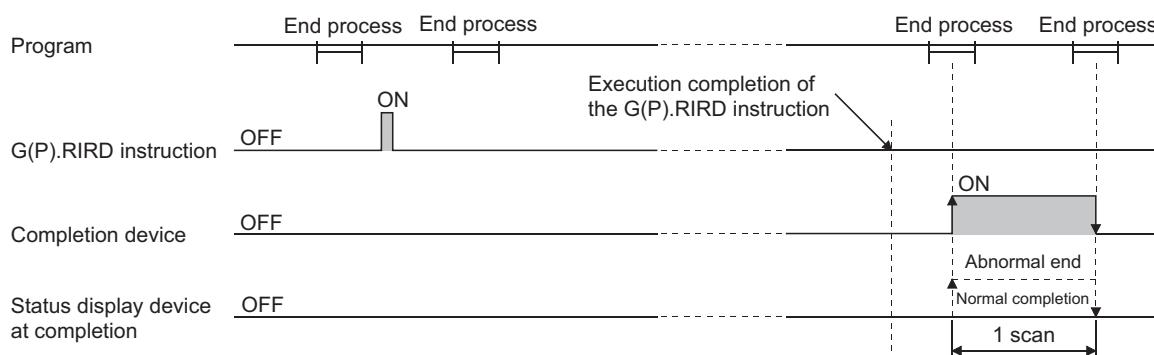
Turns on in the END process of the scan where the G(P).RIRD instruction is completed, and turns off in the next END process.

- 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

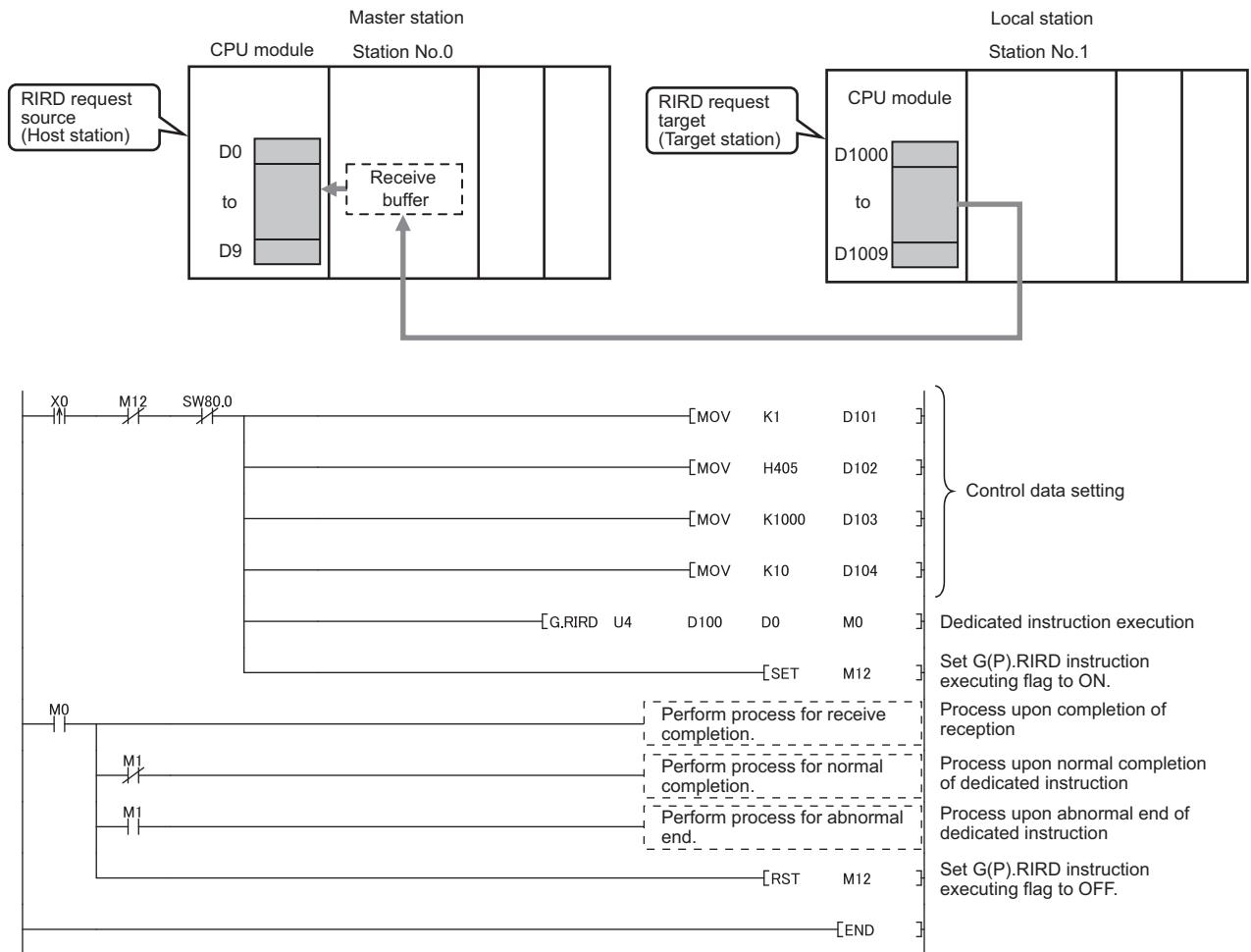
For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

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

9.2.1 Program example

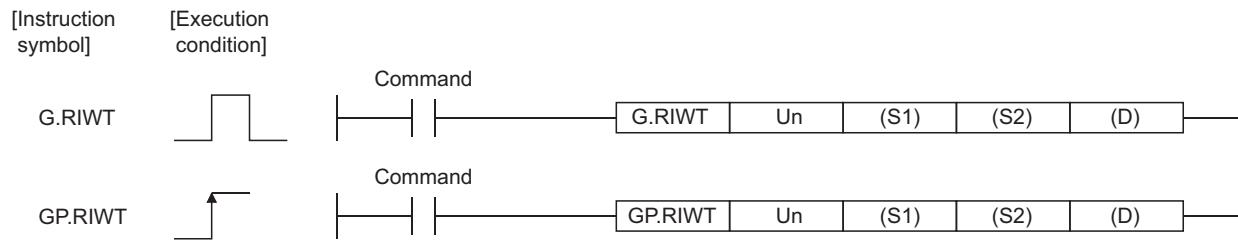
This section shows an example of the program to read 10-word data from the area starting from D1000 in the local station (station number 1) to the area starting from D0 in the master station when X0 is turned on in the following system configuration.

- 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.



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								Others		
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□		Index register Z□	Constant		
	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.

(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. <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>b15 to b8</td> <td>b7 to b0</td> </tr> <tr> <td>Access code</td> <td>Attribute code</td> </tr> </table>	b15 to b8	b7 to b0	Access code	Attribute code	Refer to (b) and (C).	User
b15 to b8	b7 to b0							
Access code	Attribute code							
(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	
Buffers in a master station and a local station	Random access buffer	20 _H	04 _H
	Remote input	21 _H	
	Remote output	22 _H	
	Remote register	24 _H	
	Link special relay	63 _H	
	Link special register	64 _H	

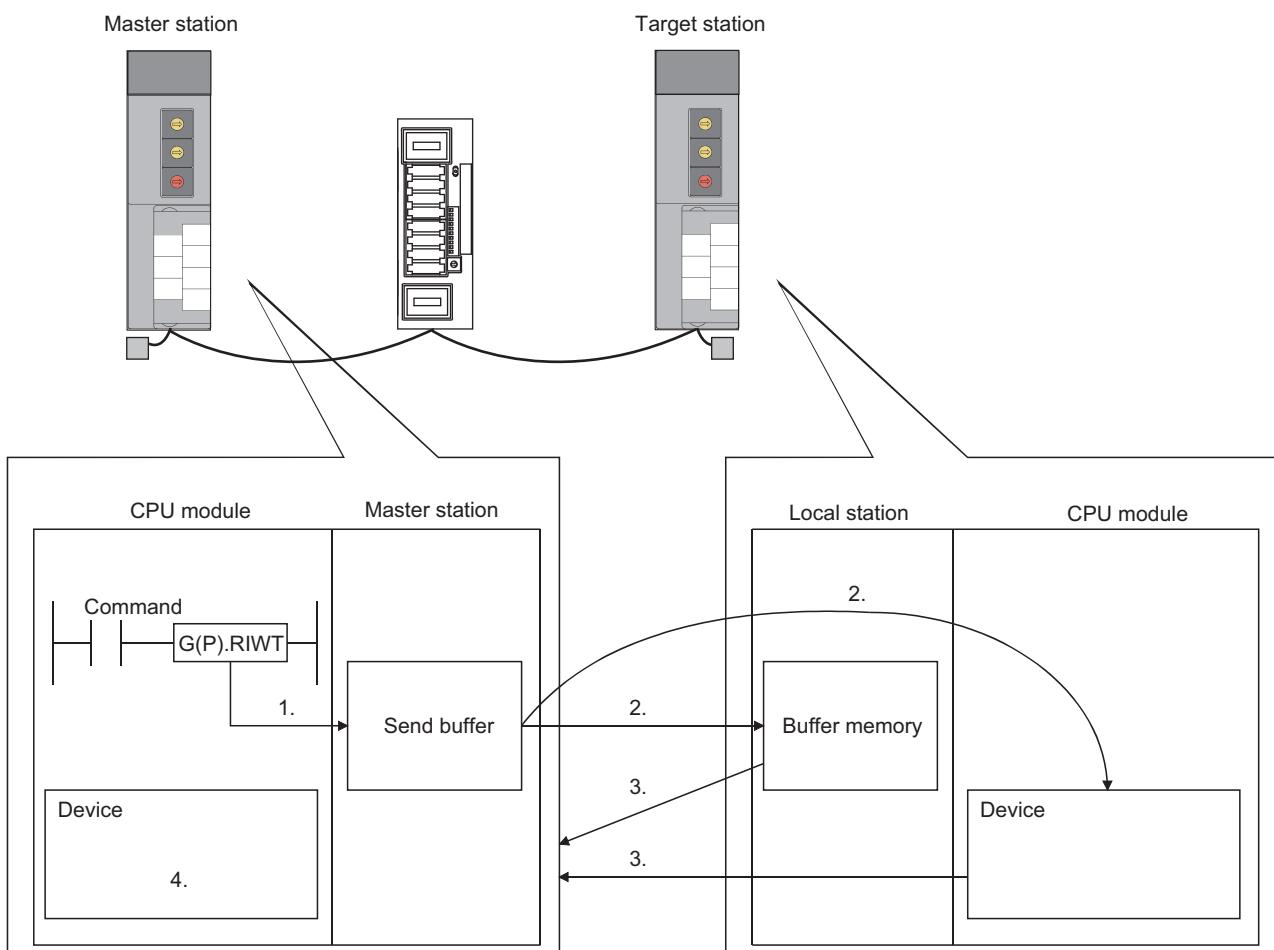
(c) Access code and attribute code (When accessing to the device in a CPU module)

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.

(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, a standby master station, or intelligent device stations from a master station.

However, concurrent execution of the instruction is not allowed to the same station. In addition, concurrent execution of the instruction is not allowed to the different stations from local stations. (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.

(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

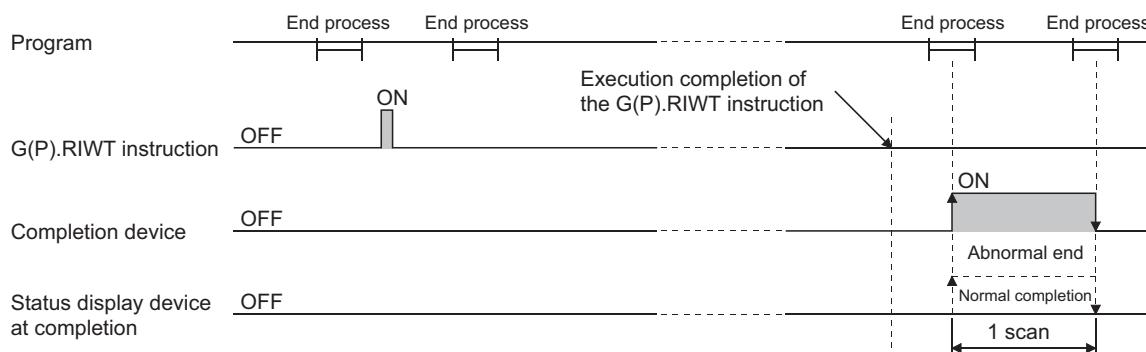
Turns on in the END process of the scan where the G(P).RIWT instruction is completed, and turns off in the next END process.

- 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

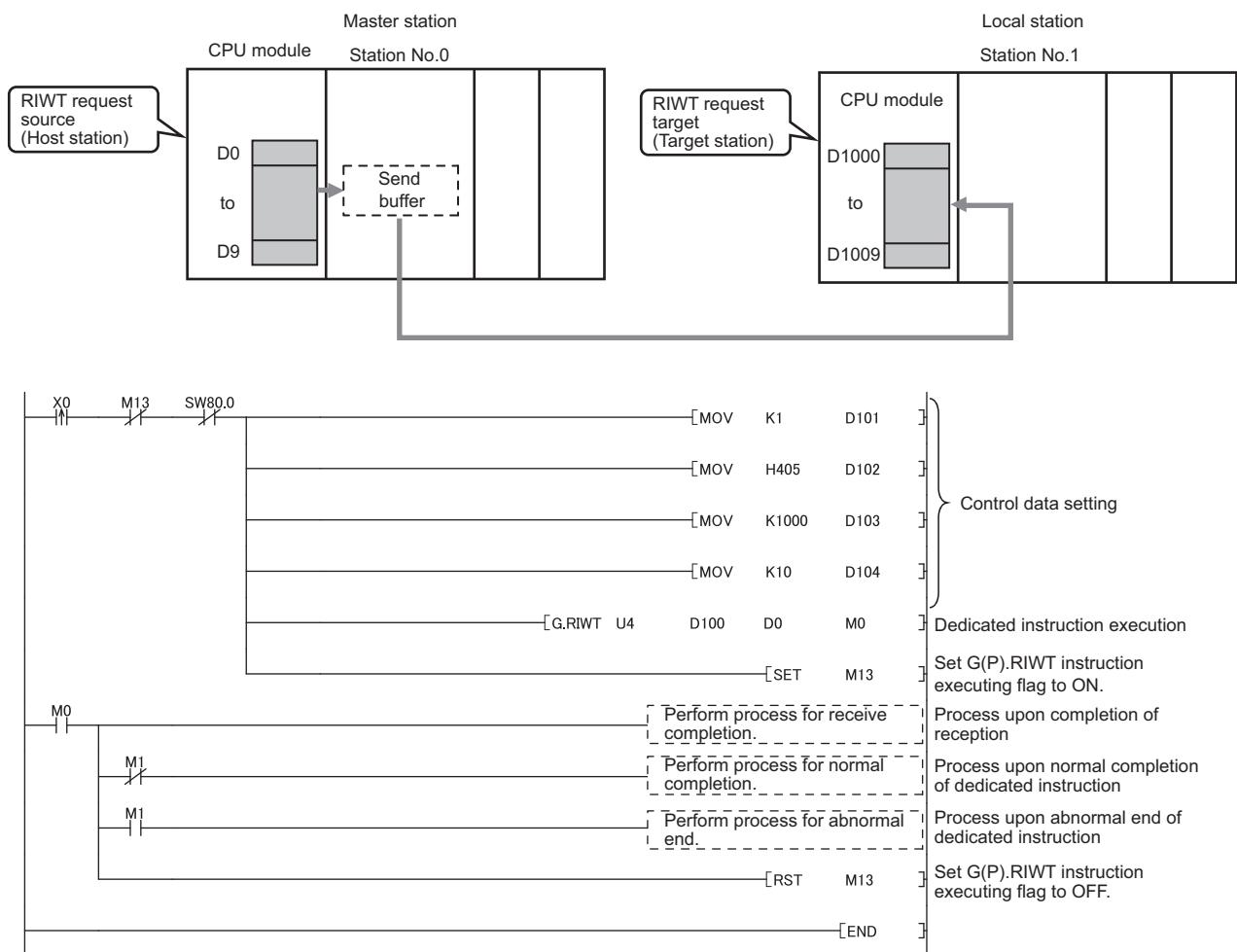
For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

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

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.

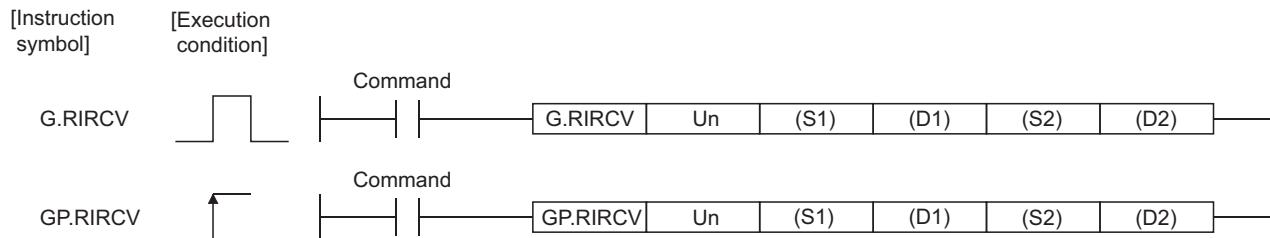
- Assume that the I/O number of the master station is X/Y40 to X/Y5F.
- Assume that SW0 is set to the refresh device of the link special register (SW).
- M13 is the G(P).RIWT instruction executing flag.



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								Others		
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant			
	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.

(a) Control data

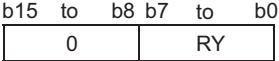
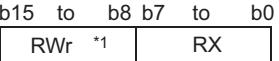
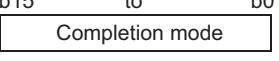
Device	Item	Setting data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S1) + 1	Station number	Specify the station number of the intelligent device station.	0 to 64	User
(S1) + 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

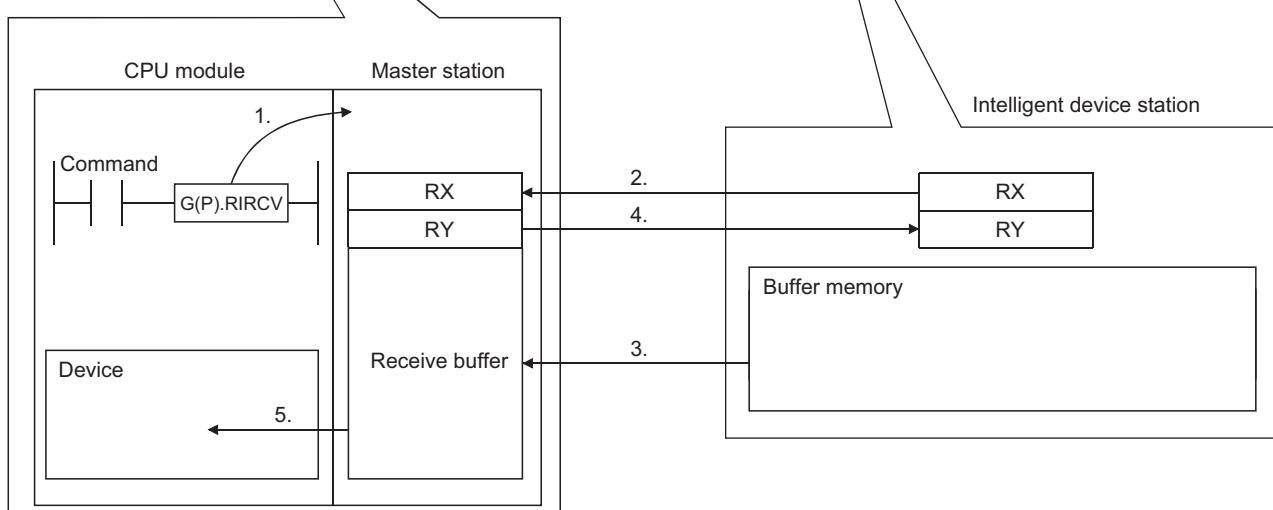
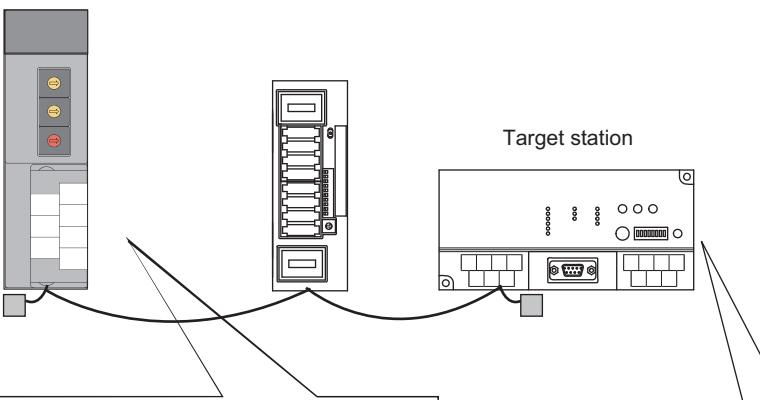
Device	Item	Setting data	Setting range	Set by
(S2) + 0	b15 to b8 b7 to b0 	RY: Request device	0 to 127	User
		Set 0 to the upper eight bits.	0	User
(S2) + 1	b15 to b8 b7 to b0 	RX: Completion device	0 to 127	User
		RW: Error code storage device If the error code storage device does not exist, set FF _H .	0 to 15, FF _H	User
(S2) + 2	b15 to b0 	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.

(2) Functions

(a) Operation chart of the G(P).RIRCV instruction

Master station



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.

(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

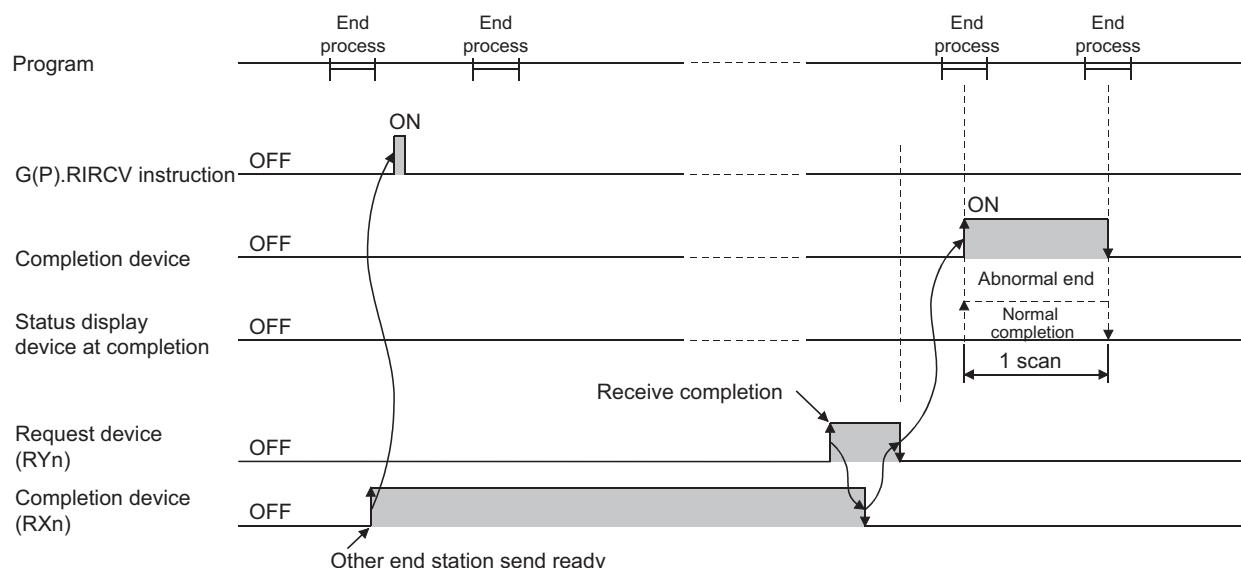
Turns on in the END process of the scan where the G(P).RIRCV instruction is completed, and turns off in the next END process.

- 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

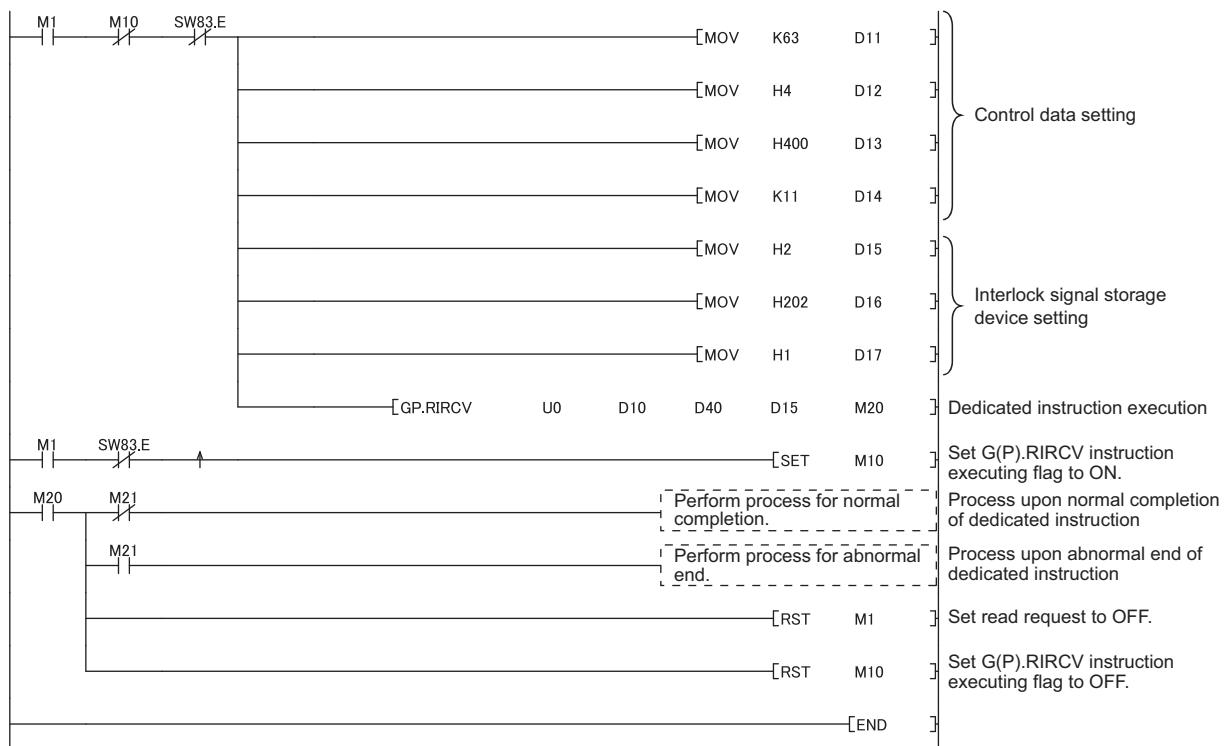
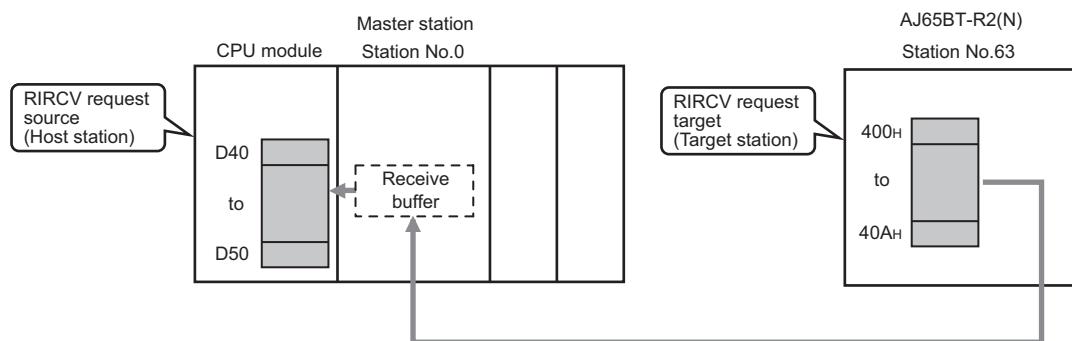
For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

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

9.4.1 Program example

This section shows an example of the program to read 11-word data from the buffer memory address 400H 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.

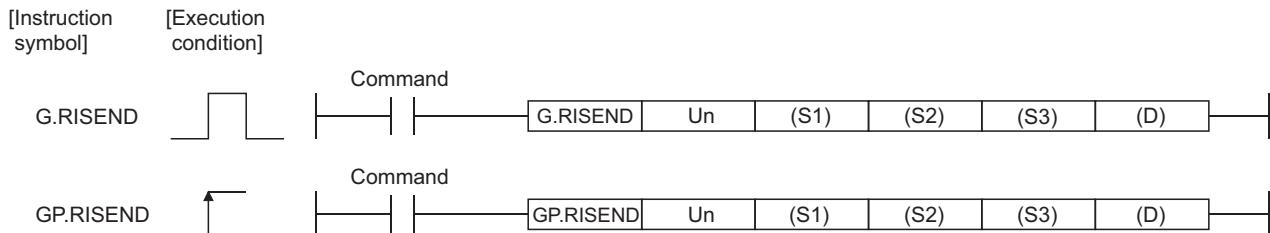
- Assume that the I/O number of the master station is X/Y00 to X/Y1F.
- Assume that SW0 is set to the refresh device of the link special register (SW).
- M10 is the G(P).RIRCV instruction executing flag.
- Assume that the settings of the interlock signal storage device are Request device: RY2, Completion device: RX2, Error code storage device: RW_r2, and Completion mode: 1.



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.

(a) Control data

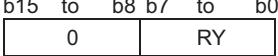
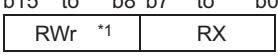
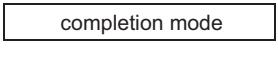
Device	Item	Setting data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0: No error (normal completion) Value other than 0: Error code	—	System
(S1) + 1	Station number	Specify the station number of the intelligent device station.	0 to 64	User
(S1) + 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.

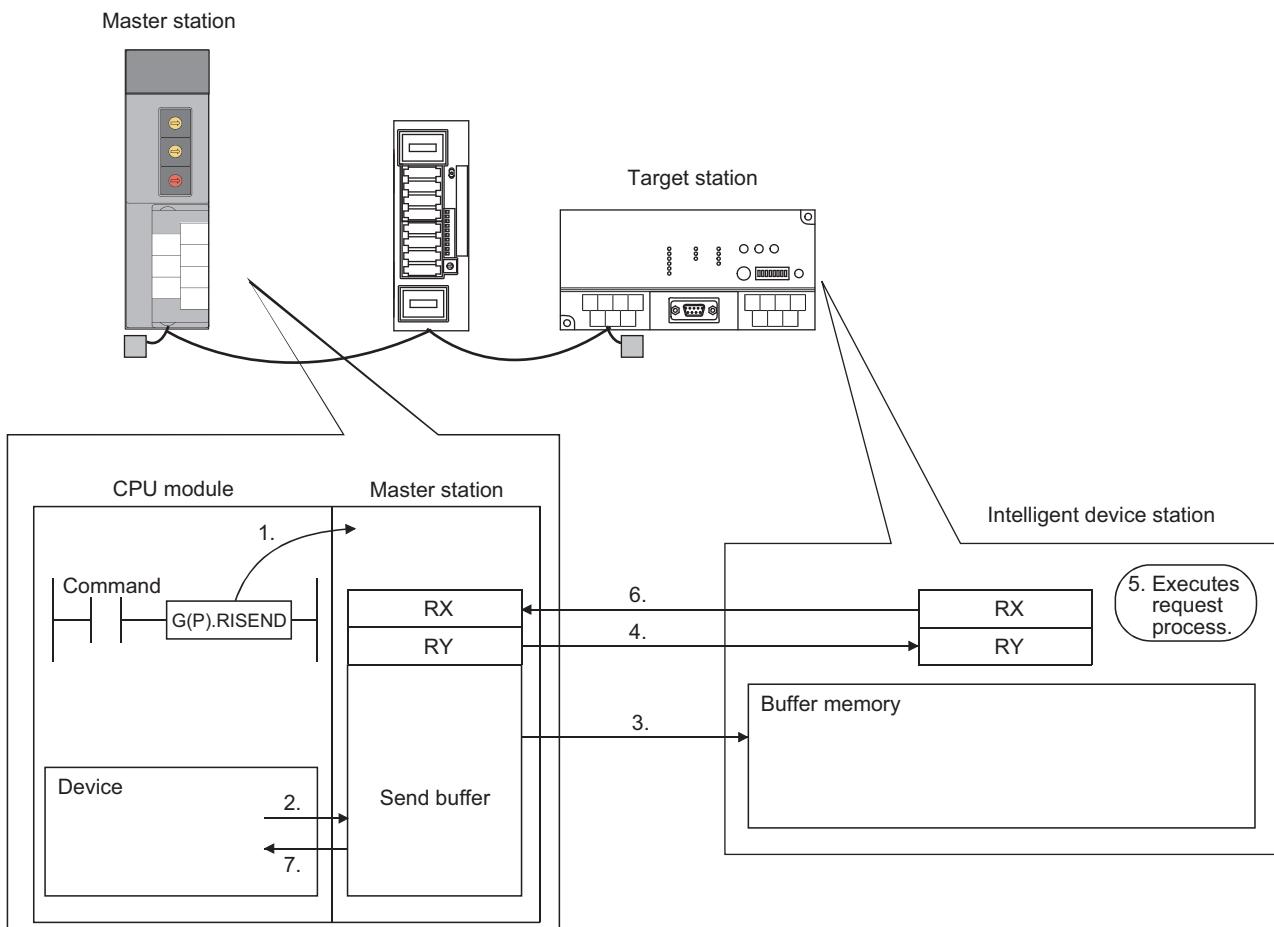
(b) Interlock signal storage device

Device	Item	Setting data	Setting range	Set by
(S3) + 0	b15 to b8 b7 to b0 	RY: Request device	0 to 127	User
		Set 0 to the upper eight bits.	0	User
(S3) + 1	b15 to b8 b7 to b0 	RX: Completion device	0 to 127	User
		RW: 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 	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.

(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.

(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

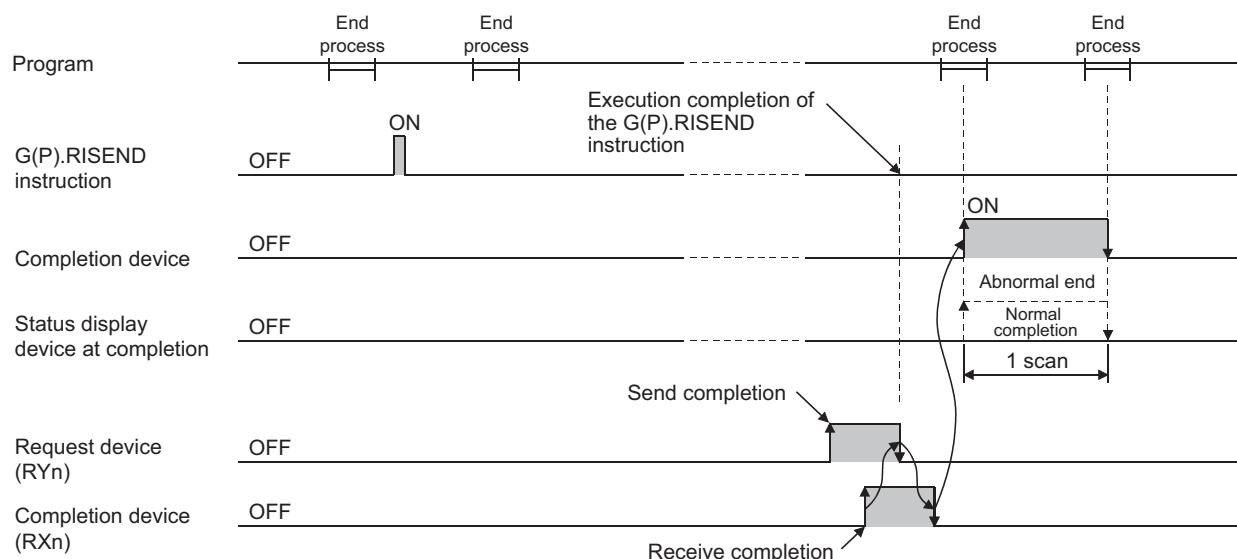
Turns on in the END process of the scan where the G(P).RISEND instruction is completed, and turns off in the next END process.

- 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

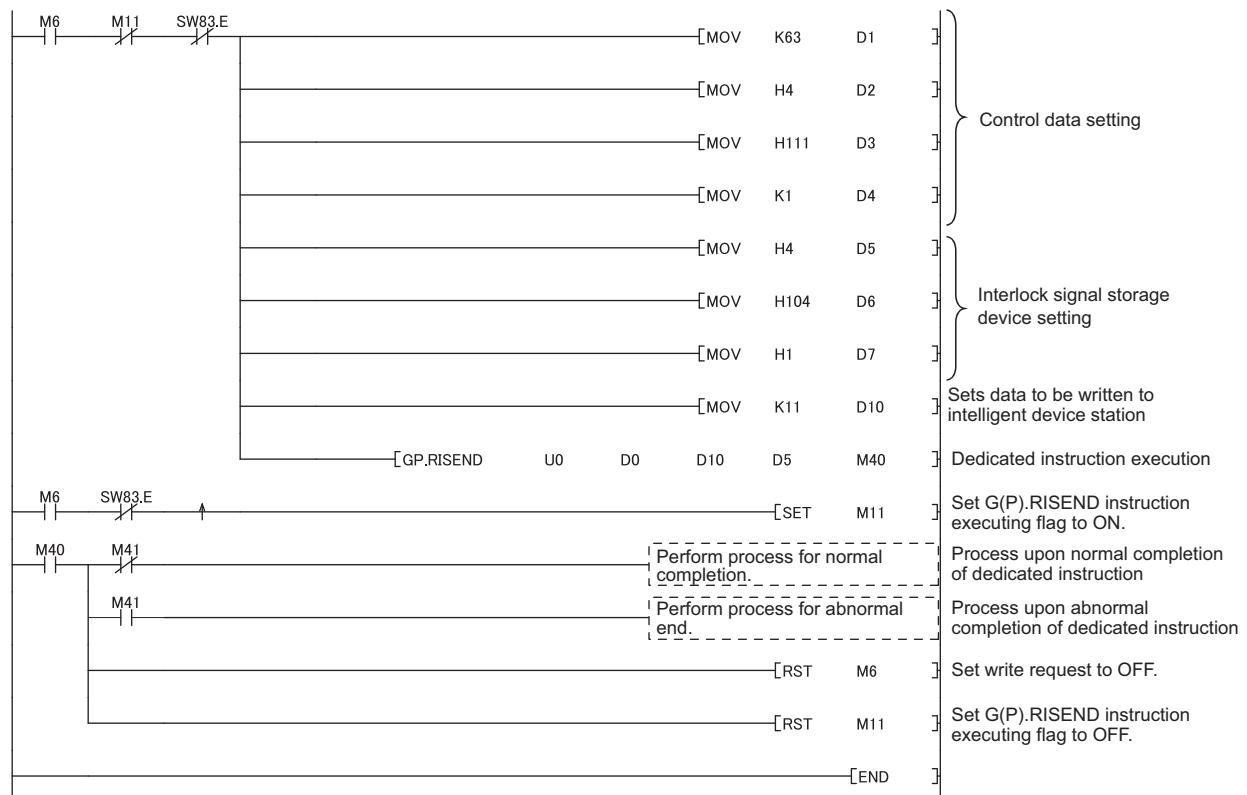
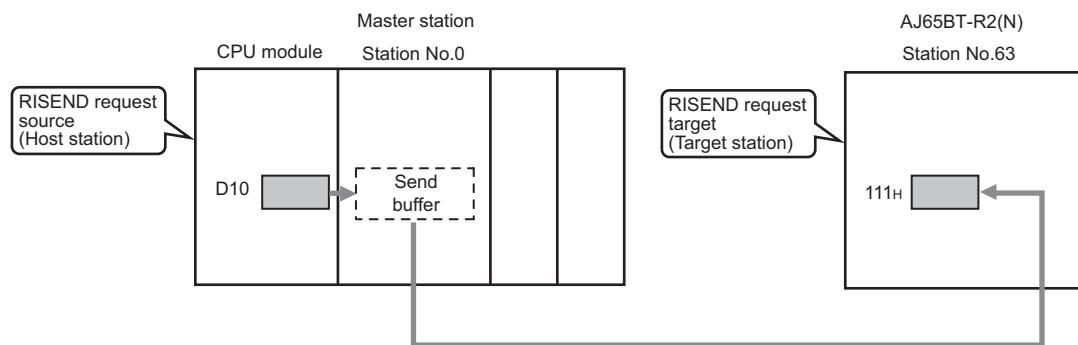
For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

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

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: RWL1, and Completion mode: 1.

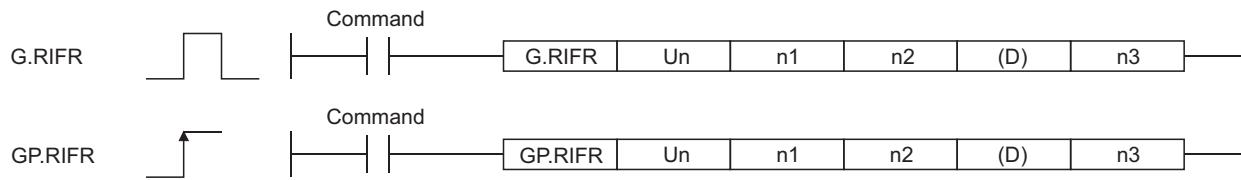


9.6 G(P).RIFR

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)).

[Instruction symbol] [Execution condition]



Setting data	Applicable device								Others	
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		
	Bit	Word		Bit	Word			K, H	\$	
n1	○	○				—		○	—	—
n2	○	○				—		○	—	—
(D)	—	○				—		—	—	—
n3	○	○				—		○	—	—

(1) Setting data

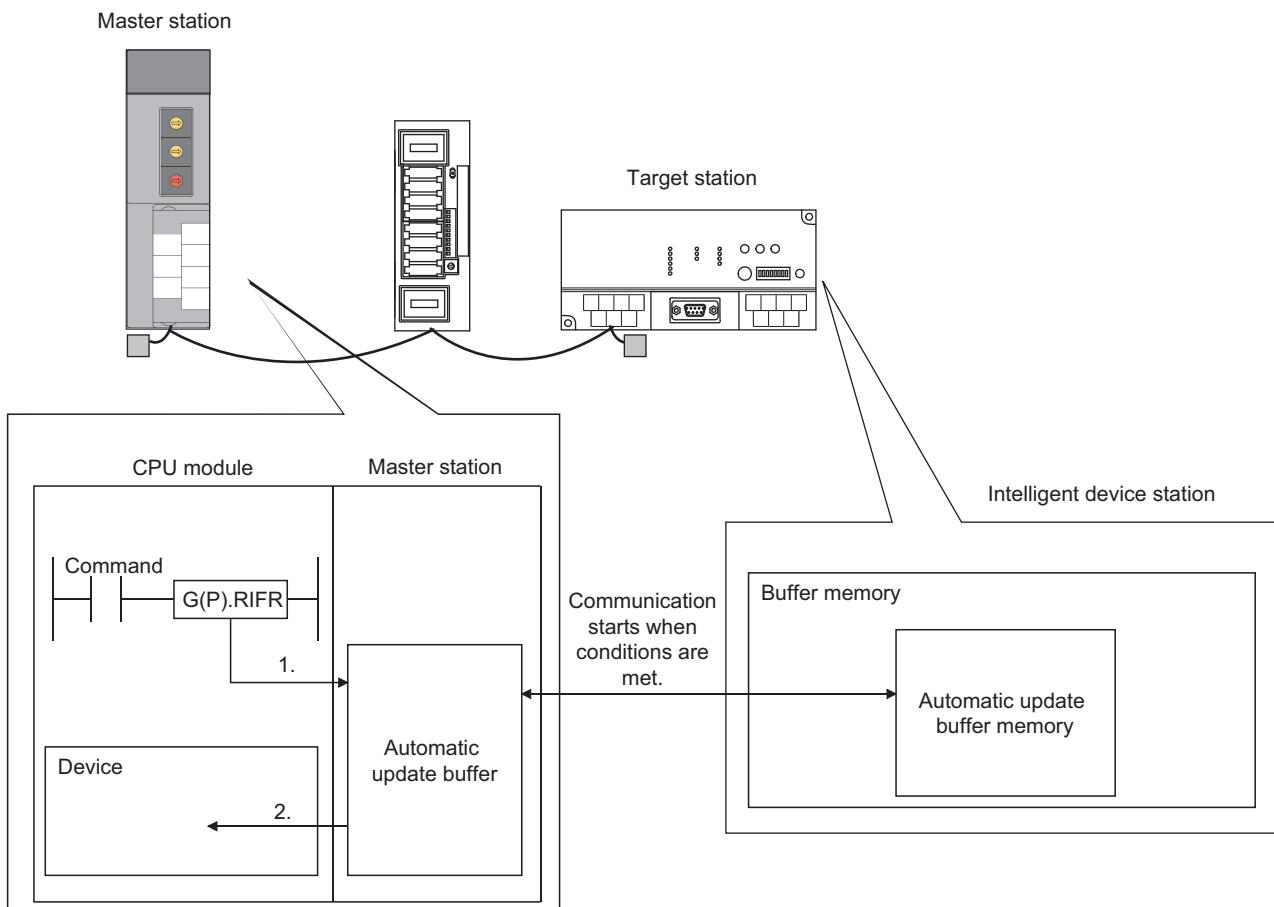
Device	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE _H	16-bit binary
n1	The station number of the intelligent device station	1 to 64	
	Random access buffer specification	FF _H	
n2	The offset value of the automatic 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.

(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))

(3) Operation error

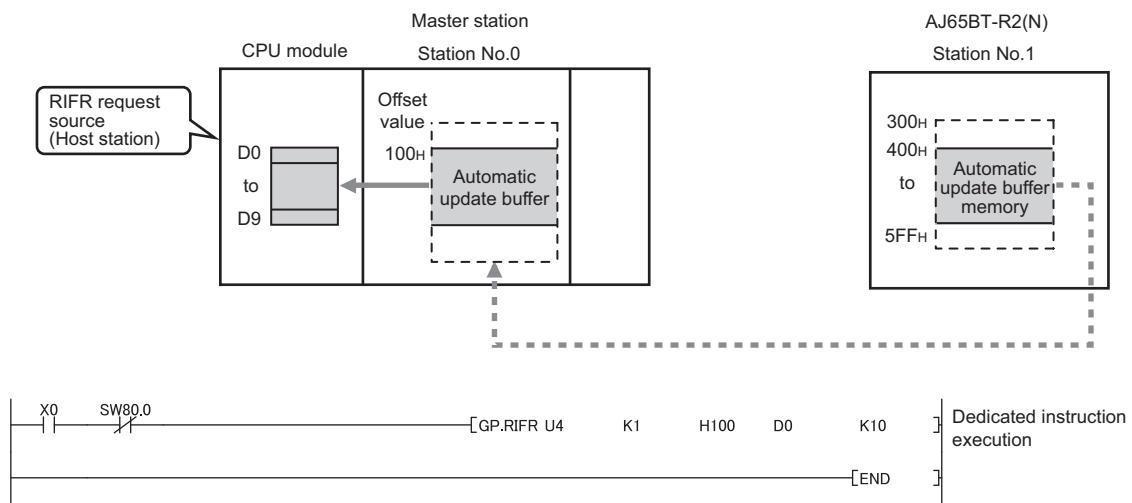
For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

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

9.6.1 Program example

This section shows an example of the program to read 10-word data from the offset value 100H of automatic update buffer in the master station (400H 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).



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								Others		
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□		Index register Z□	Constant		
	Bit	Word		Bit	Word				K, H	\$	
	n1	○	○		—	—	○		—	—	
n2	○	○			—	—	—	○	—	—	
(D)	—	○			—	—	—	—	—	—	
n3	○	○			—	—	—	○	—	—	

(1) Setting data

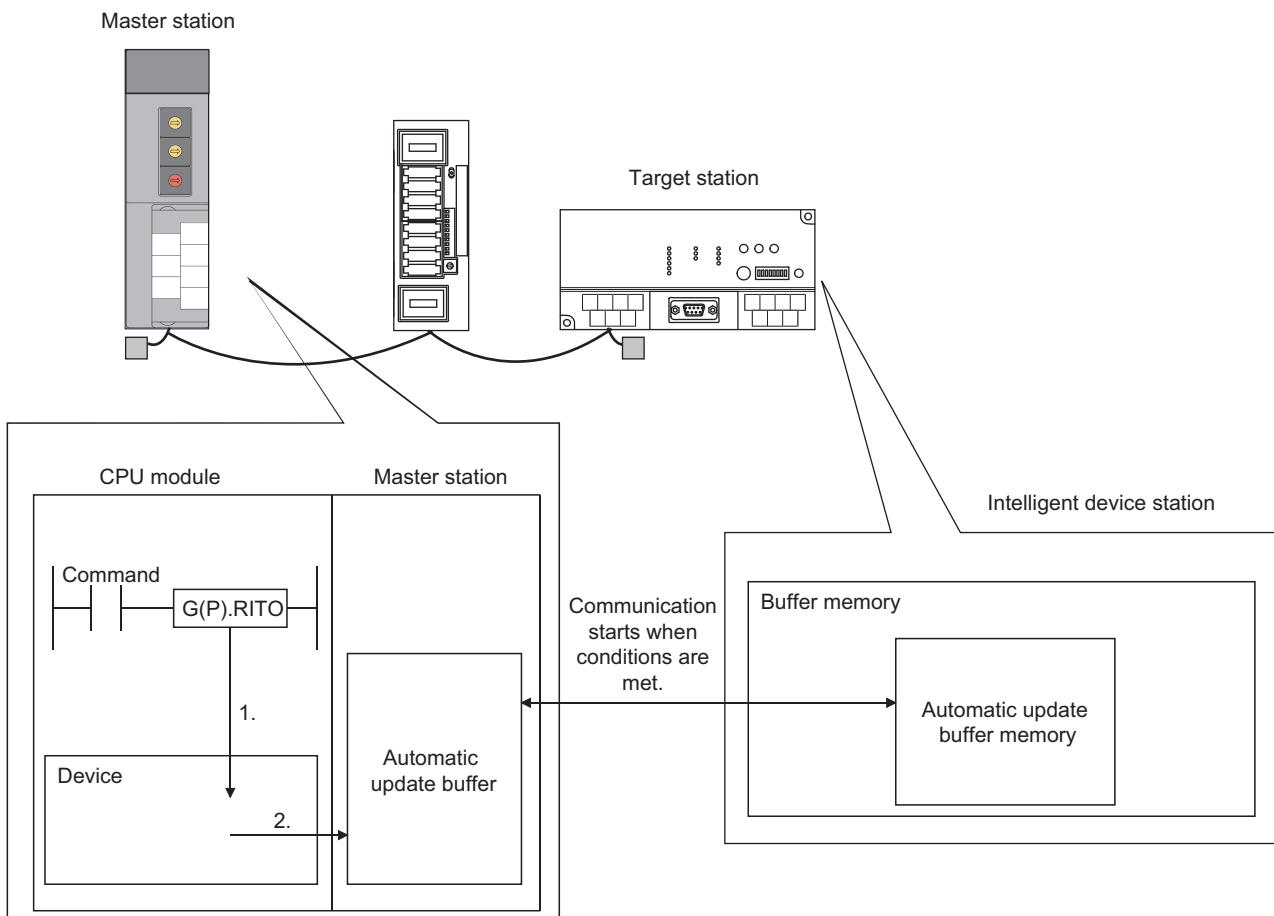
Device	Description	Setting range	Data type
Un	Start I/O number of the module (First two digits of I/O number written with three digits)	0 to FE _H	16-bit binary
n1	The station number of the intelligent device station	1 to 64	
	Random access buffer specification	FF _H	
n2	The offset value of the automatic 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.

(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))

(3) Operation error

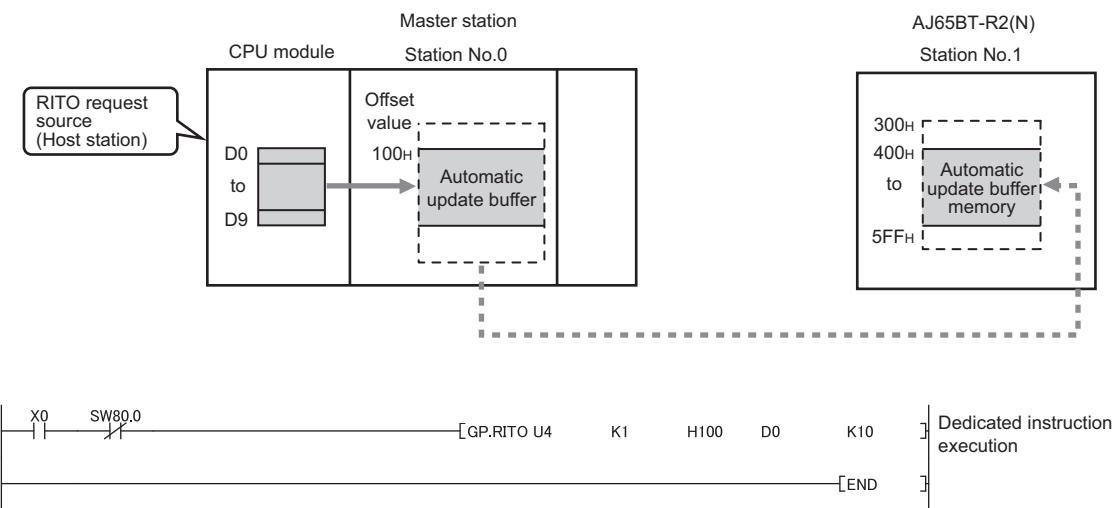
For the following cases, an operation error occurs; Error flag (SM0) turns on and the error code is stored in SD0.

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

9.7.1 Program example

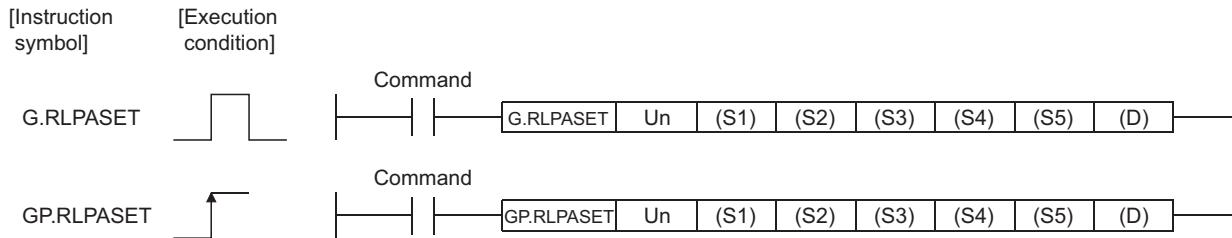
This section shows an example of the program to write 10-word data from the area starting from D0 in the master station to the offset value 100_{H} of automatic update buffer or later (400_{H} or later in the intelligent device station) when X0 is turned on in the following system configuration.

- 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).



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								Others	
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		
	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 device 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.

(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 Mode 00: Remote Net(Ver.1 Mode) 01: Remote Net(Additional Mode) 10: Remote Net(Ver.2 Mode) 11: Cannot be used	—	User
(S1) + 2	Total module connected	Set the number of connected device 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 device 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.

(b) Device station setting data

Device	Item	Setting data	Setting range	Set by																																		
(S2) + 0 to (S2) + 63	Setting for 1 to 64 stations ^{*1}	<p>Set the station type, number of occupied stations, and station number as follows:</p> <p>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).</p> <p>(1) Station number setting 1 to 64 (BIN setting)</p> <p>(2) Number of occupied stations setting</p> <table border="1"> <thead> <tr> <th>Number of occupied stations</th> <th>Setting</th> </tr> </thead> <tbody> <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> </tbody> </table> <p>(3) Station type setting^{*2*3}</p> <table border="1"> <thead> <tr> <th>Station type</th> <th>Setting</th> </tr> </thead> <tbody> <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> </tbody> </table>	Number of occupied stations	Setting	1	1 _H	2	2 _H	3	3 _H	4	4 _H	Station type	Setting	Ver.1-compatible remote I/O station	0 _H	Ver.1-compatible remote device station	1 _H	Ver.1-compatible intelligent device station	2 _H	Ver.2-compatible remote device station (single)	5 _H	Ver.2-compatible intelligent device station (single)	6 _H	Ver.2-compatible remote device station (double)	8 _H	Ver.2-compatible intelligent device station (double)	9 _H	Ver.2-compatible remote device station (quadruple)	B _H	Ver.2-compatible intelligent device station (quadruple)	C _H	Ver.2-compatible remote device station (octuple)	E _H	Ver.2-compatible intelligent device station (octuple)	F _H	— 1 to 4 _H 0 to F _H	User
Number of occupied stations	Setting																																					
1	1 _H																																					
2	2 _H																																					
3	3 _H																																					
4	4 _H																																					
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Ver.1-compatible intelligent device station	2 _H																																					
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Ver.2-compatible intelligent device station (single)	6 _H																																					
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Ver.2-compatible remote device station (octuple)	E _H																																					
Ver.2-compatible intelligent device station (octuple)	F _H																																					

*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.

(c) Reserved station specification data

Device	Item	Setting data	Setting range	Set by																																																	
(S3) + 0 to (S3) + 3	Specification of 1 to 64 stations ^{*1}	<p>Specify reserved stations.^{*2}</p> <p>0: Not specified 1: Specified</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></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> <p>1 to 64 in the table indicate station numbers.</p> <p>Default value is "0: Not specified" for all stations.</p>	b15	b14	b13	b12	to	b3	b2	b1	b0	(S3)+0	16	15	14	13	to	4	3	2	1	(S3)+1	32	31	30	29	to	20	19	18	17	(S3)+2	48	47	46	45	to	36	35	34	33	(S3)+3	64	63	62	61	to	52	51	50	49	—	User
b15	b14	b13	b12	to	b3	b2	b1	b0																																													
(S3)+0	16	15	14	13	to	4	3	2	1																																												
(S3)+1	32	31	30	29	to	20	19	18	17																																												
(S3)+2	48	47	46	45	to	36	35	34	33																																												
(S3)+3	64	63	62	61	to	52	51	50	49																																												

*1 Configure settings for station numbers up to the largest one set for the device station setting data.

*2 Set the start station number of the module only for a device station that occupies two or more stations.

(d) Error invalid station specification data

Device	Item	Setting data	Setting range	Set by																																																	
(S4) + 0 to (S4) + 3	Specification of 1 to 64 stations ^{*1}	<p>Specify error invalid stations.^{*2}</p> <p>0: Not specified 1: Specified</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>to</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></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> <p>1 to 64 in the table indicate station numbers.</p> <p>Default value is "0: Not specified" for all stations.</p>	b15	b14	b13	b12	to	b3	b2	b1	b0	(S4)+0	16	15	14	13	to	4	3	2	1	(S4)+1	32	31	30	29	to	20	19	18	17	(S4)+2	48	47	46	45	to	36	35	34	33	(S4)+3	64	63	62	61	to	52	51	50	49	—	User
b15	b14	b13	b12	to	b3	b2	b1	b0																																													
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(S4)+2	48	47	46	45	to	36	35	34	33																																												
(S4)+3	64	63	62	61	to	52	51	50	49																																												

*1 Configure settings for station numbers up to the largest one set for the device station setting data.

*2 Set only the start station number of the module for a device 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.

(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}	<p>Specify assignments of buffer memory size at transient transmission to local stations and intelligent device stations.</p> <p>The default values are send buffer size: 40H, receive buffer size: 40H, and automatic update buffer size: 80H.</p>	<p>Communication buffers^{*2} : 0H (no setting), 40H to 1000H 0 (word) (no setting) 64 to 4096 (words)</p> <p>Automatic update buffer^{*3} : 0H (no setting), 80H to 1000H 0 (word) (no setting) 128 to 4096 (words)</p>	User

^{*1} Configure settings for stations specified as local stations or intelligent device stations in the device station setting data, starting from the smallest station number.

^{*2} The total size of the communication buffers must be within 1000H (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.

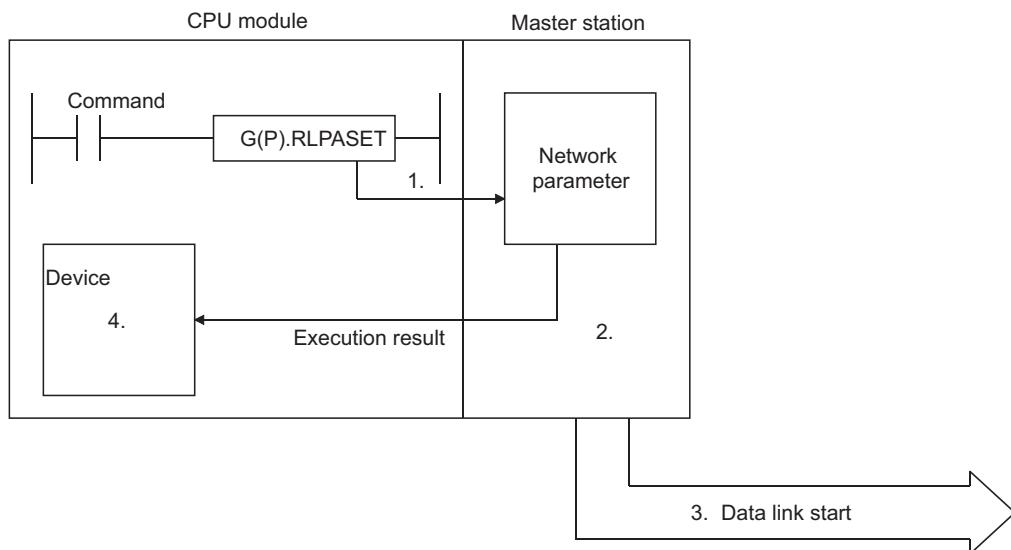
^{*3} The total size of the automatic update buffer must be within 1000H (4096 (word)).

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.

(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

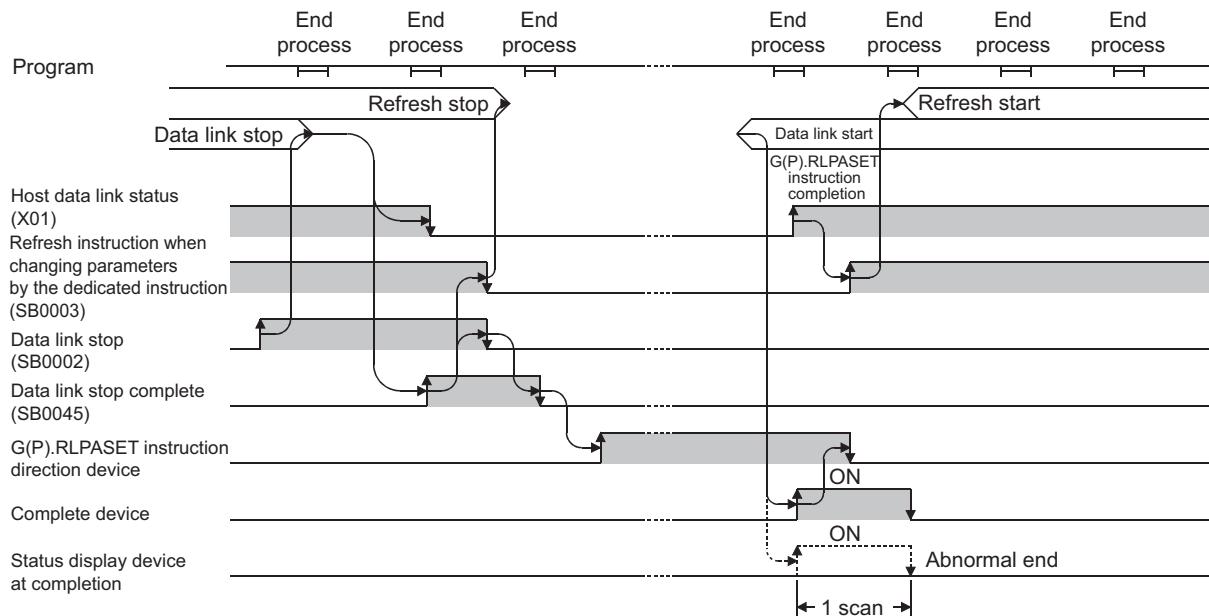
There are two types of interlock signals for the G(P).RLPASET instruction: Completion device (D) and Status display device at completion (D) + 1.

- 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.

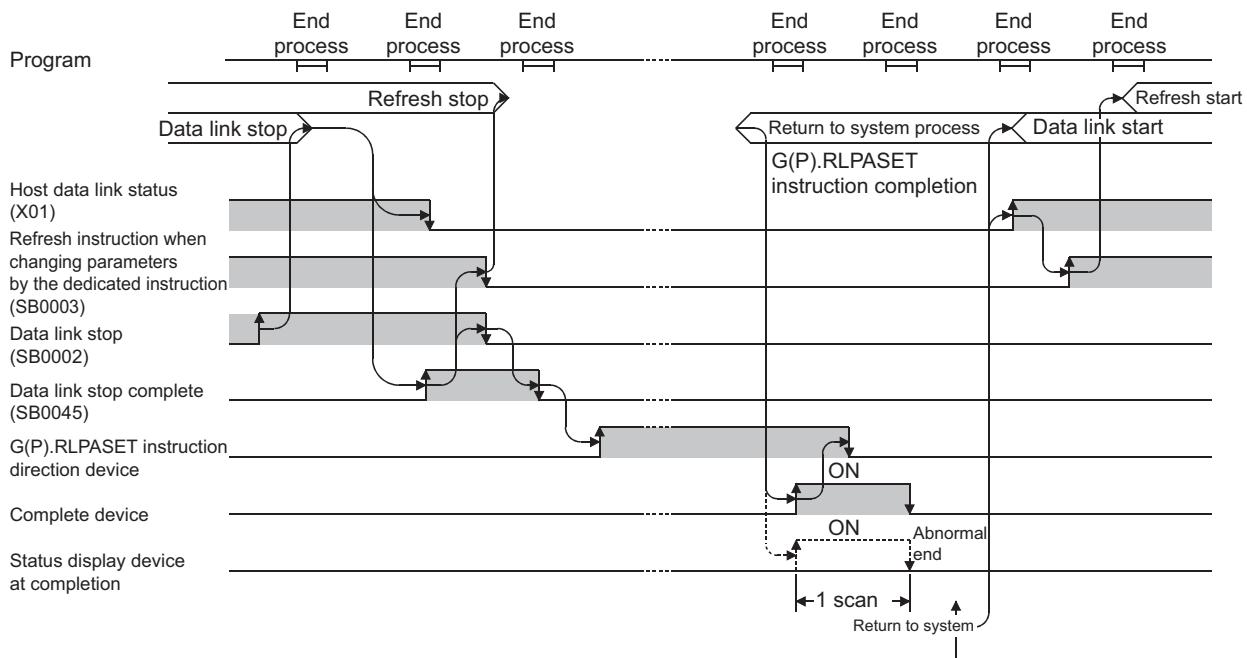
(d) Process after the completion of the G(P).RLPASET instruction

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]



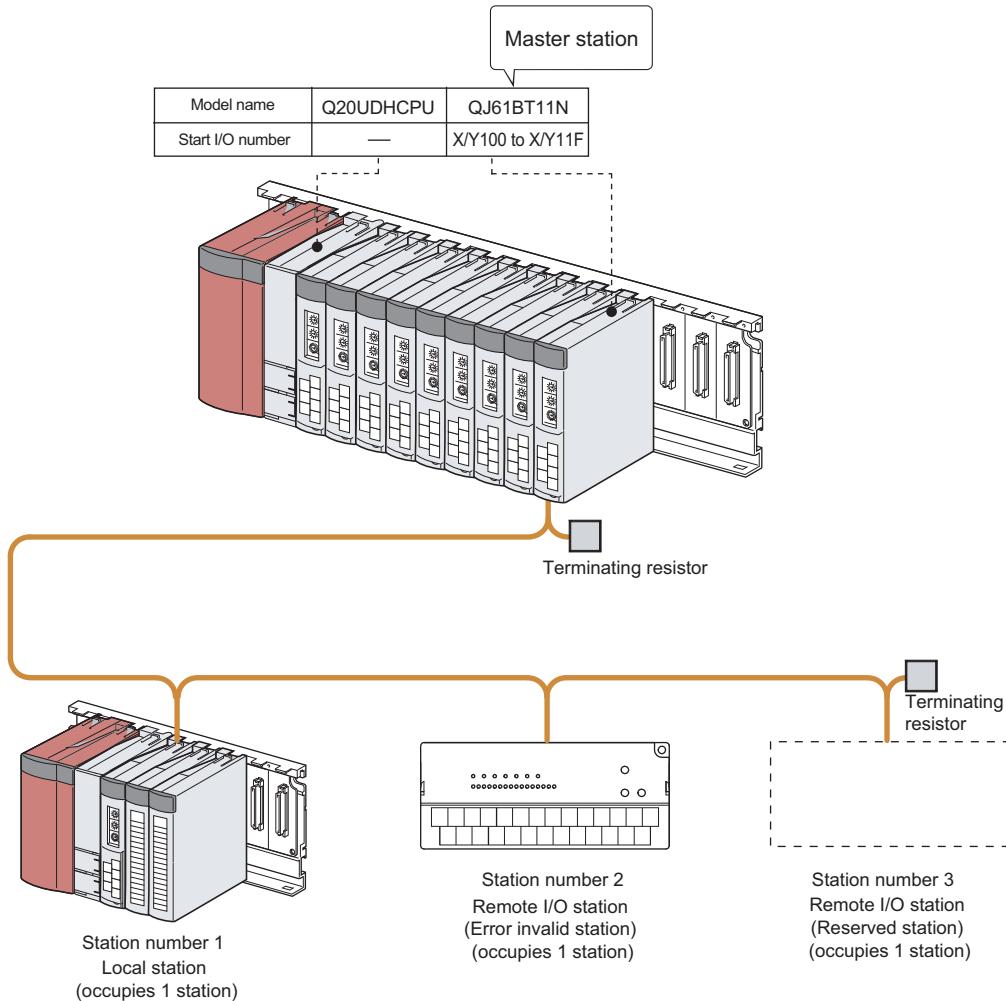
(3) Operation error

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	<p>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).</p> <p>The number of points required for each data is described below.</p> <ul style="list-style-type: none">• Control data: 8 points• Device 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 <p>Ex. If D12284 is set as the start device number of the device station setting data (S2) on the condition that D0 to D12287 is set to the device in the CPU module, the device station setting data (S2) becomes D12284 to D12347 (64 points) and an error occurs due to values out of the range.</p>

9.8.1 Program example (parameter setting example)

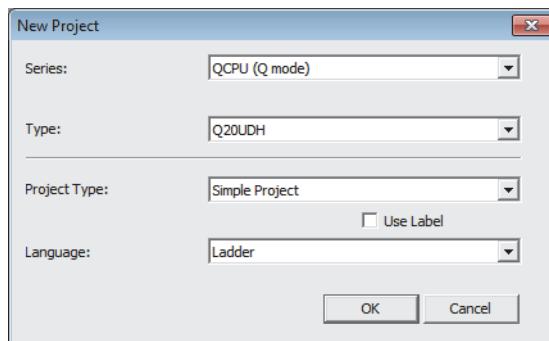
This section shows an example of configuring settings for a master/local module in the following system configuration.



1. Create a project on a programming tool.

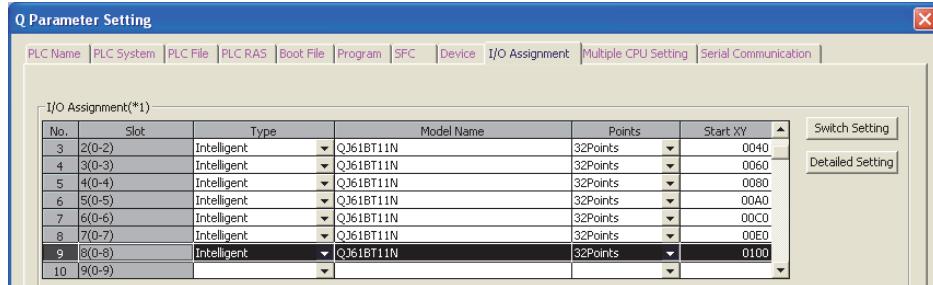
Select "QCUPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

[Project] \Rightarrow [New]



2. Open the "I/O Assignment" tab of "PLC Parameter", and configure the settings as follows.

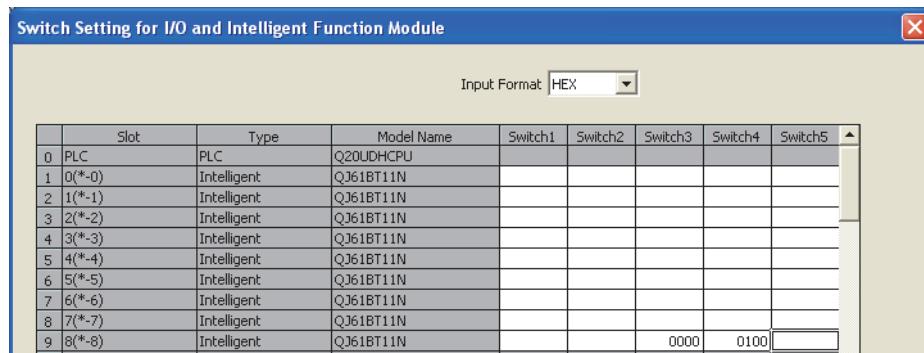
→ Project window ⇒ [Parameter] ⇒ [PLC Parameter] ⇒ "I/O Assignment" tab



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.



Switch	Description									
Switch1	Blank									
Switch2	Blank									
Switch3	<p>Set the mode for a master/local module. (Mode setting)</p> <ul style="list-style-type: none"> Remote net Ver.1 mode: 0000_H Remote net Ver.2 mode: 0200_H Remote net additional mode: 0100_H 									
Switch4	<p>Set the "Case of CPU STOP Setting"^{*1} and "Auto Detect Setting of the Connected Device"^{*2} for a master/local module.</p> <ul style="list-style-type: none"> 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 0: 2100_H When "Auto Detect Setting of the Connected Device" is 1 and "Case of CPU STOP Setting" is 1: 2300_H <p>b15b14b13b12 b10 b9 b8 b7 b0</p> <table border="1"> <tr> <td>0</td><td>0</td><td>0</td><td>to</td><td>0</td><td>1</td><td>0</td><td>to</td><td>0</td> </tr> </table> <p>Case of CPU STOP Setting 0: Refresh 1: Clear compulsorily.</p> <p>Auto Detect Setting of the Connected Device 0: Not read the model name of the device stations 1: Read the model name of the device stations</p>	0	0	0	to	0	1	0	to	0
0	0	0	to	0	1	0	to	0		
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.

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.

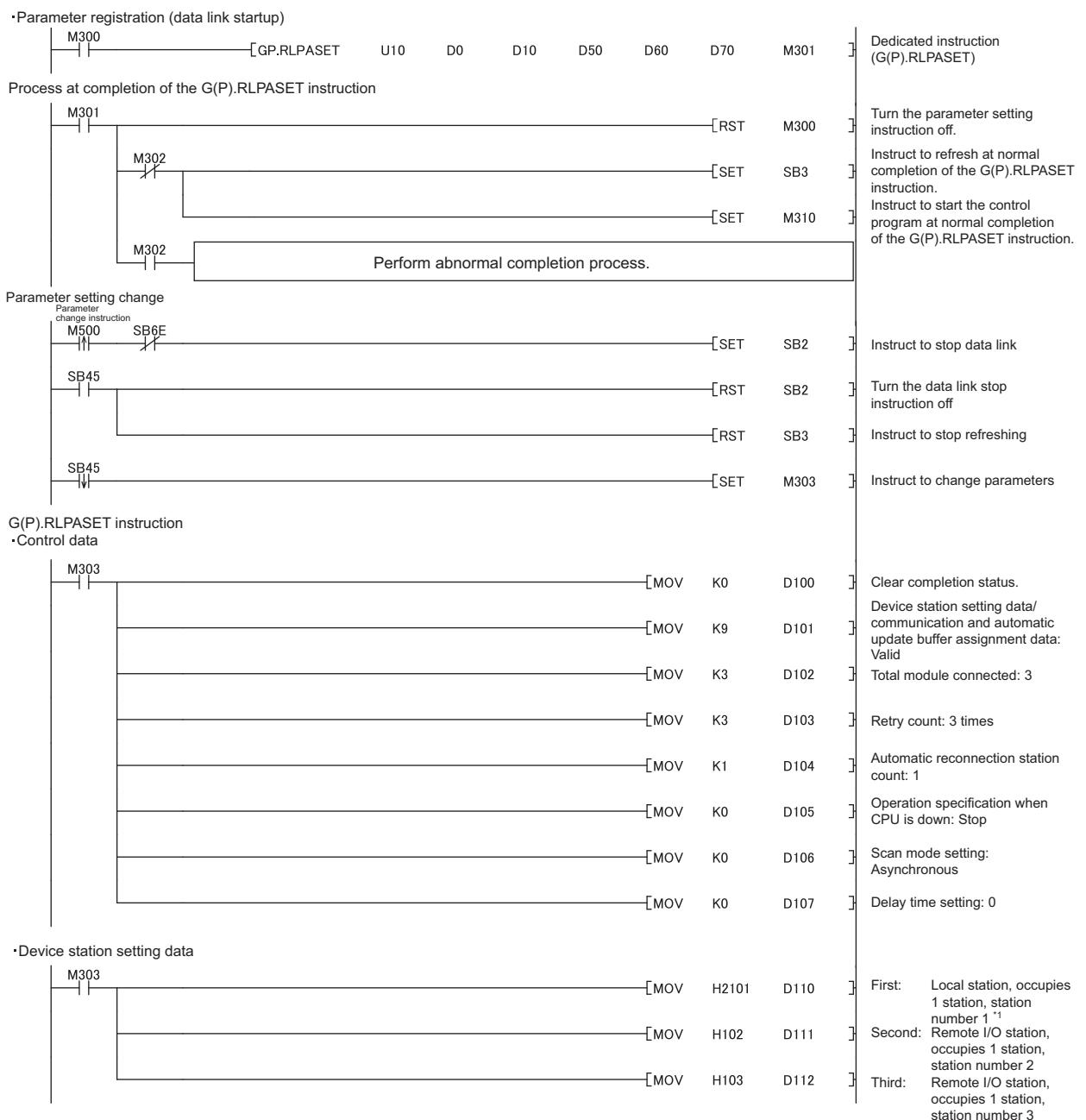
4. Click the  button to terminate the setting.

5. Create the following program.

Refresh of SB/SW						
SM400		[FROM H10 H5E2 K4SB20 K30]				
		[FROM H10 H620 SW20 K480]				
Parameter setting		[SET M300]				
G(P).RLPASET instruction		Instruct to set parameters				
Control data		[MOV K0 D0]				
		Clear completion status.				
		[MOV K15 D1]				
		All setting data: Valid				
		[MOV K3 D2]				
		Total module connected: 3				
		[MOV K3 D3]				
		Retry count: 3 times				
		[MOV K1 D4]				
		Automatic reconnection station count: 1				
		[MOV K0 D5]				
		Operation specification when CPU is down: Stop				
		[MOV K0 D6]				
		Scan mode setting:				
		[MOV K0 D7]				
		Delay time setting: 0				
Device station setting data		[MOV H2101 D10]				
		First: Local station, occupies 1 station, station number 1 ^{*1}				
		[MOV H102 D11]				
		Second: Remote I/O station, occupies 1 station, station number 2				
		[MOV H103 D12]				
		Third: Remote I/O station, occupies 1 station, station number 3				
Reserved station specification data		[MOV H4 D50]				
		Reserved station specification: station number 3				
Error invalid station specification data		[MOV H2 D60]				
		Error invalid station specification: station number 2				
Communication and automatic update buffer assignment data		[MOV K100 D70]				
		First (station number 1) local station Send buffer: 100 word				
		[MOV K100 D71]				
		First (station number 1) local station Receive buffer: 100 word				
		[MOV K0 D72]				
		First (station number 1) local station Automatic update buffer: 0 word				

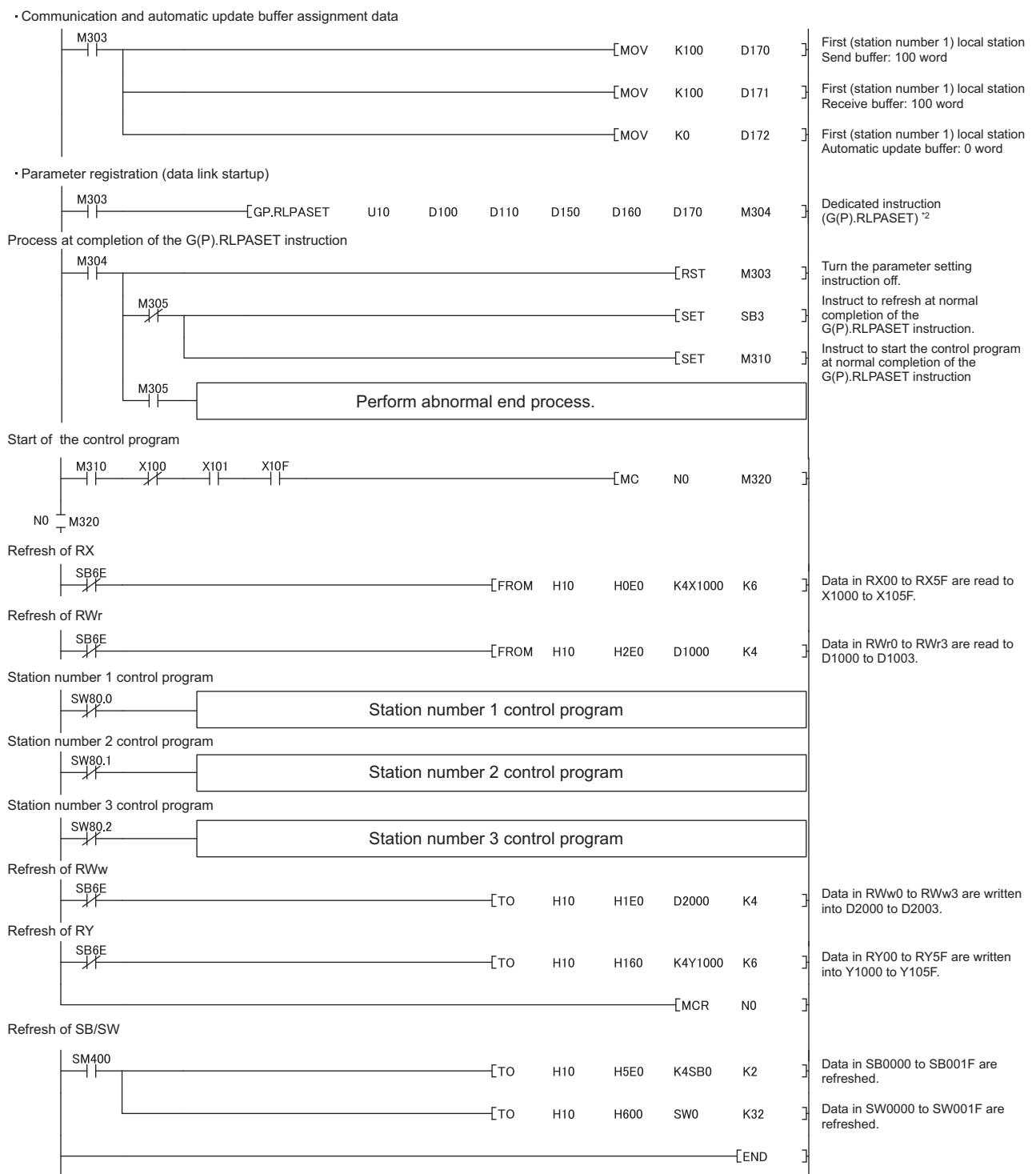
*1 Set the station number in hexadecimal. (Example) Set 14H for station No. 20.

(To the next page)



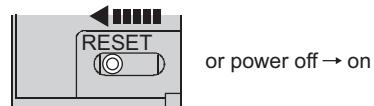
*1 Set the station number in hexadecimal. (Example) Set 14H for station No. 20.

(To the next page)



²D150 and D160 are dummy devices.

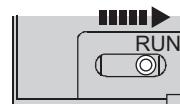
- 6. Write the PLC parameters and program to the CPU module. Then reset the CPU module or power off and on the system.**



- 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.)



(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	Data Link Faulty Station Setting	Can be set
	Case of CPU STOP Setting	Can be set
	Block Data Assurance per Station	Can be set
	Master Station	Can be set
	• Master Station(Duplex Function) • Master station (Extension Base) • Local Station • Standby Master Station	Can be set
	• Remote Net(Ver.1 Mode) • Remote Net(Ver.2 Mode) • Remote Net(Additional Mode)	Can be set
	Remote I/O Net Mode	Can be set
	Refresh device (auto refresh)	Can be set
	Retry Count	Can be set
	Automatic Reconnection Station Count	Can be set
	Standby Master Station No.	Can be set
	PLC Down Select	Can be set
	Scan Mode Setting	Can be set
	Delay Time Setting	Can be set
Station Information Setting	Remote Station Points	Can be set
	Other than the above	Can be set
Remote Device Station Initial Setting		Can be set
Interrupt Settings		Can 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.

(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.

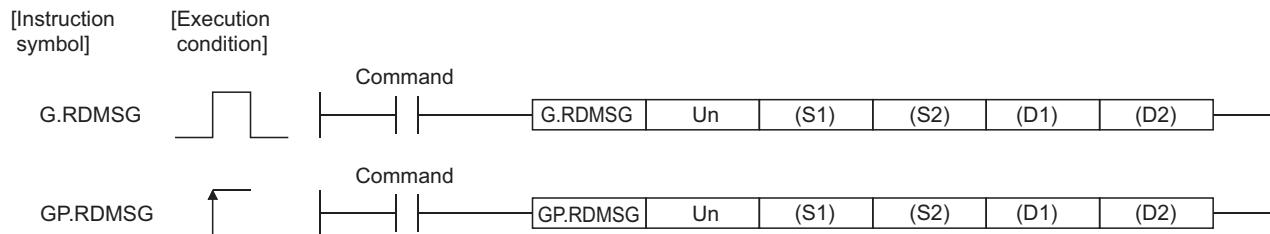
(f) Output when a CPU module is switched from RUN to STOP

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)

9.9 G(P).RDMMSG

These instructions read/write parameters from the master station to the remote device station and read out the status.
(A master/local module with a serial number (first five digits) of 10032 or later supports these instructions.)

The instructions can be used with the remote device station, for example NZ2AW1C2AL, that supports the message transmission function.



Setting data	Applicable device								Others		
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant			
	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

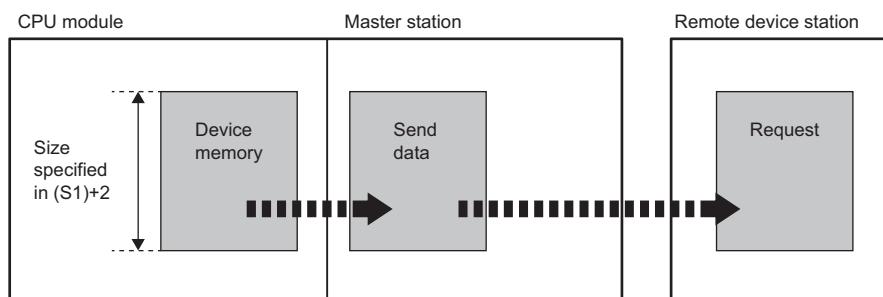
*1 The local device and the file register of each program cannot be used as a device for setting data.

*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.

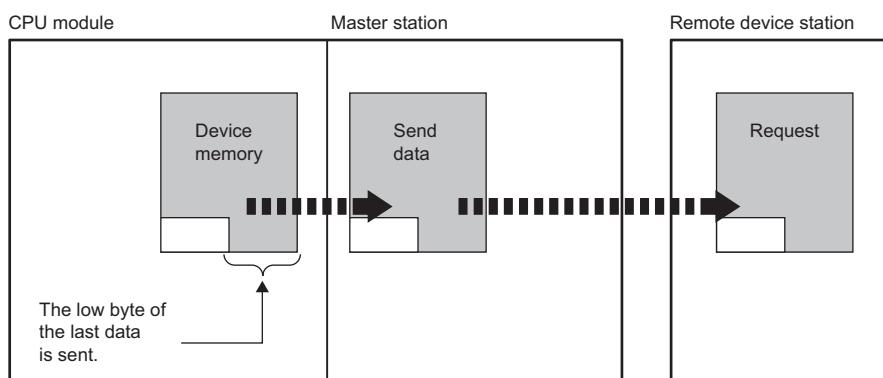
(2) Control data

Device	Item	Setting data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is completed. 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	
(S1) + 2	Send data size	Specify a send data size (in bytes).	1 to 255 (Page 222, Section 9.9 (2) (a))	User
(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



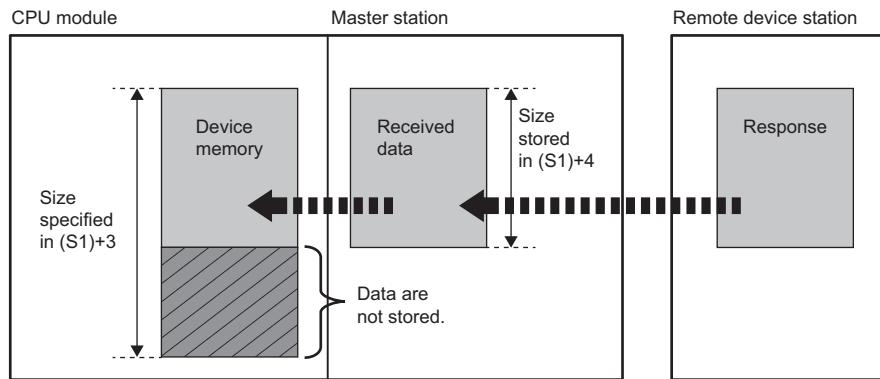
When the send data size ((S1)+2) is an odd number of bytes, the low byte of the last data is sent as the last byte.



(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 $((S1)+3) \geq$ Receive data size $((S1)+4)$

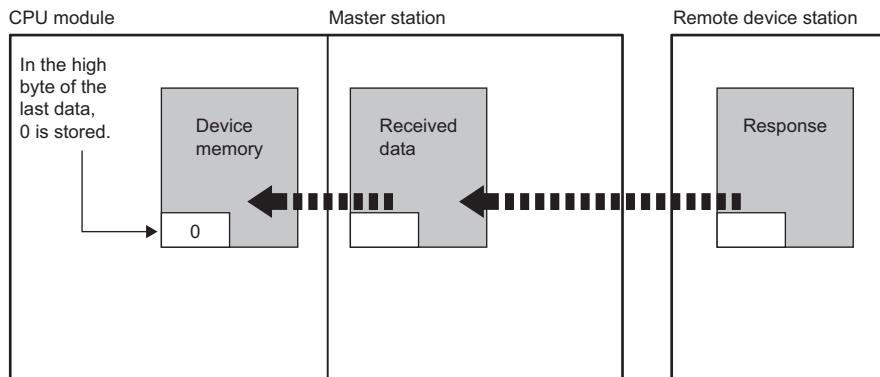


If the receivable data size $((S1)+3)$ is smaller than the receive data size $((S1)+4)$, data sent from a remote device station cannot be received.

The G(P).RDMSG instruction will fail (error code: B418_H).

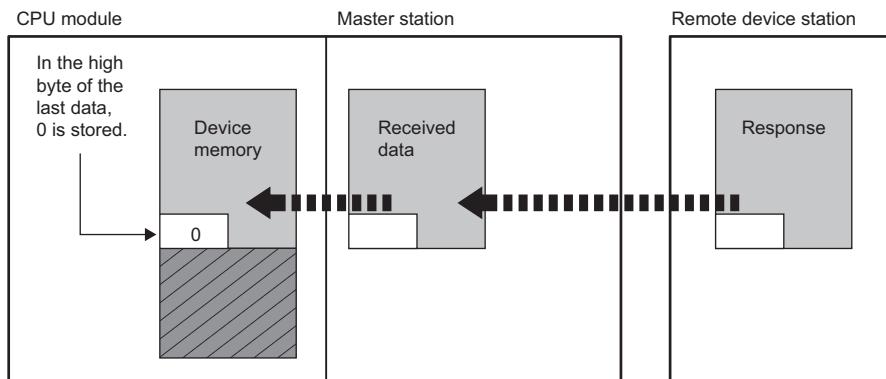
- When the receivable data size $((S1)+3)$ is an odd byte

If the receive data size is the same, 0 is stored in the upper byte of the last data.



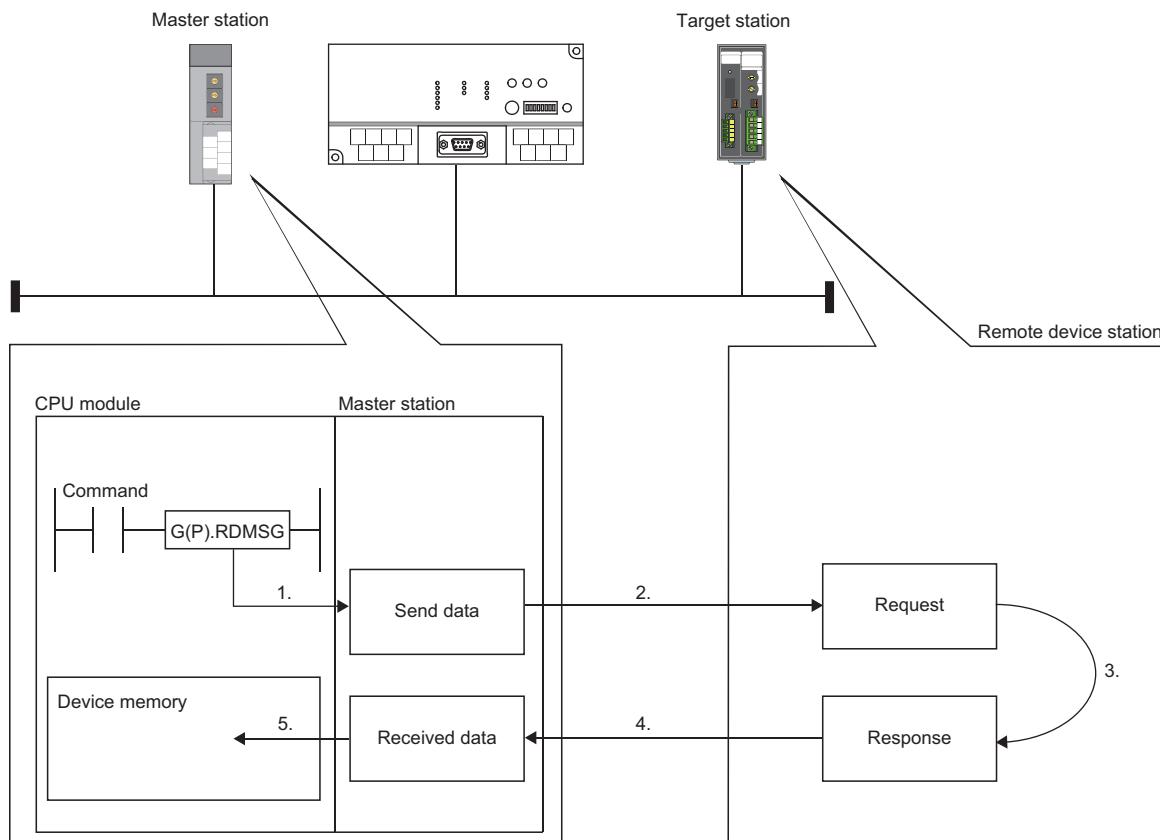
- When the receive data size $((s1)+4)$ is an odd byte (when data received from a remote device station is an odd byte)

The last receive data is stored in the lower byte of the last data. 0 is stored in the upper byte of the last data storage area.



(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 module.
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. Create a program so that the next dedicated instruction is executed after Completion device (D2) turns on.

(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

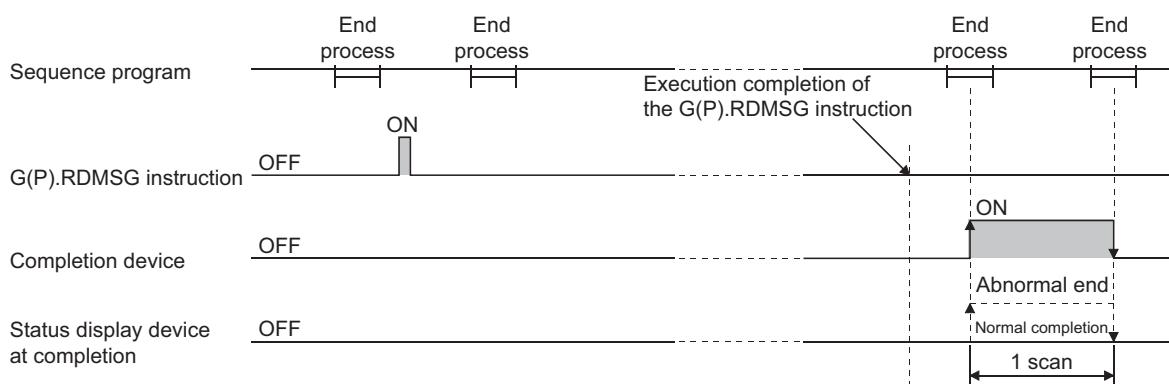
Turns on in the END process of the scan where the G(P).RDMSG instruction is completed, and turns off in the next END process.

- 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
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

9.9.1 Program example

The RDMSG instruction uses a part or all of remote register that performs cyclic transmission between the master station and the target station in the system. For program examples, refer to the manual for the remote device station that supports the message transmission function.

Add SW0160 to SW0163 (Remote register use prohibited status) to a program as an interlock.

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 device station and interlock with the station. Use Other station data link status (SW0080 to SW0083) to detect data link status in a device station. ( Page 351, Appendix 3.2)

Also create an error-handling program.

Ex. Interlock method

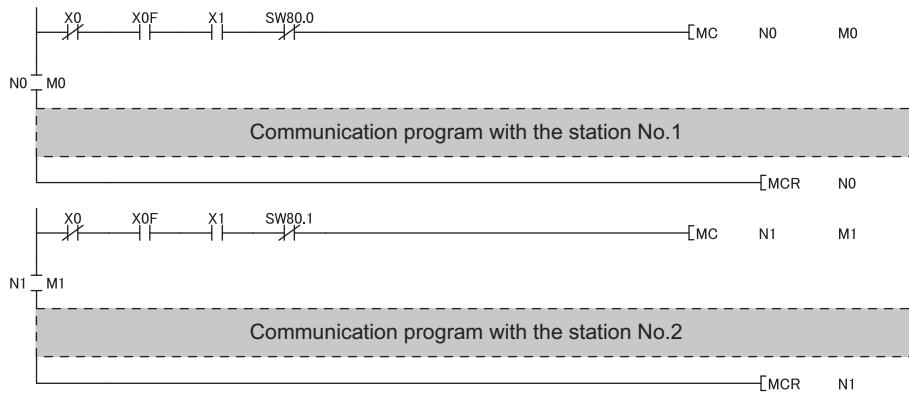
Assume that the start I/O number of the master/local module is 0000 and a refresh device is set as follows.

Number of Modules	1	Boards	Blank : No Setting	<input checked="" type="checkbox"/> Set
Start I/O No.	1	0000	2	
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)		SBO		
Special Register(SW)		SW0		

Refresh device

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

Number of Modules	1	Boards	Blank : No Setting	<input checked="" type="checkbox"/> Set
Start I/O No.	1	0000	2	
Operation Setting	Operation Setting			
Type	Master Station	<input type="button" value="Setting"/>		
Master Station Data Link Type	PLC Parameter Auto Start	<input type="button" value="Setting"/>		
Mode	Remote Net(Ver.1 Mode)	<input type="button" value="Setting"/>		
Total Module Connected(*1)	2			
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)	S80			
Special Register(SW)	SW0			
Retry Count	3			
Automatic Reconnection Station Count	1			
Standby Master Station No.(*1)				
PLC Down Select	Stop	<input type="button" value="Setting"/>		
Scan Mode Setting	Asynchronous	<input type="button" value="Setting"/>		
Delay Time Setting	0			
Station Information Setting	CC-Link Configuration Setting			
Remote Device Station Initial Setting	Initial Setting			
Interrupt Setting	Interrupt Settings			

(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.

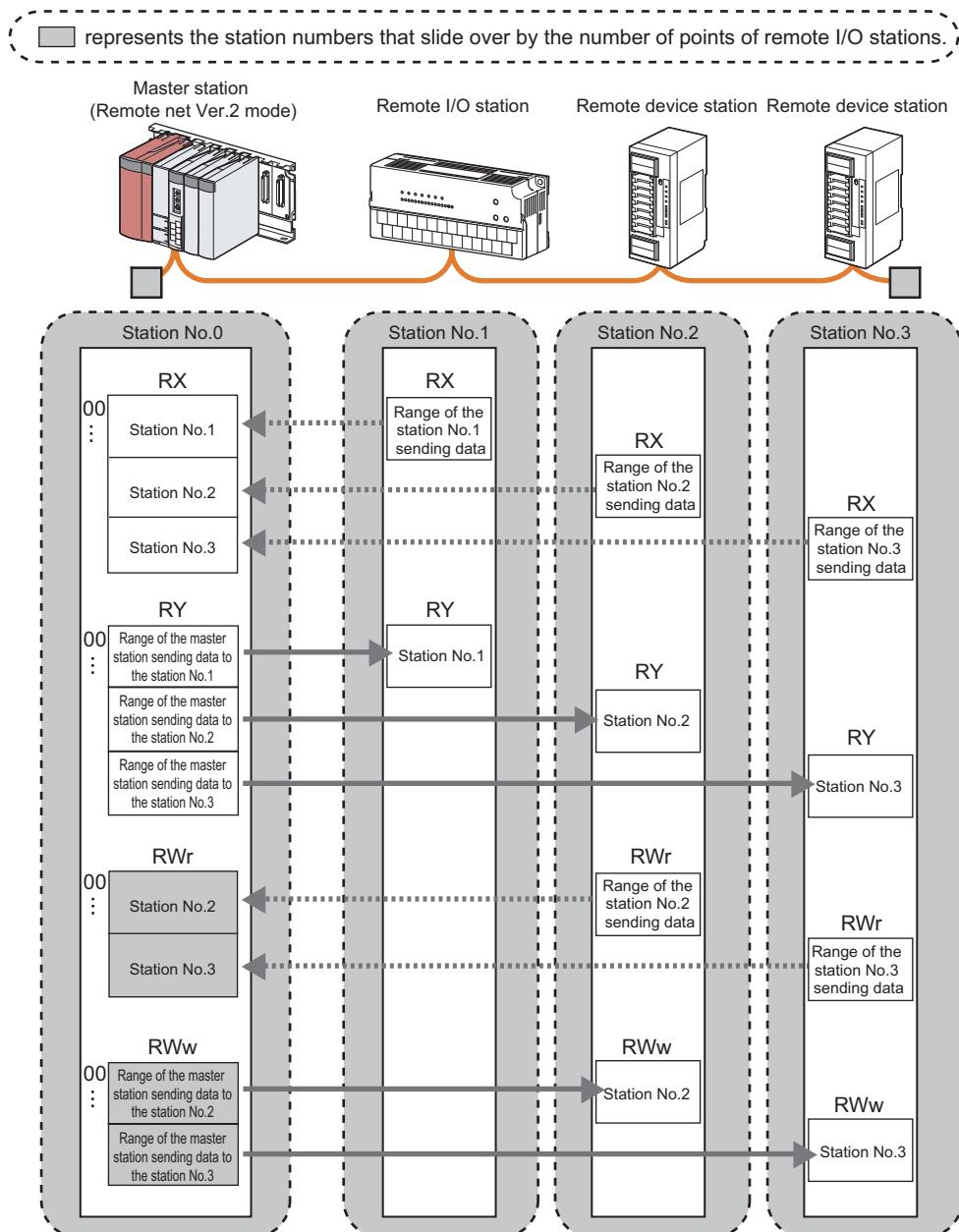
 QnPRHCPU User's Manual (Redundant System)

(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, RW_r/RW_w 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 RW_r/RW_w slide over



Point

The storage locations for each station can be checked using Device station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))

10.2 Example of Communications Between a Master Station and a Remote Device Station

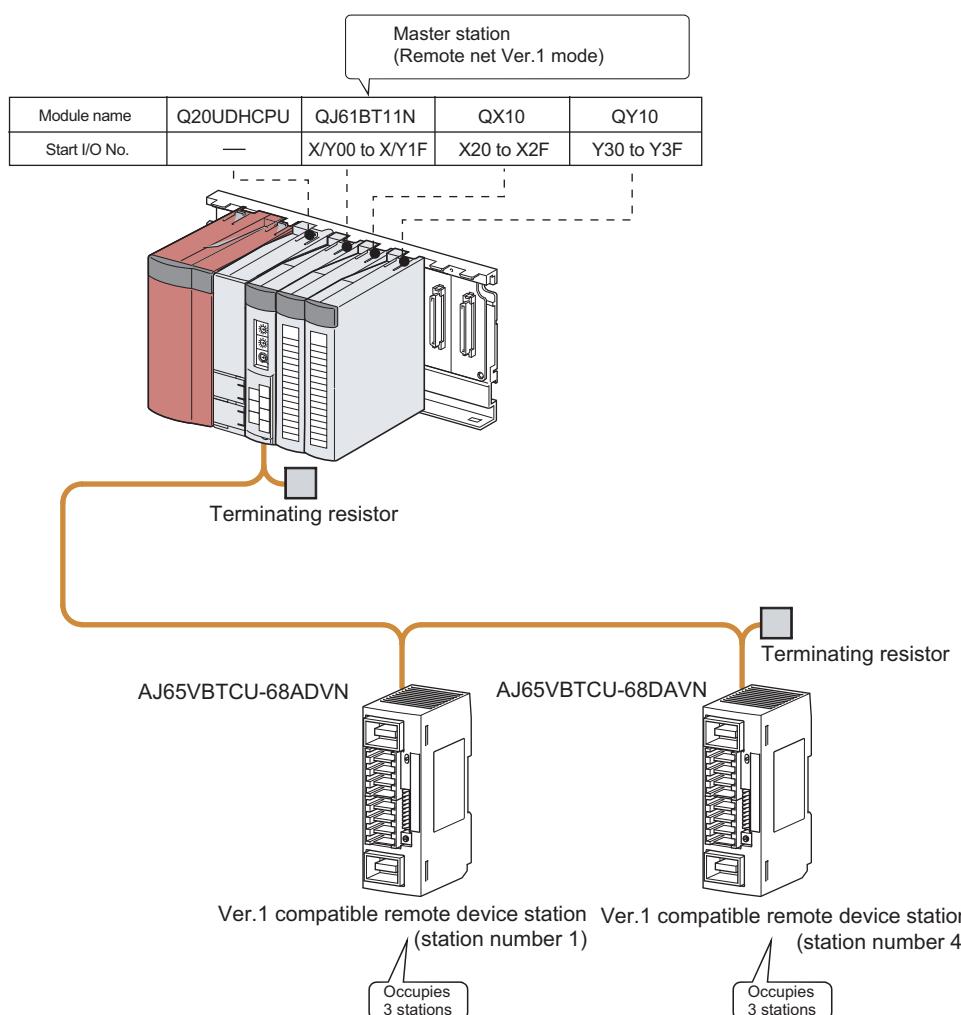
This section describes an example of how to configure the initial settings for the remote device station and perform an analog input and digital output.

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.



(2) Assignment of the remote I/O (RX, RY) and remote register (RW_r, RW_w)

In the program example, the following assignment is used to perform data link.



The status of a device assignment can be checked on GX Works2 by setting information of a device 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)				Remote Output(RY)				Remote Register(RW _r)				Remote Register(RW _w)			
Host STA	STA#	Link Device	Explanation	Host STA	STA#	Link Device	Explanation	Host STA	STA#	Link Device	Explanation	Host STA	STA#	Link Device	Explanation
X1000	RX0	CH1 AD conversion comp.		Y1000	RY0			V0	RWr0	CH1 digital output val		V100	RWw0	AD conv enable prohibit CH	
X1001	RX1	CH2 AD conversion comp.		Y1001	RY1			V1	RWr1	CH2 digital output val		V100.0	RWw0.0	AD conv enable prohibit CH	
X1002	RX2	CH3 AD conversion comp.		Y1002	RY2			V2	RWr2	CH3 digital output val		V100.1	RWw0.1	AD conv enable prohibit CH	
X1003	RX3	CH4 AD conversion comp.		Y1003	RY3			V3	RWr3	CH4 digital output val		V100.2	RWw0.2	AD conv enable prohibit CH	
X1004	RX4	CH5 AD conversion comp.		Y1004	RY4			V4	RWr4	CH5 digital output val		V100.3	RWw0.3	AD conv enable prohibit CH	
X1005	RX5	CH6 AD conversion comp.		Y1005	RY5			V5	RWr5	CH6 digital output val		V100.4	RWw0.4	AD conv enable prohibit CH	
X1006	RX6	CH7 AD conversion comp.		Y1006	RY6			V6	RWr6	CH7 digital output val		V100.5	RWw0.5	AD conv enable prohibit CH	
X1007	RX7	CH8 AD conversion comp.		Y1007	RY7			V7	RWr7	CH8 digital output val		V100.6	RWw0.6	AD conv enable prohibit CH	
X1008	RX8			Y1008	RY8			V8	RWr8	Error code		V100.7	RWw0.7	AD conv enable prohibit CH	
X1009	RX9			Y1009	RY9			V9	RWr9			V100.8	RWw0.8		
X100A	RX0A			Y100A	RY0A			V10A	RWr10A			V100.9	RWw0.9		
X100B	RX0B			Y100B	RY0B			V10B	RWr10B			V100.A	RWw0.A		
X100C	RX0C	EEPROM write error		Y100C	RY0C			V10C	RWr10C	CH1 set val check code		V100.B	RWw0.B		



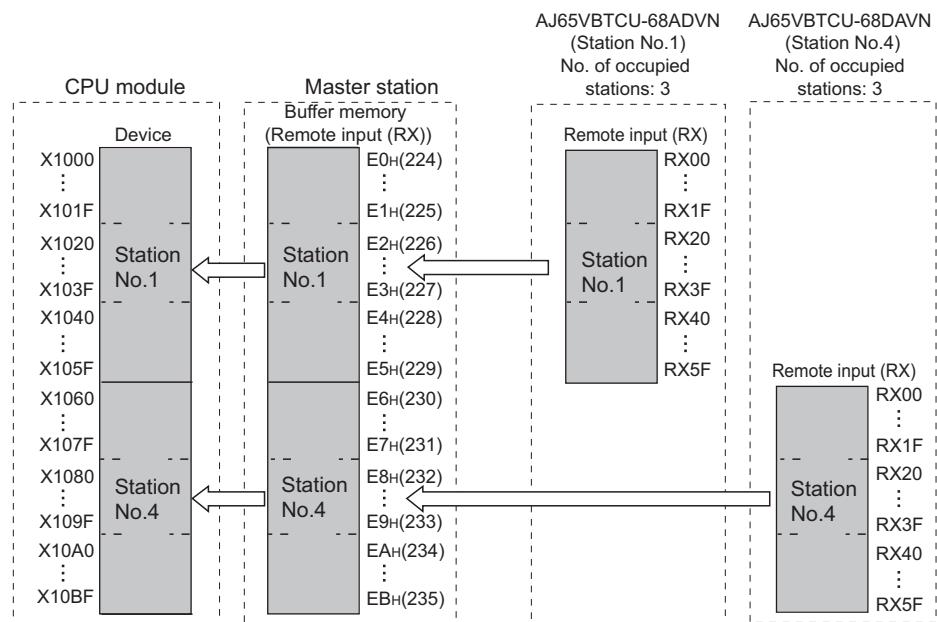
- When a master station is in the remote net Ver.2 mode or remote net additional mode
In the system configuration of the program example, the assignment is the same as that in the remote net Ver.1 mode, except for buffer memory addresses of data storage locations. (☞ Page 48, Section 3.6.4, Page 51, Section 3.6.5)
- The remote I/O (RX/RY) and remote register (RW_r/RW_w) of the AJ65VBTCU-68ADV 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		Device station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)	
	Hexadecimal	Decimal				
X1000 to X100F	E0 _H	224	1	AJ65VBTCU-68ADV	RX0 to RXF	
X1010 to X101F	E1 _H	225			RX10 to RX1F	
X1020 to X102F	E2 _H	226	2	AJ65VBTCU-68ADV	RX20 to RX2F	
X1030 to X103F	E3 _H	227			RX30 to RX3F	
X1040 to X104F	E4 _H	228	3	AJ65VBTCU-68ADV	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	

The assignment by each signal of the AJ65VBTU-68ADV and AJ65VBTU-68DAVN are shown below.



CPU module	Remote station		
	Device	Module name	Signal name
X1000	AJ65VBTU-68ADV	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 ² PROM 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	

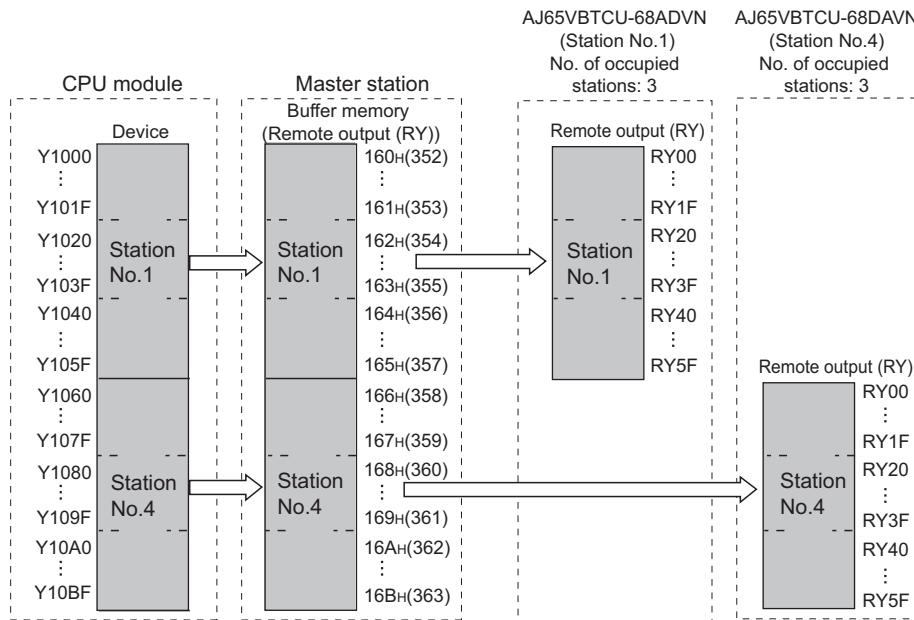
CPU module	Remote station			
	Device	Module name	Remote input (RX)	Signal name
X1060	AJ65VBTCU-68DAVN		RX00	Reserved
to			to	
X106B			RX0B	
X106C			RX0C	E ² PROM write error flag
X106D			RX0D	Reserved
to			to	
X1077			RX17	
X1078			RX18	Initial data processing request flag
X1079			RX19	Initial data setting complete flag
X107A			RX1A	Error status flag
X107B			RX1B	Remote READY
X107C			RX1C	Reserved
to			to	
X10BF			RX5F	

(b) Remote output (RY)

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

CPU module	Master station		Device station		
	Device	Buffer memory address		Station number	Module name
		Hexadecimal	Decimal		
Y1000 to Y100F		160 _H	352	1	AJ65VBTU-68ADVN
Y1010 to Y101F		161 _H	353		
Y1020 to Y102F		162 _H	354	2	AJ65VBTU-68ADVN
Y1030 to Y103F		163 _H	355		
Y1040 to Y104F		164 _H	356	3	AJ65VBTU-68ADVN
Y1050 to Y105F		165 _H	357		
Y1060 to Y106F		166 _H	358	4	AJ65VBTU-68DAVN
Y1070 to Y107F		167 _H	359		
Y1080 to Y108F		168 _H	360	5	AJ65VBTU-68DAVN
Y1090 to Y109F		169 _H	361		
Y10A0 to Y10AF		16A _H	362	6	AJ65VBTU-68DAVN
Y10B0 to Y10BF		16B _H	363		

The assignment by each signal of the AJ65VBTU-68ADVN and AJ65VBTU-68DAVN are shown below.



CPU module	Remote station			
	Device	Module name	Remote output (RY)	
Y1000			RY00	
to	AJ65VBTU-68ADVN		to	
Y1017			RY17	
Y1018			RY18	
Y1019			RY19	
Y101A			RY1A	
			Reserved	
			Initial data processing completion flag	
			Initial data setting request flag	
			Error reset request flag	

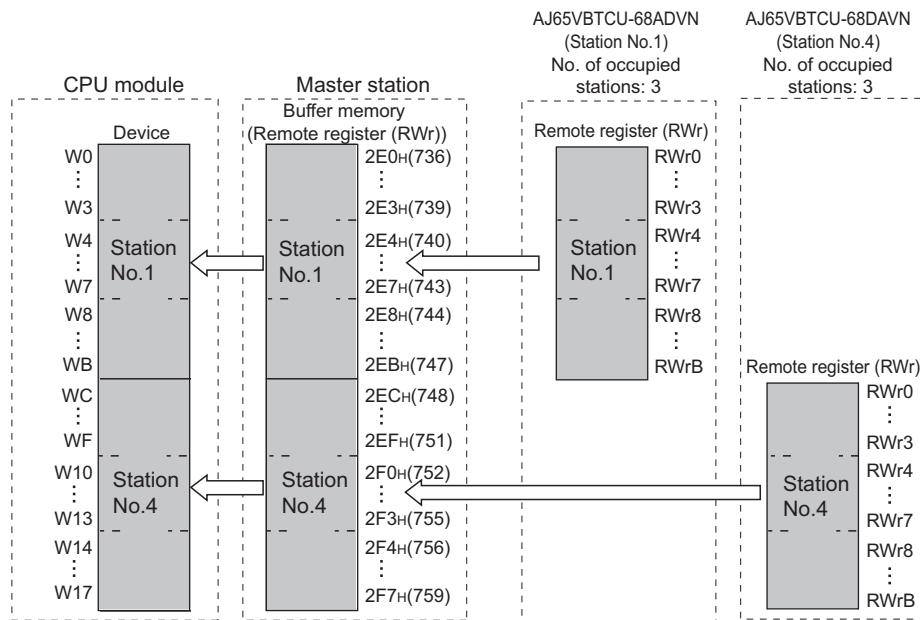
CPU module		Remote station	
Device	Module name	Remote output (RY)	Signal name
Y101B	AJ65VBTU-68ADVN	RY1B	Reserved
to		to	
Y105F		RY5F	
Y1060	AJ65VBTU-68DAVN	RY00	CH.1 analog output enable/disable flag
Y1061		RY01	CH.2 analog output enable/disable flag
Y1062		RY02	CH.3 analog output enable/disable flag
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	

(c) Remote register (RWr)

Plan the assignment using the assignment sheet on Page 408, Appendix 8.1 (2).

CPU module	Master station		Device station			
	Device	Buffer memory address		Station number	Module name	Remote register (RWr/RWw)
		Hexadecimal	Decimal			
W0	2E0 _H	736	1	AJ65VBTU-68ADVN		RWr0
W1	2E1 _H	737				RWr1
W2	2E2 _H	738				RWr2
W3	2E3 _H	739				RWr3
W4	2E4 _H	740	2	AJ65VBTU-68ADVN		RWr4
W5	2E5 _H	741				RWr5
W6	2E6 _H	742				RWr6
W7	2E7 _H	743				RWr7
W8	2E8 _H	744	3	AJ65VBTU-68ADVN		RWr8
W9	2E9 _H	745				RWr9
WA	2EA _H	746				RWrA
WB	2EB _H	747				RWrB
WC	2EC _H	748	4	AJ65VBTU-68DAVN		RWr0
WD	2ED _H	749				RWr1
WE	2EE _H	750				RWr2
WF	2EF _H	751				RWr3
W10	2F0 _H	752	5	AJ65VBTU-68DAVN		RWr4
W11	2F1 _H	753				RWr5
W12	2F2 _H	754				RWr6
W13	2F3 _H	755				RWr7
W14	2F4 _H	756	6	AJ65VBTU-68DAVN		RWr8
W15	2F5 _H	757				RWr9
W16	2F6 _H	758				RWrA
W17	2F7 _H	759				RWrB

The assignment by each data of the AJ65VBTCU-68ADVN and AJ65VBTCU-68DAVN are shown below.



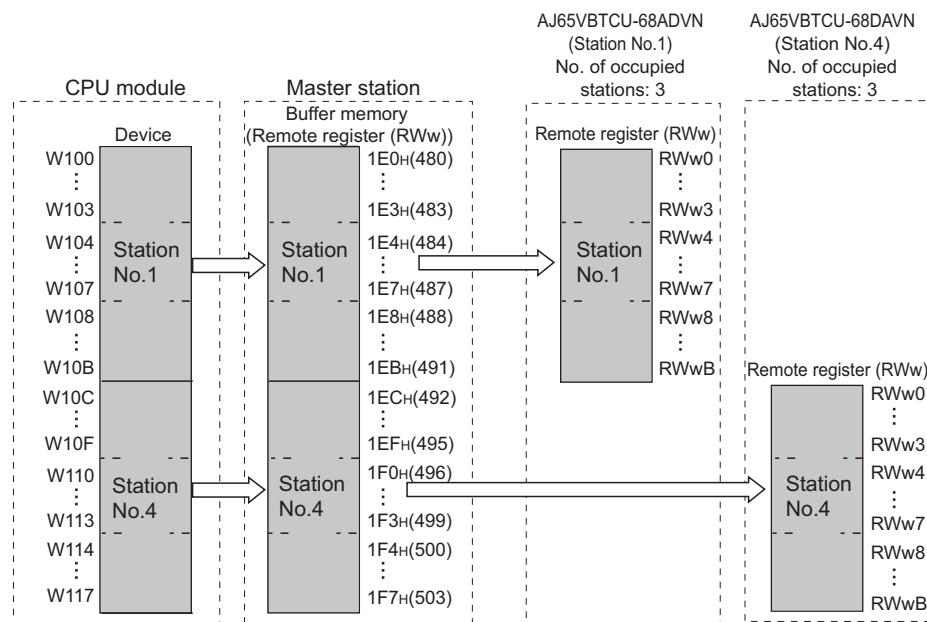
CPU module	Remote station		
	Device	Module name	Remote register (RW)
W0	AJ65VBTCU-68ADVN	RWr0	CH.1 digital output value
W1		RWr1	CH.2 digital output value
W2		RWr2	CH.3 digital output value
W3		RWr3	CH.4 digital output value
W4		RWr4	CH.5 digital output value
W5		RWr5	CH.6 digital output value
W6		RWr6	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	

(d) Remote register (RWw)

Plan the assignment using the assignment sheet on Page 408, Appendix 8.1 (2).

CPU module	Master station		Device station			
	Device	Buffer memory address		Station number	Module name	Remote register (RWr/RWw)
		Hexadecimal	Decimal			
W100		1E0 _H	480	1	AJ65VBTU-68ADVN	RWw0
W101		1E1 _H	481			RWw1
W102		1E2 _H	482			RWw2
W103		1E3 _H	483			RWw3
W104		1E4 _H	484	2	AJ65VBTU-68ADVN	RWw4
W105		1E5 _H	485			RWw5
W106		1E6 _H	486			RWw6
W107		1E7 _H	487			RWw7
W108		1E8 _H	488	3	AJ65VBTU-68ADVN	RWw8
W109		1E9 _H	489			RWw9
W10A		1EA _H	490			RWwA
W10B		1EB _H	491			RWwB
W10C		1EC _H	492	4	AJ65VBTU-68DAVN	RWw0
W10D		1ED _H	493			RWw1
W10E		1EE _H	494			RWw2
W10F		1EF _H	495			RWw3
W110		1F0 _H	496	5	AJ65VBTU-68DAVN	RWw4
W111		1F1 _H	497			RWw5
W112		1F2 _H	498			RWw6
W113		1F3 _H	499			RWw7
W114		1F4 _H	500	6	AJ65VBTU-68DAVN	RWw8
W115		1F5 _H	501			RWw9
W116		1F6 _H	502			RWwA
W117		1F7 _H	503			RWwB

The assignment by each data of the AJ65VBT CU-68ADV N and AJ65VBT CU-68DAVN are shown below.

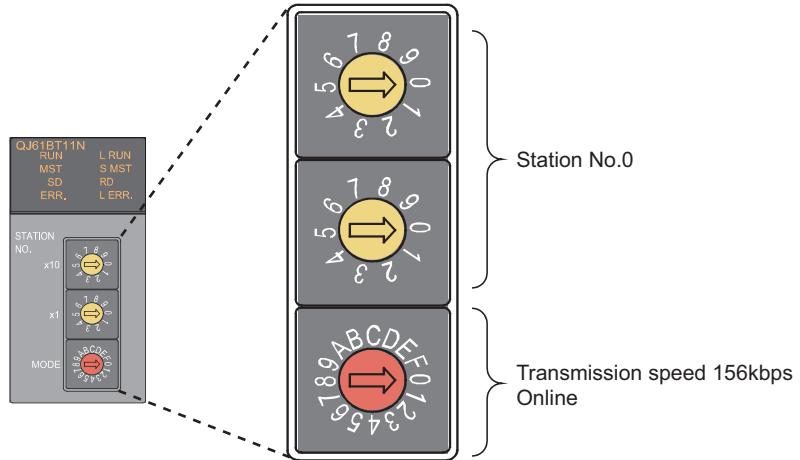


CPU module	Remote station			
	Device	Module name	Remote register (RWw)	Data name
W100	AJ65VBT CU-68ADV N		RWw0	A/D conversion enable/prohibit specification
W101			RWw1	CH.1 to 4 input range setting
W102			RWw2	CH.5 to 8 input range setting
W103			RWw3	Average processing specification
W104			RWw4	CH.1 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			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

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)



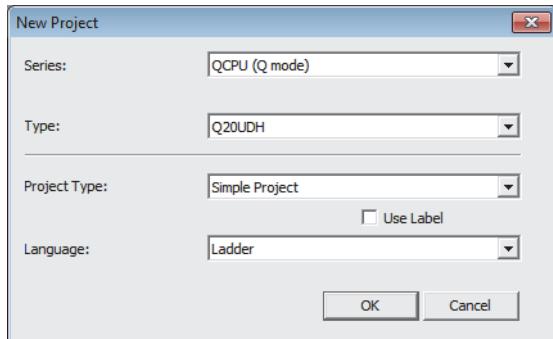
(2) Parameter settings by using a programming tool

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.

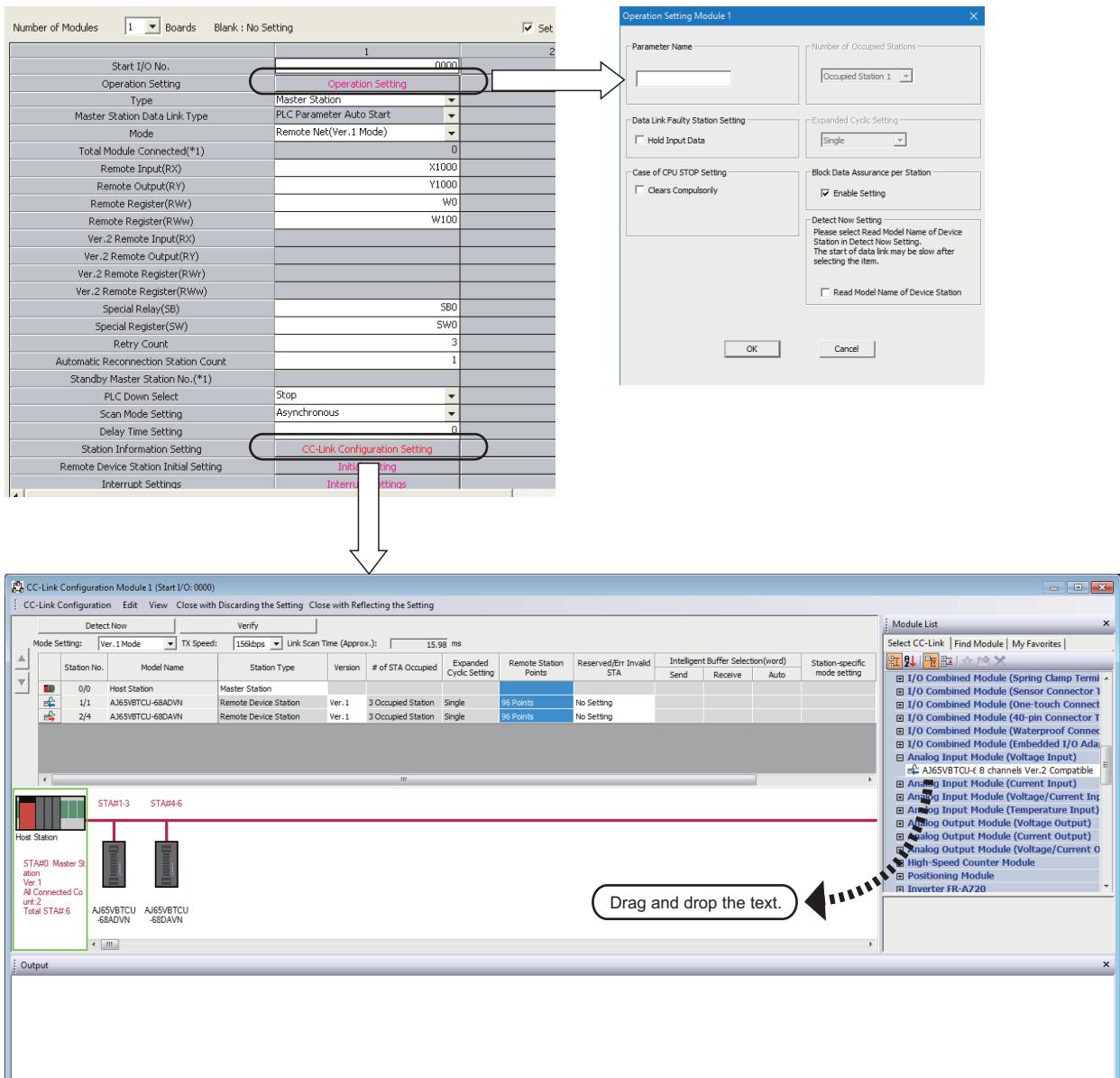
Select "QCPCU (Q mode)" under "Series". Select "Q20UDH" under "Type".

☞ [Project] ⇒ [New]



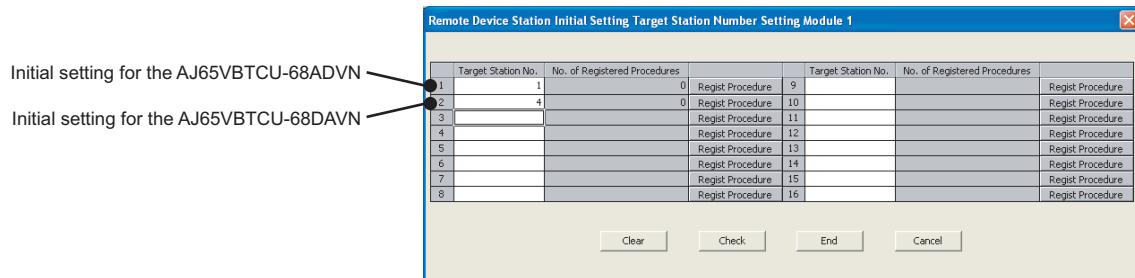
2. Open the "Network Parameter" window to configure the setting as follows.

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link]



3. Open the "Remote Device Station Initial Setting" window to configure the setting as follows.

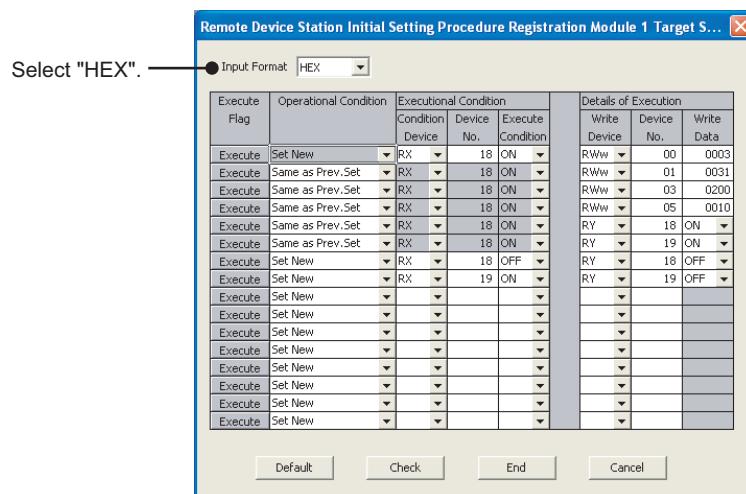
 Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link] \Rightarrow 



4. Click the **Register 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.

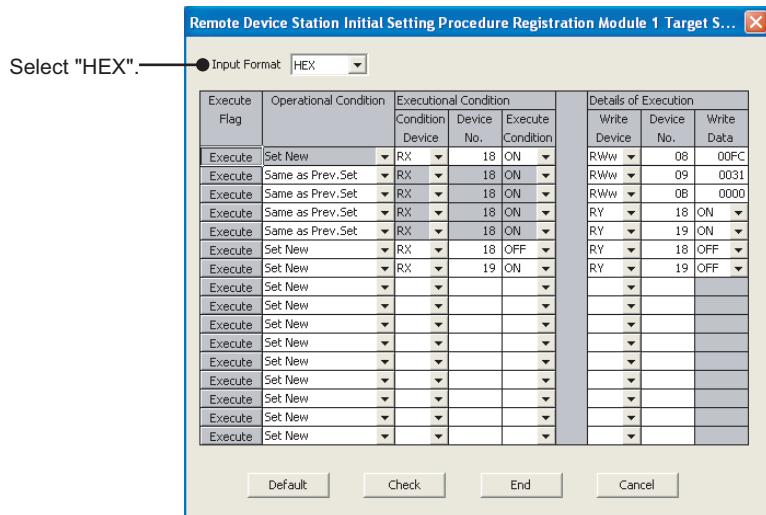
- Initial setting for an AJ65VBTCU-68ADVN (station number 1)



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.
	<ul style="list-style-type: none"> • 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.
	<ul style="list-style-type: none"> • 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.

- Initial setting for an AJ65VBTCU-68DAVN (station number 4)



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. <ul style="list-style-type: none"><li data-bbox="528 1035 1318 1048">• Channel 1: 0 to 5V<li data-bbox="528 1048 1318 1062">• Channel 2: User range setting 1 (-10 to 10V)
3rd	The HOLD/CLEAR setting is configured. <ul style="list-style-type: none"><li data-bbox="528 1048 1318 1062">• Channel 1: CLEAR<li data-bbox="528 1062 1318 1075">• 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.

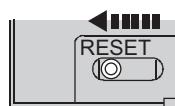
Remark

The initial setting of a remote device station can be also configured on a program. (☞ Page 252, Section 10.2.6)

6. Click the  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]

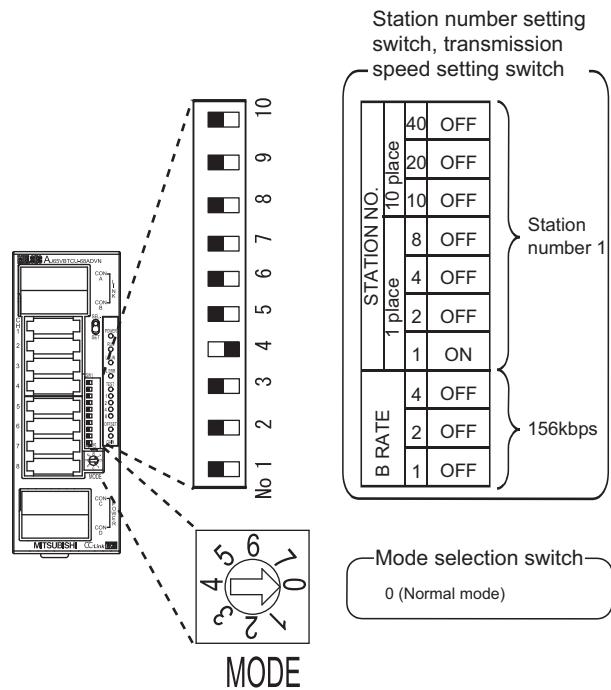


or power off → on

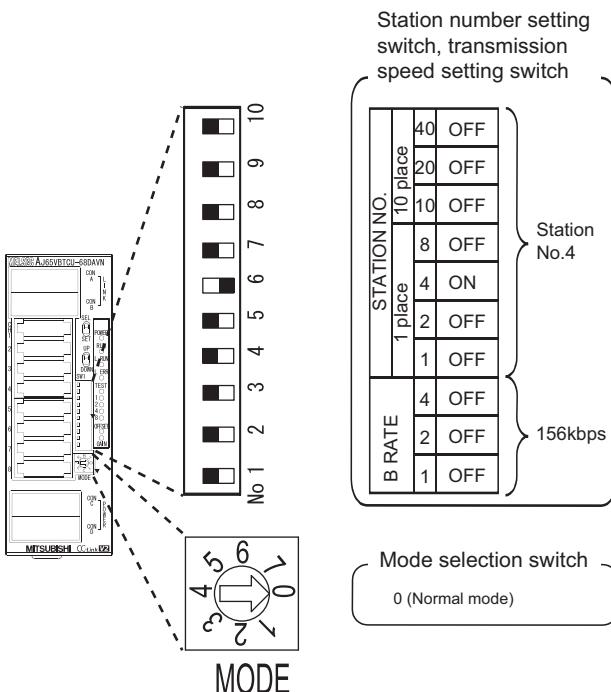
10.2.3 Settings for a remote device station

Set the station number, transmission speed, and mode using the switches on the remote device station.

(1) Switch setting on an AJ65VBTU-68ADVN



(2) Switch setting on an AJ65VBTU-68DAVN

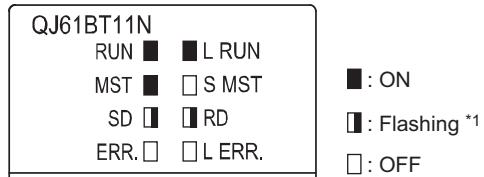


10.2.4 Checking the status of data link

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

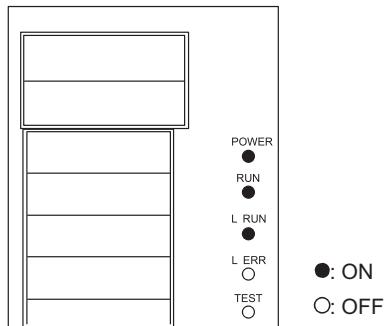
When the LEDs are in the following states, data link is being performed normally.

(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



10.2.5 Program example

This section provides a program example. Write a program to the CPU module in a master station.

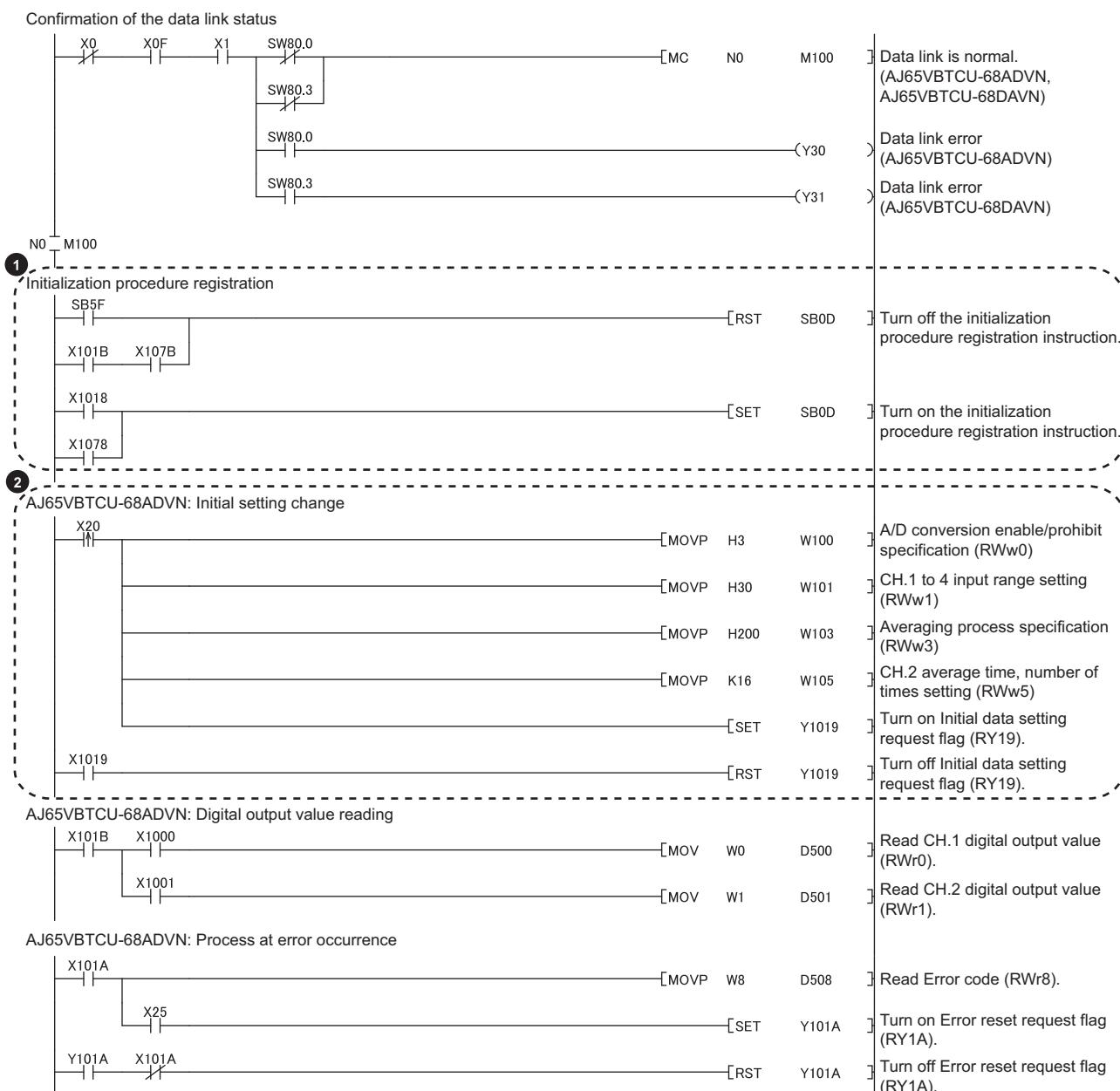
(1) Devices to be used

The following table lists the devices to be used in the program example.

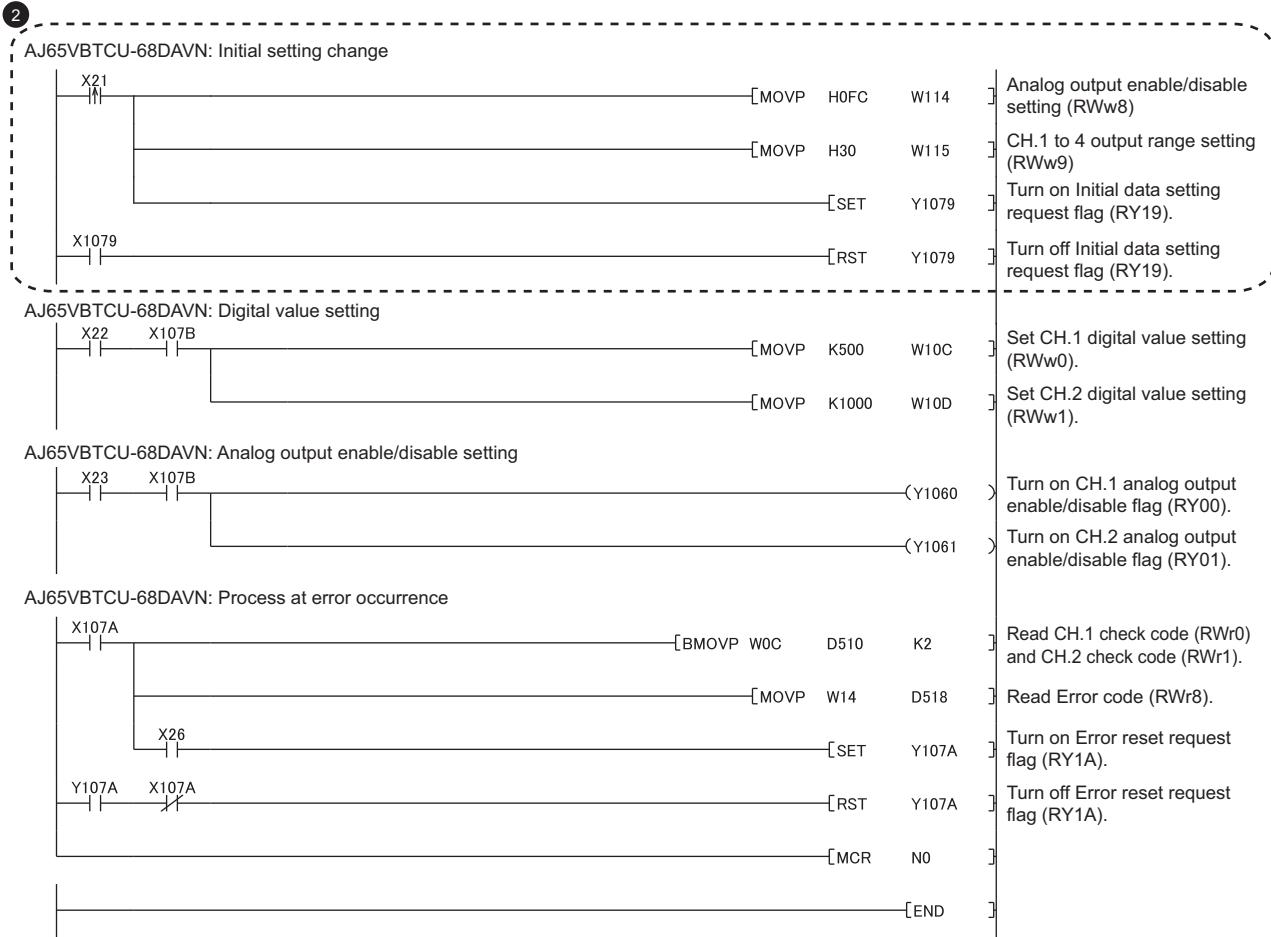
Device	Description	Module
X0	Module error	QJ61BT11N
X1	Host data link status	
XF	Module ready	
SB000D	Remote device station initialization procedure registration instruction	
SB005F	Completion status of remote device station initialization procedure	
SW0080.0	Other station data link status (station number 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	

(2) Program example

1. Create the following program on a programming tool.



(To the next page)



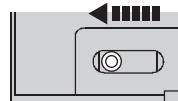
When creating the program ①, refer to the manual for the remote device station used and change the program as needed.

The program ② 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.



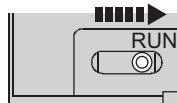
[Online] ⇒ [Write to PLC]



or power off → on

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.

10.2.6 Program example (when the initial setting is configured only on a program)

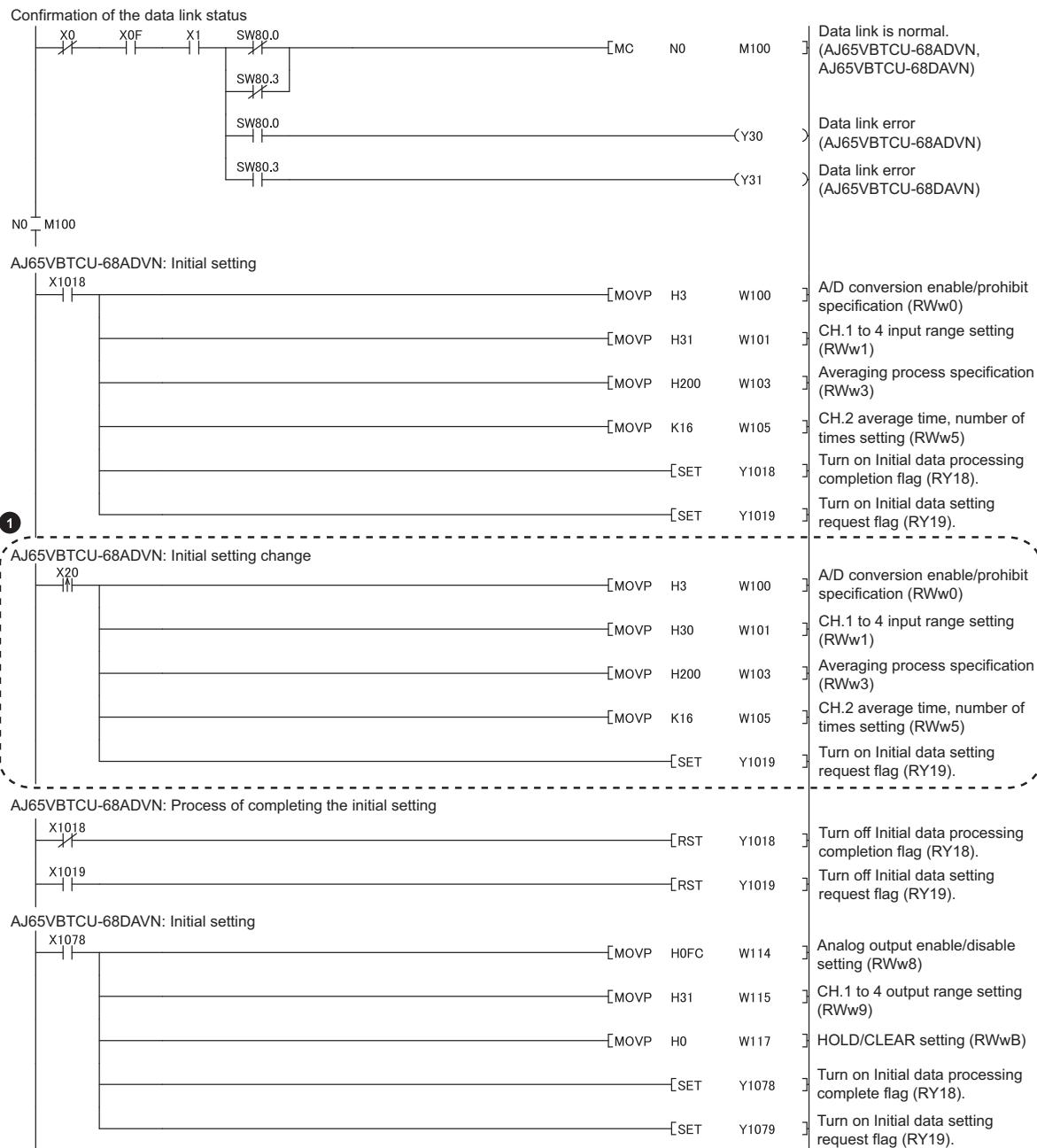
This section provides an example of when the initial setting is configured only on a program, not on a programming tool.

(1) Devices to be used

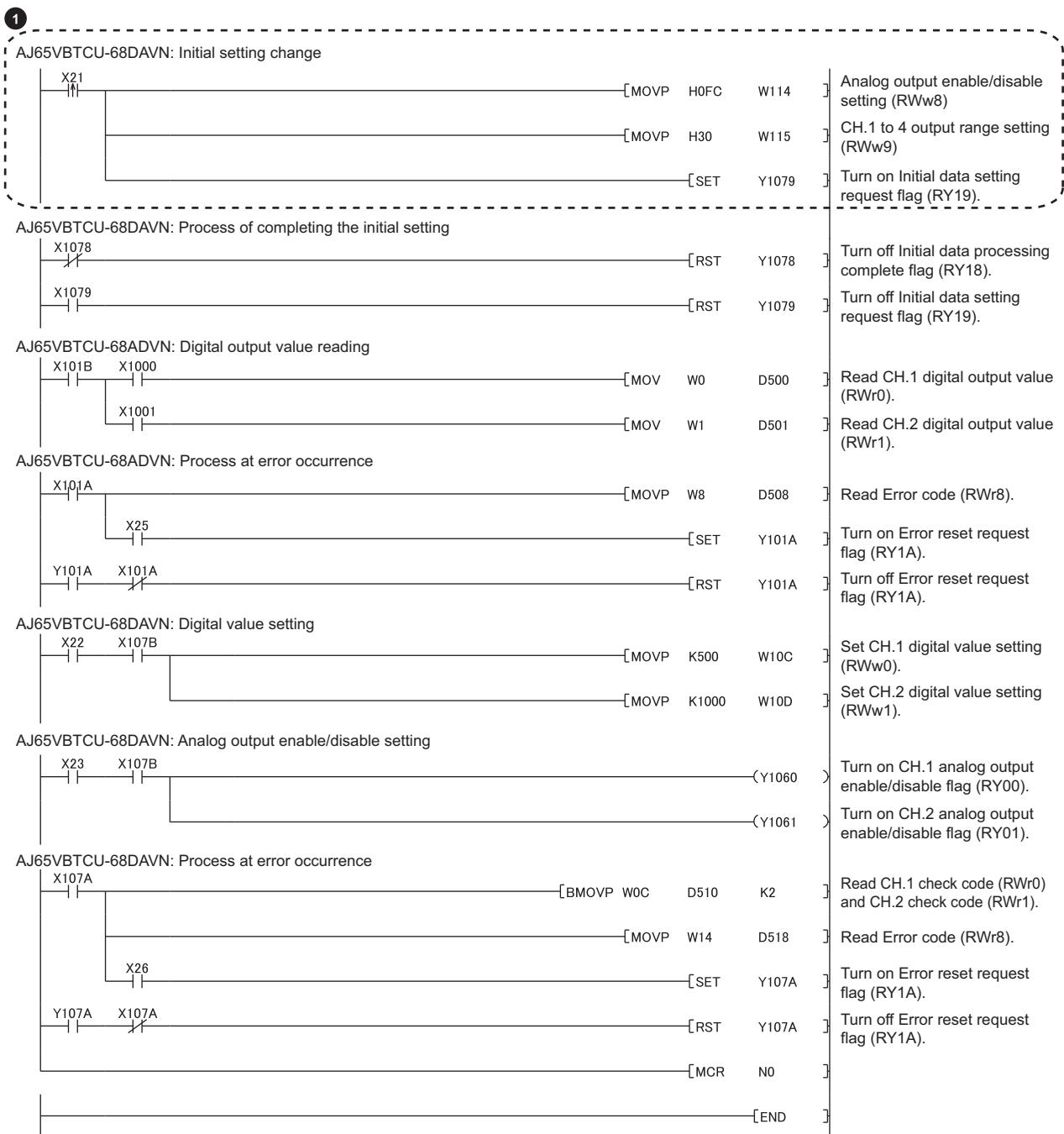
Devices are the same as those when the initial setting is configured on a programming tool. (☞ Page 248, Section 10.2.5 (1))

(2) Program example

1. Create the following program on a programming tool.



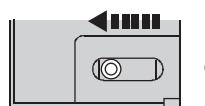
(To the next page)



The program ① 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]

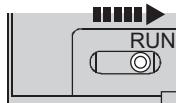


or power off → on

10.2 Example of Communications Between a Master Station and a Remote Device Station
10.2.6 Program example (when the initial setting is configured only on a program)

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 AJ65VBTU-68ADVN and AJ65VBTU-68DAVN. Then the initial setting is executed.



When the initial setting is completed, the input value of the AJ65VBTU-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 AJ65VBTU-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 AJ65VBTU-68DAVN.

5. Turning on X23 outputs the analog value from the AJ65VBTU-68DAVN.

If an error occurs in the AJ65VBTU-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.

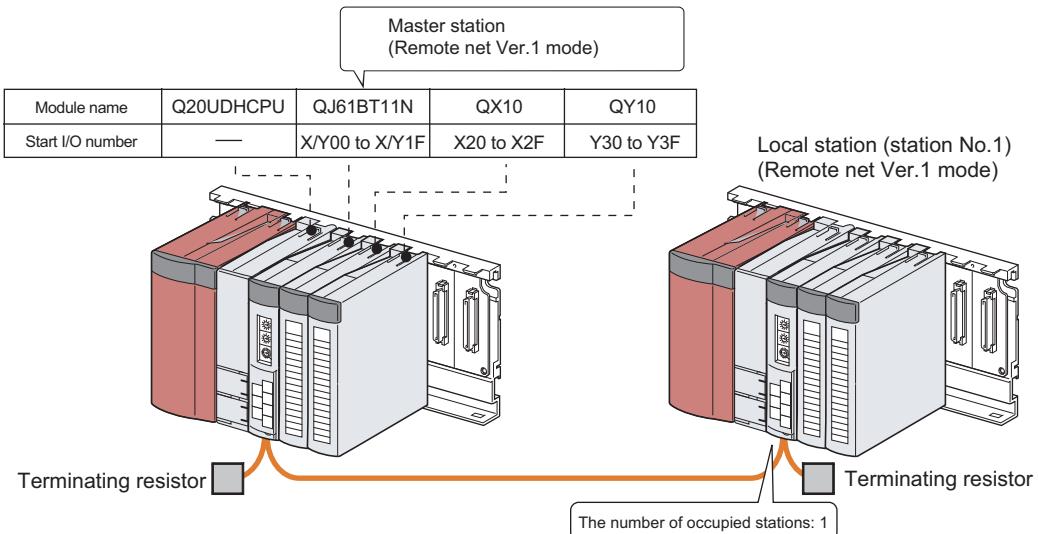
10.3 Example of Communications Between a Master Station and a Local Station

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.



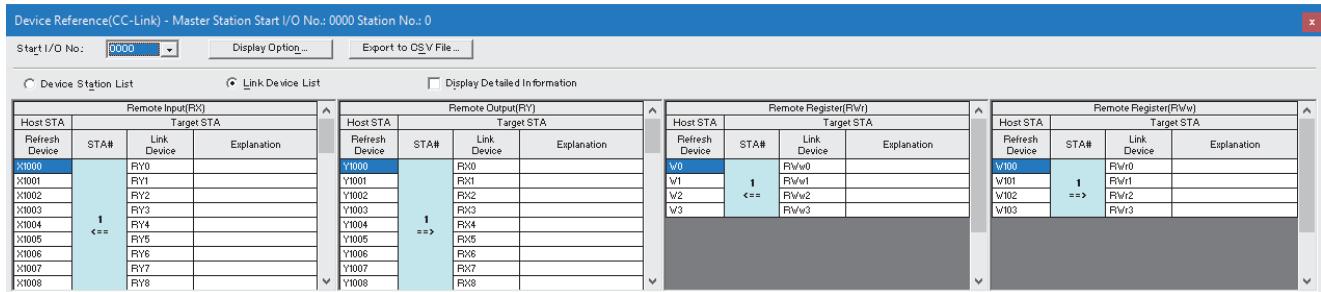
(2) Assignment of the remote I/O (RX, RY) and remote register (RWr, RWw)

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 device station on the CC-Link configuration window on GX Works2. (☞ Page 102, Section 7.3.2 (2) (a))

☞ [View] ⇒ [Docking Window] ⇒ [Device Reference]



Remark

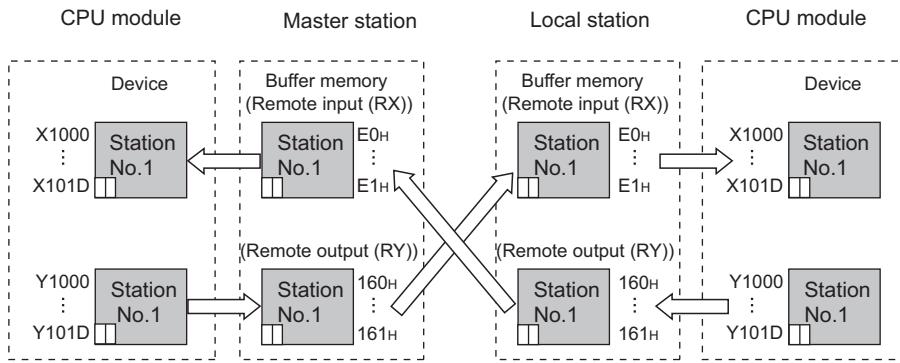
- When a master/local module is in the remote net Ver.2 mode or remote net additional mode
In the system configuration of the program example, the assignment is the same as that in the remote net Ver.1 mode, except for buffer memory addresses of data storage locations. (☞ Page 48, Section 3.6.4, Page 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		Device station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)	
	Hexadecimal	Decimal				
X1000 to X100F	E0H	224	1	QJ61BT11N	RY0 to RYF	
X1010 to X101D	E1H	225			RY10 to RY1D	

CPU module		Master station		Device station		
Device	Buffer memory address		Station number	Module name	Remote I/O (RX/RY)	
	Hexadecimal	Decimal				
Y1000 to Y100F	160H	352	1	QJ61BT11N	RX0 to RXF	
Y1010 to Y101D	161H	353			RX10 to RX1D	

**Point**

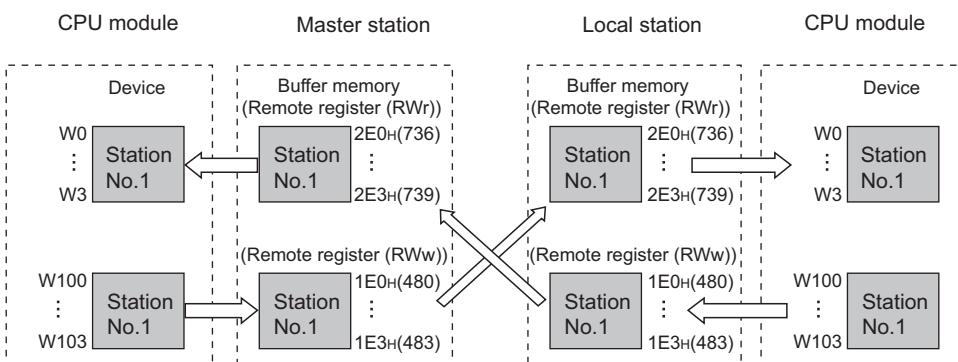
The last two bits in RX and RY cannot be used for communications between a master station and a local station.

(b) Remote register (RW_r/RW_w)

Plan the assignment using the assignment sheet on Page 408, Appendix 8.1 (2).

CPU module	Master station		Device station		
	Buffer memory address		Station number	Module name	Remote register (RW _r /RW _w)
	Hexadecimal	Decimal			
W0	2E0 _H	736	1	QJ61BT11N	RW _{w0}
W1	2E1 _H	737			RW _{w1}
W2	2E2 _H	738			RW _{w2}
W3	2E3 _H	739			RW _{w3}

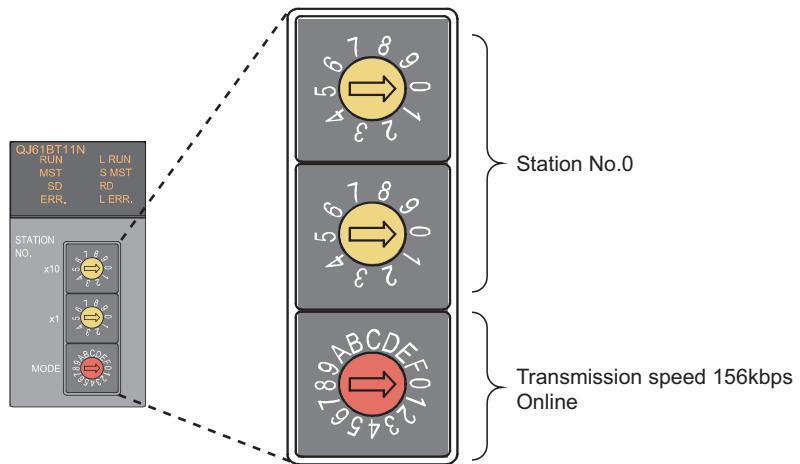
CPU module	Master station		Device station		
	Buffer memory address		Station number	Module name	Remote register (RW _r /RW _w)
	Hexadecimal	Decimal			
W100	1E0 _H	480	1	QJ61BT11N	RW _{r0}
W101	1E1 _H	481			RW _{r1}
W102	1E2 _H	482			RW _{r2}
W103	1E3 _H	483			RW _{r3}



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)



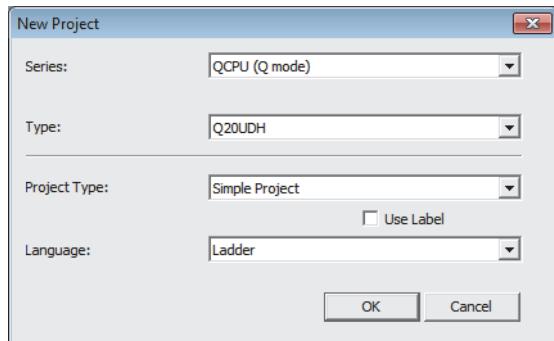
(2) Parameter settings by using a programming tool

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.

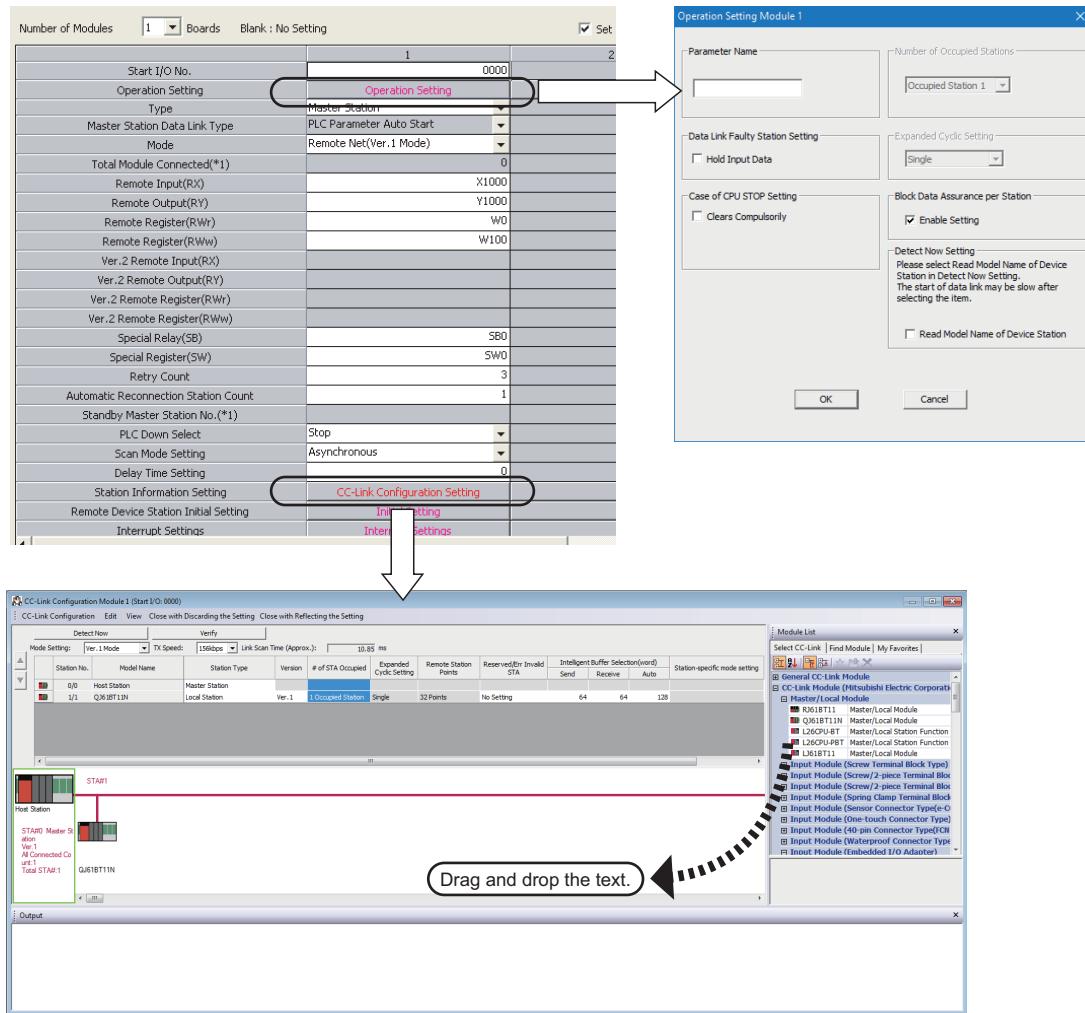
Select "QCPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

☞ [Project] ➔ [New]



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

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link]

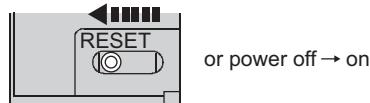


3. Click the **End** button to terminate the setting.

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.

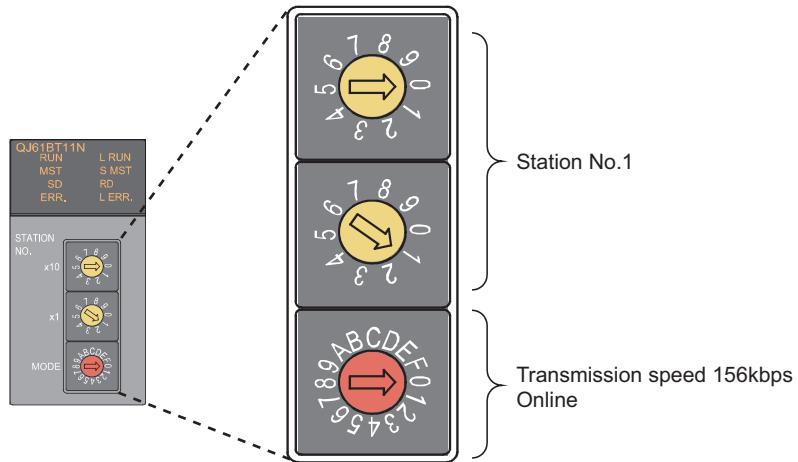
[Online] \Leftrightarrow [Write to PLC]



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)



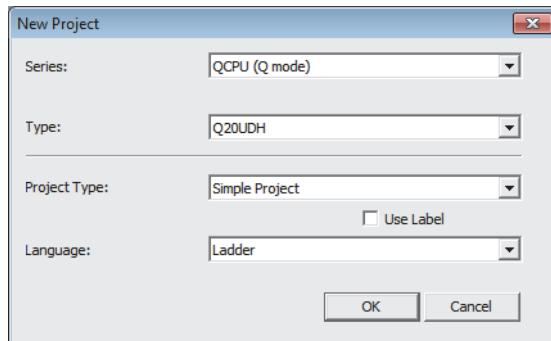
(2) Parameter settings by using a programming tool

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.

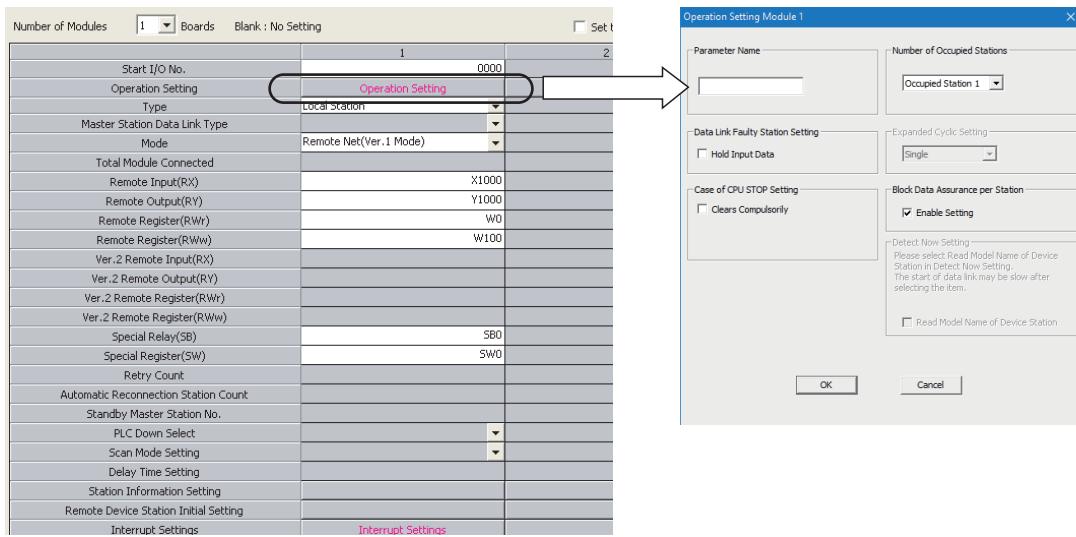
Select "QCPU (Q mode)" under "Series". Select "Q20UDH" under "Type".

☞ [Project] ➔ [New]



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

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link]

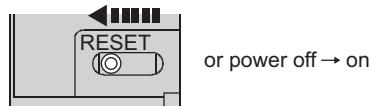


3. Click the button to terminate the setting.

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] \Rightarrow [Write to PLC]



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

QJ61BT11N		
RUN	■	■ L RUN
MST	■	□ S MST
SD	□	■ RD
ERR.	□	□ L ERR.

■: ON
■: Flashing *1
□: OFF

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

(2) LEDs on the local station

QJ61BT11N		
RUN	■	■ L RUN
MST	□	□ S MST
SD	□	■ RD
ERR.	□	□ L ERR.

■: ON
■: Flashing *1
□: OFF

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

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)	(☞ 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)	

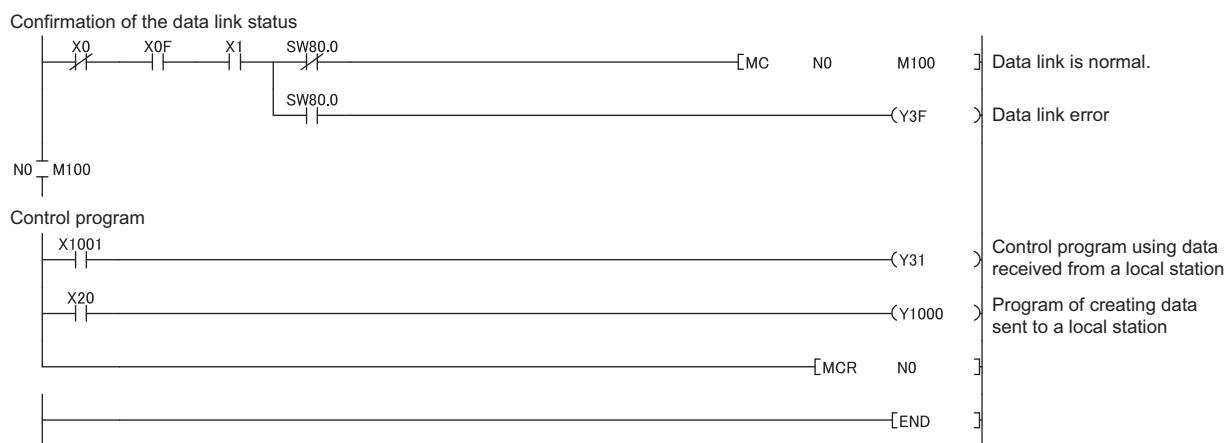
(b) Devices in the local station

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	
Y30	Output from RY0 in the master station	QX10
M100	Communication condition established flag	-
X1000 to X101D	Remote input (RX0 to RX1D)	(☞ 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)	

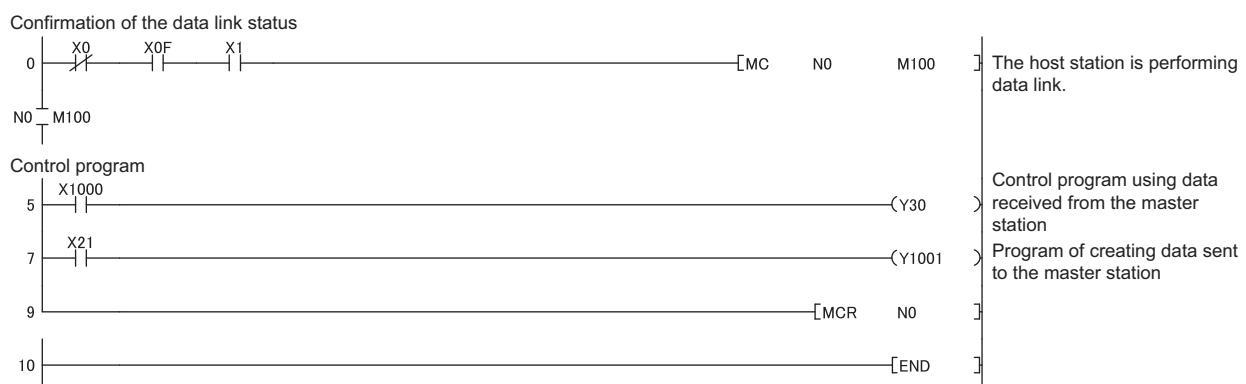
(2) Program example

1. Create the following program on a programming tool.

- Program for the master station



- Program for the local station



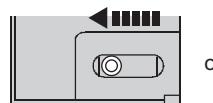
2. Write the program to the CPU module. Then reset the CPU module or power off and on the system.

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 Y1000 in the local station turns on, Y30 in the local station turns on.

5 Turning on X21 in the local station turns on Y001 in the master station

When X1001 is the master station turns on, X21 in the master station turns on.

10.3.6 Program example (to assure the integrity of cyclic data in each device station)

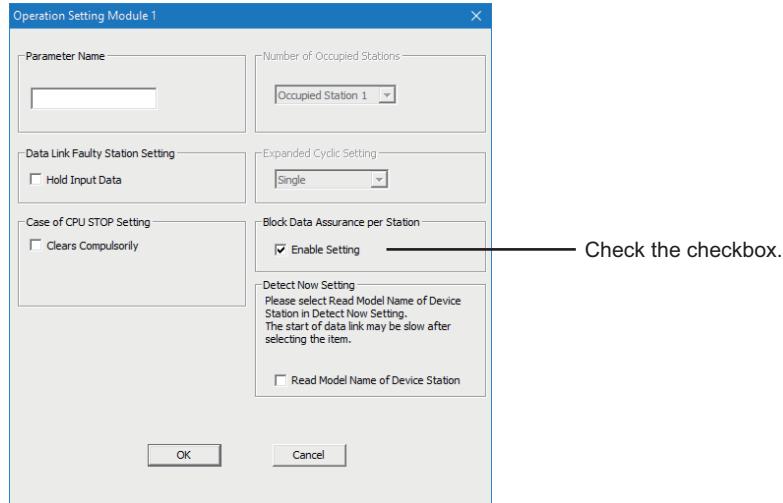
One of the following actions assures the integrity of cyclic data in each device station.

Note that data integrity is not assured across device stations.

(1) Using a programming tool

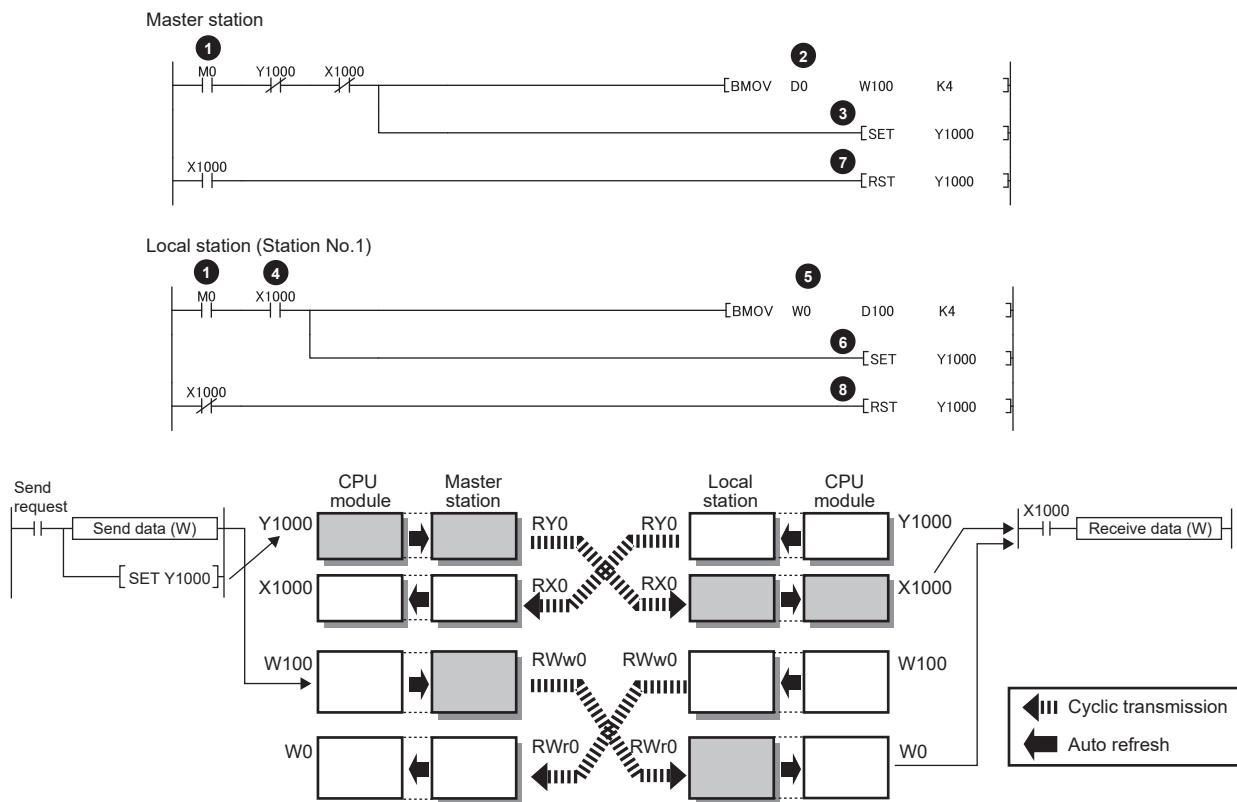
On the "Operation Setting" window, check the checkbox in "Block Data Assurance per Station".

Project window \Rightarrow [Parameter] \Rightarrow [Network Parameter] \Rightarrow [CC-Link] \Rightarrow
 button



(2) Using a program

Set an interlock in the remote I/O (RX/RY).



- ① Turn on Send request (M0) in the master station. Turn on Receive request (M0) in the local station.
- ② Information in D0 to D3 is transferred to W100 to W103 (RWw0 to RWw3).
- ③ After the information is stored in W100 to W103, turn on Y1000 for a handshake in the master station.*¹
- ④ Data in RWw is sent before data in RY is sent by cyclic transmission. Then X1000 in the local station turns on.
- ⑤ Information in W0 to W3 is stored into D100 to D103.
- ⑥ After the information is stored in D100 to D103, turn on Y1000 for a handshake in the local station.*¹
- ⑦ Turning on Y1000 in the local station turns off Y1000 in the master station.
- ⑧ 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 device station. An interlock for the number of occupied stations (in units of four words) is not required.

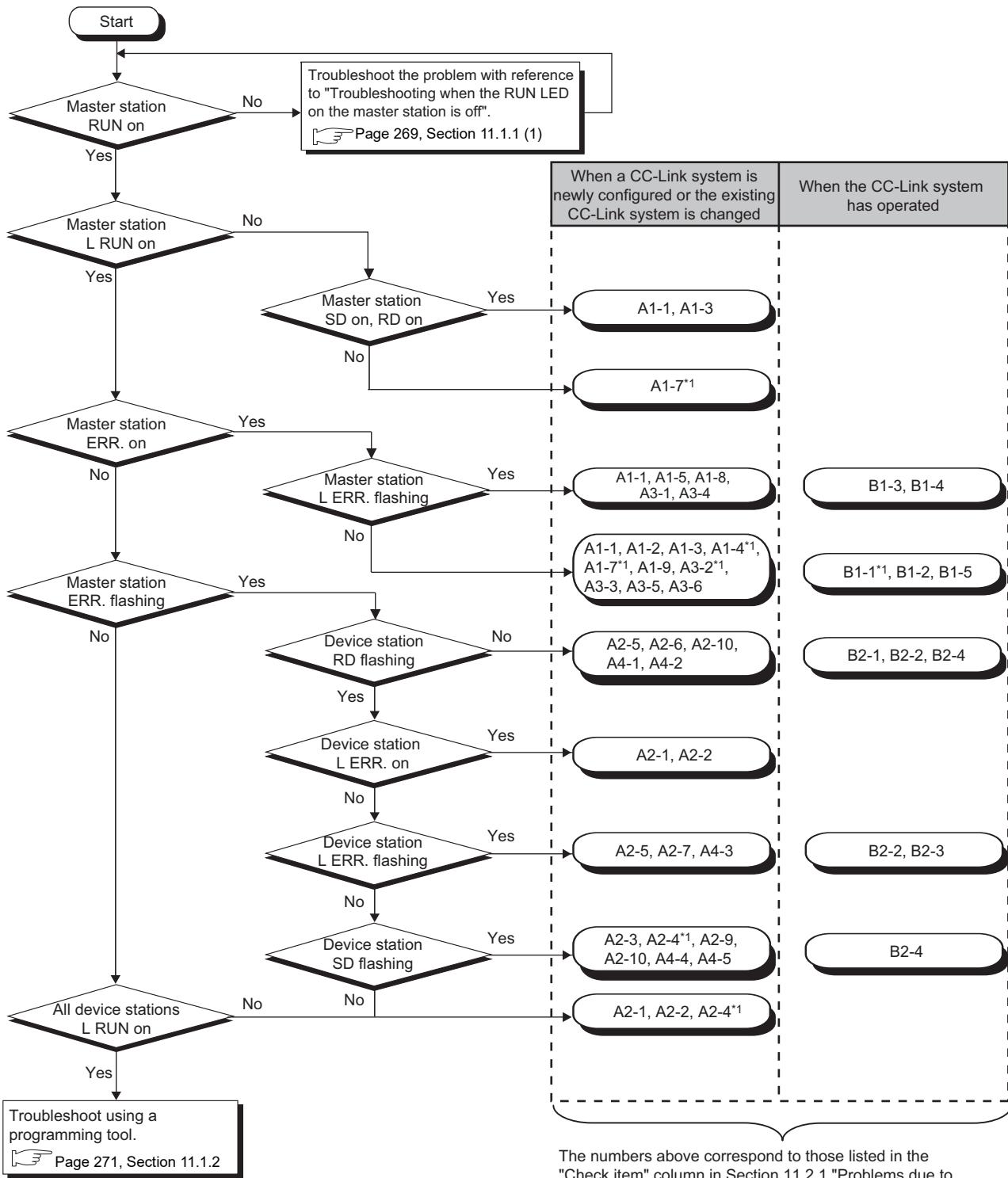
CHAPTER 11 TROUBLESHOOTING

This chapter describes details on errors that might occur when the master/local module is used and the troubleshooting.

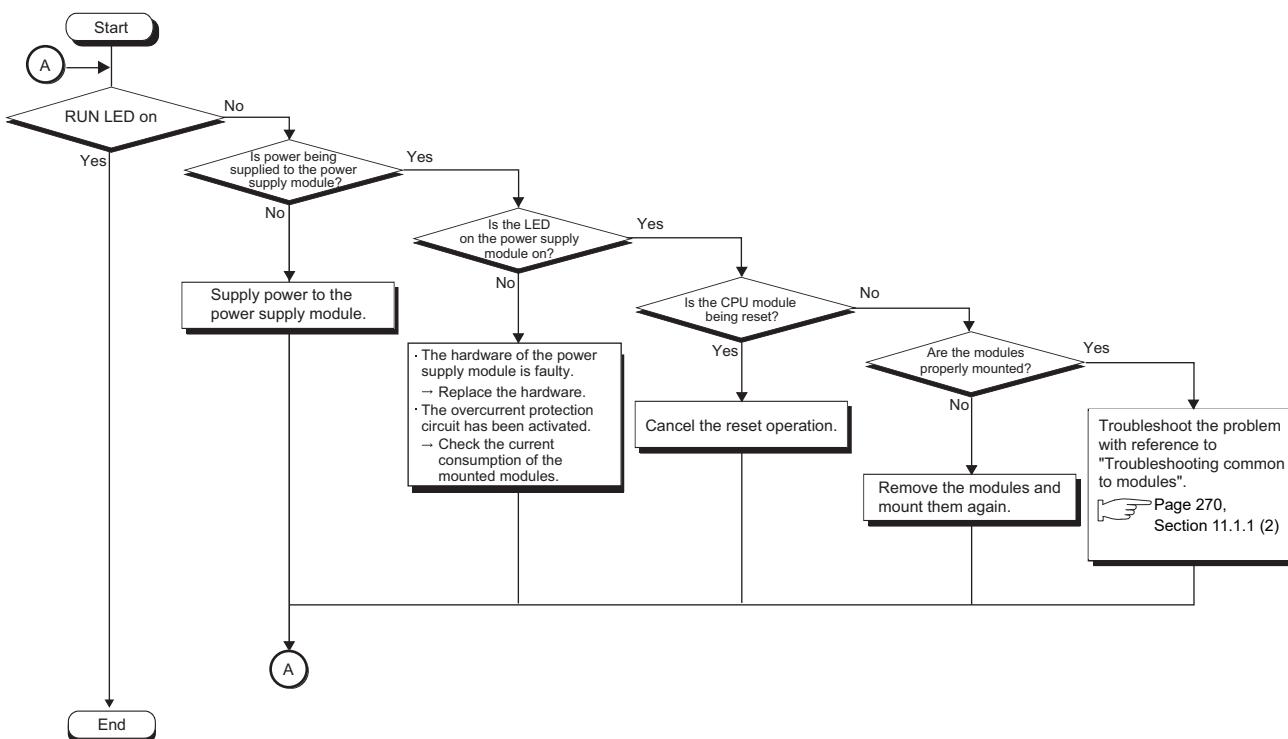
11

11.1 Troubleshooting Flowcharts

11.1.1 Troubleshooting using LEDs

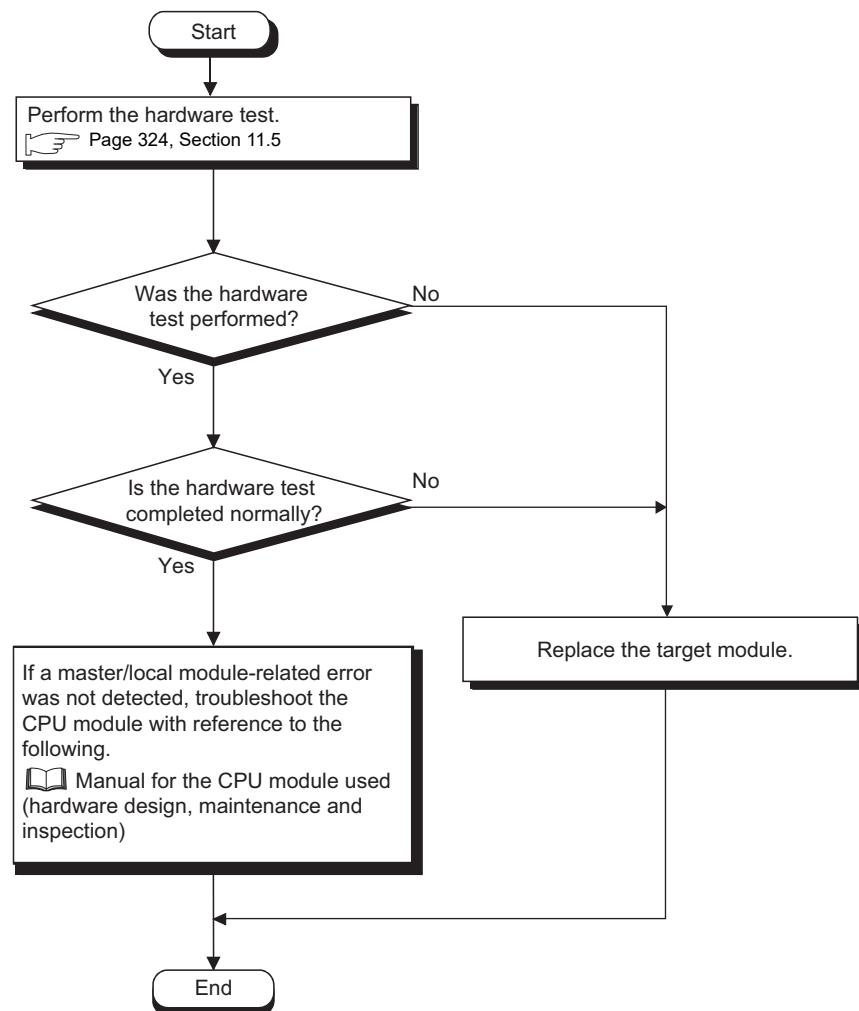


*1 To check error details, a programming tool is required.

(1) Troubleshooting when the RUN LED on the master station is off

11.1 Troubleshooting Flowcharts
11.1.1 Troubleshooting using LEDs

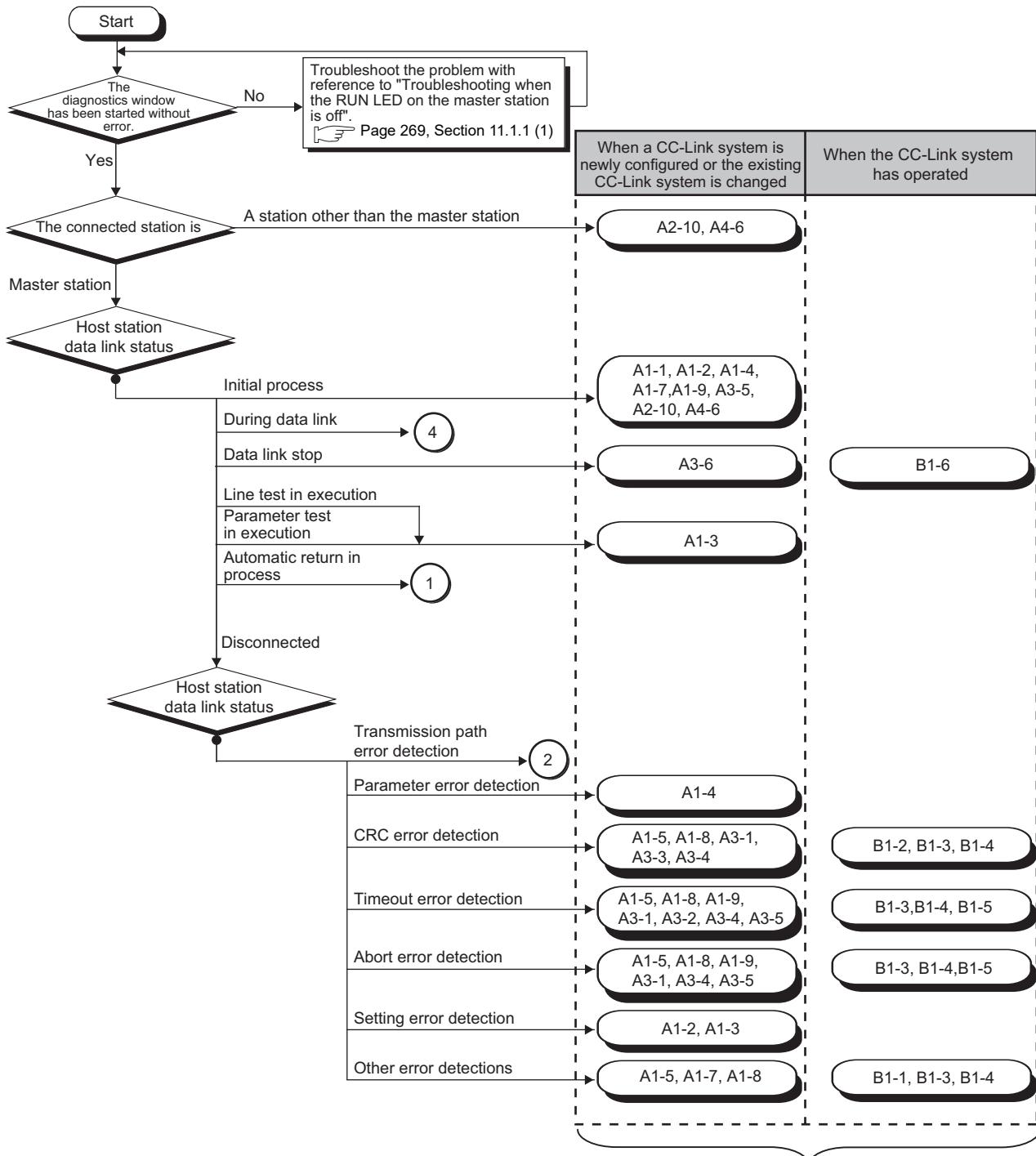
(2) Troubleshooting common to modules



11.1.2 Troubleshooting using a programming tool

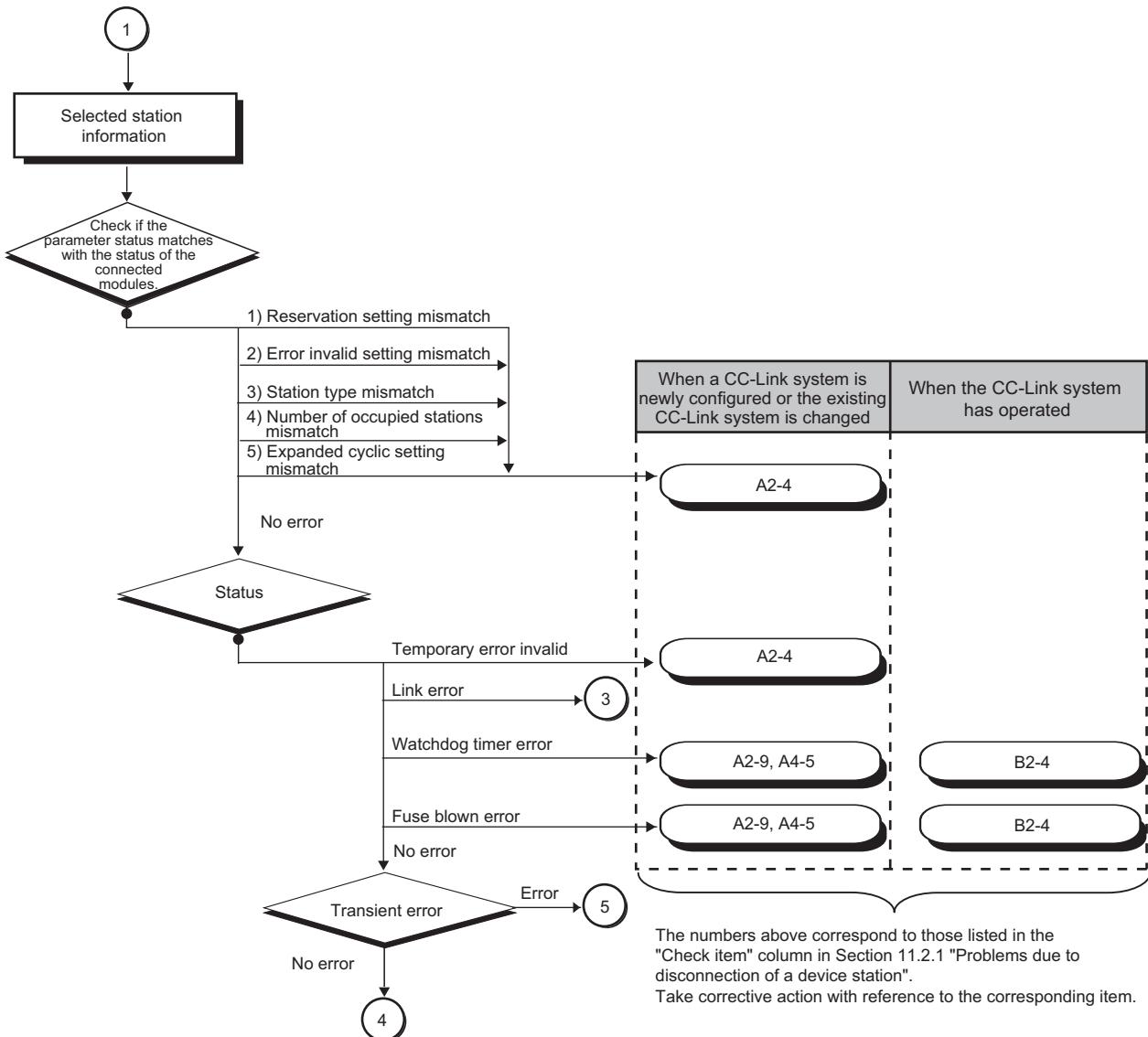
(1) Troubleshooting by the CC-Link diagnostics

Connect a programming tool to the master station and execute the CC-Link diagnostics.



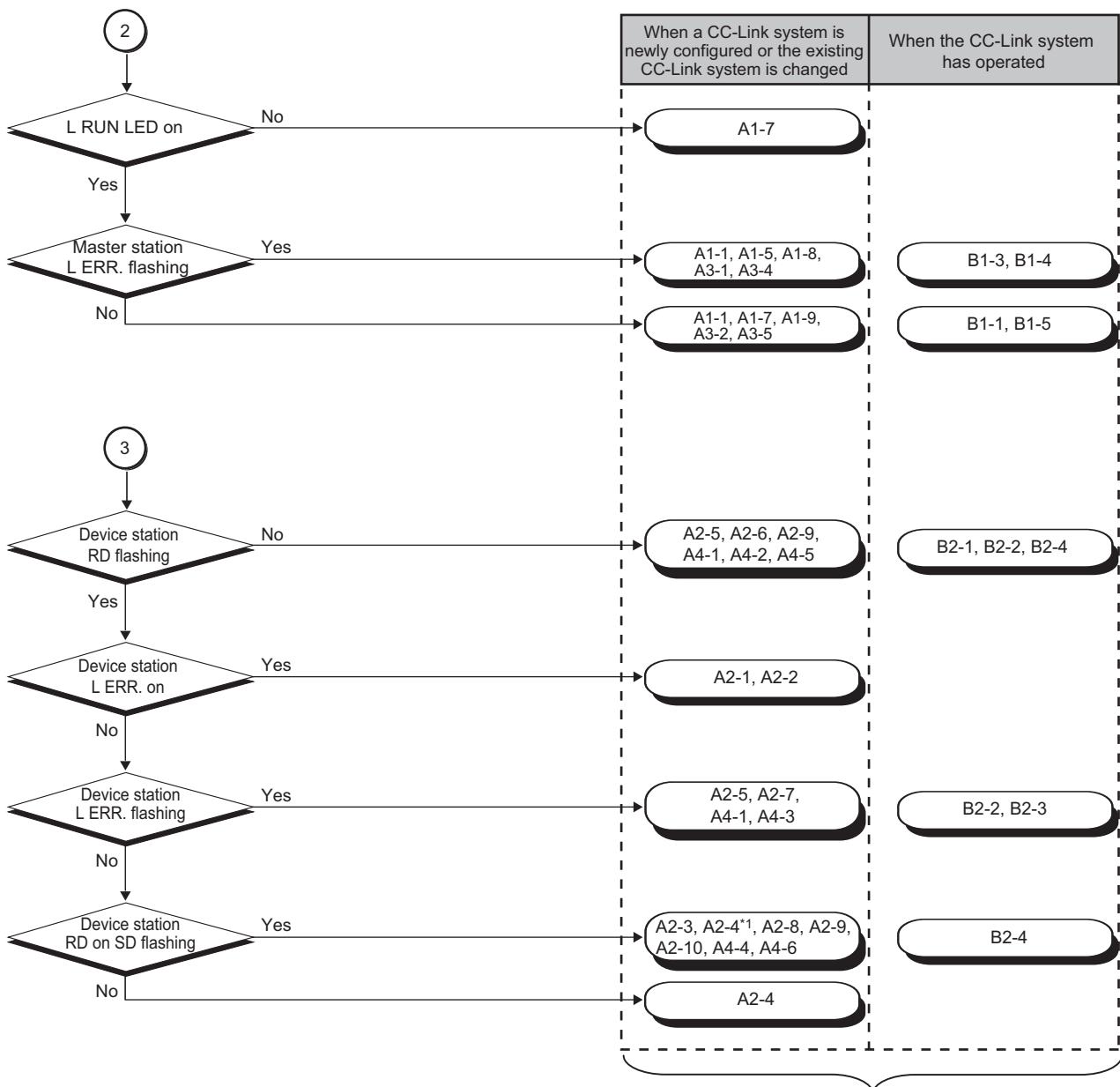
The numbers above correspond to those listed in the "Check item" column in Section 11.2.1 "Problems due to disconnection of a device station". Take corrective action with reference to the corresponding item.

(To the next page)



*1 To check error details, a programming tool is required.

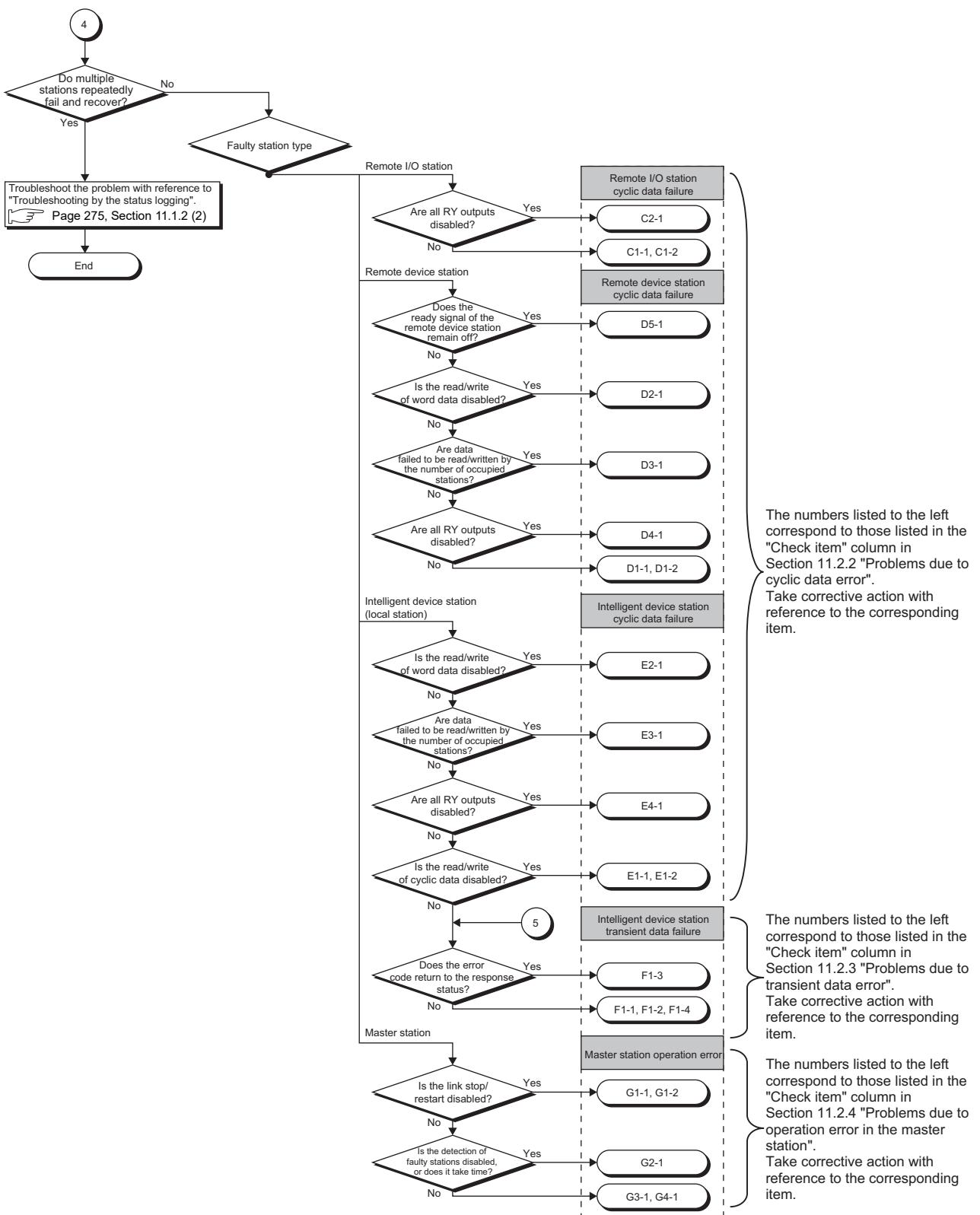
(To the next page)



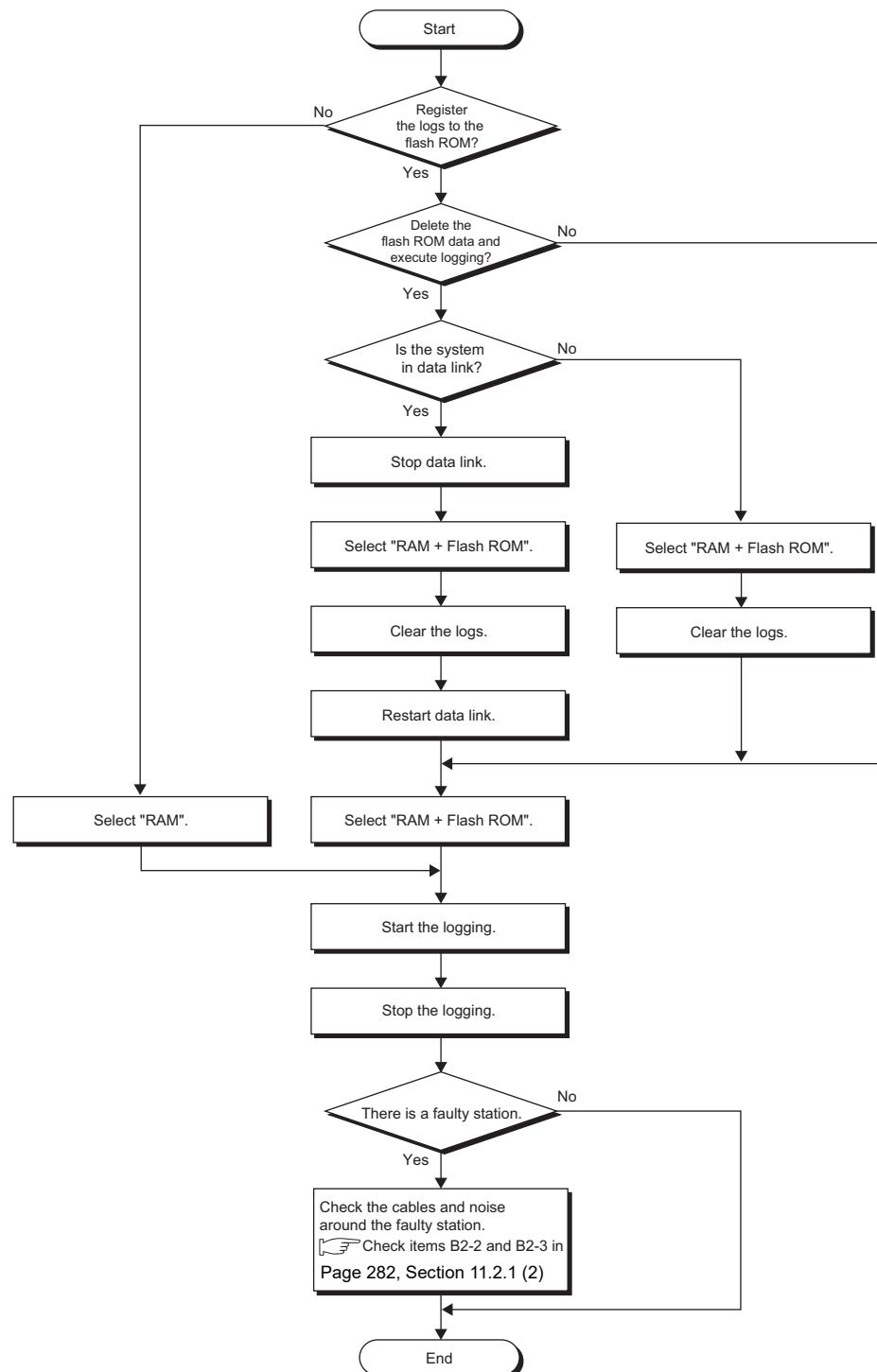
The numbers above correspond to those listed in the "Check item" column in Section 11.2.1 "Problems due to disconnection of a device station".
Take corrective action with reference to the corresponding item.

*1 To check error details, a programming tool is required.

(To the next page)



(2) Troubleshooting by the status logging



11.1 Troubleshooting Flowcharts
11.1.2 Troubleshooting using a programming tool

11.2 Lists of Problems

11.2.1 Problems due to disconnection of a device station

(1) Problems due to disconnection of a device 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 device 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	<ul style="list-style-type: none"> • 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 device 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.	

(To the next page)

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?		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?		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.

(To the next page)

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 (device station)	Is the CC-Link interface of the faulty station online?	Check the faulty station.	Set it online.
	A2-4	Parameter setting	<ul style="list-style-type: none"> • 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? 	<p>Check the network parameters of the CPU module on the master station using the programming tool.</p> <p>Check SW0068, SW0069, SW0070, SW0071, SW0072, SW0074 to SW0077, SW0098 to SW009B, SW009C to SW009F, and SW0144 to SW0147.</p>	<p>Correct the network parameter.</p> <p>Format the CPU module memory then write the network parameters.</p>
			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.

(To the next page)

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.
		Are terminating resistors connected?	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.
			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.
	A2-6 Power supply (for communications)	Is the power on and is the applied voltage within the specified range?	Check if a station with built-in terminating resistor is connected other than at both ends in the CC-Link system.	Check if modules on the faulty station are on.
			Are modules on the faulty station on?	Power on the module.
	A2-7 Noise	Is the transmission cable free from noise?	Is the applied voltage within the specified range?	Apply the voltage within the specified range.
			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.
	A2-9 Failure of a device station	Do device stations normally operate?	Reduce the transmission speed and check if the frequency of occurrence of noise is reduced.	Take noise reduction measures. Reduce the transmission speed.
	A2-10 Standby master station	Isn't the standby master station controlling the data link?	Replace modules on the faulty station and check for operation.	Repair or replace the module on the faulty station.
			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.

(To the next page)

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 device 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 device 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 a distance of 100mm or more is recommended.)	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.

(To the next page)

Problem	Check item	Description	Check method	Corrective action
A station cannot perform data link 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. 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.	
			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 device station	Do device 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.

(2) Problems due to disconnection of a device 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 device 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 device 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)

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 a distance of 100mm or more is recommended.)	Keep the transmission cable away from the power cable. (Keep a distance of 100mm or more is recommended.)
	B2-4	Failure of a device station	Do device stations normally operate?	Replace modules on the faulty station and check for operation.	Repair or replace the module on the faulty station.

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. 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).
			Are the auto refresh to refresh devices using the network parameter and the refresh process using a program (UnlG□ or FROM/TO instructions) executed at the same time?	Check the program. Check the refresh devices set in the network parameter.
			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).
	C1-2	Parameter setting	Isn't a station to which reading/writing cannot be performed specified as a reserved station?	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.
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. Cancel the reserved station setting.
				Turn on Refresh instruction when changing parameters by the dedicated instruction (SB0003).

(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.

(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).

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.

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.	

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.

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.

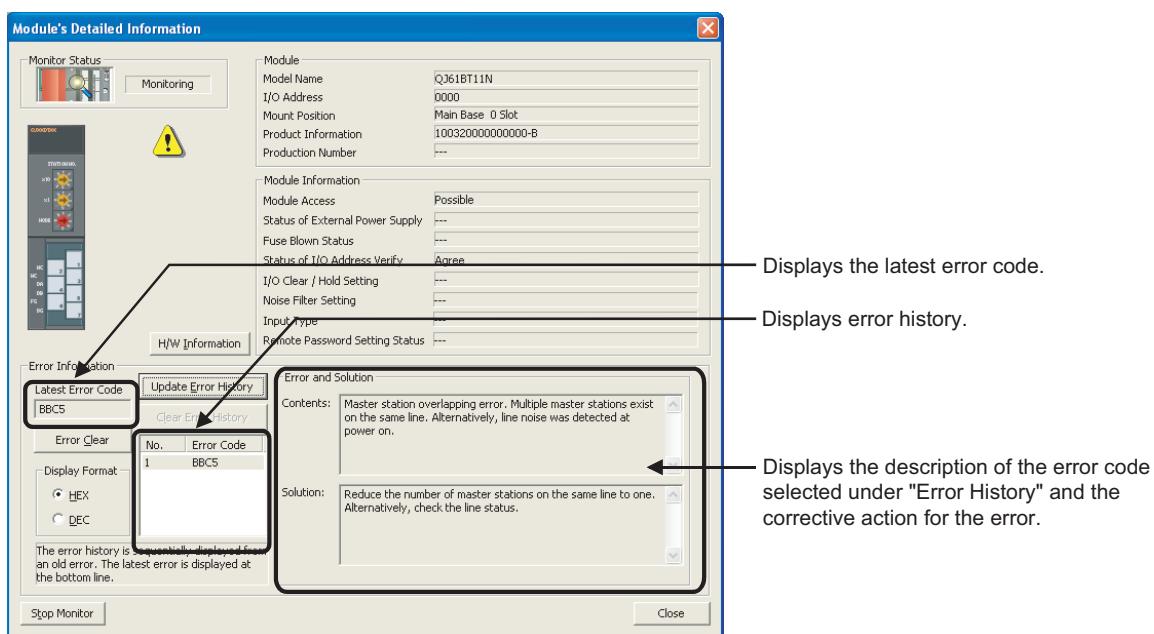
11.3.1 How to check error codes

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

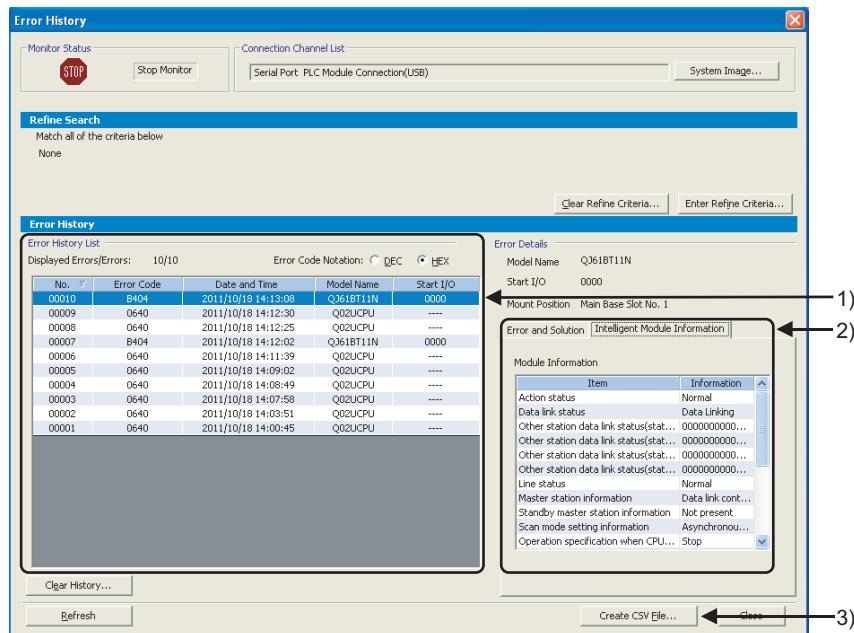


(2) Checking in the "Error History" window

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
 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.

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.
Device station refresh/compulsory clear setting status in case of programmable controller CPU STOP (SB007C)	Displays the status of the device 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	Q361BT11N	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.

11.3.2 Error code list

The following table lists error codes.

When using a master/local module as a standby master station, refer to the respective columns under "Detectability" 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	Detectability	
				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.	<input type="radio"/>	x
B101 and B102					<input type="radio"/>
B103 to B106					x
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.	<input type="radio"/>	x
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.	<input type="radio"/>	x
B110	Transient data receiving disabled	A line error has occurred.	Modify the line.	<input type="radio"/>	<input type="radio"/>
B111	Transient data receiving order error	A line error has occurred.	Modify the line.	<input type="radio"/>	<input type="radio"/>
B112	Transient data length error	A line error has occurred.	Modify the line.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
B115	Link error	A line error has occurred.	Modify the line.	<input type="radio"/>	<input type="radio"/>
B116	Packet error	A line error has occurred.	Modify the line.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	x
B122	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
B123					x

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	○	×

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability									
				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 device 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. <table border="1"><tr><td>Connected module</td><td>Parameter setting</td></tr><tr><td>Remote device</td><td>Remote I/O</td></tr><tr><td>Intelligent device</td><td>Remote I/O</td></tr><tr><td>Intelligent device</td><td>Remote device</td></tr></table>	Connected module	Parameter setting	Remote device	Remote I/O	Intelligent device	Remote I/O	Intelligent device	Remote device	Correct the parameter.	○	✗
Connected module	Parameter setting												
Remote device	Remote I/O												
Intelligent device	Remote I/O												
Intelligent device	Remote device												
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.	○	○								

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	x	○
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.	○	x
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).	○	x
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).	○	x
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.	x	○
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.	○	x
B316	System error	—	Please consult your local Mitsubishi representative.	○	x
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)	○	x
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.	○	x
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).	○	x

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				Master station	Local station
B31C and B31D	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
B31E	Status logging start error	Logging was started while logs were being deleted.	Delete the logs then start logging.	<input type="radio"/>	<input type="radio"/>
B31F	Status logging clear error	Logs were deleted during logging.	Stop the logging then delete the logs.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
B321	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
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 .	<input type="radio"/>	<input checked="" type="checkbox"/>
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.	<input type="radio"/>	<input checked="" type="checkbox"/>
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.	<input type="radio"/>	<input checked="" type="checkbox"/>
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.	<input type="radio"/>	<input checked="" type="checkbox"/>
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.	<input type="radio"/>	<input checked="" type="checkbox"/>
B38A	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input checked="" type="checkbox"/>
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.	<input type="radio"/>	<input checked="" type="checkbox"/>

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	○	✗

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				Master station	Local station
B397	Station information setting error (parameter)	The station information parameter setting does not meet the following condition: $(16 \times A) + (54 \times B) + (88 \times C) \leq 2304$ A: The number of remote I/O stations B: The number of remote device stations C: The number of intelligent device stations (including local stations)	Set parameters 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.		

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	○	x
		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 device station is set greater than the minimum station number of Ver.2-compatible device 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 device station may be less than the minimum station number of Ver.2-compatible device station.	○	x
B3A0	Invalid mode (among the master station, local station, and standby master station)	<p>The mode setting is invalid in the master station, local station, or standby master station.</p> <ul style="list-style-type: none"> • 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.	x	○
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.	○	x
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.	○	x
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.	○	x

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	○	✗

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	<ul style="list-style-type: none"> 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.	○	○

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
B801	Access code setting error	A non-existing access code or attribute is set.	Set the correct access code or attribute.	<input type="radio"/>	<input type="radio"/>
B802	Access code error	A non-existing access code was used.	Use the correct access code.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
B805	Number of data points error	The number of data is outside the range.	Set a value within 1 to 100 for writing or within 1 to 160 for reading.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
B80A	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
B80F to B812	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
B814	File register capacity setting error	The file register capacity is not set.	Set the capacity.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
B817	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
B821 and B822					
B823	Remote control mode error	The mode setting of the remote control is incorrect.	Check the setting.	<input type="radio"/>	<input type="radio"/>
B824	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
B826					

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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	Parameter error	<ul style="list-style-type: none"> • The parameter setting has not been reflected to the module. • The parameter setting is corrupted. 	<ul style="list-style-type: none"> • Power off and on the programmable controller system or reset the CPU module. • Rewrite a network parameter to the CPU module. Then, power off and on the programmable controller system or reset the CPU module. <p>If the same error persists after taking the above action, please consult your local Mitsubishi representative.</p>	○	○
B984	System error	—	Please consult your local Mitsubishi representative.		×
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.	<ul style="list-style-type: none"> • 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.	○	○

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				Master station	Local station
BA16 and BA17	Error (hardware test)	A hardware (communication circuit) error has been detected.	<ul style="list-style-type: none"> 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.	○	×
BA1E to BA21	System error	—	Please consult your local Mitsubishi representative.	○	○
BB01	Concurrent execution error	<p>The following requests (including the same request) were tried to be executed to the same station at the same time.</p> <ul style="list-style-type: none"> 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.

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	x	○
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.	○	x
BC02	System error	—	Please consult your local Mitsubishi representative.	○	x
BC03	Message transmission target station failure	The target station specified for the message transmission function is in any of the following status. <ul style="list-style-type: none">• 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.	○	x
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.	○	x
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.	○	x
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.	x	○
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.	○	x
BC08 to BC09	System error	—	Please consult your local Mitsubishi representative.	○	x
BC30					
BC33 to BC34				○	○
BC35 to BC39					
BC3A				x	○

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				Master station	Local station
BC50		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	Message transmission handshake failure	During execution of message transmission, a data link error has occurred on the corresponding station.	Check the operation of the target remote device station.	○	x
		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.	○	x
		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.	○	x
		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			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	Message transmission handshake failure	With the message transmission function, abnormal data were received.			

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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	<ul style="list-style-type: none"> 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)	<p>The remote device station to be accessed from the peripherals is any of the following.</p> <ul style="list-style-type: none"> 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.	○	✗

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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 device 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.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • 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.	○	○

Error code (hexadecimal)	Description	Error cause (details)	Corrective action	Detectability	
				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.	<input type="radio"/>	<input type="radio"/>
BF44	System error	—	Please consult your local Mitsubishi representative.	<input type="radio"/>	<input type="radio"/>
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.	<input type="radio"/>	<input checked="" type="radio"/>
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.	<input type="radio"/>	<input type="radio"/>
BFFE	CPU monitoring timer timeout	The CPU monitoring timer timed out.	Check operations of the target station.	<input type="radio"/>	<input type="radio"/>
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)				

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.

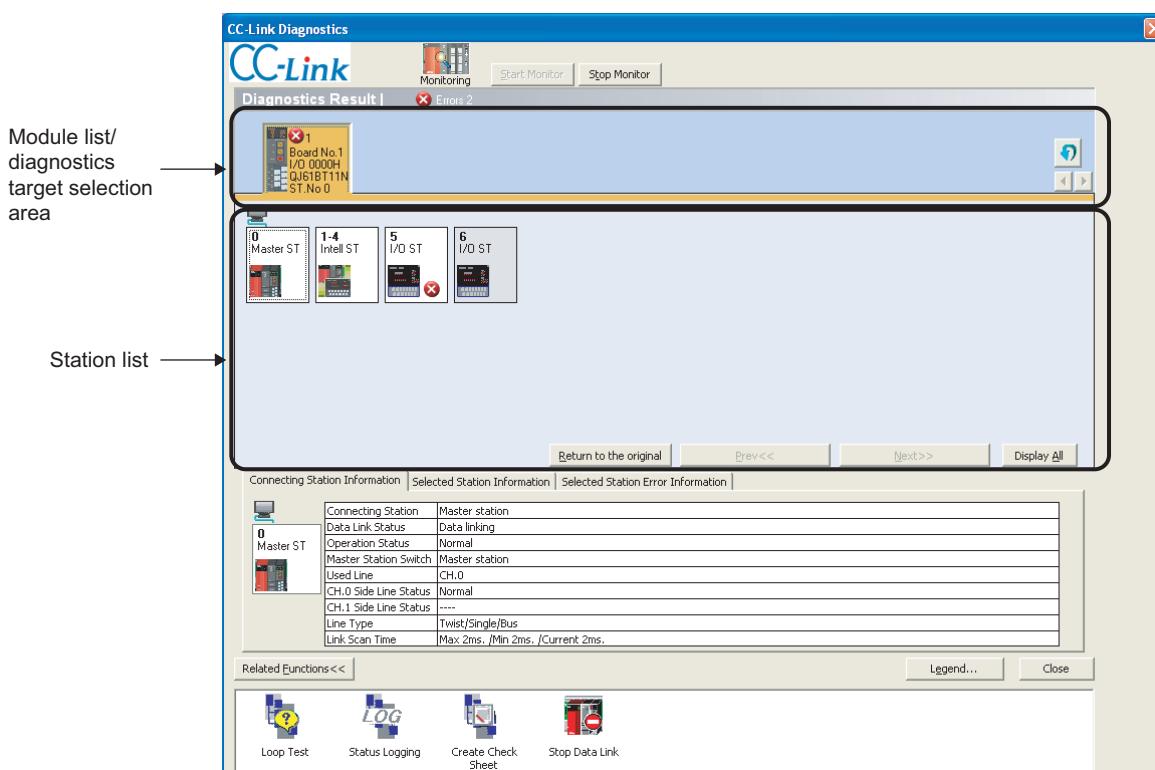
Remark

For the CC-Link diagnostics using GX Developer, refer to Page 402, Appendix 7.3.

11.4.1 Monitoring the host station/other stations

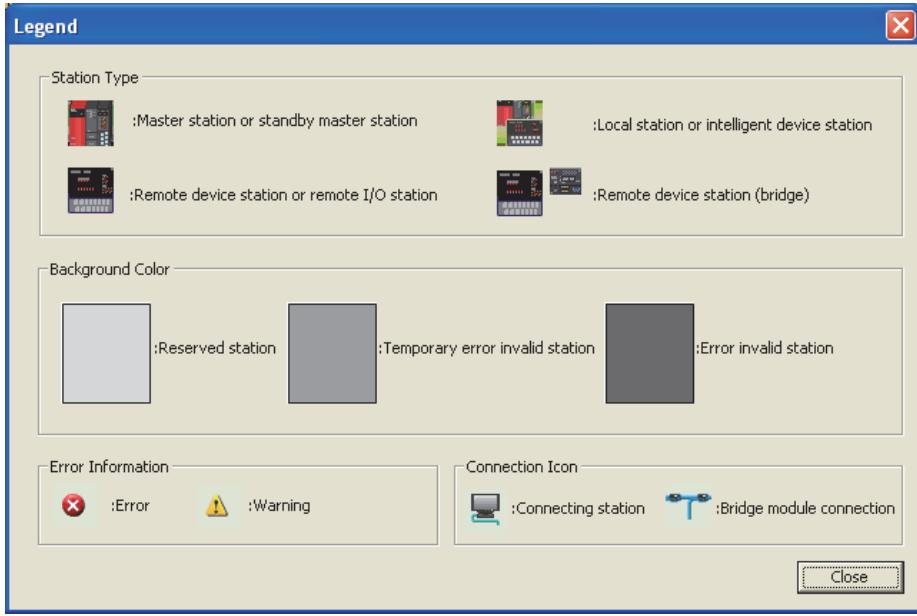
Data link status of the host station (station to which a programming tool is connected) and other stations (stations other than the host station) can be monitored.

1. Open the "CC-Link Diagnostics" window.
[Diagnostics] ⇔ [CC-Link Diagnostics]
2. Refer to the subsequent descriptions for operation.



(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	<p>Lists master/local modules. The number of errors and warnings is also displayed. The diagnostics target can be changed by clicking a module icon.</p> <p>: Updates the list.</p> <p> : Switches the displayed modules in units of eight modules.</p>																					
Station list	<p>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 .</p> <p>The display status can be switched by clicking the and 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.</p> <p>To display the icons in the order of station number, click the .</p> <p>Move the icon by drag and drop.</p>																					
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	<p>Displays error information of the station selected in the station list area.</p> <table border="1"> <tr> <th>Connecting Station Information</th> <th>Selected Station Information</th> <th>Selected Station Error Information</th> </tr> <tr> <td>1-2 Intel ST</td> <td>1</td> <td></td> </tr> <tr> <td></td> <td>Number of Occupied Stations</td> <td>2</td> </tr> <tr> <td></td> <td>Station Type</td> <td>Local Station or Intelligent Device Station</td> </tr> <tr> <td></td> <td>Company</td> <td>MITSUBISHI ELECTRIC CORPORATION</td> </tr> <tr> <td></td> <td>Connecting Module</td> <td>PLC</td> </tr> <tr> <td></td> <td>Comment</td> <td></td> </tr> </table> <p>By double-clicking each error shown below, the details and corrective actions can be displayed.</p> <p> Data link error</p>	Connecting Station Information	Selected Station Information	Selected Station Error Information	1-2 Intel ST	1			Number of Occupied Stations	2		Station Type	Local Station or Intelligent Device Station		Company	MITSUBISHI ELECTRIC CORPORATION		Connecting Module	PLC		Comment	
Connecting Station Information	Selected Station Information	Selected Station Error Information																				
1-2 Intel ST	1																					
	Number of Occupied Stations	2																				
	Station Type	Local Station or Intelligent Device Station																				
	Company	MITSUBISHI ELECTRIC CORPORATION																				
	Connecting Module	PLC																				
	Comment																					
Related Functions>>	<p>Displays or hides the related function icons.</p> <p>For details on the related functions, refer to the following.</p> <ul style="list-style-type: none"> • "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) 																					

Item	Description
	<p>Displays the explanation of icons on the diagnostics window.</p> 

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.

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)

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

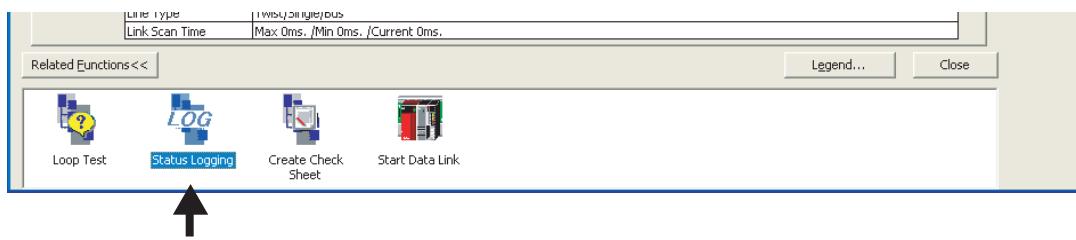
(a) Starting the status logging

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

[Diagnostics] → [CC-Link Diagnostics]

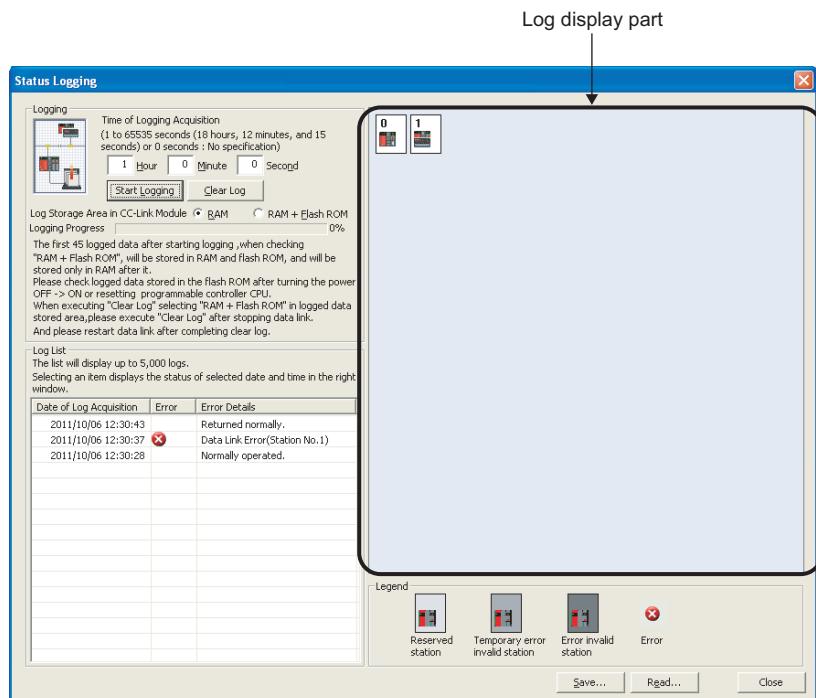
2. Double-click "Status Logging" on the bottom of the window.

If "Status Logging" is not displayed on the bottom of the window, click the button on the bottom left corner of the window.



Double-click the icon.

3. The "Status Logging" window appears.



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").

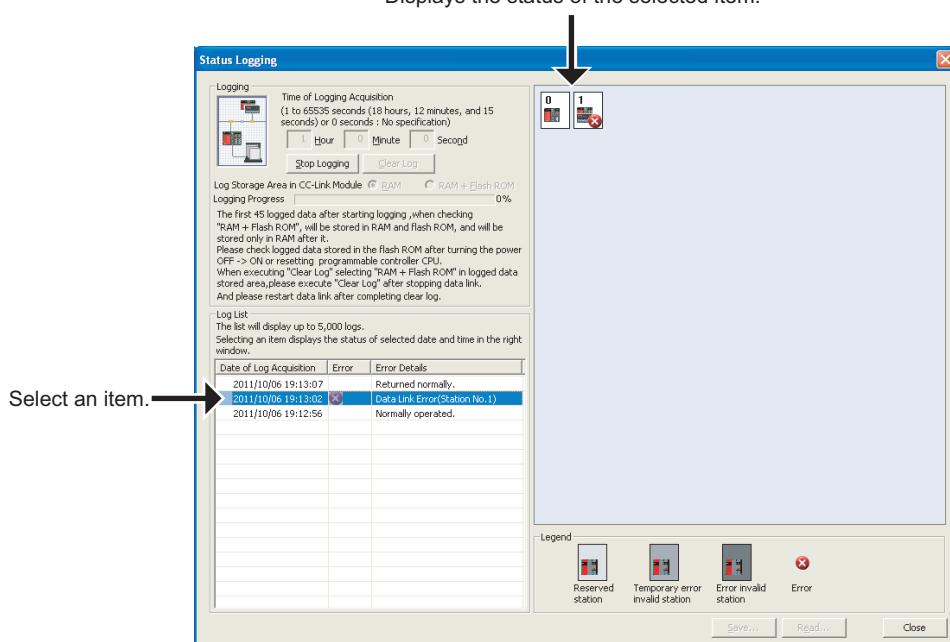
6. Click the **Start Logging** button.

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.

Displays the status of the selected item.

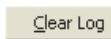


(b) Saving logs in a CSV file and reading the saved logs

To save the information displayed under "Log List" in a CSV file, click the  button.

To read the saved CSV log file and display the contents under "Log List", click the  button.

(c) Deleting logs

1. To delete logs in a master/local module, click the  button.

If the  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.

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.

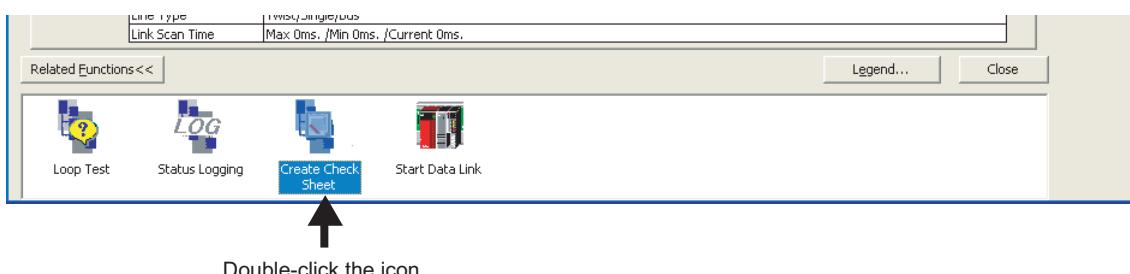
(1) Operating procedure

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

→ [Diagnostics] ⇔ [CC-Link Diagnostics]

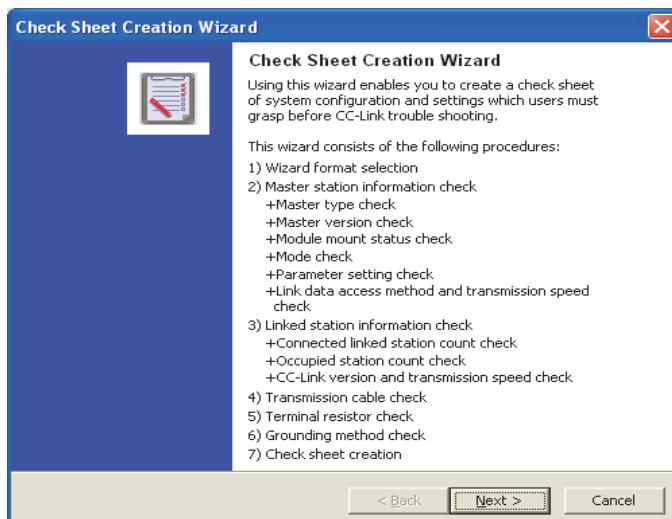
2. Double-click "Create Check Sheet" on the bottom of the window.

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.



● 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.

(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 Master Module	Q20UDEHCPU QJ61BT11N
	[2]Master Version	Programmable Controller Master Module	120820000000000B 100320000000000B
	[3]Module Mount Status	I/O Address:	0000H
	[4]Other Network Module	Other Network Module:	QJ61BT11
	[5]Mode	Mode Setting: Scan Mode: Module Mode:	[*]Remote Net Mode([*]Ver.1/ []Additional / []Ver.2) / []Remote I/O Net Mode []Synchronous/[*]Asynchronous 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	
	[16]Cable Type	Cable Model Name:	
3. Transmission Cable	[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		

11.4.5 Stopping and restarting data link

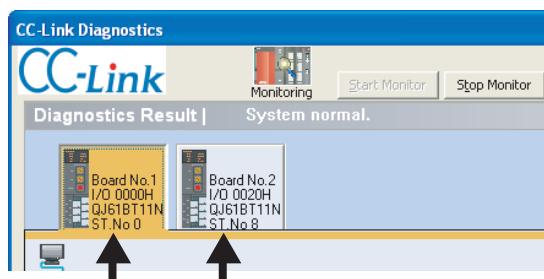
How to stop and restart data link of a master/local module is described below.

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.

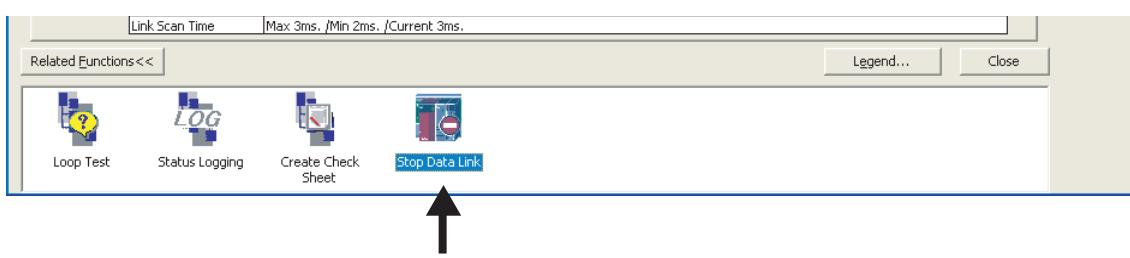


Select the applicable module.

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.



When stopping or restarting data link, do not write data to the buffer memory area (buffer memory address: 5E0H).

11.4.6 Setting and canceling a temporary error invalid station

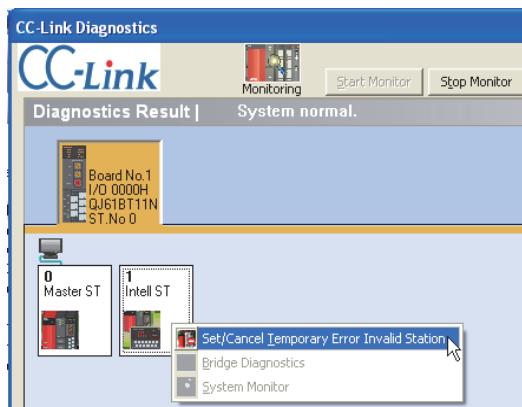
Even if a data link error occurs in a device station, the station is not detected as a faulty station in the master station and local station. This setting can be configured even during data link, unlike the error invalid station setting function. This function is used to exchange device stations during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

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

 [Diagnostics] \Rightarrow [CC-Link Diagnostics]

2. Right-click the target device 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

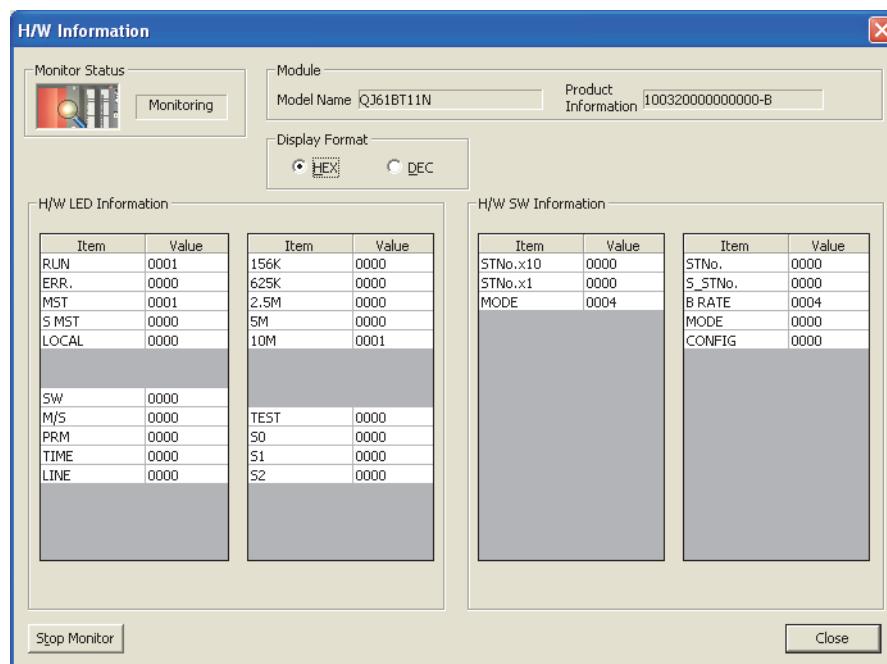
When configuring the temporary error invalid station setting, do not write data to the buffer memory areas (buffer memory addresses: 5E0_H and 603_H to 607_H).

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.

10032000000000-B
↑ Function version B
 Serial No. (First 5 digits)

(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

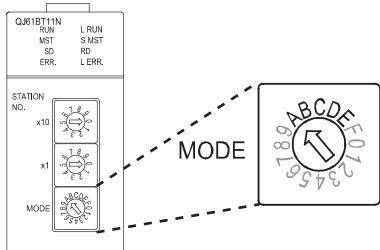
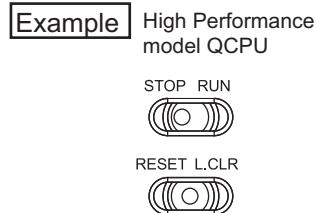
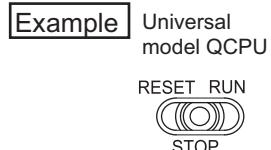
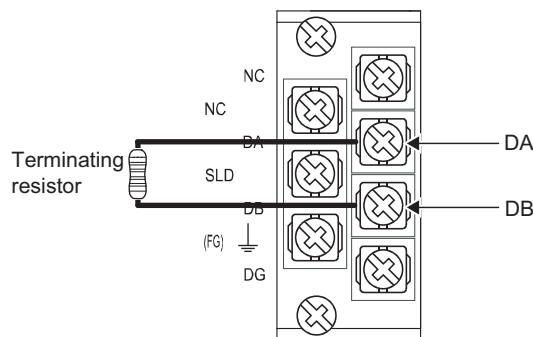
The following table lists information displayed under "H/W SW Information".

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)

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)

QJ61BT11N	RUN	<input checked="" type="checkbox"/> L RUN	<input type="checkbox"/>
	MST	<input checked="" type="checkbox"/> S MST	<input type="checkbox"/>
	SD	<input type="checkbox"/> RD	<input type="checkbox"/>
	ERR.	<input type="checkbox"/> L ERR.	<input type="checkbox"/>

: ON
: Flashing
: OFF

When the test is completed

CPU module	Master/local module

: ON
: Flashing
: OFF

When the test is not completed

CPU module	Master/local module

: ON
: Flashing
: OFF

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.

APPENDICES

Appendix 1 Description of I/O Signals

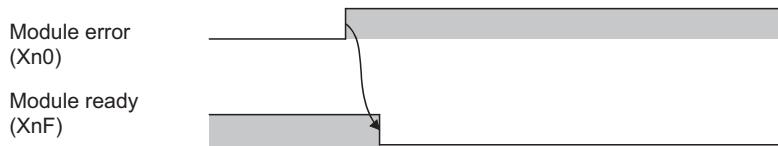
This appendix describes on/off timing and conditions of I/O signals.

(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.)



It takes maximum of six seconds for Other station data link status (Xn3) to turn on after a device station connected to the master station or local station becomes faulty.

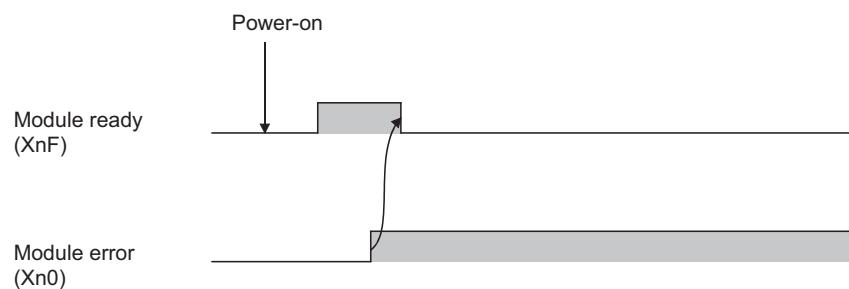
The time until this signal turns on differs depending on the system configuration and error status.

(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.



A

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		
0H	0	(Use prohibited)	—
1H	1	Total number of connected stations	The number of device stations (including a reserved station) connected to the master station is stored. Default: 64 (stations) Range: 1 to 64 (station)
2H	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)
3H	3	Number of automatic return stations	The number of device stations that return to system operation by one link scan is stored. Default: 1 (station) Range: 1 to 10 (station)
4H	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)
5H	5	(Use prohibited)	—
6H	6	Operation specification when CPU is down	The specified data link status if a programmable controller CPU error occurs in the master station is stored. Default: 0 (Stop) Range: 0 (Stop) 1 (Continued)
7H	7	Scan mode setting	Whether to synchronize a link scan with a sequence scan is stored. Default: 0 (Asynchronous) Range: 0 (Asynchronous) 1 (Synchronous)
8H	8	Delay time setting	Delay time is stored. (Set 0.)
10H to 13H	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.
14H to 17H	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.

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	<p>The setting status of the station type, the number of occupied stations, and expanded cyclic setting of the connected device stations is stored.</p> <p>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)</p> <p>Range: Refer to the following.</p> <table border="1"> <tr> <td>b15 to b12</td> <td>b11 to b8</td> <td>b7 to b0</td> </tr> <tr> <td>Station type</td> <td>Number of occupied stations</td> <td>Station No.</td> </tr> </table> <p>1 to 64 (01H to 40H)</p> <p>1H: Number of occupied stations: 1 2H: Number of occupied stations: 2 3H: Number of occupied stations: 3 4H: Number of occupied stations: 4</p> <p>0H: Ver.1-compatible remote I/O station 1H: Ver.1-compatible remote device station 2H: Ver.1-compatible intelligent device station 5H: Ver.2-compatible remote device station (single) 6H: Ver.2-compatible intelligent device station (single) 8H: Ver.2-compatible remote device station (double) 9H: Ver.2-compatible intelligent device station (double) BH: Ver.2-compatible remote device station (quadruple) CH: Ver.2-compatible intelligent device station (quadruple) EH: Ver.2-compatible remote device station (octuple) FH: Ver.2-compatible intelligent device station (octuple)</p>	b15 to b12	b11 to b8	b7 to b0	Station type	Number of occupied stations	Station No.
b15 to b12	b11 to b8	b7 to b0							
Station type	Number of occupied stations	Station No.							
60 _H to 7F _H	96 to 127	(Use prohibited)	—						
80 _H (Send buffer) 81 _H (Receive buffer) 82 _H (Automatic update buffer) to CB _H (Send buffer) CC _H (Receive buffer) CD _H (Automatic update buffer)	128 (Send buffer) 129 (Receive buffer) 130 (Automatic update buffer) to 203 (Send buffer) 204 (Receive buffer) 205 (Automatic update buffer)	The first intelligent device The 26th intelligent device Assignment of communication buffer and automatic update buffer	<p>The buffer memory sizes assigned for a local station, intelligent device station, and standby master station during transient transmission are stored.</p> <p>Default Send buffer size: 40_H (64) (word) Receive buffer size: 40_H (64) (word) Automatic update buffer size: 80_H (128) (word)</p> <p>Range</p> <ul style="list-style-type: none"> 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	<p>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</p> <p>Default: 0 (Not set)</p> <p>Range: The bit corresponding to the station number turns on.</p>						

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.

(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 device 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)

A

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 14D _H (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 155 _H (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 123 _H (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)	—	—

(b) Remote output (RY)

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)	—	—

(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 device station. (☞ Page 54, Section 3.6.5 (3))

(a) Remote register (RWr)

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	37C _H 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)	—	—

(b) Remote register (RWw)

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)	—	—

(4) Device 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.

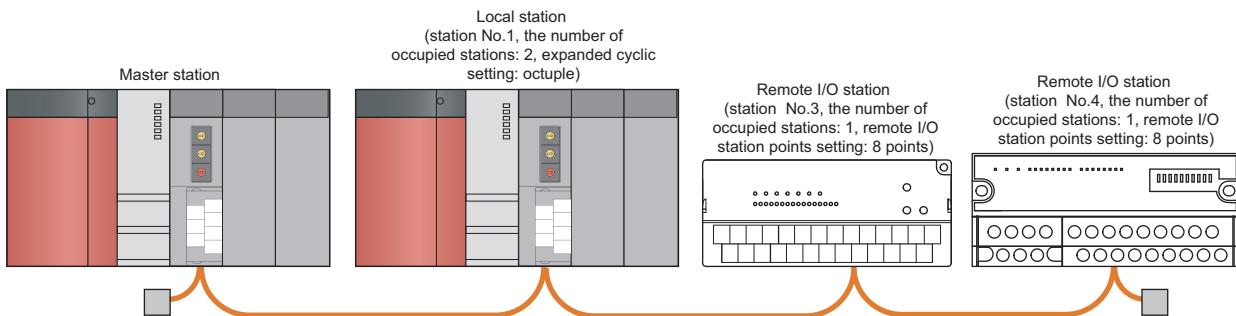
When eight points are set in the remote I/O station points setting, 1 is stored. For the remote I/O station points setting, refer to Page 170, Section 8.3.9.

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	0000_V
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

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

Buffer memory area	Value	Description
Station No.1 RWr size	64 (40_H)	2 (number of occupied stations) \times 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
$5E7_H$ (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

(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

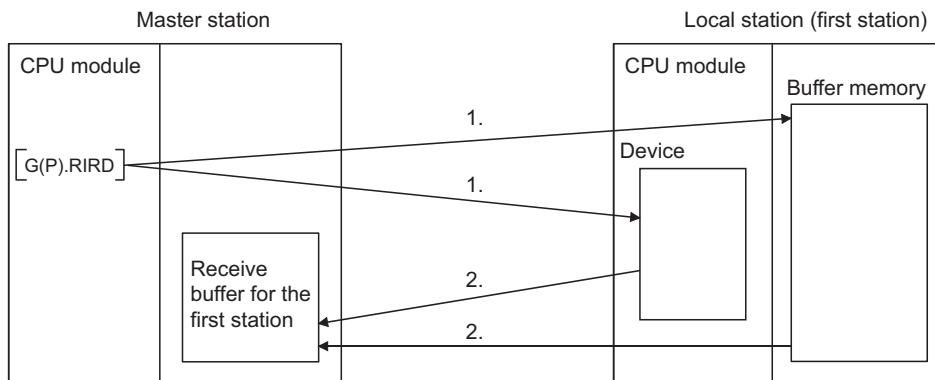
This area stores data to be sent to other stations. The data are read and written by transient transmission.

(8) Communication buffer

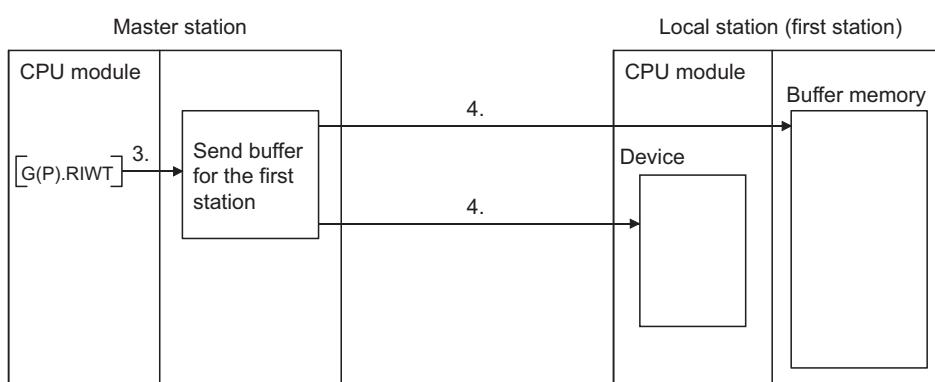
This area stores sending/receiving data when transient transmission (communications using a communication buffer) is performed with a local station, standby master station, and intelligent device station.

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.



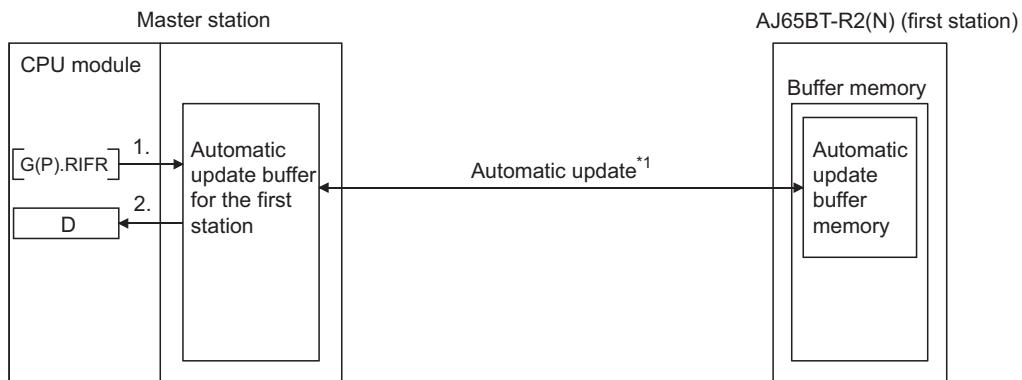
3. The data to be written to the buffer memory in the local station or to the device in the CPU module is stored in the send buffer for the first station.
4. The buffer memory in the local station or the device in the CPU module is accessed.

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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))

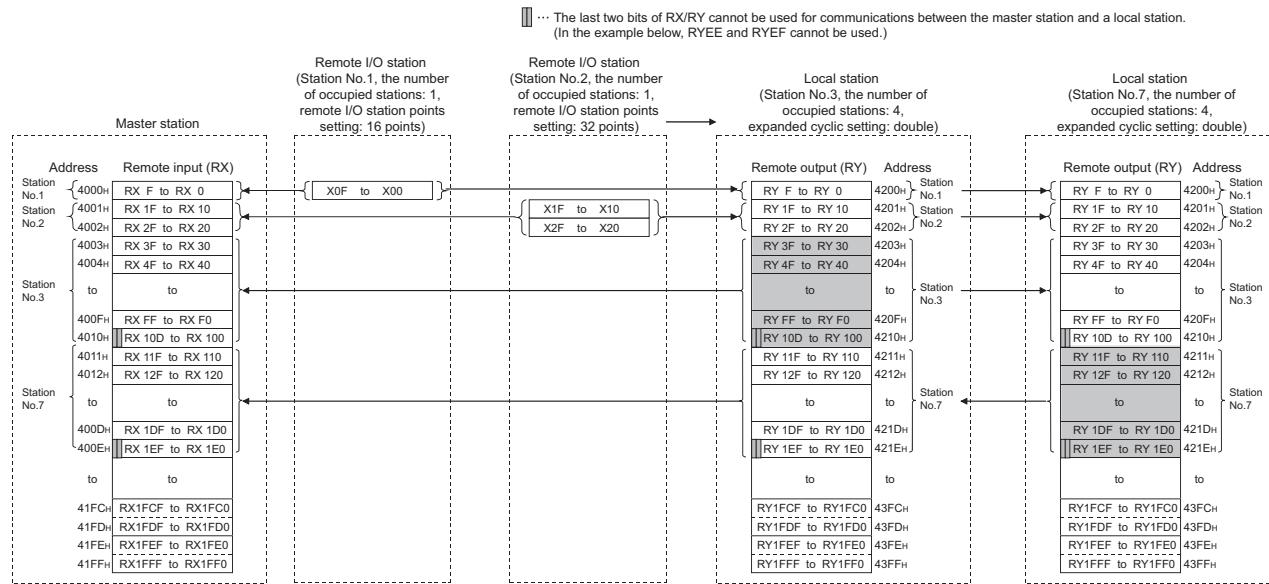
(10) Ver.2-compatible remote input (RX) and Ver.2-compatible remote output (RY)

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 device stations (including Ver.1-compatible device 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 device 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 device stations. The storage locations for each station can be checked using Device station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))



A

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

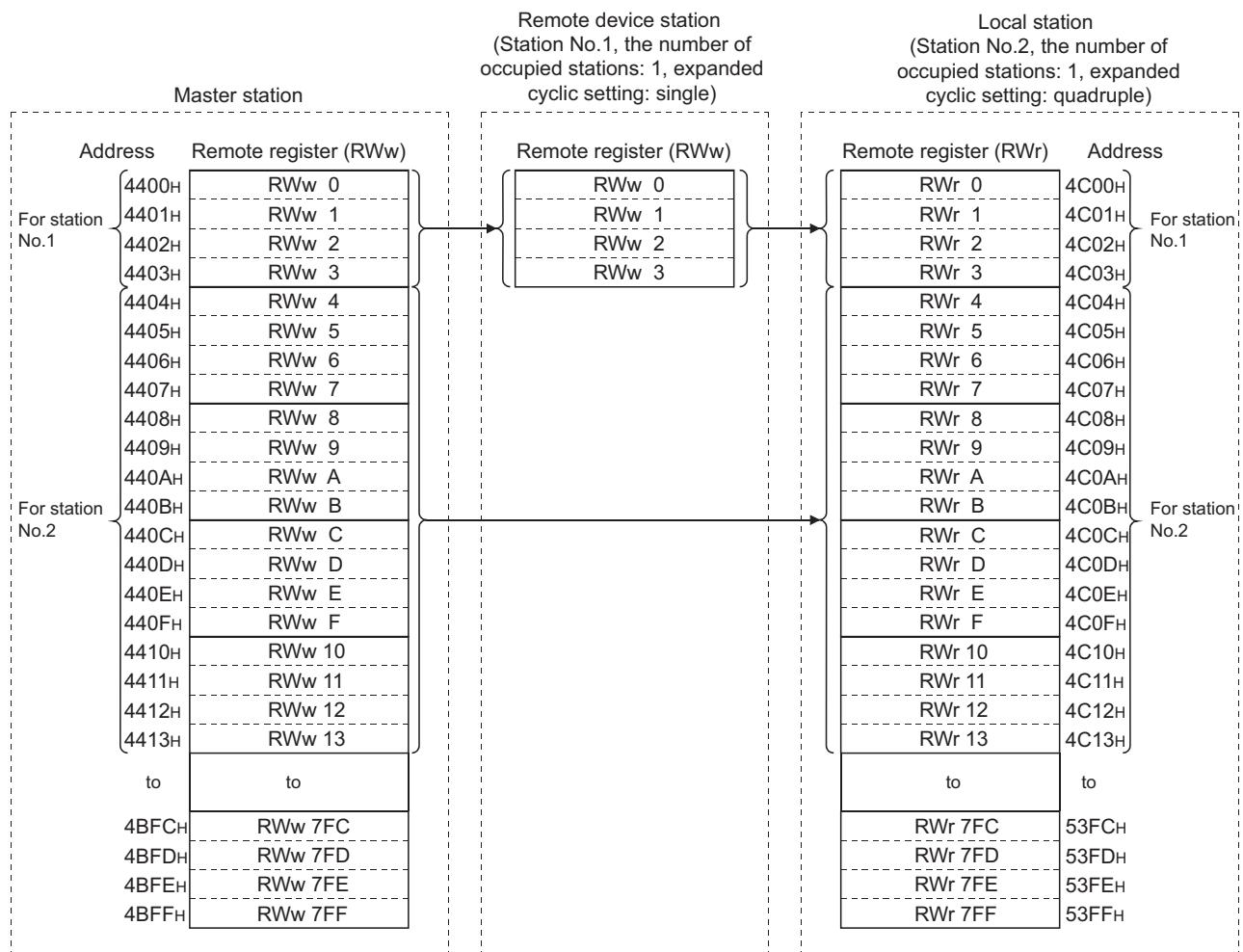
These areas are used when the remote net Ver.2 mode or remote net additional mode is selected.

- In the remote net Ver.2 mode, data are stored in the remote register (RWr/RWw) of all device stations (including a Ver.1-compatible device 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 device 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 device stations. The storage locations for each station can be checked using Device station offset, size information (Un\G992 to Un\G1503). (☞ Page 335, Appendix 2 (4))

Ex.



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: 600H to 7FF_H

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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 using a master/local module as a standby master station, 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	○	×	×

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	○	○	×

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/specify 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)	×

Number	Name	Description	Availability (○: Yes, ×: No)													
			Online		Offline											
			Master station	Local station												
SB005C (5E5 _H , b12)	Forced master switching request acknowledgement	Whether a forced master switching request has been accepted is stored. OFF: Not accepted ON: Accepted	○ (Standby master station only)	×	×											
SB005D (5E5 _H , b13)	Forced master switching request complete	Whether a forced master switching request has been completed is stored. OFF: Not completed ON: Completed	○ (Standby master station only)	○ (Standby master station only)	×											
SB005E (5E5 _H , b14)	Execution status of remote device station initialization procedure	Whether the initialization procedure is being performed is stored. OFF: Not performed ON: In process	○	×	×											
SB005F (5E5 _H , b15)	Completion status of remote device station initialization procedure	Whether the initialization procedure has been completed is stored. OFF: Not completed ON: Completed	○	×	×											
SB0060 (5E6 _H , b0)	Host mode	The setting status of the transmission speed/mode setting switch on the host station is stored. OFF: Online ON: Mode other than online	○	○	○											
SB0061 (5E6 _H , b1)	Host type	The station type of the host station is stored. OFF: Master station (station number: 0) ON: Local station (station number: 1 to 64)	○	○	×											
SB0062 (5E6 _H , b2)	Host standby master station setting information	Whether the host station has been set as a standby master station is stored. OFF: Not set ON: Set	○	○	○											
SB0065 (5E6 _H , b5)	Input data status of host data link faulty station	The status of the data link faulty station setting configured for the host station is stored. OFF: Clear ON: Hold	○	○	×											
SB0066 (5E6 _H , b6)	Number of host occupied stations	The number of occupied stations of the host station is stored.	×	○	×											
SB0067 (5E6 _H , b7)		<table border="1"> <thead> <tr> <th>Number of occupied stations</th> <th>SB0066</th> <th>SB0067</th> </tr> </thead> <tbody> <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> </tbody> </table>				Number of occupied stations	SB0066	SB0067	1	OFF	OFF	2	OFF	ON	3	ON
Number of occupied stations	SB0066	SB0067														
1	OFF	OFF														
2	OFF	ON														
3	ON	ON														
4	ON	OFF														
SB006A (5E6 _H , b10)	Whether the switch has been correctly set is stored. OFF: Correct ON: Setting incorrect (An error code is stored in SW006A.)															

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).	○	○	×

Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0076 (5E7 _H , b6)	Temporary error invalid station setting information	<p>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.)</p> <p>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).</p>	○	○	×
SB0077 (5E7 _H , b7)	Parameter receive status	<p>Whether parameters have been received from the master station is stored. OFF: Received ON: Not received</p>	×	○	×
SB0078 (5E7 _H , b8)	Host station switch change detection	<p>Whether the setting of setting switches of the host station during data link has been changed is detected. OFF: No change ON: Changed</p>	○	○	×
SB0079 (5E7 _H , b9)	Master station return specification information	<p>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)</p>	○	×	×
SB007A (5E7 _H , b10)	Host standby master station operation history	<p>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</p>	○	×	×
SB007B (5E7 _H , b11)	Host master/standby master operation status	<p>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).</p>	○	○	×
SB007C (5E7 _H , b12)	Device station refresh/compulsory clear setting status in case of programmable controller CPU STOP	<p>The parameter setting status of the device station refresh/compulsory clear setting in case of programmable controller CPU STOP is stored. OFF: Refreshed ON: Forcibly cleared</p>	○	○	×
SB007D (5E7 _H , b13)	Automatic detection of connected devices	<p>The setting status of the automatic detection of connected devices is stored. OFF: Do not read the model name of the device stations ON: Read the model name of the device stations</p>	○	×	×

Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0080 (5E8 _H , b0)	Other station data link status	<p>Whether communications are being normally performed with a remote station, local station, intelligent device station, and standby master station is stored.</p> <p>OFF: All stations normal</p> <p>ON: A faulty station exists. (The faulty station number is stored in SW0080 to SW0083.)</p> <p>It takes maximum of six seconds for Other station data link status (SB0080) to turn on after a device station connected to the master station or local station becomes faulty.</p>	○	○	×
SB0081 (5E8 _H , b1)	Other station watchdog timer error status	<p>Whether a watchdog timer error has occurred in other stations is stored.</p> <p>OFF: No error</p> <p>ON: Error</p> <p>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).</p>	○	○	×
SB0082 (5E8 _H , b2)	Other station fuse blown status	<p>Whether a fuse blown error has occurred in other stations is stored (SW0088 to SW008B).</p> <p>OFF: No error</p> <p>ON: Error</p> <p>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).</p>	○	○	×
SB0083 (5E8 _H , b3)	Other station switch change status	<p>Whether the setting of setting switches of other stations during data link has been changed is detected.</p> <p>OFF: No change</p> <p>ON: Changed</p> <p>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).</p>	○	○	×
SB0090 (5E9 _H , b0)	Host line status	<p>Whether the line to the host station is normally operating is stored.</p> <p>OFF: Normal</p> <p>ON: Error (disconnected)</p>	×	○	×

A

Appendix 3 Link Special Relays (SBs) and Link Special Registers (SWs)
Appendix 3.1 Link special relays (SBs)

Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SB0094 (5E9 _H , b4)	Other stations transient transmission status	<p>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.</p> <p>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).</p>	○	○	×
SB0095 (5E9 _H , b5)	Master station transient transmission status	<p>Whether the master station is normally performing transient transmission is stored. OFF: Normal ON: Error</p>	×	○	×
SB00B4 (5EB _H , b4)	Standby master station test result	<p>The result of the line test 1 or line test 2 is stored. OFF: Normal ON: Error</p>	○	×	○
SB0160 (5F6 _H , b0)	Remote register use prohibited status	<p>The use prohibited status of the remote register is stored. OFF: Usable ON: Use prohibited (The status information is stored in SW0160 to SW0163.)</p> <p>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).</p>	○	×	×
SB0184 (5F8 _H , b4)	Transmission speed test result for standby master station	<p>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)</p>	○	×	×
SB0185 (5F8 _H , b5)	Transmission speed test accept status	<p>Whether Transmission speed test request (SB000B) has been accepted is stored. OFF: Not accepted ON: Accepted</p>	○	×	×
SB0186 (5F8 _H , b6)	Transmission speed test completion status	<p>Whether a transmission speed test has been completed is stored. OFF: Not completed ON: Completed</p>	○	×	×

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.

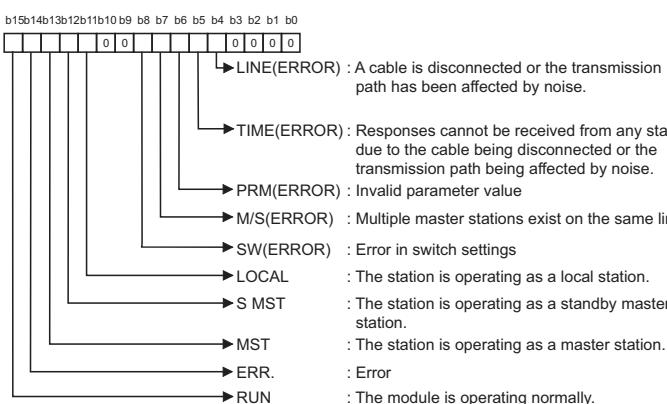
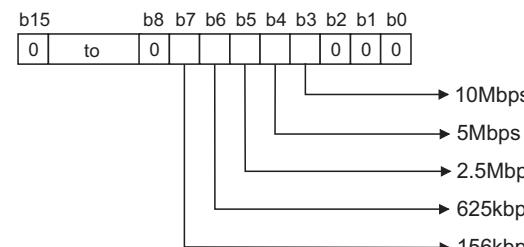
Values in parentheses are buffer memory addresses.

When using a master/local module as a standby master station, 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)	Temporary error invalid station specification	Specify a temporary error invalid station. 0: Temporary error invalid station not specified 1: Temporary error invalid station specified	○	×	×
SW0005 (605 _H)		b15 b14 b13 b12 to b3 b2 b1 b0			
SW0006 (606 _H)		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			
SW0007 (607 _H)		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.	○	○	×

Number	Name	Description	Availability (○: Yes, ×: No)																																					
			Online		Offline																																			
			Master station	Local station																																				
SW000B (60B _H)	Dedicated instruction retry count setting	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.	○	○	×																																			
SW0014 (614 _H)	Specification of remote device station to be initialized	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	○	×	×																																			
SW0015 (615 _H)		SW0014 b15 b14 b13 b12 to b3 b2 b1 b0 <table border="1"> <tr><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>			16	15	14	13	to	4	3	2	1	SW0015	32	31	30	29	to	20	19	18	17	SW0016	48	47	46	45	to	36	35	34	33	SW0017	64	63	62	61	to	52
16	15	14	13	to	4	3	2	1																																
SW0015	32	31	30	29	to	20	19	18	17																															
SW0016	48	47	46	45	to	36	35	34	33																															
SW0017	64	63	62	61	to	52	51	50	49																															
SW0016 (616 _H)	1 to 64 in the table indicate station numbers.																																							
SW0017 (617 _H)	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.																																							
SW0020 (620 _H)	Module status	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)	○	○	○																																			
SW0041 (641 _H)	Data link restart result	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)	○	○	×																																			
SW0043 (643 _H)	Refresh instruction at standby master switching result	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)	○	×	×																																			
SW0045 (645 _H)	Data link stop result	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)	○	○	×																																			
SW0049 (649 _H)	Temporary error invalid station specification result	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)	○	×	×																																			
SW004B (64B _H)	Temporary error invalid station specification cancel result	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)	○	×	×																																			
SW004D (64D _H)	Line test result	The result of a line test is stored. 0: Normal Values other than 0: Error code ( Page 293, Section 11.3.2)	○	×	×																																			

Number	Name	Description	Availability		
			Online		Offline
			Master station	Local station	
SW0052 (652H)	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 (657H)	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 (658H)	Detailed LED display status	The details of the LED display status are stored. 0: OFF 1: ON  LINE(ERROR) : A cable is disconnected or the transmission path has been affected by noise. TIME(ERROR) : Responses cannot be received from any station due to the cable being disconnected or the transmission path being affected by noise. PRM(ERROR) : Invalid parameter value M/S(ERROR) : Multiple master stations exist on the same line. SW(ERROR) : Error in switch settings LOCAL : The station is operating as a local station. S MST : The station is operating as a standby master station. MST : The station is operating as a master station. ERR. : Error RUN : The module is operating normally.	○	○	○
SW0059 (659H)	Transmission speed setting	Transmission speed setting status is stored. 0: Cleared 1: Set  10Mbps 5Mbps 2.5Mbps 625kbps 156kbps	○	○	○
SW005D (65DH)	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 (65FH)	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)	○	✗	✗

Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SW0060 (660H)	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 (661H)	Host station number	The current host station number is stored. 0: Master station 1 to 64: Local station	○	○	○
SW0062 (662H)	Module operating status	The operation setting configured using the parameter is stored. <p>Station type 0: Master station/local station 1: Standby master station (Valid only when b1 is 0)</p> <p>Master station duplex function 0: Master station duplex function disabled 1: Master station duplex function enabled</p> <p>Status of input data from a data link faulty station 0: Clear 1: Hold</p> <p>Number of occupied stations 00: Number of occupied stations: 1 10: Number of occupied stations: 2 11: Number of occupied stations: 3 01: Number of occupied stations: 4</p> <p>Master station/local station start by dedicated instruction 0: Start by CPU parameter 1: Start by dedicated instruction</p> <p>Device station refresh/compulsory clear setting in case of programmable controller CPU STOP 0: Refresh 1: Clears compulsorily</p> <p>Expanded cyclic setting 00: Single 01: Double 10: Quadruple 11: Octuple</p> <p>Block guarantee of cyclic data per station 0: Not set 1: Set</p> <p>Automatic detection of connected devices 0: Not read the model name of the device stations 1: Read the model name of the device stations</p>	○	○	○
SW0064 (664H)	No. of retries information	The set number of retries upon an error response is stored. 1 to 7 (time)	○	×	×
SW0065 (665H)	No. of automatic return stations	The set number of automatic return stations in one link scan is stored. 1 to 10 (station)	○	×	×
SW0066 (666H)	Delay timer information	The set delay time is stored.	○	×	×
SW0067 (667H)	Parameter information	The parameter setting used is stored. 0H: Parameter written to the CPU module 3H: Parameter setting and data link start using the dedicated instruction (G(P).RLPASET) DH: Default parameter (automatic CC-Link startup)	○	×	○
SW0068 (668H)	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)	○	×	×

Number	Name	Description	Availability (○ : Yes, × : No)																																																				
			Online		Offline																																																		
			Master station	Local station																																																			
SW0069 (669 _H)	Loading status	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.	○	×	×																																																		
SW006A (66A _H)	Switch setting status	Whether the switch has been correctly set is stored. 0: Correct Values other than 0: Error code (☞ Page 293, Section 11.3.2)	○	○	○																																																		
SW006D (66D _H)	Max. link scan time	The maximum link scan time is stored (unit: 1ms).	○	○	×																																																		
SW006E (66E _H)	Current link scan time	The current link scan time is stored (unit: 1ms).	○	○	×																																																		
SW006F (66F _H)	Min. link scan time	The minimum link scan time is stored (unit: 1ms).	○	○	×																																																		
SW0070 (670 _H)	Total number of stations	The last station number set using the parameter is stored. 1 to 64 (station)	○	×	×																																																		
SW0071 (671 _H)	Max. communication station number	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.	○	×	×																																																		
SW0072 (672 _H)	Number of connected modules	The number of modules performing data link is stored. Reserved stations are excepted.	○	×	×																																																		
SW0073 (673 _H)	Standby master station number	The standby master station number is stored. 1 to 64 (station)	○	○	×																																																		
SW0074 (674 _H)	Reserved station specified status	Whether a station has been set as a reserved station is stored. 0: A station other than a reserved station 1: Reserved station	<table border="1"> <thead> <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> </thead> <tbody> <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> </tbody> </table> 1 to 64 in the table indicate station numbers.		b15	b14	b13	b12	to	b3	b2	b1	b0	SW0074	16	15	14	13	to	4	3	2	1	SW0075	32	31	30	29	to	20	19	18	17	SW0076	48	47	46	45	to	36	35	34	33	SW0077	64	63	62	61	to	52	51	50	49	○	○
	b15	b14	b13	b12	to	b3	b2	b1	b0																																														
SW0074	16	15	14	13	to	4	3	2	1																																														
SW0075	32	31	30	29	to	20	19	18	17																																														
SW0076	48	47	46	45	to	36	35	34	33																																														
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SW0075 (675 _H)																																																							
SW0076 (676 _H)																																																							
SW0077 (677 _H)																																																							

Number	Name	Description	Availability		Offline																																																		
			(○: Yes, ×: No)																																																				
			Online	Master station Local station																																																			
SW0078 (678H)	Error invalid station specified status	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 border="1"> <thead> <tr> <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> </thead> <tbody> <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> </tbody> </table> <p>1 to 64 in the table indicate station numbers.</p> <p>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.</p>	b15	b14	b13	b12	to	b3	b2	b1	b0	SW0078	16	15	14	13	to	4	3	2	1	SW0079	32	31	30	29	to	20	19	18	17	SW007A	48	47	46	45	to	36	35	34	33	SW007B	64	63	62	61	to	52	51	50	49	○	○	×
b15	b14	b13	b12	to	b3	b2	b1	b0																																															
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SW0079 (679H)																																																							
SW007A (67AH)																																																							
SW007B (67BH)																																																							
SW007C (67CH)	Temporary error invalid status	Whether a station is in the temporary error invalid status is stored. 0: Normal 1: Temporary error invalid status	<table border="1"> <thead> <tr> <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> </thead> <tbody> <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> </tbody> </table> <p>1 to 64 in the table indicate station numbers.</p> <p>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.</p>	b15	b14	b13	b12	to	b3	b2	b1	b0	SW007C	16	15	14	13	to	4	3	2	1	SW007D	32	31	30	29	to	20	19	18	17	SW007E	48	47	46	45	to	36	35	34	33	SW007F	64	63	62	61	to	52	51	50	49	○	○	×
b15	b14	b13	b12	to	b3	b2	b1	b0																																															
SW007C	16	15	14	13	to	4	3	2	1																																														
SW007D	32	31	30	29	to	20	19	18	17																																														
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SW007D (67DH)																																																							
SW007E (67EH)																																																							
SW007F (67FH)																																																							
SW0080 (680H)	Other station data link status	Data link status of each station is stored. 0: Normal 1: Data link error	<table border="1"> <thead> <tr> <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> </thead> <tbody> <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> </tbody> </table> <p>1 to 64 in the table indicate station numbers.</p> <ul style="list-style-type: none"> The bits turn on by the number of occupied stations. It takes maximum of six seconds for this register to turn on after a device 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. 	b15	b14	b13	b12	to	b3	b2	b1	b0	SW0080	16	15	14	13	to	4	3	2	1	SW0081	32	31	30	29	to	20	19	18	17	SW0082	48	47	46	45	to	36	35	34	33	SW0083	64	63	62	61	to	52	51	50	49	○	○	×
b15	b14	b13	b12	to	b3	b2	b1	b0																																															
SW0080	16	15	14	13	to	4	3	2	1																																														
SW0081	32	31	30	29	to	20	19	18	17																																														
SW0082	48	47	46	45	to	36	35	34	33																																														
SW0083	64	63	62	61	to	52	51	50	49																																														
SW0081 (681H)																																																							
SW0082 (682H)																																																							
SW0083 (683H)																																																							

Number	Name	Description	Availability (○: Yes, ×: No)		Offline																																																
			Online																																																		
			Master station	Local station																																																	
SW0084 (684H)	Other station watchdog timer error occurrence status	Whether a watchdog timer error has occurred is stored. 0: No watchdog timer error 1: Watchdog timer error	<table border="1"> <thead> <tr> <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> </thead> <tbody> <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> </tbody> </table>	b15	b14	b13	b12	to	b3	b2	b1	b0	SW0084	16	15	14	13	to	4	3	2	1	SW0085	32	31	30	29	to	20	19	18	17	SW0086	48	47	46	45	to	36	35	34	33	SW0087	64	63	62	61	to	52	51	50	49	○ ○ ×
b15	b14	b13	b12	to	b3	b2	b1	b0																																													
SW0084	16	15	14	13	to	4	3	2	1																																												
SW0085	32	31	30	29	to	20	19	18	17																																												
SW0086	48	47	46	45	to	36	35	34	33																																												
SW0087	64	63	62	61	to	52	51	50	49																																												
SW0085 (685H)	1 to 64 in the table indicate station numbers.																																																				
SW0086 (686H)	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.																																																				
SW0087 (687H)																																																					
SW0088 (688H)	Other station fuse blown status	Whether a fuse blown error has occurred is stored. 0: Normal 1: Error	<table border="1"> <thead> <tr> <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> </thead> <tbody> <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> </tbody> </table>	b15	b14	b13	b12	to	b3	b2	b1	b0	SW0088	16	15	14	13	to	4	3	2	1	SW0089	32	31	30	29	to	20	19	18	17	SW008A	48	47	46	45	to	36	35	34	33	SW008B	64	63	62	61	to	52	51	50	49	○ × ×
b15	b14	b13	b12	to	b3	b2	b1	b0																																													
SW0088	16	15	14	13	to	4	3	2	1																																												
SW0089	32	31	30	29	to	20	19	18	17																																												
SW008A	48	47	46	45	to	36	35	34	33																																												
SW008B	64	63	62	61	to	52	51	50	49																																												
SW0089 (689H)	1 to 64 in the table indicate station numbers.																																																				
SW008A (68AH)	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.																																																				
SW008B (68BH)																																																					
SW008C (68CH)	Other station switch change status	Whether the setting of switches of other stations during data link has been changed is stored. 0: No change 1: Changed	<table border="1"> <thead> <tr> <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> </thead> <tbody> <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> </tbody> </table>	b15	b14	b13	b12	to	b3	b2	b1	b0	SW008C	16	15	14	13	to	4	3	2	1	SW008D	32	31	30	29	to	20	19	18	17	SW008E	48	47	46	45	to	36	35	34	33	SW008F	64	63	62	61	to	52	51	50	49	○ ○ ×
b15	b14	b13	b12	to	b3	b2	b1	b0																																													
SW008C	16	15	14	13	to	4	3	2	1																																												
SW008D	32	31	30	29	to	20	19	18	17																																												
SW008E	48	47	46	45	to	36	35	34	33																																												
SW008F	64	63	62	61	to	52	51	50	49																																												
SW008D (68DH)	1 to 64 in the table indicate station numbers.																																																				
SW008E (68EH)	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.																																																				
SW008F (68FH)																																																					
SW0090 (690H)	Line status	Line status is stored. 0: Normal 1: Data link disabled (disconnected)	×	○	×																																																

Number	Name	Description	Availability (○: Yes, ×: No)		Offline																																																	
			Online																																																			
			Master station	Local station																																																		
SW0094 (694H)	Other stations transient transmission status	Whether a transient transmission error has occurred in other stations is stored. 0: No transient transmission error 1: Transient transmission error	<table border="1"> <thead> <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> </thead> <tbody> <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> </tbody> </table>		b15	b14	b13	b12	to	b3	b2	b1	b0	SW0094	16	15	14	13	to	4	3	2	1	SW0095	32	31	30	29	to	20	19	18	17	SW0096	48	47	46	45	to	36	35	34	33	SW0097	64	63	62	61	to	52	51	50	49	○ ○ ×
	b15	b14	b13	b12	to	b3	b2	b1	b0																																													
SW0094	16	15	14	13	to	4	3	2	1																																													
SW0095	32	31	30	29	to	20	19	18	17																																													
SW0096	48	47	46	45	to	36	35	34	33																																													
SW0097	64	63	62	61	to	52	51	50	49																																													
SW0095 (695H)	1 to 64 in the table indicate station numbers.																																																					
SW0096 (696H)	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.																																																					
SW0097 (697H)	Even when the transient transmission is retried using a dedicated instruction, the error will be detected.																																																					
SW0098 (698H)	Station number overlap status	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 border="1"> <thead> <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> </thead> <tbody> <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> </tbody> </table>		b15	b14	b13	b12	to	b3	b2	b1	b0	SW0098	16	15	14	13	to	4	3	2	1	SW0099	32	31	30	29	to	20	19	18	17	SW009A	48	47	46	45	to	36	35	34	33	SW009B	64	63	62	61	to	52	51	50	49	○ × ×
	b15	b14	b13	b12	to	b3	b2	b1	b0																																													
SW0098	16	15	14	13	to	4	3	2	1																																													
SW0099	32	31	30	29	to	20	19	18	17																																													
SW009A	48	47	46	45	to	36	35	34	33																																													
SW009B	64	63	62	61	to	52	51	50	49																																													
SW0099 (699H)	1 to 64 in the table indicate station numbers.																																																					
SW009A (69AH)	• Reserved stations, station with the last station number, and stations later than that are excepted.																																																					
SW009B (69BH)	• 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 device 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.																																																					

Number	Name	Description	Availability (○: Yes, ×: No)		Offline																																																
			Online																																																		
			Master station	Local station																																																	
SW009C (69C _H)	Loading/parameter consistency status	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.)																																																			
SW009D (69D _H)		0: Normal 1: Mismatch error Example of a mismatch error	○	×	×																																																
SW009E (69E _H)		<table border="1"> <tr> <td>Installation</td> <td>Parameter</td> </tr> <tr> <td>Remote device station</td> <td>Remote I/O station</td> </tr> <tr> <td>Intelligent device station</td> <td>Remote I/O station</td> </tr> <tr> <td></td> <td>Remote device station</td> </tr> </table>	Installation	Parameter	Remote device station	Remote I/O station	Intelligent device station	Remote I/O station		Remote device station																																											
Installation	Parameter																																																				
Remote device station	Remote I/O station																																																				
Intelligent device station	Remote I/O station																																																				
	Remote device station																																																				
SW009F (69F _H)	<table border="1"> <tr> <td>b15</td> <td>b14</td> <td>b13</td> <td>b12</td> <td>to</td> <td>b3</td> <td>b2</td> <td>b1</td> <td>b0</td> </tr> <tr> <td>SW009C</td> <td>16</td> <td>15</td> <td>14</td> <td>13</td> <td>to</td> <td>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.	b15	b14	b13	b12	to	b3	b2	b1	b0	SW009C	16	15	14	13	to	4	3	2	1	SW009D	32	31	30	29	to	20	19	18	17	SW009E	48	47	46	45	to	36	35	34	33	SW009F	64	63	62	61	to	52	51	50	49			
b15	b14	b13	b12	to	b3	b2	b1	b0																																													
SW009C	16	15	14	13	to	4	3	2	1																																												
SW009D	32	31	30	29	to	20	19	18	17																																												
SW009E	48	47	46	45	to	36	35	34	33																																												
SW009F	64	63	62	61	to	52	51	50	49																																												
SW00B4 (6B4 _H)	Line test 1 result	The result of the line test 1 is stored. 0: Normal 1: Error																																																			
SW00B5 (6B5 _H)		<table border="1"> <tr> <td>b15</td> <td>b14</td> <td>b13</td> <td>b12</td> <td>to</td> <td>b3</td> <td>b2</td> <td>b1</td> <td>b0</td> </tr> <tr> <td>SW00B4</td> <td>16</td> <td>15</td> <td>14</td> <td>13</td> <td>to</td> <td>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.	b15	b14	b13	b12	to	b3	b2	b1	b0	SW00B4	16	15	14	13	to	4	3	2	1	SW00B5	32	31	30	29	to	20	19	18	17	SW00B6	48	47	46	45	to	36	35	34	33	SW00B7	64	63	62	61	to	52	51	50	49	○	×
b15	b14	b13	b12	to	b3	b2	b1	b0																																													
SW00B4	16	15	14	13	to	4	3	2	1																																												
SW00B5	32	31	30	29	to	20	19	18	17																																												
SW00B6	48	47	46	45	to	36	35	34	33																																												
SW00B7	64	63	62	61	to	52	51	50	49																																												
SW00B6 (6B6 _H)	The bits turn on by the number of occupied stations.																																																				
SW00B7 (6B7 _H)																																																					
SW00B8 (6B8 _H)	Line test result	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)	×	×	○																																																

Number	Name	Description	Availability (○: Yes, ×: No)		
			Online		Offline
			Master station	Local station	
SW0110 (710H)	Remote device station initialization procedure registration execution individual information (target 1)				
SW0111 (711H)	Remote device station initialization procedure registration execution individual information (target 2)				
SW0112 (712H)	Remote device station initialization procedure registration execution individual information (target 3)	The execution progress of the initialization procedure registration is stored. Upper bit: Next execution procedure number (Upon completion, FFH is stored.) Lower bit: Target station number	○	×	×
SW0113 (713H)	Remote device station initialization procedure registration execution individual information (target 4)				
SW0114 (714H)	Remote device station initialization procedure registration execution individual information (target 5)				

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)				
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)	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	○	×	×
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)				

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)				
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)	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	○	×	×
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)				

Number	Name	Description	Availability (○ : Yes, × : No)																																						
			Online		Offline																																				
			Master station	Local station																																					
SW011F (71F _H)	Remote device station initialization procedure registration execution individual information (target 16)	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	○	×	×																																				
SW0140 (740 _H)	Compatible CC-Link ver. information	A device station that supports the CC-Link Ver.2 mode is stored. 0: Ver.1-compatible device station 1: Ver.2-compatible device station	○	×	×																																				
SW0141 (741 _H)		b15 b14 b13 b12 to b3 b2 b1 b0 <table border="1"> <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>			SW0140	16	15	14	13	to	4	3	2	1	SW0141	32	31	30	29	to	20	19	18	17	SW0142	48	47	46	45	to	36	35	34	33	SW0143	64	63	62	61	to	52
SW0140	16	15	14	13	to	4	3	2	1																																
SW0141	32	31	30	29	to	20	19	18	17																																
SW0142	48	47	46	45	to	36	35	34	33																																
SW0143	64	63	62	61	to	52	51	50	49																																
SW0142 (742 _H)	1 to 64 in the table indicate station numbers.																																								
SW0143 (743 _H)	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.																																								
SW0144 (744 _H)	CC-Link ver. installation/parameter matching status	Whether a CC-Link version matches between the parameter settings and the modules on device stations is stored. 0: Normal 1: Mismatch error Example of a mismatch error	○	×	×																																				
SW0145 (745 _H)		<table border="1"> <tr><th colspan="2">Installation</th><th colspan="2">Parameter</th></tr> <tr><td>Ver.2-compatible remote device station</td><td></td><td>Ver.1-compatible remote device station</td><td></td></tr> <tr><td>Ver.1-compatible remote device station</td><td></td><td>Ver.2-compatible remote device station</td><td></td></tr> </table>				Installation		Parameter		Ver.2-compatible remote device station		Ver.1-compatible remote device station		Ver.1-compatible remote device station		Ver.2-compatible remote device station																									
Installation		Parameter																																							
Ver.2-compatible remote device station		Ver.1-compatible remote device station																																							
Ver.1-compatible remote device station		Ver.2-compatible remote device station																																							
SW0146 (746 _H)	b15 b14 b13 b12 to b3 b2 b1 b0 <table border="1"> <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>	SW0144	16	15	14	13	to	4	3	2	1	SW0145	32	31	30	29	to	20	19	18	17	SW0146	48	47	46	45	to	36	35	34	33	SW0147	64	63	62	61	to	52	51	50	49
SW0144	16	15	14	13	to	4	3	2	1																																
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SW0146	48	47	46	45	to	36	35	34	33																																
SW0147	64	63	62	61	to	52	51	50	49																																
SW0147 (747 _H)	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.																																								
SW0148 (748 _H)	Parameter mode	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	○	○	×																																				
SW0149 (749 _H)	Host parameter mode	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	○	○	○																																				

Number	Name	Description	Availability (○: Yes, ×: No)		Offline																																
			Online																																		
			Master station	Local station																																	
SW0160 (760 _H)	Remote register use prohibited status	The use prohibited status of the remote register is stored. 0: Usable 1: Use prohibited	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>																																
SW0161 (761 _H)		SW0160 b15 b14 b13 b12 to b3 b2 b1 b0 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><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>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>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>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>		16	15	14	13	to	4	3	2	1	32	31	30	29	to	20	19	18	17	48	47	46	45	to	36	35	34	33	64	63	62	61	to	52	51
16	15	14	13	to	4	3	2	1																													
32	31	30	29	to	20	19	18	17																													
48	47	46	45	to	36	35	34	33																													
64	63	62	61	to	52	51	50	49																													
SW0162 (762 _H)	1 to 64 in the table indicate station numbers.																																				
SW0163 (763 _H)	Only the bit for the first station number is turned on. Reserved stations and final station number onwards are not targeted.																																				
SW0183 (783 _H)	Transmission speed test result	The result of a transmission speed test is stored. 0: Normal Values other than 0: Error code (☞ Page 293, Section 11.3.2)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>																																
SW0184 (784 _H)	Transmission speed test result for each station	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)	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>																																
SW0185 (785 _H)		1 to 64 in the table indicate station numbers.																																			
SW0186 (786 _H)		Only the bit corresponding to the start station number turns on.																																			
SW0187 (787 _H)		1 to 64 in the table indicate station numbers.																																			

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		—	—

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

$$LS = BT\{27 + (NI \times 4.8) + (NW \times 9.6) + (N \times 30) + (ni \times 4.8) + (nw \times 9.6) + TR\} + ST + EX + RT + F [\mu s]$$

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

$40.8 \times$ number of stations that issued a transient request

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) $800 + (A \times 15)$
- 2) $900 + (B \times 50)$
- 3) $C \leq 26: 1200 + (C \times 100)$
 $C > 26: 3700 + \{(C - 26) \times 25\}$

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	$70 \times \text{number of stations}$	$80 \times \text{number of stations}$	$90 \times \text{number of stations}$	$100 \times \text{number of stations}$
Quadruple	$90 \times \text{number of stations}$	$110 \times \text{number of stations}$	$130 \times \text{number of stations}$	$150 \times \text{number of stations}$
Octuple	$110 \times \text{number of stations}$	$160 \times \text{number of stations}$	$210 \times \text{number of stations}$	$260 \times \text{number of stations}$

RT: Retry processing time (Only the link scan with a faulty device station where data link is being performed is added.)

$$\alpha + \beta \times (\text{number of detected faulty stations} - 1)$$

α : Retry processing time of the first station

$$BT \times \{(200 + R) \times \text{retry count setting value} + 178.5\}$$

• With a transient request

$$R: 13.2 + (NI \times 4.8) + (NW \times 9.6) + 180$$

• Without a transient request

$$R: 13.2 + (NI \times 4.8) + (NW \times 9.6)$$

β : Retry processing time of the second and subsequent stations

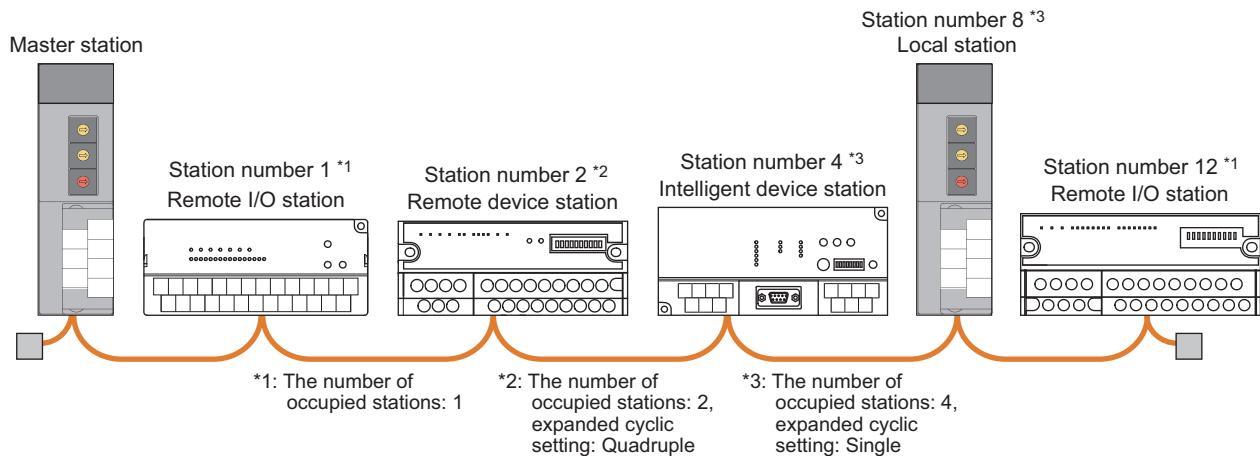
$$BT \times \{(200 + P) \times \text{retry count setting value} + 178.5\}$$

$$P: 10.8$$

F: Return processing time (added only when there is a faulty station)

$$BT \times \{243.1 + 210.8 \times (\text{number of automatic return modules} - 1)\} + ST$$

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.)



$$BT = 0.8$$

$$NI = 12 \rightarrow 16$$

$$NW = 11 \rightarrow 16$$

$$N = 5$$

$$ni = 12$$

$$nw = 10$$

$$\begin{aligned} LS &= 0.8\{27 + (16 \times 4.8) + (16 \times 9.6) + (5 \times 30) + (12 \times 4.8) + (10 \times 9.6)\} + 2300 + 160 \\ &= 2908.8\mu s \\ &= 2.91ms \end{aligned}$$

$$ST = 2300$$

$$1) 800 + (12 \times 15) = 980$$

$$2) 900 + (3 \times 50) = 1050$$

$$3) 1200 + (11 \times 100) = 2300$$

$$A = 12, B = 3, C = 11$$

$$EX = 50 + 110 \times 1 = 160$$

(2) In the remote I/O net mode

$$LS = BT\{27 + (NI \times 4.8) + (N \times 30) + (ni \times 4.8)\} + ST + RT + F [\mu s]$$

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

$$250 + (ni \times 10)$$

RT: Retry processing time (Only the link scan with a faulty device station where data link is being performed is added.)

$$\alpha + \beta \times (\text{number of detected faulty stations} - 1)$$

α : Retry processing time of the first station

$$BT \times (778.5 + R \times 3)$$

$$R: 13.2 + (NI \times 4.8)$$

β : Retry processing time of the second and subsequent stations

$$BT \times (778.5 + P \times 3)$$

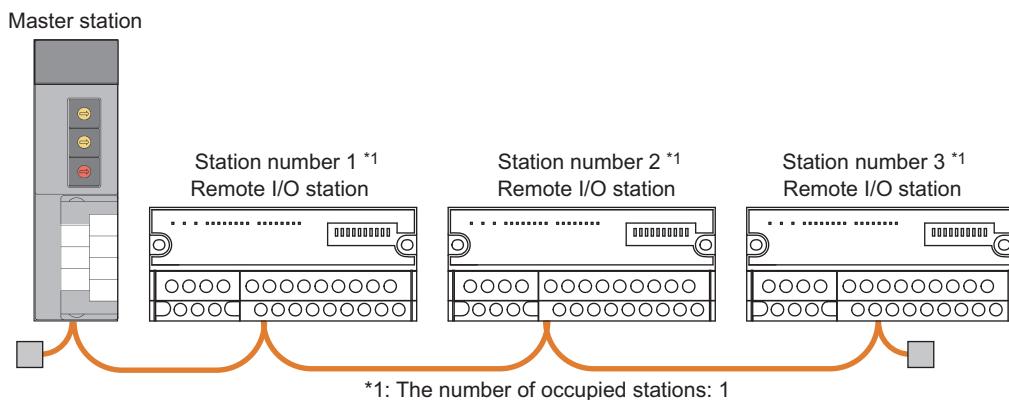
$$P: 10.8$$

F: Return processing time (added only when there is a faulty station)

$$BT \times 243.1 + ST$$

A

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.)



$$BT = 0.8$$

$$NI = 3 \rightarrow 8$$

$$N = 3$$

$$ni = 3$$

$$nw = 10$$

$$LS = 0.8\{27 + (8 \times 4.8) + (3 \times 30) + (3 \times 4.8)\} + 280$$

$$= 415.84\mu s$$

$$= 0.42ms$$

$$ST = 250 + (ni \times 10)$$

$$250 + (3 \times 10)$$

$$280$$

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.

A

SM: Master station sequence scan time

LS: Link scan time

n: $LS \div SM$ (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	$(SM \times n) + (LS \times 1) + Rio$	$\{(SM \times n) \times 1\} + Rio$	$SM + (LS \times 1) + Rio$	$\{(SM \times n) \times 1\} + Rio$
Max. value	$(SM \times n) + (LS \times 2) + Rio$	$\{(SM \times n) \times 2\} + Rio$	$SM + (LS \times 2) + Rio$	$\{(SM \times n) \times 2\} + Rio$

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	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms	$\{(20 \times 1) \times 1\} + 1.5$ = 21.5ms	$20 + (3 \times 1) + 1.5$ = 24.5ms	$\{(20 \times 1) \times 1\} + 1.5$ = 21.5ms
Max. value	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms	$\{(20 \times 1) \times 2\} + 1.5$ = 41.5ms	$20 + (3 \times 2) + 1.5$ = 27.5ms	$\{(20 \times 1) \times 2\} + 1.5$ = 41.5ms

(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: $LS \div SM$ (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	$(SM \times n) + (LS \times 1) + Rio$	$(SM \times n) + (LS \times 1) + Rio$	$SM + (LS \times 1) + Rio$	$(SM \times n) + (LS \times 1) + Rio$
Max. value	$(SM \times n) + (LS \times 2) + Rio$	$(SM \times n) + (LS \times 2) + Rio$	$SM + (LS \times 2) + Rio$	$(SM \times n) + (LS \times 2) + Rio$

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	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms	$20 + (3 \times 1) + 1.5$ = 24.5ms	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms
Max. value	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms	$20 + (3 \times 2) + 1.5$ = 27.5ms	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms

(2) Master station ↔ remote device station (Ver.1-compatible device 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: $LS \div SM$ (The decimal point is rounded up.)

Rd: Remote device station processing time

A

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	$(SM \times n) + (LS \times 1) + Rd$	$\{(SM \times n) \times 1\} + Rd$	$SM + (LS \times 1) + Rd$	$\{(SM \times n) \times 1\} + Rd$
Max. value	$(SM \times n) + (LS \times 2) + Rd$	$\{(SM \times n) \times 2\} + Rd$	$SM + (LS \times 2) + Rd$	$\{(SM \times n) \times 2\} + Rd$

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	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms	$\{(20 \times 1) \times 1\} + 1.5$ = 21.5ms	$20 + (3 \times 1) + 1.5$ = 24.5ms	$\{(20 \times 1) \times 1\} + 1.5$ = 21.5ms
Max. value	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms	$\{(20 \times 1) \times 2\} + 1.5$ = 41.5ms	$20 + (3 \times 2) + 1.5$ = 27.5ms	$\{(20 \times 1) \times 2\} + 1.5$ = 41.5ms

(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: $LS \div SM$ (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	$(SM \times n) + (LS \times 1) + Rd$	$(SM \times n) + (LS \times 1) + Rd$	$SM + (LS \times 1) + Rd$	$(SM \times n) + (LS \times 1) + Rd$
Max. value	$(SM \times n) + (LS \times 2) + Rd$	$(SM \times n) + (LS \times 2) + Rd$	$SM + (LS \times 2) + Rd$	$(SM \times n) + (LS \times 2) + Rd$

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	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms	$20 + (3 \times 1) + 1.5$ = 24.5ms	$(20 \times 1) + (3 \times 1) + 1.5$ = 24.5ms
Max. value	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms	$20 + (3 \times 2) + 1.5$ = 27.5ms	$(20 \times 1) + (3 \times 2) + 1.5$ = 27.5ms

(3) Master station ↔ remote device station (Ver.2-compatible device 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: $LS \div SM$ (The decimal point is rounded up.)
- t: $LS \times m \div SM$ (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	$(SM \times n) + (LS \times 1 \times m) + Rd$	$\{(SM \times t) \times 1\} + Rd$	$SM + (LS \times 1 \times m) + Rd$	$\{(SM \times t) \times 1\} + Rd$
Max. value	$(SM \times n) + (LS \times 2 \times m) + Rd$	$\{(SM \times t) \times 2\} + Rd$	$SM + (LS \times 2 \times m) + Rd$	$\{(SM \times t) \times 2\} + Rd$

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	$(20 \times 1) + (3 \times 1 \times 3) + 1.5 = 30.5\text{ms}$	$\{(20 \times 1) \times 1\} + 1.5 = 21.5\text{ms}$	$20 + (3 \times 1 \times 3) + 1.5 = 30.5\text{ms}$	$\{(20 \times 1) \times 1\} + 1.5 = 21.5\text{ms}$
Max. value	$(20 \times 1) + (3 \times 2 \times 3) + 1.5 = 39.5\text{ms}$	$\{(20 \times 1) \times 2\} + 1.5 = 41.5\text{ms}$	$20 + (3 \times 2 \times 3) + 1.5 = 39.5\text{ms}$	$\{(20 \times 1) \times 2\} + 1.5 = 41.5\text{ms}$

(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: $LS \div SM$ (The decimal point is rounded up.)
- t: $LS \times m \div SM$ (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	$(SM \times n) + [LS \times \{(1 \times m) + 1\}] + Rd$	$(SM \times t) + (LS \times m) + Rd$	$SM + [LS \times \{(1 \times m) + 1\}] + Rd$	$(SM \times t) + (LS \times m) + Rd$
Max. value	$(SM \times n) + [LS \times \{(2 \times m) + 1\}] + Rd$	$(SM \times t) + (LS \times m) + Rd$	$SM + [LS \times \{(2 \times m) + 1\}] + Rd$	$(SM \times t) + (LS \times m) + Rd$

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	$(20 \times 1) + [3 \times \{(1 \times 3) + 1\}] + 1.5 = 33.5\text{ms}$	$(20 \times 1) + (3 \times 3) + 1.5 = 30.5\text{ms}$	$20 + [3 \times \{(1 \times 3) + 1\}] + 1.5 = 33.5\text{ms}$	$(20 \times 1) + (3 \times 3) + 1.5 = 30.5\text{ms}$
Max. value	$(20 \times 1) + [3 \times \{(2 \times 3) + 1\}] + 1.5 = 42.5\text{ms}$	$(20 \times 1) + (3 \times 3) + 1.5 = 30.5\text{ms}$	$20 + [3 \times \{(2 \times 3) + 1\}] + 1.5 = 42.5\text{ms}$	$(20 \times 1) + (3 \times 3) + 1.5 = 30.5\text{ms}$

(4) Master station ↔ local station (Ver.1-compatible device 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.

A

SM: Master station sequence scan time

LS: Link scan time

SL: Local station sequence scan time

n: $LS \div SM$ (The decimal point is rounded up.)

k: $LS \div SL$ (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	$(SM \times n) + (LS \times 2) + \{SL \times (k + 1)\}$	$\{(SM \times n) \times 2\} + LS + \{SL \times (k + 1)\}$	$SM + (LS \times 2) + SL$	$\{(SM \times n) \times 2\} + LS + SL$
Max. value	$(SM \times n) + (LS \times 3) + \{SL \times (k + 1)\}$	$\{(SM \times n) \times 3\} + LS + \{SL \times (k + 1)\}$	$SM + (LS \times 3) + SL$	$\{(SM \times n) \times 3\} + LS + SL$

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	$(20 \times 1) + (3 \times 2) + \{10 \times (1 + 1)\} = 46\text{ms}$	$\{(20 \times 1) \times 2\} + 3 + \{10 \times (1 + 1)\} = 63\text{ms}$	$20 + (3 \times 2) + 10 = 36\text{ms}$	$\{(20 \times 1) \times 2\} + 3 + 10 = 53\text{ms}$
Max. value	$(20 \times 1) + (3 \times 3) + \{10 \times (1 + 1)\} = 49\text{ms}$	$\{(20 \times 1) \times 3\} + 3 + \{10 \times (1 + 1)\} = 83\text{ms}$	$20 + (3 \times 3) + 10 = 39\text{ms}$	$\{(20 \times 1) \times 3\} + 3 + 10 = 73\text{ms}$

(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: $LS \div SM$ (The decimal point is rounded up.)

k: $LS \div SL$ (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	$(SM \times n) + (LS \times 2) + \{SL \times (k + 1)\}$	$(SM \times n) + (LS \times 2) + \{SL \times (k + 1)\}$	$SM + (LS \times 2) + SL$	$(SM \times n) + (LS \times 2) + SL$
Max. value	$(SM \times n) + (LS \times 3) + \{SL \times (k + 1)\}$	$(SM \times n) + (LS \times 2) + \{SL \times (k + 1)\}$	$SM + (LS \times 3) + SL$	$(SM \times n) + (LS \times 2) + SL$

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	$(20 \times 1) + (3 \times 2) + \{10 \times (1 + 1)\} = 46\text{ms}$	$(20 \times 1) + (3 \times 2) + \{10 \times (1 + 1)\} = 46\text{ms}$	$20 + (3 \times 2) + 10 = 36\text{ms}$	$(20 \times 1) + (3 \times 2) + 10 = 36\text{ms}$
Max. value	$(20 \times 1) + (3 \times 3) + \{10 \times (1 + 1)\} = 49\text{ms}$	$(20 \times 1) + (3 \times 2) + \{10 \times (1 + 1)\} = 46\text{ms}$	$20 + (3 \times 3) + 10 = 39\text{ms}$	$(20 \times 1) + (3 \times 2) + 10 = 36\text{ms}$

(5) Master station ↔ local station (Ver.2-compatible device 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.

A

- SM: Master station sequence scan time
- LS: Link scan time
- SL: Local station sequence scan time
- n: $LS \div SM$ (The decimal point is rounded up.)
- t: $LS \times m \div SM$ (The decimal point is rounded up.)
- k: $LS \div SL$ (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	$(SM \times n) + [LS \times \{(1 \times m) + 1\}] + \{SL \times (k + 1)\}$	$\{(SM \times t) \times 2\} + \{SL \times (k + 1)\}$	$SM + [LS \times \{(1 \times m) + 1\}] + SL$	$(SM \times t) \times 2$
Max. value	$(SM \times n) + [LS \times \{(2 \times m) + 1\}] + \{SL \times (k + 1)\}$	$\{(SM \times t) \times 3\} + \{SL \times (k + 1)\}$	$SM + [LS \times \{(2 \times m) + 1\}] + SL$	$(SM \times t) \times 3$

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	$(20 \times 1) + [3 \times \{(1 \times 3) + 1\}] + \{10 \times (1 + 1)\} = 52\text{ms}$	$\{(20 \times 1) \times 2\} + \{10 \times (1 + 1)\} = 60\text{ms}$	$20 + [3 \times \{(1 \times 3) + 1\}] + 10 = 42\text{ms}$	$(20 \times 1) \times 2 = 40\text{ms}$
Max. value	$(20 \times 1) + [3 \times \{(2 \times 3) + 1\}] + \{10 \times (1 + 1)\} = 61\text{ms}$	$\{(20 \times 1) \times 3\} + \{10 \times (1 + 1)\} = 80\text{ms}$	$20 + [3 \times \{(2 \times 3) + 1\}] + 10 = 51\text{ms}$	$(20 \times 1) \times 3 = 60\text{ms}$

(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: $LS \div SM$ (The decimal point is rounded up.)
- t: $LS \times m \div SM$ (The decimal point is rounded up.)
- k: $LS \div SL$ (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	$(SM \times n) + [LS \times \{(1 \times m) + 1\}] + \{SL \times (k + 1)\}$	$\{(SM \times t) \times 1\} + \{SL \times (k + 1)\}$	$SM + [LS \times \{(1 \times m) + 1\}] + SL$	$\{(SM \times t) \times 1\} + SL$
Max. value	$(SM \times n) + [LS \times \{(2 \times m) + 1\}] + \{SL \times (k + 1)\}$	$\{(SM \times t) \times 2\} + \{SL \times (k + 1)\}$	$SM + [LS \times \{(2 \times m) + 1\}] + SL$	$\{(SM \times t) \times 2\} + SL$

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	$(20 \times 1) + [3 \times \{(1 \times 3) + 1\}] + \{10 \times (1 + 1)\} = 52ms$	$\{(20 \times 1) \times 1\} + \{10 \times (1 + 1)\} = 40ms$	$20 + [3 \times \{(1 \times 3) + 1\}] + 10 = 42ms$	$\{(20 \times 1) \times 1\} + 10 = 30ms$
Max. value	$(20 \times 1) + [3 \times \{(2 \times 3) + 1\}] + \{10 \times (1 + 1)\} = 61ms$	$\{(20 \times 1) \times 2\} + \{10 \times (1 + 1)\} = 60ms$	$20 + [3 \times \{(2 \times 3) + 1\}] + 10 = 51ms$	$\{(20 \times 1) \times 2\} + 10 = 50ms$

(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.

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

$$\text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 16\}^{*1} \times 1.067] + \text{SL}$$

$$+ (\text{WT} \times \text{RT} \times 1000)^{*2} \text{ ms}$$

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

$$\text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 16\}^{*1} \times 1.067] + \text{SL} + (\text{WT} \times \text{RT} \times 1000)$$

$$= 0.5 + 5 \times [12 + \{(20 + 16) \div 16\}^{*1} \times 1.067] + 0 + (10 \times 0 \times 1000)$$

$$= 0.5 + 5 \times [12 + \{3 \times 1.067\}] + 0$$

$$= 76.505$$

$$= 76.5\text{ms}$$

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

- G(P).RIWT instruction

$$OT + LS \times [BC + \{(number of write points + 16) \div 72\}^{*1} \times 1.13] + SL$$

$$+ (WT \times RT \times 1000)^{*2} \text{ ms}$$

OT: Processing time of QCPU dedicated instructions

Basic model QCPU, Q02CPU: 1ms

QCUPU (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

$$\begin{aligned} OT + LS \times [BC + \{(number of write points + 16) \div 72\}^{*1} \times 1.13] + SL + (WT \times RT \times 1000) \\ = 0.5 + 5 \times [12 + \{(20 + 16) \div 72\}^{*1} \times 1.13] + 0 + (10 \times 0 \times 1000) \\ = 0.5 + 5 \times [12 + \{1 \times 1.13\}] + 0 \\ = 66.15 \\ = 66.2\text{ms} \end{aligned}$$

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

(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

$$\text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 72\}^{*1} \times 1.13] + \text{SM}$$

$$+ (\text{WT} \times \text{RT} \times 1000)^{*2} \text{ ms}$$

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

A

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

$$\begin{aligned} &\text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 72\}^{*1} \times 1.13] + \text{SM} + (\text{WT} \times \text{RT} \times 1000) \\ &= 0.5 + 5 \times [12 + \{(20 + 16) \div 72\}^{*1} \times 1.13] + 0 + (10 \times 0 \times 1000) \\ &= 0.5 + 5 \times [12 + \{1 \times 1.13\}] + 0 \\ &= 66.15 \\ &= 66.2\text{ms} \end{aligned}$$

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

- G(P).RIWT instruction

$$OT + LS \times [BC + \{(number of write points + 16) \div 16\}^{*1} \times 1.067] + SM$$

$$+ (WT \times RT \times 1000)^{*2} \text{ ms}$$

OT: Processing time of QCPU dedicated instructions

Basic model QCPU, Q02CPU: 1ms

QCUPU (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

$$OT + LS \times [BC + \{(number of write points + 16) \div 16\}^{*1} \times 1.067] + SM + (WT \times RT \times 1000)$$

$$= 0.5 + 5 \times [12 + \{(20 + 16) \div 16\}^{*1} \times 1.067] + 0 + (10 \times 0 \times 1000)$$

$$= 0.5 + 5 \times [12 + \{3 \times 1.067\}] + 0$$

$$= 76.505$$

$$= 76.5\text{ms}$$

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

(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

$$\text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 16\}^{*1} \times 1.067] + \text{SL}$$

$$+ (\text{WT} \times \text{RT} \times 1000)^{*2} \text{ ms}$$

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

A

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

$$\begin{aligned}
 & \text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 16\}^{*1} \times 1.067] + \text{SL} + (\text{WT} \times \text{RT} \times 1000) \\
 & = 0.5 + 5 \times [12 + \{(20 + 16) \div 16\}^{*1} \times 1.067] + 0 + (10 \times 0 \times 1000) \\
 & = 0.5 + 5 \times [12 + \{3 \times 1.067\}] + 0 \\
 & = 76.505 \\
 & = 76.5\text{ms}
 \end{aligned}$$

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

- 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
QCUP (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

$$\begin{aligned}
& \text{OT} + \text{LS} \times [\text{BC} + \{(20 + 16) \div 16\}^{*1} \times 1.067] + \text{SL} + (\text{WT} \times \text{RT} \times 1000) \\
&= 0.5 + 5 \times [12 + \{(20 + 16) \div 16\}^{*1} \times 1.067] + 0 + (10 \times 0 \times 1000) \\
&= 0.5 + 5 \times [12 + \{3 \times 1.067\}] + 0 \\
&= 76.505 \\
&= 76.5\text{ms}
\end{aligned}$$

*1 The decimal point is rounded up.
*2 Time that occurs when a dedicated instruction is retried

(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

$$\text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 16\}^{*1} \times 1.067]$$

$$+ (\text{WT} \times \text{RT} \times 1000)^{*2} \text{ ms}$$

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

A

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

$$\text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of read points} + 16) \div 16\}^{*1} \times 1.067] + (\text{WT} \times \text{RT} \times 1000)$$

$$= 0.5 + 5 \times [12 + \{(20 + 16) \div 16\}^{*1} \times 1.067] + (10 \times 0 \times 1000)$$

$$= 0.5 + 5 \times [12 + \{3 \times 1.067\}] + 0$$

$$= 76.505$$

$$= 76.5\text{ms}$$

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

- 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
QCUP (excluding a Basic model QCUP 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
- $$\begin{aligned} & \text{OT} + \text{LS} \times [\text{BC} + \{(\text{number of write points} + 16) \div 72\}^{*1} \times 1.13] + (\text{WT} \times \text{RT} \times 1000) \\ &= 0.5 + 5 \times [12 + \{(20 + 16) \div 72\}^{*1} \times 1.13] + (10 \times 0 \times 1000) \\ &= 0.5 + 5 \times [12 + \{1 \times 1.13\}] + 0 \\ &= 66.15 \\ &= 66.2\text{ms} \end{aligned}$$

*1 The decimal point is rounded up.

*2 Time that occurs when a dedicated instruction is retried

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]

A

$$\alpha T = KM1 + KM2 \times \left(\frac{RX+RY+SB}{16} + RWw+RWr+SW \right) \times \alpha E + (\text{Number of CC-Link modules}-1) \times KM4 [ms]$$

$$\alpha E = KM3 \times \left(\frac{RX+RY+SB}{16} + RWw+RWr+SW \right) [ms]$$

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.

CPU type	Constant	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

(Local station)^{*1}

—: The block guarantee of cyclic data per station function is not supported.

CPU type	Constant		KM1
	With block guarantee of cyclic data per station	Without block guarantee of cyclic data per station	KM1
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)

CPU type	Constant	KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		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

(When a master/local module is mounted on an extension base unit)

CPU type	Constant KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		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

$$\begin{aligned}
 & KM1 + KM2 \times \left(\frac{RX+RY+SB}{16} + RWw+RWr+SW \right) \times \alpha E + (\text{Number of CC-Link modules}-1) \times KM4 \\
 & = 0.22 + 0.00043 \times \left(\frac{2048+2048+512}{16} + 256+256+512 \right) + 0 + (1-1) \times 0.2 \\
 & = 0.78416 \\
 & = 0.79 \text{ ms}
 \end{aligned}$$

(b) Remote net additional mode

[Formula]

$$\alpha T = KM1 + KM2 \times \left(\frac{RX+RX2+RY+RY2+SB}{16} + RWw+RWw2+RWr+RWr2+SW \right)$$

+ $\alpha E + (\text{Number of CC-Link modules}-1) \times KM4$ [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.

CPU type	Constant	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

(Local station)*1

—: The block guarantee of cyclic data per station function is not supported.

CPU type	Constant		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)

A

CPU type	Constant KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		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

(When a master/local module is mounted on an extension base unit)

CPU type	Constant KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		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

$$\begin{aligned}
 & KM1 + KM2 \times \left(\frac{RX+RX2+RY+RY2+SB}{16} + RWw+RWw2+RWr+RWr2+SW \right) \\
 & + \alpha E + (\text{Number of CC-Link modules}-1) \times KM4 \text{ [ms]} \\
 & = 0.28 + 0.00043 \times \left(\frac{1024+896+1024+896+512}{16} + 128+128+128+128+512 \right) \\
 & + 0+(1-1) \times 0.2 \\
 & = 0.83728 \\
 & = 0.84 \text{ ms}
 \end{aligned}$$

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.

A

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 (Yn6 and Yn8 cannot be used) and a dedicated instruction 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 ² PROM	Yes	Yes	No (Parameters of a CPU module)

(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

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

O: 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	○	○	○
		○	○	○
Applications to improve the system reliability	Parameter settings using dedicated instructions	○	○	×
	Device 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 device 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	×	×

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	○	○	○
Performing transient transmission	Remote net Ver.2 mode	○	○	○
	Remote net additional mode	○ ^{*2}	○	×
	Master station duplication error canceling function	○	○	○
	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.

(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}		8.03D or later
Refreshing/compulsorily clearing a device 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

*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.

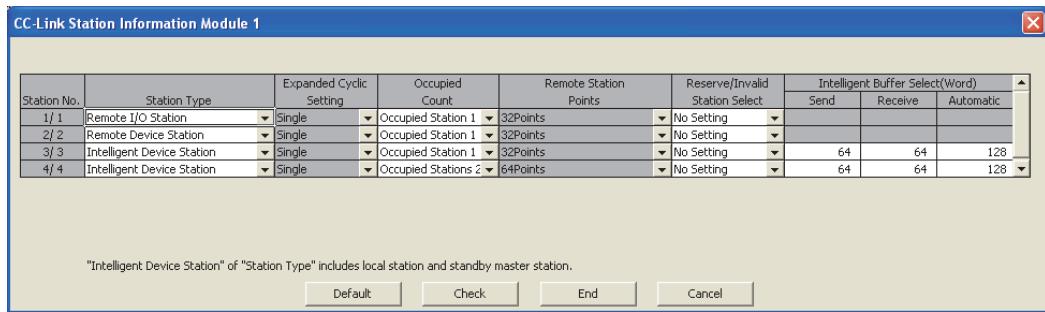
Appendix 7 When using GX Developer

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

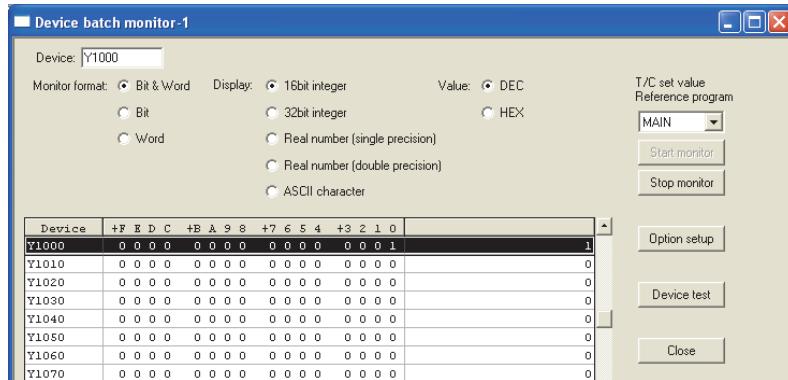
GX Developer does not have the station information setting on the CC-Link configuration window. Set the station information on the "CC-Link Station Information" window. (☞ Page 106, Section 7.3.2 (2) (b))



Appendix 7.2 Device test

Execute a device test on the following menu.

☞ [Online] ⇒ [Monitor] ⇒ [Device batch monitor]



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.

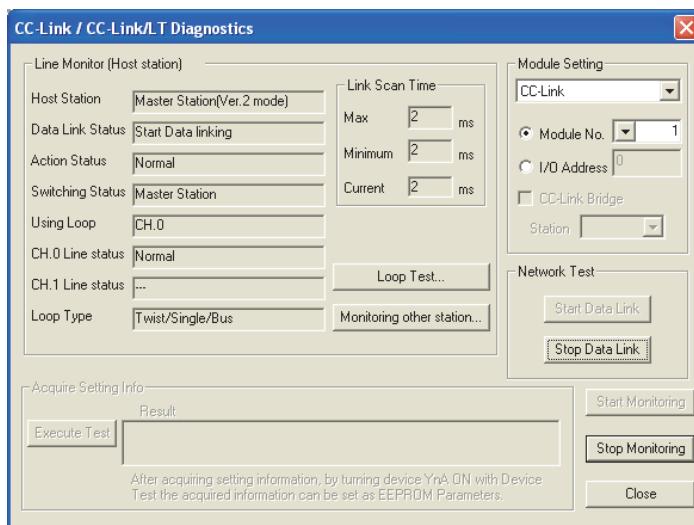
(1) Host station monitoring

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  button.
4. Follow the subsequent instructions for monitoring.

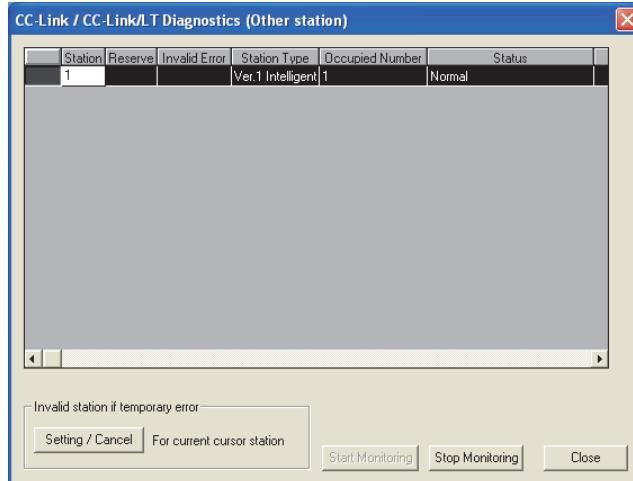


Item		Description
Line Monitor (Host station)	Host Station	Displays the station type and mode of the host station. Note that the mode is not displayed when the master/local module is in the remote net Ver.1 mode.
	Data Link Status	Displays the data link status of the host station.
	Action Status	Displays 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.
	 button	Executes a line test. ( Page 404, Appendix 7 (3))
	 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))	

(2) Other stations monitoring

How to monitor the status of a device station is described below.

- 1. Open the "CC-Link/CC-Link/LT Diagnostics" window.**
- 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  button.**
- 4. Click the  button to monitor the status of the device station.**



A

(3) Line test

Whether a CC-Link dedicated cable is properly connected and data link can be performed with device stations can be checked.

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

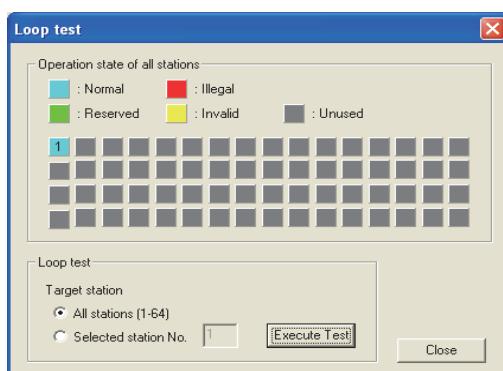
 [Diagnostics] \Rightarrow [CC-Link/CC-Link/LT Diagnostics]

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  button.

4. Click the  button.

The "Loop test" window appears.



5. Specify the station where a line test is executed in "Target station". Then click the  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  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.

(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.

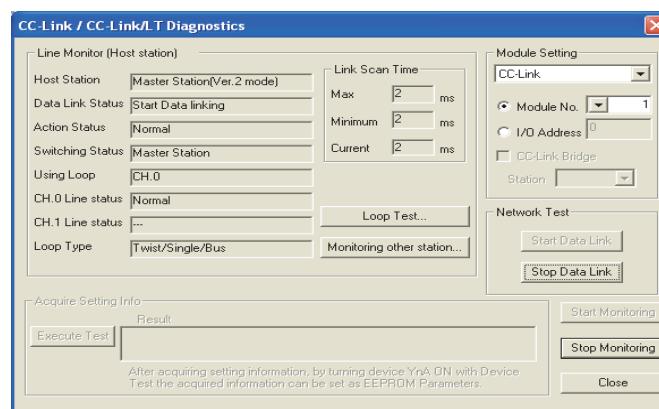
1. Open the "CC-Link/CC-Link/LT Diagnostics" window.

[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 button.

4. Click the button or button.



Point

When stopping or restarting data link, do not write data to the buffer memory area (buffer memory address: 5E0H).

(7) Setting and canceling a temporary error invalid station

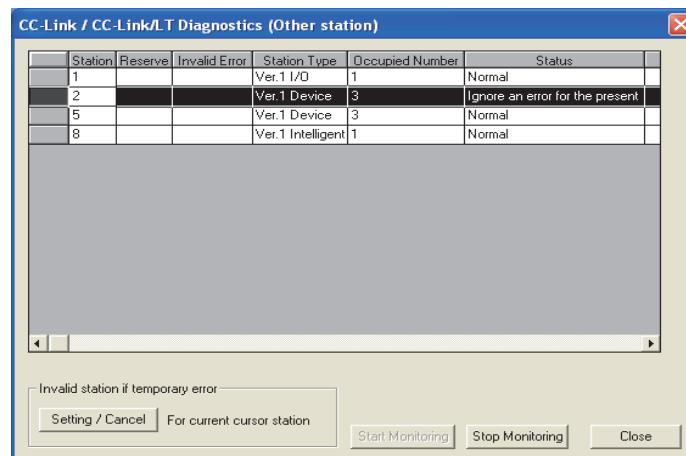
Even if a data link error occurs in a device station, the station is not detected as a faulty station in the master station and local station. This setting can be configured even during data link, unlike the error invalid station setting function.

This function is used to exchange device 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.

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.

(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.

Appendix 8.2 Network parameter setting sheet

A

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
	Case of CPU STOP Setting	Refresh or clear compulsorily. Default: Refresh
	Block Data Assurance per Station	Disable or enable the setting. Default: Disable the setting
	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.	

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.	

Appendix 8.3 Station information setting sheet

A

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								
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25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								

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								
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Appendix 9 Checking the Function Version and Serial Number

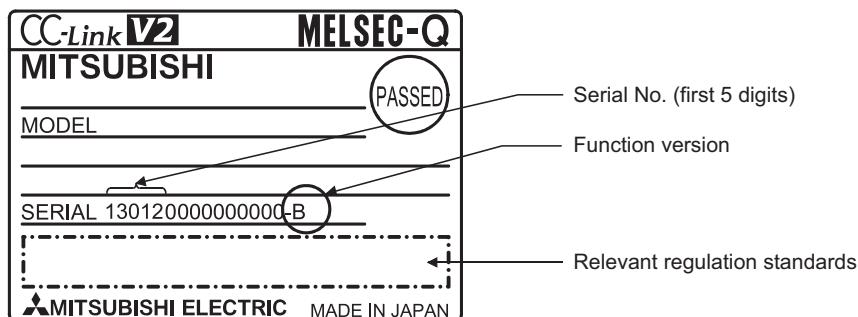
The serial number and function version of a master/local module can be checked on the rating plate, the front of the module, and the system monitor of a programming tool.

(1) Checking the function version and serial number of a master/local module

(a) On the rating plate

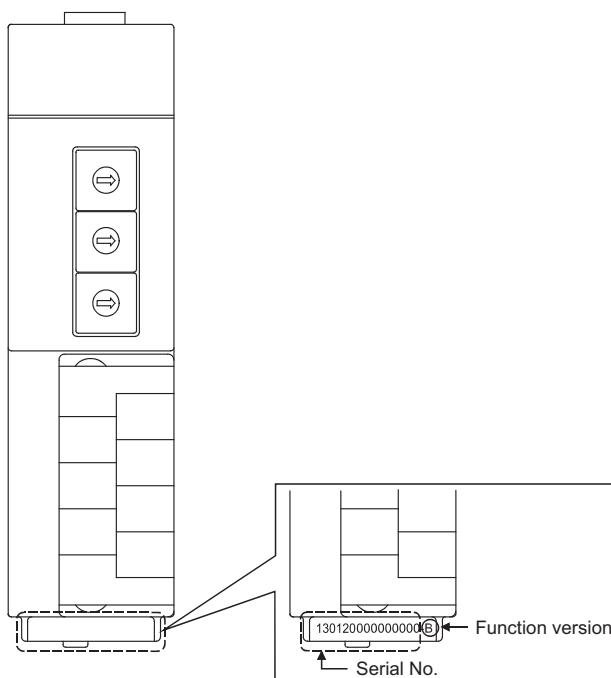
The rating plate is located on the side of a master/local module.

A



(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.



(c) On the system monitor (Product Information List)

In "System Monitor" of "Diagnostics" on a programming tool, click the **Product Information List** button.

The screenshot shows a software window titled "Product Information List". At the top, there is a "Sort" section with two radio buttons: "Order by Installation" (selected) and "Order by Type Name". Below this is a table with the following columns: Base, Slot, Type, Series, Model Name, Point, I/O Address, Master PLC, Serial No., Ver, and Production Number. The table contains the following data:

Base	Slot	Type	Series	Model Name	Point	I/O Address	Master PLC	Serial No.	Ver	Production Number
0	CPU	CPU	Q	Q02UCPU	-	-	-	1302200000000000	B	091012092915091-B
0	0	Intelli.	Q	QJ61BT11N	32Point	0000	-	1301200000000000	B	-
0	1	-	-	Empty	-	-	-	-	-	-
0	2	-	-	Empty	-	-	-	-	-	-
0	3	-	-	Empty	-	-	-	-	-	-
0	4	-	-	Empty	-	-	-	-	-	-

At the bottom left is a "Create CSV File" button, and at the bottom right is a "Close" button.

- 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.

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.

A

(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

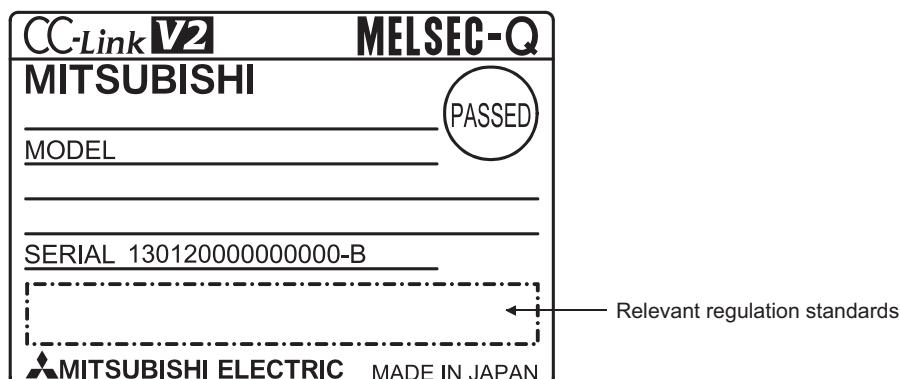
In a system where a Ver.1.00-compatible module is included, the maximum overall cable distance and station-to-station cable length need to meet the specifications of Ver.1.00.

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

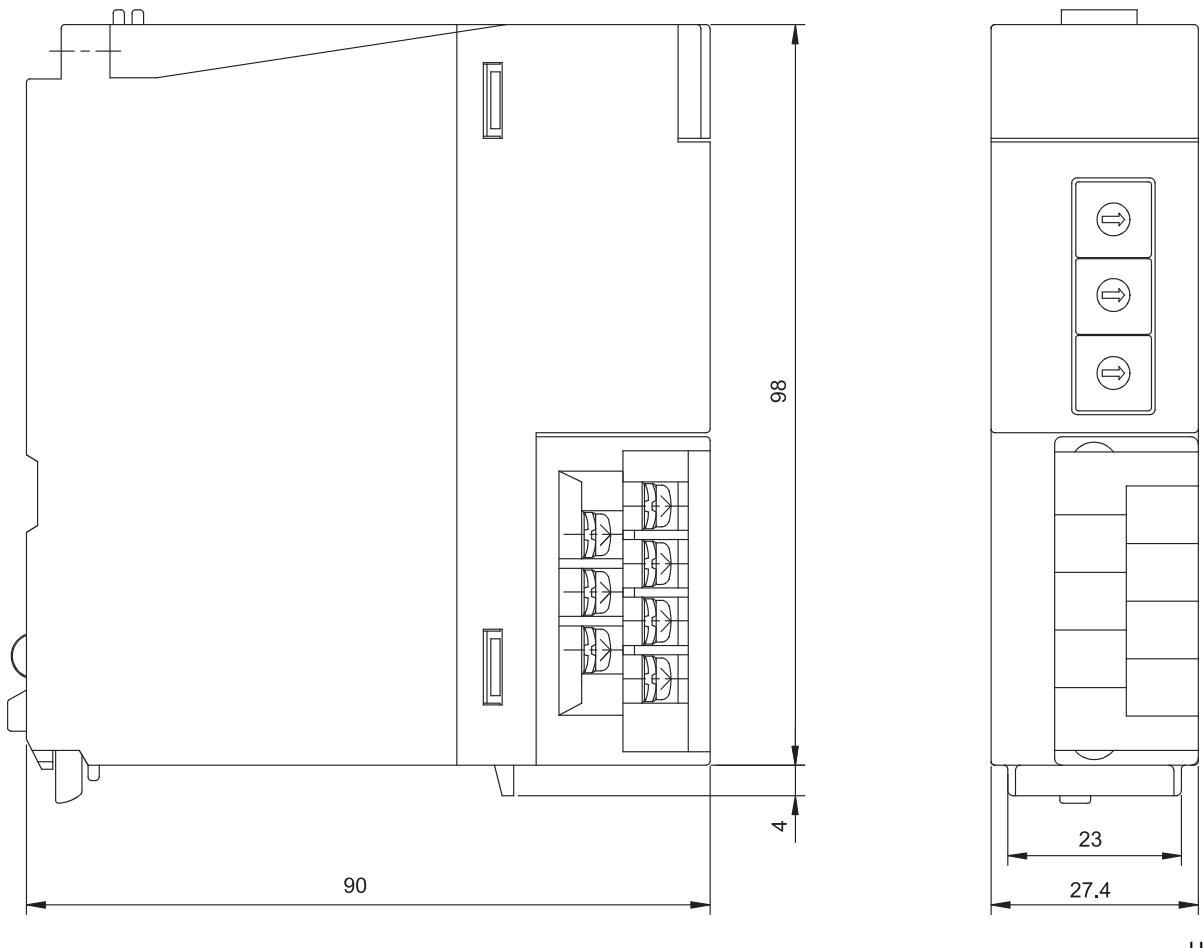
On a Ver.1.10-compatible module, the rating plate has a logo "CC-Link".

On a Ver.2-compatible module, the rating plate has a logo "V2".



Memo

Appendix 11 External Dimension Diagram



A

Appendix 11 External Dimension Diagram

INDEX

Symbols

of STA Occupied 105

0 to 9

32-bit data integrity assurance 153

A

ACPU 13
Added functions 399
AJ65BT-R2(N) 13
AnUCPU 13
Assignment 41
Assignment sheet 407
Asynchronous mode 163
Automatic CC-Link startup 159
Automatic Reconnection Station Count 100
Automatic return 128
Automatic update buffer 340
Available functions of CPU modules 397

B

Basic model QCPU 13
Block data assurance per station 101,150
Buffer memory 13
Buffer memory address 13
Buffer memory areas 328
Built-in Ethernet port QCPU 13

C

C Controller module 13
Cables 76
Case of CPU STOP Setting 101
CC-Link 16
CC-Link dedicated cable 13,33
CC-Link dedicated cable (Ver.1.00-compatible) 76
CC-Link dedicated high-performance cable (Ver.1.00-compatible) 76
CC-Link diagnostics using GX Works2 311
CC-Link system configuration 69
CC-Link versions 415
Combination of the modes 44
Communication buffer 339
Communication specifications for a T-branch connection 80
Conditions of use for the product 6
Configuration of the system where a master/local module is mounted 70
Connectable modules 70
Connection cable 25
Countermeasure against an incorrect input 73
Creating a check sheet 318
Cyclic data assurance 150
Cyclic transmission 13,125

D

Data link 13
Data Link Faulty Station Setting 101
Data link processing time 366
Data link start function using a standby master station 135
Data link stop/restart 169
Dedicated instruction 14,173
Delay Time Setting 100
Description of I/O signals 326
Detecting overlapped station numbers 84
Device 13
Device Reference 60
Device station 14
Device station cut-off 128
Device station offset, size information 335
Difference between the asynchronous and synchronous modes 163
Difference from traditional modules 395
Disconnection 14

E

EMC and Low Voltage Directives 7
ERR. LED 22
Error code list 293
Error History 291
Error invalid station setting 167
Example 59
Example of communications between a master station and a local station 255
Example of communications between a master station and a remote device station 232
Example of communications when the master station duplex function is used 147
Execute Flag 109
Executional Condition 109
Expanded Cyclic Setting 101,105,106
External dimension diagram 417

F

Function version 413

G

G(P).RDMSG 221
G(P).RIFR 197
G(P).RIRCVR 187
G(P).RIRD 175
G(P).RISEND 192
G(P).RITO 201
G(P).RIWT 181
G(P).RLPASET 205
General specifications 24
GX Developer 401

H

H/W LED Information	323
H/W SW Information	323
Handling precautions	75
Hardware information	322
Hardware test	324
High Performance model QCPU	13
Host data link status: Xn1	326
How to check error codes	290
How to perform the initial process only in a specified station	155
How to set the station number	83
How to set the transmission speed	85

I

Installation	75
Installing the module	75
Intelligent Buffer Select(Word)	107
Intelligent Buffer Size(word)	105
Intelligent device station	13
Intelligent function module	13
Internal current consumption (5VDC)	25
Interrupt Settings	100, 111

L

L ERR. LED	22
L RUN LED	21
Line test	86
Link refresh time	389
Link scan time	366
Link Scan Time (Approx.)	104
Link special register (SW)	339, 351
Link special relay (SB)	338, 343
List of buffer memory areas	38
List of dedicated instructions	173
List of functions	34
List of I/O signals	37
List of modes	43
Lists of problems	276
Local station	14

M

Manual page organization	12
Master station	13
Master Station Data Link Type	98
Master station duplex function	135
Master station duplication error canceling	172
Master station switching function	135
Master/local module	13, 17
Maximum number of connected modules	27
Maximum number of connected modules (master station)	24
Maximum number of link points per system	24
Maximum overall cable distance (CC-Link Ver.1.00)	30
Maximum overall cable distance (CC-Link Ver.1.10)	29
MELSECNET/H remote I/O station	70, 74
Mode	43, 98
Mode Setting	104

Model Name	104
Module error logs	291
Module error: Xn0	326
Module List	106
Module ready: XnF	327
Monitoring the host station/other stations	311
MST LED	21
Multiple CPU system	70

N

Network parameter setting sheet	409
No. of Registered Procedures	108
Non-periodic communications (transient transmission)	17
Number of connectable modules	70
Number of initial settings registered	154
Number of Modules	97
Number of occupied I/O points	25
Number of Occupied stations	101
Number of occupied stations (local station)	24

O

Occupied Count	107
Operation example	59
Operation of the standby master function	135
Operation Setting	97, 101
Operational Condition	109
Other station data link status: Xn3	326

P

Packing list	15
Parameter information area	328
Parameter Name	101
Parameter setting list	94
Parameter setting method	93
Parameter settings	93
Parameter settings by using a programming tool	93
Parameter settings by using the dedicated instruction (G(P).RLPASET instruction)	93
Parameter settings for a local station	114
Parameter settings for a master station	96
Parameter settings for a standby master station	114
Part names	21
Performance specifications	24
Periodic communications (cyclic transmission)	17
PLC Down Select	100
Precautions for programming	228
Preparation before wiring	76
Problems due to cyclic data error	284
Problems due to disconnection of a device station	276
Problems due to operation error in the master station	288
Problems due to transient data error	287
Procedure before the operation	57
Process CPU	13
Processing time of dedicated instructions	381
Programming	228
Programming tool	13, 71

Q

QCPU	13
QnACPU	13

R

RAS	13
RD LED	21
Redundant CPU	14
Redundant system	74
Refreshing/compulsorily clearing a device station when the switch on a programmable controller CPU is set to STOP	133
Remote device station	14
Remote device station initial setting	100, 108
Remote device station initialization procedure registration function	154
Remote I/O net mode	14, 43, 55
Remote I/O station	14
Remote I/O station points setting	170
Remote input (RX)	99, 331
Remote net additional mode	14, 43, 51
Remote net mode	14
Remote net Ver.1 mode	14, 43, 46
Remote net Ver.2 mode	14, 43, 48
Remote output (RY)	99, 332
Remote register (RWr)	99, 333
Remote register (RWw)	99, 334
Remote station	14
Remote Station Points	105, 107
Replacing a QJ61BT11 with a QJ61BT11N	396
Replacing an A(1S)J61BT11/A(1S)J61QBT11 with a QJ61BT11N	395
Reserve/Invalid Station Select	107
Reserved station	162
Reserved/Err Invalid STA	105
Retry Count	100
Return	14
RUN LED	21
RWr	13
RWw	13
RX	13
RY	13

S

S MST LED	21
Safety precautions	1
SB	13, 343
Scan Mode Setting	100
Scan synchronization	163
Screws	78
SD LED	21
Serial number	413
Serial number display	23
Set the station information in the CC-Link configuration window	97, 102, 106
Setting and canceling a temporary error invalid station	321
Setting of the data link status upon an error in the programmable controller CPU of the master station	130

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

Setting sheet	407
Solderless terminal	78
Special Register(SW)	100
Special Relay(SB)	100
Specification of remote device station to be initialized	155
Specifications	24
Standby master function	135
Standby master station	14
Standby Master Station No.	100
Start I/O No.	97
Station Information Setting	100, 102
Station information setting sheet	411
Station No.	104, 106
Station number setting	82
Station number setting switch	22
Station Type	105, 106
Station-specific mode setting	105
Status difference between a master station and a device station at an error	121
Status logging	315
Stopping and restarting data link	320
SW	13, 351
Synchronous mode	163
System configuration	69

T

T-branch connection	79
T-branch system configuration	79
Temporary error invalid station setting	168
Terminal block	23, 78
Terminating resistors	76
Test after wiring	86
The order of connecting the cables	76
Tightening torque	78
Total Module Connected	98
Transient transmission	13, 127
Transmission delay time	371
Transmission speed	24
Transmission speed setting	85
Transmission speed test	90
Transmission speed/mode setting switch	23
Troubleshooting by the CC-Link diagnostics	271
Troubleshooting by the status logging	275
Troubleshooting common to modules	270
Troubleshooting flowcharts	268
Troubleshooting using a programming tool	271
Troubleshooting using LEDs	268
Troubleshooting when the RUN LED on the master station is off	269
TX Speed	104
Type	98
Types of the standby master function	135

U

Universal model QCPU	14
Upgrading the functions	397
Upon a momentary power failure of a remote station	72

V

Ver.1.10-compatible CC-Link dedicated cable	76
Ver.1-compatible device station	13
Ver.2 Remote Input(RX)	99
Ver.2 Remote Output(RY)	99
Ver.2 Remote Register(RWr)	99
Ver.2 Remote Register(RWw)	99
Ver.2-compatible device station	13
Ver.2-compatible remote input (RX)	341
Ver.2-compatible remote output (RY)	341
Ver.2-compatible remote register (RWr)	342
Ver.2-compatible remote register (RWw)	342
Version	105,399

W

Weight	25
Wiring	76
Wiring diagram	77
Wiring procedure	77

I

REVISIONS

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

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Apr., 2008	SH (NA)-080394E-I	<p>Change of a term</p> <p>"PLC" was changed to "programmable controller".</p> <p>Addition</p> <p>Section 7.9, Appendix 2.9</p> <p>Partial correction</p> <p>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</p>
Jan., 2009	SH (NA)-080394E-J	<p>Partial correction</p> <p>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</p>
Aug., 2009	SH (NA)-080394E-K	<p>Addition</p> <p>Section 13.3.1</p> <p>Partial correction</p> <p>Section 2.2.1, 2.2.3, 5.2.3, 8.4.2, 11.4.4, 13.3.2, Appendix 7</p>
Nov., 2010	SH (NA)-080394E-L	<p>Addition</p> <p>Section 4.4.15, CONDITIONS OF USE FOR THE PRODUCT</p> <p>Partial correction</p> <p>SAFETY PRECAUTIONS, Compliance with the EMC and Low Voltage Directives, Section 2.2.1, Section 2.2.4, Section 4.1, Section 4.4.1, Section 4.4.2, Section 4.4.3, Section 4.4.15, Section 5.1, Section 5.4.1, Section 6.3.2, Section 6.4.2, Section 6.7, Section 7.3, Section 7.5, Section 8.4.1, Section 10.2.5, Section 10.1.3, Section 10.2.3, Section 10.3.3, Section 10.3.5, Section 11.2.4, Section 11.3.4, Section 11.4.4, Section 13.3.1, Section 13.3.2, Appendix 2.3, Appendix 2.5, Appendix 2.8, Appendix 6, Appendix 7</p> <p>Deletion</p> <p>Section 7.2.2</p>
May, 2012	SH (NA)-080394E-M	Complete revision (layout change)
Mar., 2015	SH (NA)-080394E-N	TERMS, PACKING LIST, Section 1.1, 1.2, Chapter 2, Section 3.2.2, 3.2.3, 3.2.4, 3.3, 3.6.2, 4.1, 5.2.1, 5.3, 6.2.3, 6.4, 7.2, 7.3.2, 7.4.2, 8.2.1, 8.2.5, 8.2.6, 8.3.1, 8.3.4, 8.3.6, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.8.1, 10.2.1, 10.3.1, 11.1, 11.2, 11.5, Appendix 2, 3.1, 3.2, 4.1, 4.4, 6, 9, 11
Feb., 2018	SH (NA)-080394E-O	<p>Partial correction</p> <p>Section 6.2.3, Section 9.1, Section 9.2, Section 9.3, Section 9.9, Section 9.9.1, Section 11.3.2, Appendix 6</p>

Print date	*Manual number	Revision
Jan., 2019	SH (NA)-080394E-P	Partial correction TERMS, Section 6.2.3, Section 11.3.2
Feb., 2023	SH (NA)-080394E-Q	Partial correction SAFETY PRECAUTIONS, CONDITIONS OF USE FOR THE PRODUCT, COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES, PACKING LIST, Section 3.2.3, Section 4.1, Section 6.2.1
Oct., 2023	SH(NA)-080394E-R	Partial correction TERMS, Section 3.2, Section 3.2.1, Section 3.3, Section 3.5, Section 3.6, Section 3.6.1, Section 3.6.2, Section 3.6.3, Section 3.6.4, Section 3.6.5, Section 3.6.6, Chapter 4, Section 4.1, Section 5.1, Section 6.2.2, Section 6.3, Section 6.4, Section 6.5.1, Section 6.5.2, Chapter 7, Section 7.3.1, Section 7.3.2, Section 7.4.2, Section 7.5, Section 8.1.1, Section 8.2.1, Section 8.2.4, Section 8.2.5, Section 8.2.6, Section 8.3.4, Section 8.3.6, Section 8.3.7, Section 9.8, Section 9.8.1, Section 10.1, Section 10.2.1, Section 10.2.2, Section 10.3.1, Section 10.3.2, Section 10.3.3, Section 10.3.6, Section 11.1.1, Section 11.1.2, Section 11.2.1, Section 11.3.1, Section 11.3.2, Section 11.4.6, Appendix 1, Appendix 2, Appendix 3.1, Appendix 3.2, Appendix 4.1, Appendix 4.2, Appendix 6, Appendix 7.3, Appendix 8.1
Jun., 2024	SH(NA)-080394E-S	Partial correction Section 3.2.2

Japanese Manual Version SH-080395-U

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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.
 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
 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.
- (2) Product supply (including repair parts) is not available after production is discontinued.

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.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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