

MELSEC System Q

Programmable Logic Controllers

User's Manual

QJ61BT11N CC-Link Master/Local Module

• 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, please read the user's manual of the CPU module used.

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



DANGER

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



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in 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 PRECAUTION]



DANGER

- See Chapter 5 of this manual for each station's operating status when a communication error has occurred in the data link.
- When changing data of running programmable controller from a personal computer connected to an intelligent function module or a peripheral connected to a CPU module, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely. For program modification and operating status change, read relevant manuals carefully and ensure the safety before operation.
Especially, in the case of a control from an external device to a remote programmable controller, an immediate action cannot be taken for a problem on the programmable controller due to a communication failure.
To prevent this, configure an interlock circuit in the sequence program, and determine corrective actions to be taken between the external device and CPU module in case of a communication error.

[DESIGN PRECAUTION]

DANGER

- Do not write any data into the "system area" of the buffer memory of each intelligent function module. Also, do not output any "prohibited" signal to an intelligent function module from the programmable controller CPU.
Writing data into the "system area" or outputting a "prohibited" signal may cause malfunction in the programmable controller system.
- When setting automatic refresh parameters, specify "Y" for the remote output RY refresh device. If a value other than "Y" (for example, M or L) is specified, the previous status of the device will be held when the CPU is stopped.
See Section 4.4.10 for how to stop the data link.
- If a CC-Link dedicated cable is disconnected, the line status may become unreliable, resulting in a data link communication error at multiple stations. Configure an interlock circuit in the sequence program to operate the system safely even if a data link communication error occurs at multiple stations. Failure to do so may result in an accident due to an incorrect output or malfunction.

[DESIGN PRECAUTION]

CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables.
Keep a distance of 100mm (3.9 inches) or more between them.
Failure to do so may malfunction due to noise.

[INSTALLATION PRECAUTIONS]

CAUTION

- Use the module in an environment that meets the general specifications contained in the CPU user's manual to use.
Using this module in an environment outside the range of the general specifications may cause electric shock, fire, malfunction, and 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 result in malfunction, failure, or drop of the module.
When using the module in an environment of frequent vibrations, fix the module with a screw.
- Tighten the screws within the range of specified torque.
Undertightening can cause drop or the screw, short circuit, or malfunction.
Overtightening can damage to the screw and/or module, resulting in drop, short circuit or malfunction.
- Shut off the external power supply for the system in all phases before mounting or removing the module.
Failure to do so may result in damage to the product.
- Do not directly touch any conductive area or electronic components of the module.
Doing so may cause malfunction or failure of the module.

[WIRING PRECAUTIONS]

CAUTION

- After wiring, attach the included terminal cover to the module before turning it on for operation. Failure to do so may result in malfunction.
- 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, or malfunction.
Overtightening can cause damage to the screw and/or the module, resulting in drop, short circuit, or malfunction.
- 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 prevent foreign matter, such as wire chips, from entering the module during wiring.
Do not remove this film during wiring.
Remove it for heat dissipation before system operation.
- Use dedicated cables as specified by the manufacturer for the CC-Link system. If a cable other than the one specified by the manufacturer is used, the performance of the CC-Link system is not guaranteed. Also, follow the specifications listed in Chapter 3 for the overall cable distance and the station-to-station cable length. If the wiring does not meet the specifications, accurate data transmission is not guaranteed.
- Place the cables in the duct or clamp them.
If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- 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.
- Place the cables in a duct or clamp them. When disconnecting the cable with connector, hold and pull the connector on the side that is connected to the module.
When removing the cable connected to the terminal block, loosen the screws of the connector connected to the terminal block.
Failure to do so may cause malfunction or damage to the module or cable.

[STARTING AND MAINTENANCE PRECAUTIONS]

CAUTION

- Do not disassemble or modify each module.
Doing so could cause failure, malfunction, injury or a fire.
- Shut off the external power supply for the system in all phases before mounting or removing the module.
Failure to do so may cause the module to fail or malfunction.
- Do not touch any terminal while power is on.
Doing so will cause malfunction.
- Shut off the external power supply for the system in all phases before cleaning the module or retightening the terminal screws or module fixing screws.
Failure to do so may cause failure or malfunction of the module.
Undertightening the terminal screws can cause drop, short circuit, or malfunction.
Overtightening can damage the screws and/or module, resulting in drop, short circuit, 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.

REVISIONS

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INTRODUCTION

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

CONTENTS

SAFETY PRECAUTIONS.....	A- 1
REVISIONS	A- 5
INTRODUCTION.....	A- 8
Compliance with the EMC and Low Voltage Directives.....	A-15
Generic Terms and Abbreviations	A-16
PACKING LIST.....	A-18
1 OVERVIEW	1- 1 to 1-14
1.1 Overview.....	1- 1
1.2 Compatibility with CC-Link.....	1- 2
1.3 Features	1- 2
2 SYSTEM CONFIGURATION	2- 1 to 2-14
2.1 System Configuration.....	2- 1
2.2 Applicable System.....	2- 4
2.2.1 Applicable modules and number of mountable modules.....	2- 4
2.2.2 Notes on the system configuration	2- 9
2.2.3 How to confirm the function version and serial No.....	2-12
2.2.4 CC-Link version	2-14
3 SPECIFICATIONS	3- 1 to 3- 6
3.1 Performance Specifications.....	3- 1
3.1.1 Maximum overall cable distance (for Ver. 1.00).....	3- 3
3.1.2 Maximum overall cable distance (for Ver. 1.10).....	3- 5
3.2 CC-Link Dedicated Cable	3- 6
4 FUNCTIONS	4- 1 to 4-94
4.1 Function List	4- 1
4.2 Basic Functions	4- 4
4.2.1 Communication with the remote I/O stations	4- 4
4.2.2 Communication with the remote device stations.....	4- 6
4.2.3 Communication with the local stations	4-11
4.2.4 Communication with the intelligent device stations.....	4-17
4.2.5 Parameter setting with GX Developer	4-23
4.2.6 Parameter setting with dedicated instruction	4-24

4.3 Functions for Improving System Reliability	4-27
4.3.1 Disconnecting data link faulty stations and continuing the data link with only normal stations (Slave station cut-off function).....	4-27
4.3.2 Automatically reconnecting a disconnected data link faulty station when it returns to normal (Automatic return function)	4-28
4.3.3 Continuing the data link when an error occurs in the master station programmable controller CPU (Data link status setting when the master station programmable controller CPU has an error)...	4-29
4.3.4 Retaining the device status of a data link faulty station (Setting the status of input data from a data link faulty station)	4-30
4.3.5 Clearing data in case of programmable controller CPU STOP (Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP)	4-31
4.3.6 Continuing the data link even when the master station is faulty (Standby master function)	4-33
4.3.7 Data link start by standby master station (First 5 digits of serial No. is 07112 or later).....	4-47
4.3.8 Guaranteeing the cyclic data for each slave station (block guarantee of cyclic data per station)	4-50
4.4 Handy Functions	4-57
4.4.1 Simplifying the initialization procedure registration of remote device stations (Remote device station initialization procedure registration function)	4-57
4.4.2 Performing high-speed processing (Event issuance for the interrupt program)	4-68
4.4.3 Enabling the data link simply by powering on (Automatic CC-Link startup)	4-71
4.4.4 Communicating with intelligent device stations (Remote net mode).....	4-73
4.4.5 Speeding up the response from remote I/O stations (Remote I/O net mode)	4-73
4.4.6 Creating a program that contains modules to be added in the future (Reserved station function)	4-74
4.4.7 Powering off a station in operation without error detection (Error invalid station setting function).....	4-75
4.4.8 Synchronizing the link scan with the sequence scan (Scan synchronous function).....	4-76
4.4.9 Replacing modules without error detection (Temporary error invalid station setting function)	4-80
4.4.10 Checking operations for each local station (Data link stop/restart).....	4-81
4.4.11 Station number overlap checking function	4-82
4.4.12 Multiple CPU system support	4-83
4.4.13 Reducing the reserved points of the remote I/O stations (Remote I/O station points setting)	4-84
4.4.14 Increasing the number of cyclic points (Remote net ver.2 mode).....	4-86
4.5 Transient Transmission Functions	4-94
4.5.1 Performing transient transmission (Dedicated instructions)	4-94

5 DATA LINK PROCESSING TIME

5- 1 to 5-29

5.1 Link Scan Time	5- 1
5.2 Transmission Delay Time	5- 4
5.2.1 Master station ↔ remote I/O station	5- 4
5.2.2 Master station ↔ remote device station (Ver. 1 compatible slave station).....	5- 6
5.2.3 Master station ↔ remote device station (Ver. 2 compatible slave station).....	5- 8
5.2.4 Master station ↔ local station (Ver. 1 compatible slave station)	5-10
5.2.5 Master station ↔ local station (Ver. 2 compatible slave station)	5-12
5.2.6 Master station ↔ intelligent device station	5-14
5.3 Processing Time for Dedicated Instructions	5-15

5.3.1 Master station ↔ local station	5-15
5.3.2 Local station ↔ local station.....	5-18
5.3.3 Master station ↔ intelligent device station	5-20
5.4 Link Refresh Time	5-22
5.4.1 Master station/local station	5-22
5.5 Station Status at Error Occurrence	5-28
5.5.1 Status of the master station, standby master station (when the master station is operating) and remote I/O station at error occurrence	5-28
5.5.2 Status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence	5-29

6 PARAMETER SETTINGS	6- 1 to 6-58
-----------------------------	---------------------

6.1 Procedure from Parameter Settings to Data Link Startup	6- 1
6.1.1 CPU parameter area and master module parameter memory.....	6- 1
6.1.2 Procedure from parameter settings to data link startup with GX Developer	6- 2
6.1.3 Procedure from parameter settings to data link startup with dedicated instruction	6- 2
6.2 Parameter Setting Items	6- 3
6.3 Example of Parameter Settings with GX Developer (Remote net ver.1 mode).....	6- 6
6.3.1 Master station network parameter settings	6- 6
6.3.2 Master station automatic refresh parameter settings.....	6-12
6.3.3 Local station network parameter settings.....	6-14
6.3.4 Local station automatic refresh parameter settings	6-17
6.4 Example of Parameter Settings with GX Developer (Remote net ver.2 mode).....	6-19
6.4.1 Master station network parameter settings	6-19
6.4.2 Master station automatic refresh parameter settings.....	6-25
6.4.3 Local station network parameter settings.....	6-27
6.4.4 Local station automatic refresh parameter settings	6-31
6.5 Example of Parameter Settings with GX Developer (Remote net additional mode).....	6-33
6.5.1 Master station network parameter settings	6-33
6.5.2 Master station automatic refresh parameter settings.....	6-39
6.5.3 Local station network parameter settings.....	6-42
6.5.4 Local station automatic refresh parameter settings	6-46
6.6 Example of Parameter Settings with GX Developer (Remote I/O net mode).....	6-49
6.6.1 Master station network parameter settings	6-49
6.6.2 Master station automatic refresh parameter settings.....	6-52
6.7 Example of Parameter Setting with Dedicated Instruction	6-54

7 PROCEDURE BEFORE STARTING THE DATA LINK	7- 1 to 7-20
--	---------------------

7.1 Procedure Before Starting the Data Link	7- 1
7.2 Installation	7- 3
7.2.1 Handling precautions	7- 3
7.2.2 Installation environment	7- 4
7.3 Part Names and Settings	7- 4
7.4 Checking the Module Status (Hardware Test).....	7- 7
7.5 Connecting the Modules Using the CC-Link Dedicated Cables.....	7- 9
7.5.1 Wiring check	7-10
7.6 T-Branch Connection	7-11
7.6.1 T-Branch system configuration	7-11

7.6.2 T-Branch communication specifications list	7-12
7.7 Switch Settings.....	7-13
7.7.1 Station number setting	7-13
7.7.2 Transmission speed and mode settings.....	7-14
7.8 Checking the Connection Status (Line Test)	7-15
7.9 Checking the Transmission Speed (Transmission Speed Test)	7-19

8 PROGRAMMING	8- 1 to 8-43
----------------------	---------------------

8.1 Precautions on Programming	8- 1
8.2 I/O Signals for the Programmable Controller CPU	8- 2
8.2.1 I/O signal list	8- 2
8.2.2 Details of the I/O signals	8- 4
8.3 Buffer Memory	8- 6
8.3.1 Buffer memory list	8- 6
8.3.2 Buffer memory details	8- 9
8.4 Link Special Relays and Registers (SB/SW)	8-27
8.4.1 Link special relays (SB).....	8-27
8.4.2 Link special registers (SW)	8-32
8.5 Mode Selection Method	8-43

9 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE I/O STATIONS	9- 1 to 9-10
---	---------------------

9.1 When Remote I/O Net Mode is Used	9- 1
9.1.1 Configuring a system	9- 1
(1) Setting the master station	9- 2
(2) Setting the remote I/O stations	9- 3
9.1.2 Setting the master station parameters	9- 4
(1) Setting the network parameters of the master station	9- 4
(2) Setting the automatic refresh parameters of the master station	9- 6
9.1.3 Creating a program	9- 7
9.1.4 Performing the data link	9- 9
(1) Confirming the operation with the LED display	9- 9
(2) Confirming the operation with the sequence program.....	9-10

10 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE DEVICE STATIONS	10- 1 to 10-57
---	-----------------------

10.1 When Remote Net Ver. 1 Mode is Used	10- 1
10.1.1 Configuring a system	10- 1
(1) Setting the master station	10- 2
(2) Setting the remote device station	10- 3
10.1.2 Setting the master station parameters	10- 4
(1) Setting the network parameters of the master station	10- 4
(2) Setting the automatic refresh parameters of the master station	10- 6
10.1.3 Initial setting of the remote device station	10- 7
(1) Setting the target station number	10- 7
(2) Setting the regist procedure registration	10- 7
(3) Validating the remote device station initial settings	10-11
10.1.4 Creating a program	10-13

10.1.5 Performing the data link	10-16
(1) Confirming the operation with the LED display.....	10-16
(2) Confirming the operation with the sequence program.....	10-17
10.2 When Remote Net Ver. 2 Mode is Used	10-18
10.2.1 Configuring a system	10-18
(1) Setting the master station	10-19
(2) Setting the remote device station	10-20
10.2.2 Setting the master station parameters	10-22
(1) Setting the network parameters of the master station.....	10-22
(2) Setting the automatic refresh parameters of the master station	10-24
10.2.3 Initial setting of the remote device station	10-25
(1) Setting the target station number	10-25
(2) Setting the regist procedure registration	10-25
(3) Validating the remote device station initial settings	10-29
10.2.4 Creating a program	10-32
10.2.5 Performing the data link	10-36
(1) Confirming the operation with the LED display.....	10-36
(2) Confirming the operation with the sequence program.....	10-37
10.3 When Remote Net Additional Mode is Used	10-38
10.3.1 Configuring a system	10-38
(1) Setting the master station	10-39
(2) Setting the remote device station	10-40
10.3.2 Setting the master station parameters	10-42
(1) Setting the network parameters of the master station.....	10-42
(2) Setting the automatic refresh parameters of the master station	10-44
10.3.3 Initial setting of the remote device station	10-45
(1) Setting the target station number	10-45
(2) Setting the regist procedure registration	10-45
(3) Validating the remote device station initial settings	10-49
10.3.4 Creating a program	10-52
10.3.5 Performing the data link	10-56
(1) Confirming the operation with the LED display.....	10-56
(2) Confirming the operation with the sequence program.....	10-57

11 COMMUNICATION BETWEEN THE MASTER STATION AND LOCAL STATIONS	11- 1 to 11-47
---	-----------------------

11.1 Secured 32-bit Data	11- 1
11.2 When Remote Net Ver.1 Mode is Used	11- 2
11.2.1 Configuring a system	11- 2
(1) Setting the master and local stations	11- 3
11.2.2 Setting the master station parameters	11- 4
(1) Setting the network parameters of the master station.....	11- 4
(2) Setting the automatic refresh parameters of the master station	11- 6
11.2.3 Setting the local station parameters	11- 7
(1) Setting the network parameters of the local station.....	11- 7
(2) Setting the automatic refresh parameters of the local station	11- 9

11.2.4	Creating a program	11-10
(1)	Master station program	11-12
(2)	Local station program	11-12
11.2.5	Performing the data link	11-14
(1)	Confirming the operation with the LED display.....	11-14
(2)	Confirming the operation with the sequence program.....	11-15
11.3	When Remote Net Ver. 2 Mode is Used	11-16
11.3.1	Configuring a system	11-16
(1)	Setting the master and local stations	11-17
11.3.2	Setting the master station parameters	11-18
(1)	Setting the network parameters of the master station.....	11-18
(2)	Setting the automatic refresh parameters of the master station	11-20
11.3.3	Setting the local station parameters	11-21
(1)	Setting the network parameters of the ver.1 compatible local station (station number 1)	11-21
(2)	Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1).....	11-23
(3)	Setting the network parameters of the ver.2 compatible local station (station number 5)	11-24
(4)	Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5).....	11-26
11.3.4	Creating a program	11-27
(1)	Master station program	11-29
(2)	Local station program	11-29
11.3.5	Performing the data link	11-30
(1)	Confirming the operation with the LED display.....	11-30
(2)	Confirming the operation with the sequence program.....	11-31
11.4	When Remote Net Additional Mode is Used	11-32
11.4.1	Configuring a system	11-32
(1)	Setting the master and local stations	11-33
11.4.2	Setting the master station parameters	11-34
(1)	Setting the network parameters of the master station.....	11-34
(2)	Setting the automatic refresh parameters of the master station	11-36
11.4.3	Setting the local station parameters	11-37
(1)	Setting the network parameters of the ver.1 compatible local station (station number 1)	11-37
(2)	Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1).....	11-39
(3)	Setting the network parameters of the ver.2 compatible local station (station number 5)	11-40
(4)	Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5).....	11-42
11.4.4	Creating a program	11-43
(1)	Master station program	11-45
(2)	Local station program	11-45
11.4.5	Performing the data link	11-46
(1)	Confirming the operation with the LED display.....	11-46
(2)	Confirming the operation with the sequence program.....	11-47

12 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATIONS
--

12- 1 to 12- 2

13 TROUBLESHOOTING	13- 1 to 13-31
13.1 Verification upon Problem Occurrence	13- 1
13.2 Troubleshooting Procedures When the "ERR." LED of the Master Station is Flashing or When Normal Data cannot be Sent/Received During Data Link	13- 9
13.3 Error Codes	13-11
13.3.1 How to check error codes	13-11
13.3.2 Error code list	13-16
13.4 CC-Link Diagnostics	13-26
APPENDIXES	App- 1 to App-52
Appendix 1 External Dimensions.....	App- 1
Appendix 2 Dedicated Instructions	App- 2
Appendix 2.1 Dedicated instruction list, applicable devices, and precautions	App- 2
Appendix 2.2 G(P).RIRD	App- 4
Appendix 2.3 G(P).RIWT	App- 9
Appendix 2.4 G(P).RRCV	App-14
Appendix 2.5 G(P).RISEND	App-19
Appendix 2.6 G(P).RIFR	App-24
Appendix 2.7 G(P).RITO	App-27
Appendix 2.8 G(P).RLPASET	App-30
Appendix 2.9 G(P).RDMSG	App-41
Appendix 3 Differences Between the New and Previous Models	App-46
Appendix 4 Precautions when Changing from AJ61QBT11 to QJ61BT11N.....	App-47
Appendix 5 Precautions when Changing from QJ61BT11 to QJ61BT11N	App-47
Appendix 6 CPU-dependent Function Availability	App-48
Appendix 7 Functional upgrade of the QJ61BT11N	App-49
Appendix 8 Parameter Setting Checklist.....	App-50
Appendix 8.1 Parameter setting checklist	App-50
Appendix 8.2 Station information setting checklist.....	App-51
INDEX	Index- 1 to Index- 4

Compliance with the EMC and Low Voltage Directives

(1) For programmable controller system

To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and Low Voltage Directives compliant) into other machinery or equipment, refer to Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.

(2) For the product

For the compliance of this product with the EMC and Low Voltage Directives, refer to "CC-Link module" in Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

Generic Terms and Abbreviations

This manual uses the following generic terms and abbreviations to describe the QJ61BT11N CC-Link System Master/Local Module, unless otherwise specified.

Generic Term/Abbreviation	Description
QJ61BT11N	Abbreviation for QJ61BT11N CC-Link System Master/Local Module
Cyclic transmission	Transmission method by which to periodically communicate the contents of remote I/O and remote registers.
Transient transmission	Transmission method with which the counterpart is specified and 1:1 communication is used at an arbitrary timing.
Master station	Station that controls the data link system. One master station is required for each system.
Local station	Station having a programmable controller CPU and the ability to communicate with the master and other local stations.
Remote I/O station	Remote station that handles bit unit data only. (Performs input and output with external devices.) (AJ65BTB1-16D, AJ65SBTB1-16D)
Remote device station	Remote station that handles bit unit and word unit data only. (Performs input and output with external devices, and analog data conversion.) (AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI)
Remote station	Generic term for remote I/O station and remote device station. (Controlled by the master station)
AJ65BT-R2(N)	Generic term for AJ65BT-R2, AJ65BT-R2N.
Intelligent device station	Station that can perform transient transmission, such as the AJ65BT-R2(N) (including local stations).
Standby master station	Backup station for data link control when the link to the master station is disconnected due to a programmable controller CPU or power supply problem.
Slave station	Generic term for remote I/O station, remote device station, local station, intelligent device station and standby master station.
Master/local module	Generic term for QJ61BT11N, QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, and A1SJ61QBT11
Master module	Generic term for QJ61BT11N, QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, and A1SJ61QBT11 when they are used as master stations.
Local module	Generic term for QJ61BT11N, QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, and A1SJ61QBT11 when they are used as local stations.
Remote module	Generic term for AJ65BTB1-16D, AJ65SBTB1-16D, AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI, and A852GOT
Intelligent device module	Module that can perform transient transmission, such as the AJ65BT-R2(N) (including local module).
Remote I/O net mode	Dedicated mode for sending and receiving data to and from the remote I/O station at high speed.
Remote net mode	Mode that can communicate with all stations used for CC-Link (remote I/O station, remote device station, local station, intelligent device station, and standby master station) The remote net mode has three different modes: remote net ver. 1 mode, remote net ver. 2 mode, and remote net additional mode.
Remote net ver. 1 mode	Mode in which complete compatibility with the conventional module (QJ61BT11) is achieved. Select this mode when the number of cyclic points need not be increased or when the QJ61BT11N is used to replace the conventional module as a maintenance product.
Remote net ver. 2 mode	Select this mode when increasing the number of cyclic points and configuring a new system.
Remote net additional mode	Select this mode when adding a ver. 2 compatible station to the existing system to increase the number of cyclic points.

Generic Term/Abbreviation	Description
Ver. 1 compatible slave station	Slave station compatible with the remote net ver. 1 mode.
Ver. 2 compatible slave station	Slave station compatible with the remote net ver. 2 mode.
SB	Link special relay (for CC-Link) Bit unit information that indicates the module operating status and data link status of the master station/local station.
SW	Link special register (for CC-Link) 16-bit unit information that indicates the module operating status and data link status of the master station/local station.
RX	Remote input (for CC-Link) Information entered in bit units from the slave station to the master station.
RY	Remote output (for CC-Link) Information output in bit units from the master station to the slave station.
RWw	Remote register (Write area for CC-Link) Information output in 16-bit units from the master station to the slave station.
RWr	Remote register (Read area for CC-Link) Information entered in 16-bit units from the slave station to the master station.
ACPU	Generic term for AOJ2HCPU, A1SCPU, A1SHCPU, A1SJCPU-S3, A1SJHCPU, A2SCPU, A2SHCPU, A2USCPU, A2USCPU-S1, A2USHCPU-S1, A1NCP, A2NCP, A2NCP-S1, A3NCP, A2ACPU, A2ACPU-S1, A3ACPU, A2UCPU, A2UCPU-S1, A3UCPU and A4UCPU
AnUCPU	Generic term for A2USCPU, A2USCPU-S1, A2USHCPU-S1, A2UCPU, A2UCPU-S1, A3UCPU and A4UCPU
QnACPU	Generic term for Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q2ACPU, Q2ACPU-S1, Q3ACPU, Q4ACPU and Q4ARCPU
QCPU (Q mode)	Generic term for Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU, Q12PRHCPU, Q25PRHCPU, Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU and Q26UDEHCPU
Basic model QCPU	Generic term for Q00JCPU, Q00CPU and Q01CPU
High Performance model QCPU	Generic term for Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU and Q25HCPU
Process CPU	Generic term for Q02PHCPU, Q06PHCPU, Q12PHCPU and Q25PHCPU
Redundant CPU	Generic term for Q12PRHCPU and Q25PRHCPU
Universal model QCPU	Generic term for Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU and Q26UDEHCPU
Built-in Ethernet port QCPU	Generic term for Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU and Q26UDEHCPU
QCPU (A mode)	Generic term for Q02CPU-A, Q02HCPU-A and Q06HCPU-A
C Controller module	Generic term for Q06CCPU-V, Q06CCPU-V-B, and Q12DCCPU-V
GX Developer	Generic product name for SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA. ("n" in the model name is 4 or greater)
Intelligent function module	Q series modules other than the CPU module, power supply module and I/O module that are mounted on the base unit.
Special function module	A series and QnA series modules that are mounted on the base unit, excluding the CPU module, power supply module and I/O module.

PACKING LIST

The components of the QJ61BT11N are listed below.

Item name	Quantity
QJ61BT11N	1
Terminal resistor 110 Ω , 1/2 W (brown-brown-brown) (used when wiring with the CC-Link dedicated cable or Version 1.10 compatible CC-Link dedicated cable)	2
Terminal resistor 130 Ω , 1/2 W (brown-orange-brown) (used when wiring with the CC-Link dedicated high-performance cable)	2

MEMO

[illegible]

1 OVERVIEW

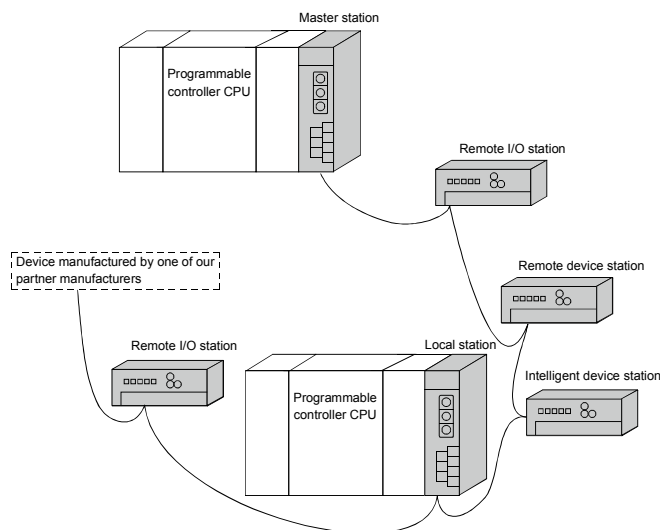
1

This manual describes the specifications, parts names and settings of the QJ61BT11N CC-Link System Master/Local Module (hereinafter referred to as the QJ61BT11N) which is used with the MELSEC-Q series programmable controller CPUs. When applying the following program examples to the actual system, make sure to examine the applicability and confirm that it will not cause system control problems.

1.1 Overview

The CC-Link system is a system that connects distributed modules such as I/O modules, intelligent function modules, and special function modules using dedicated cables so that these modules can be controlled by a programmable controller CPU.

- (1) By connecting each module separately to equipment such as a conveyor line or a machine, the number of wires can be reduced in the entire system.
- (2) Each module's on/off information of input/output and numeric data can easily be sent and received at high-speed.
- (3) By connecting multiple programmable controller CPUs, a simple distributed system can be configured.
- (4) Since various devices from Mitsubishi's partner manufacturers can be connected, the system can provide flexible solutions depending on the user's requirements.



- Master stationThe station that controls the data link system.
- Remote I/O stationThe remote station that handles bit data only.
- Remote device stationThe remote station that handles bit and word data.
- Local stationThe station having a programmable controller CPU and the ability to communicate with the master and other local stations.
- Intelligent device station ..The station that can perform transient transmission.

1.2 Compatibility with CC-Link

This product supports the following CC-Link functions and performance.

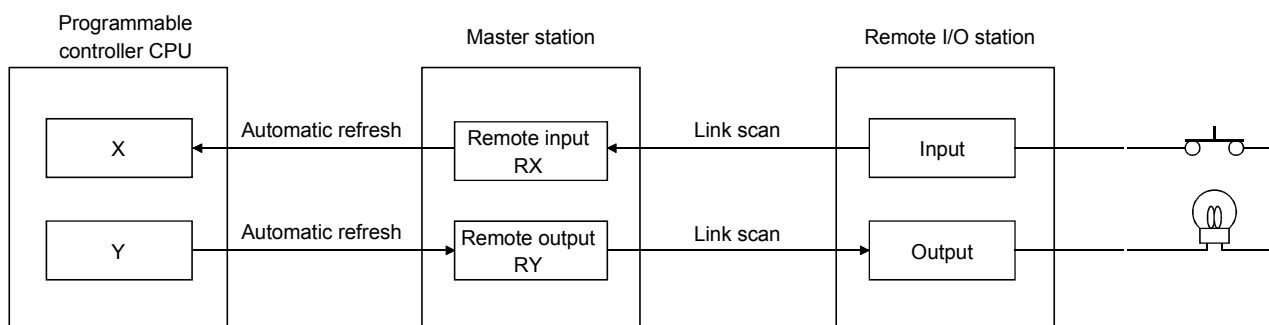
- Cyclic transmission
- Increase of cyclic transmission data size
- Transient transmission
- Less restrictions on the station-to-station cable length

1.3 Features

The features of the CC-Link are described below.

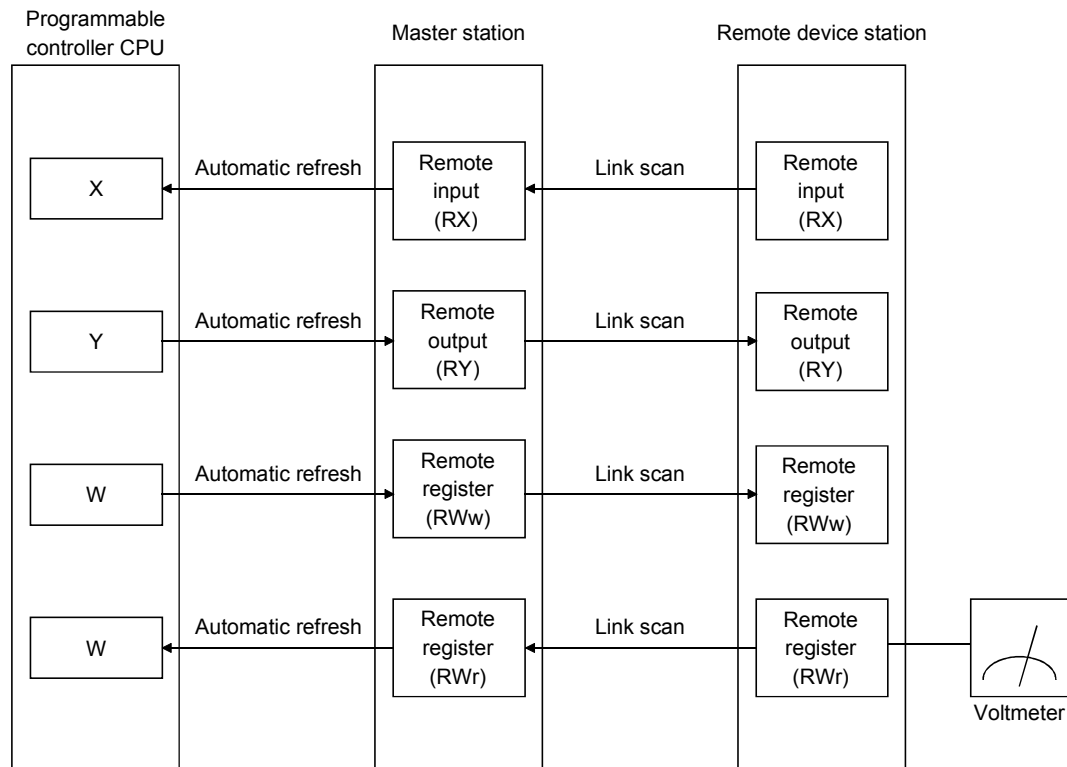
(1) Remote I/O station communication

The ON/OFF status of a switch or indicator lamp is communicated using the remote input RX and remote output RY (see Section 4.2.1).



(2) Remote device station communication

Signals for handshaking with the remote device station (initial request, error occurred flag, etc.) are communicated using the remote input RX and remote output RY. The setting data to the remote device station are communicated using remote registers RWw and RWr (see Section 4.2.2).

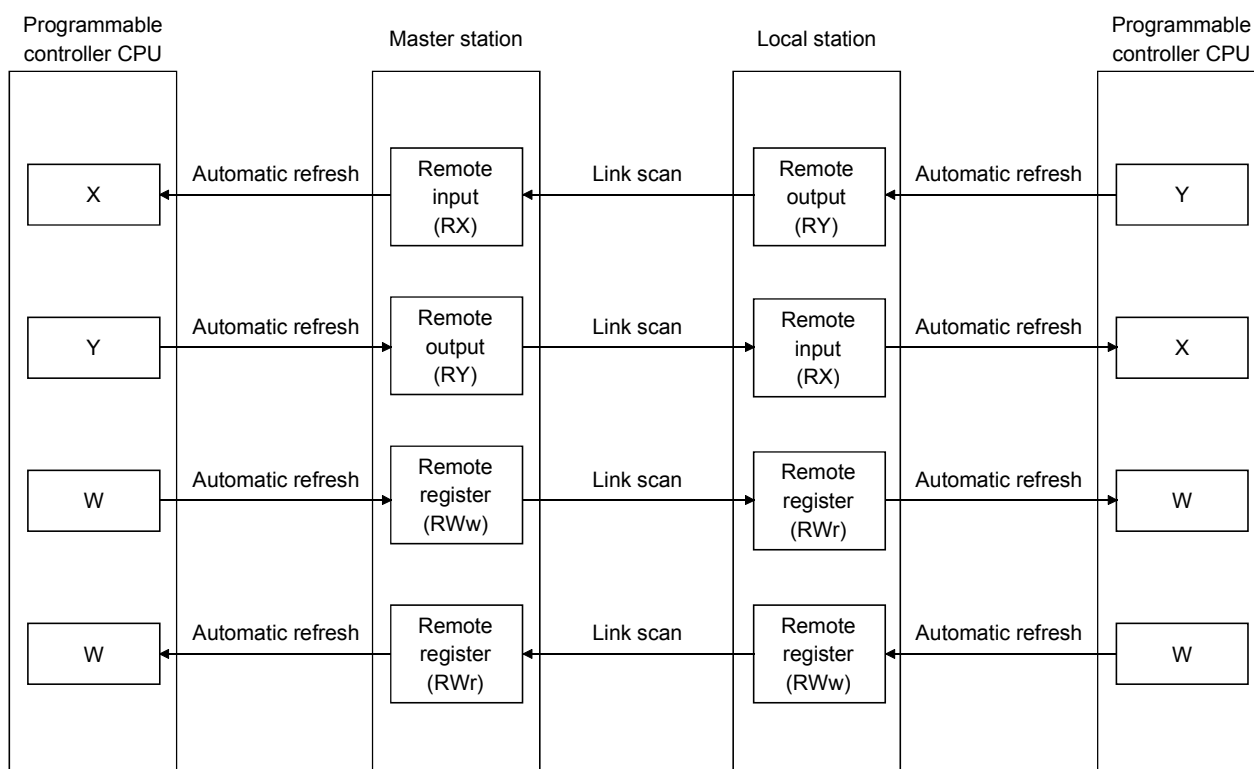


(3) Local station communication

Communication between the master station and the local station uses two types of transmission methods: cyclic transmission and transient transmission (see Section 4.2.3).

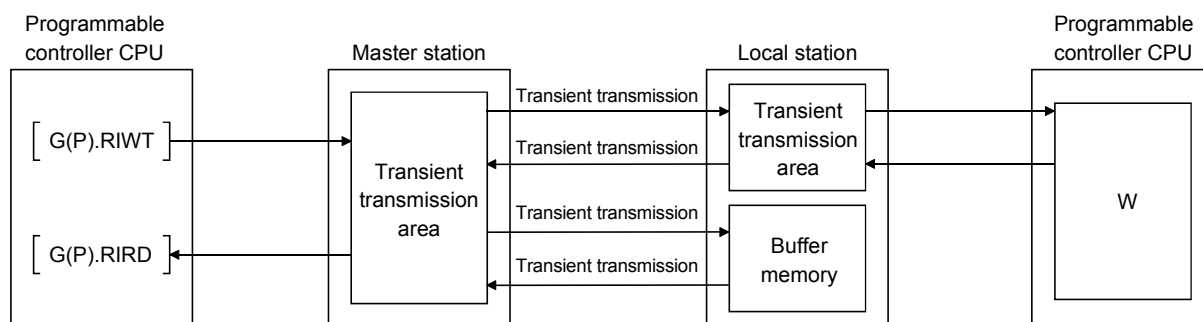
(a) Cyclic transmission

Data communication between the programmable controller CPUs can be performed in N:N mode using bit data (remote input RX and remote output RY) and word data (remote registers RWw and RWr).



(b) Transient transmission

Read (G(P).RIRD) or write (G(P).RIWT) operation of the local station buffer memory and CPU device can be performed at any timing.

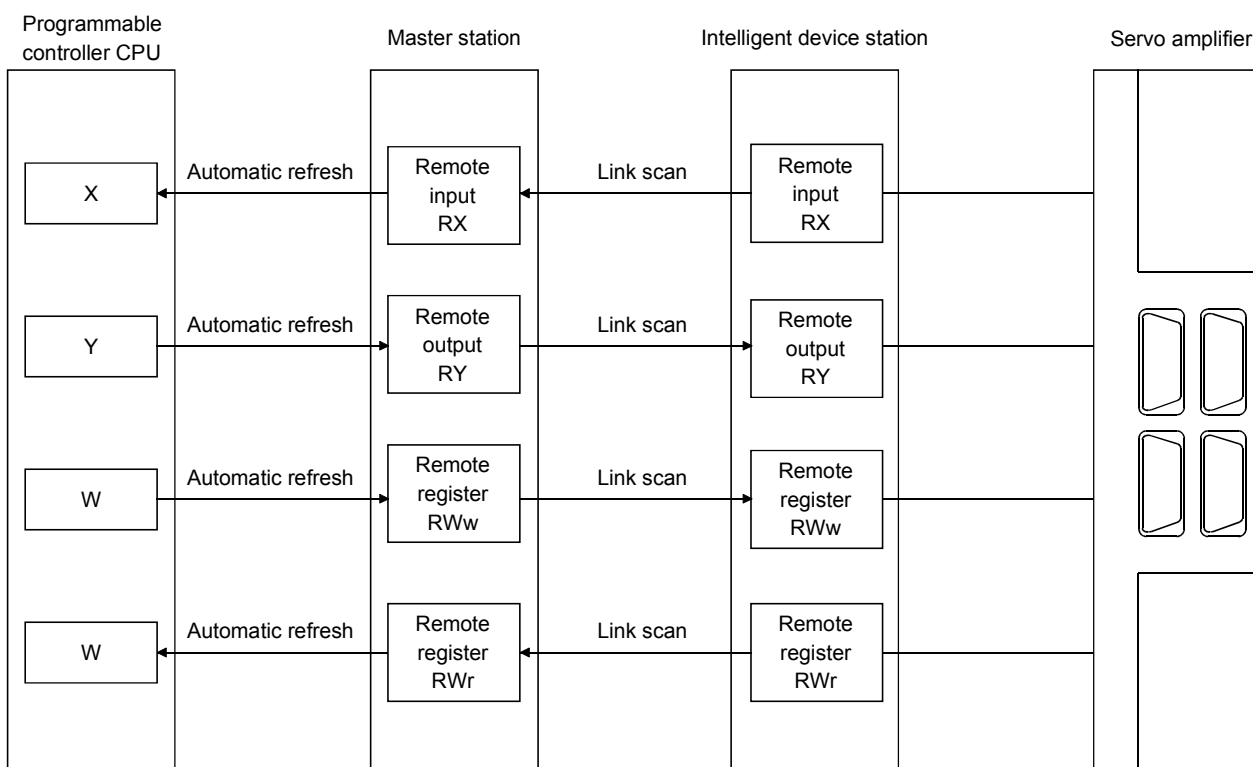


(4) Intelligent device station communication

Communication between the master station and the intelligent device station uses two types of transmission methods: cyclic transmission and transient transmission (see Section 4.2.4).

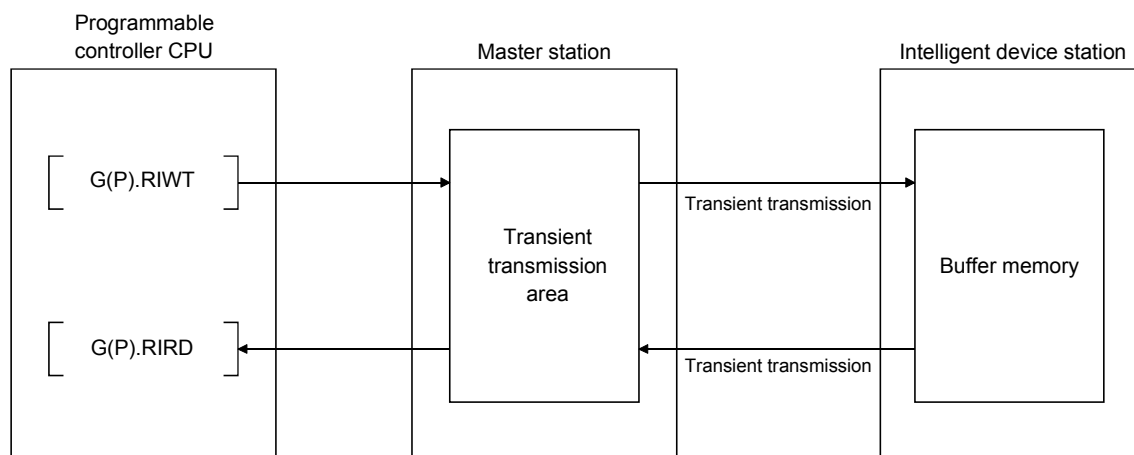
(a) Cyclic transmission

Signals for handshaking with the intelligent device station (positioning start, positioning complete, etc.) are communicated using the remote input RX and remote output RY. Numeric data (positioning start number, present feed value, etc.) is communicated using remote registers RWw and RWr.



(b) Transient transmission

Read (G(P).RIRD) or written (G(P).RIWT) operation of the intelligent device station buffer memory can be performed at any timing.



(5) Parameter setting by GX Developer or the dedicated instruction

There are two parameter setting methods; the parameters can either be set by GX Developer or by using a dedicated instruction (see Sections 2.2.1, 4.2.5 and 4.2.6).

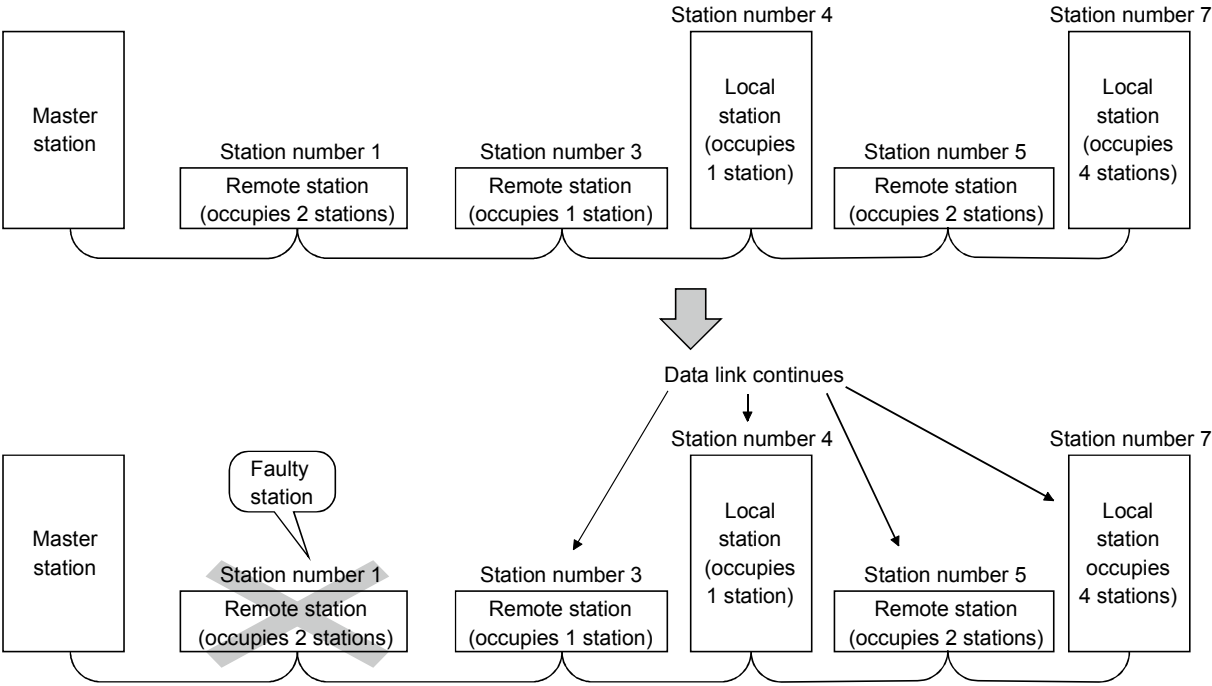
The following table lists the differences between the two setting methods.

	Program requirement for setting parameters	Automatic refresh	Number of CPUs that can be mounted	Changing the parameter settings while the programmable controller CPU is running
Parameter setting with GX Developer	Not required	○	8 modules	×
Parameter setting with dedicated instruction	Required	×	64 modules	○

(6) System down prevention (Slave station cut-off function)

Because the system employs the bus connection method, even if a module system fails due to power off, it will not affect the communication with other normal modules.

Also, for a module using a 2-piece terminal block, the module can be replaced during data link. (Replace the module after turning off the module power. Additionally, check that the settings of the new module are the same as that of the replaced module.) However, if the cable is disconnected, data link to all stations are disabled (see Section 4.3.1).



(7) Automatic return function

When a station that has been disconnected from the link due to power off recovers the normal status, it will join the data link automatically (see Section 4.3.2).

(8) Data link status setting when the master station programmable controller CPU has an error

The data-link status can be set to either "stop" or "continue" when an error causing the operation to stop such as "SP. UNIT ERROR" occurs in the programmable controller CPU at the master station. With errors enabling the operation to continue such as "BATTERY ERROR," the data link will continue regardless of the setting (see Section 4.3.3).

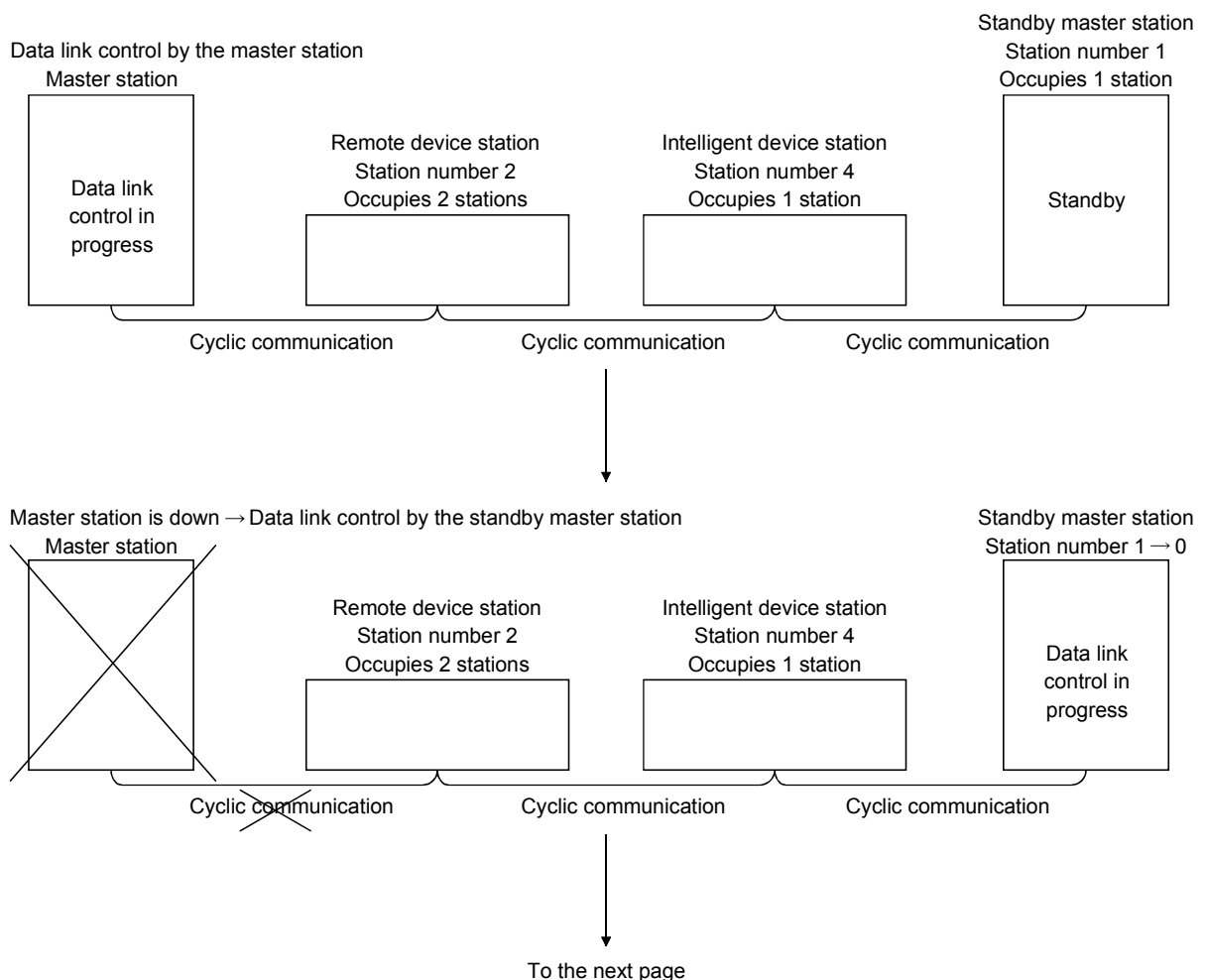
(9) Setting the status of input data from a data link faulty station

The data entered (received) from a data-link faulty station can be cleared or the previous status immediately before the error can be maintained (see Section 4.3.4).

(10) Standby master function

This function enables the data link to continue working by switching to a standby master station (backup station for the master station) if a malfunction occurs in the master station due to a malfunction of the programmable controller CPU or power supply.

The master station can return to online even during data link control by the standby master station, and prepares itself for standby master station system down (see Section 4.3.6).

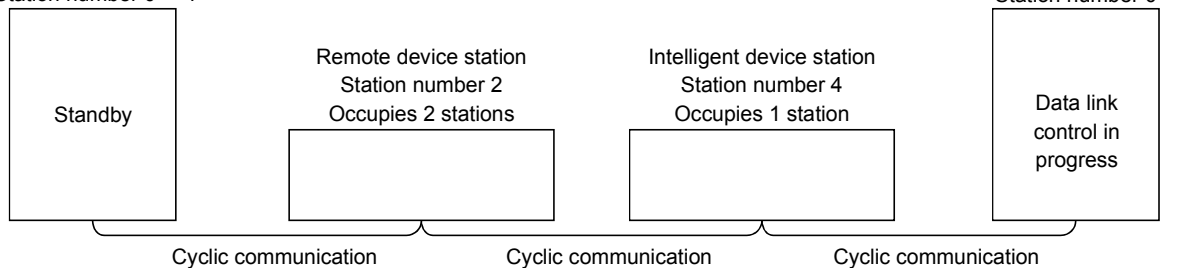


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Master station returns to normal and comes back online →
 Master station prepares itself for standby master station system down

Master station

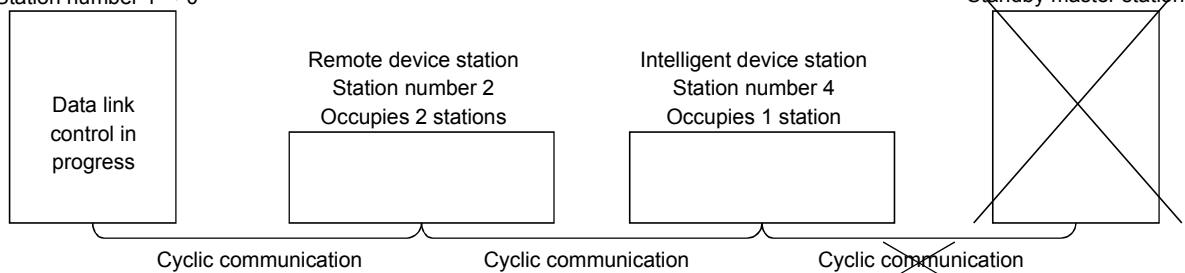
Station number 0 → 1



Problem occurrence in the standby master station → Data link control by the master station

Master station

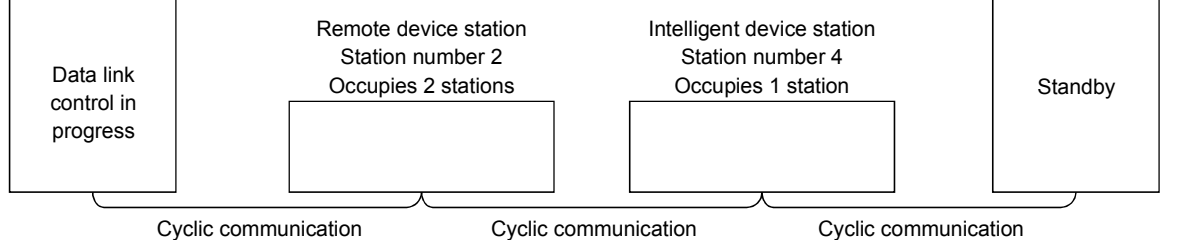
Station number 1 → 0



Standby master station returns to normal and comes back online →
 Standby master station prepares itself for master station system down

Master station

Station number 0 → 1



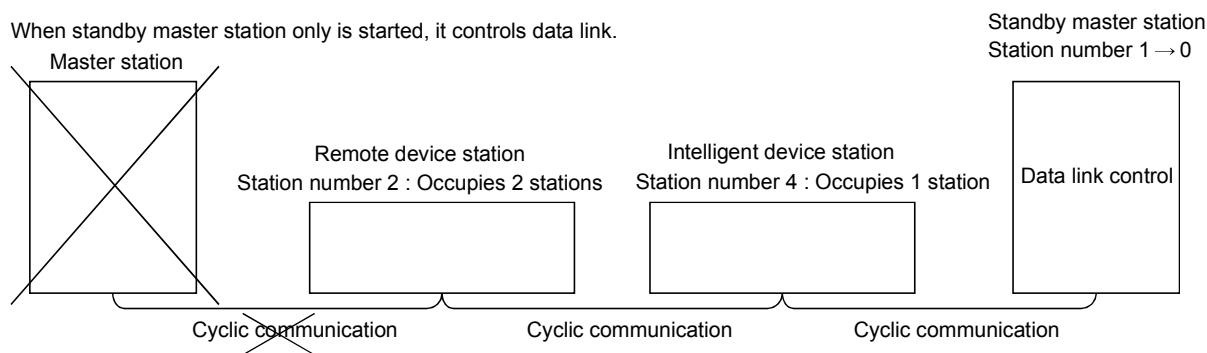
(11) Data link start by standby master station (First 5 digits of serial No. is 07112 or later)

This function allows data link to start by turning on either of the master or standby master station.

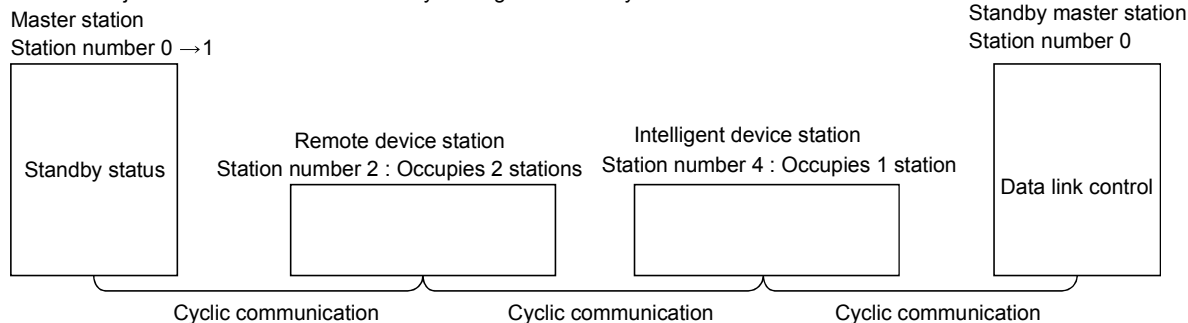
When the standby master station is turned on, even if no power is applied to the master station, data link will start.

To enable this function, the same parameters and programs must be set to the master and standby master stations. (Refer to Section 4.3.7.)

When using the standby station as a backup for the master station, utilize the standby master function explained in (10).



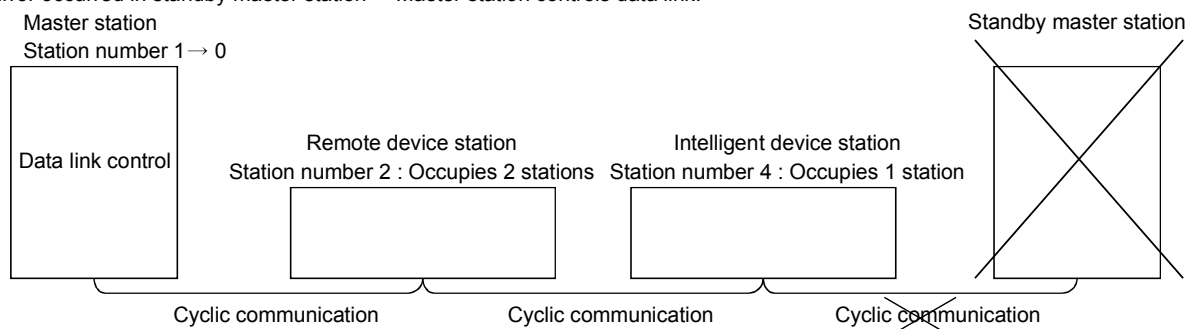
Master station joins the network. → It stands by waiting for a standby master station failure.



To the next page

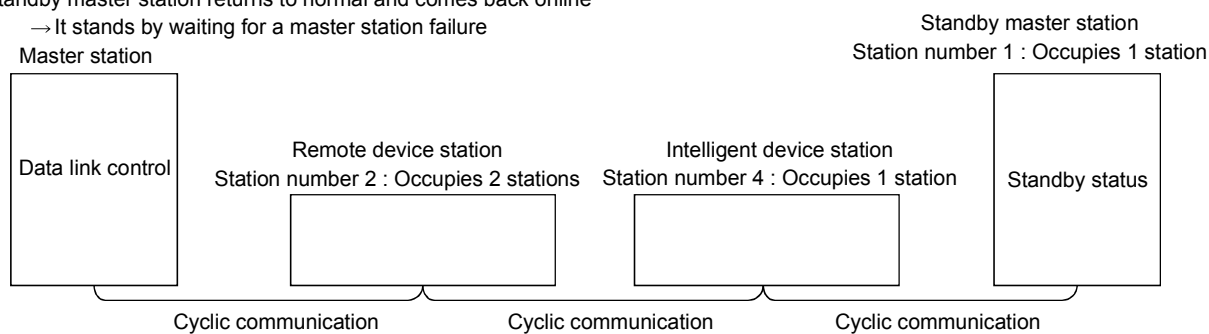
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Error occurred in standby master station → Master station controls data link.



Standby master station returns to normal and comes back online

→ It stands by waiting for a master station failure



(12) Remote device station initialization procedure registration function

This function performs the initial setting for the remote device station using the GX Developer, without creating a sequence program.

Also, if a running remote device station is replaced due to a failure, initial processing that has been done for all stations conventionally can be performed for the replaced remote device station by specifying it. (See Section 4.4.1.)

(13) Event issuance for the interrupt program

This function issues an event when the conditions set by the GX Developer are established in order to make the programmable controller CPU execute the interrupt program (see Section 4.4.2).

(14) Automatic CC-Link startup

By installing the QJ61BT11N, the CC-Link is started up and all data are refreshed by simply turning on the power, without creating a sequence program. However, when the number of connected modules is less than 64, it is necessary to set the network parameters in order to optimize the link scan time (see Section 4.4.3.).

(15) Selecting a mode according to the system

The CC-Link system has four types of modes according to various systems. (See sections 4.4.4, 4.4.5 and 4.4.14.)

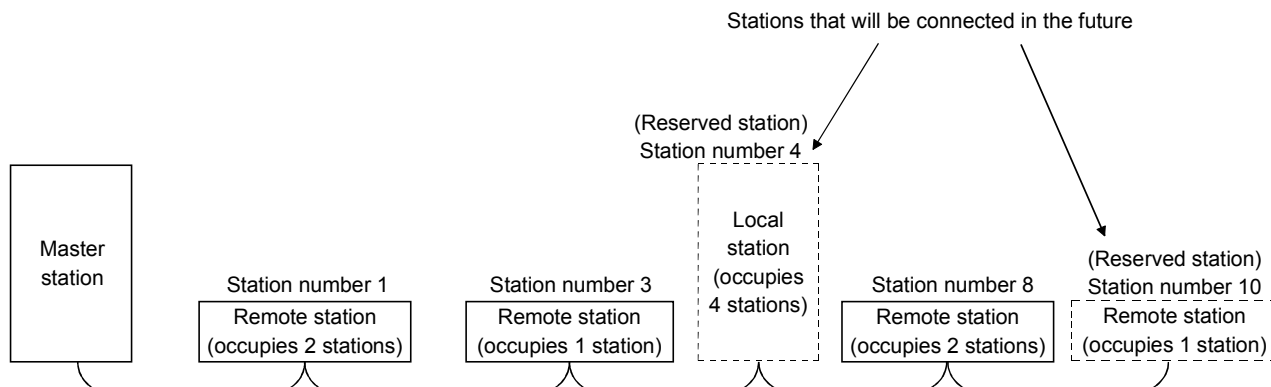
The overview of the modes is described in the following table.

Mode	Connectable	Overview
Remote net ver. 1 mode	Remote I/O station Remote device station Intelligent device station Local station Standby master station	Mode in which complete compatibility with the conventional module (QJ61BT11) is achieved. Select this mode when the number of cyclic points need not be increased or when the QJ61BT11N is used to replace the conventional module as a maintenance product.
Remote net ver. 2 mode		Select this mode when increasing the number of cyclic points and configuring a new system.
Remote net additional mode		Select this mode when adding a ver.2 compatible slave station to the existing system to increase the number of cyclic points.
Remote I/O net mode	Remote I/O station	Select this mode when the system consists of only the master station and remote I/O stations. Since cyclic transmission is made at high speed, the link scan time can be reduced.

(16) Reserved station function

Stations that are not actually connected (stations to be connected in the future) will not be treated as faulty stations if they are specified as reserved stations.

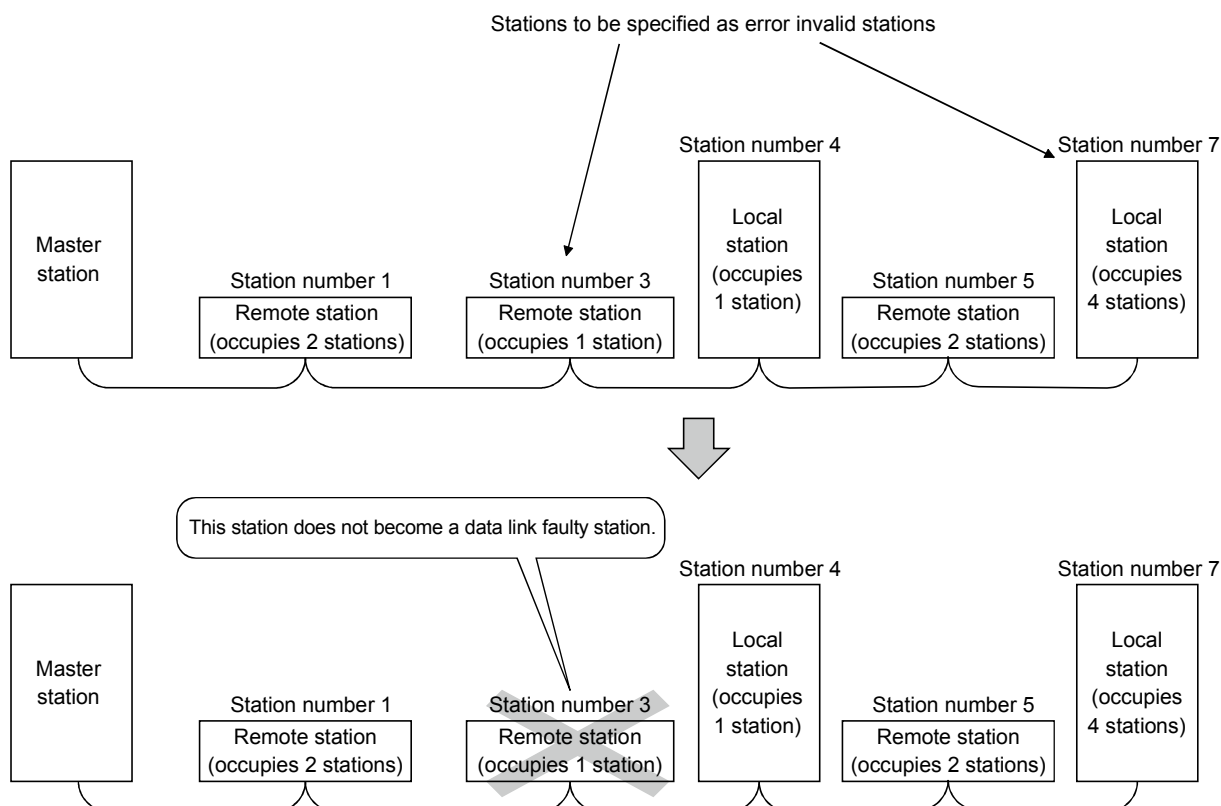
The reserved stations can also be set as 0 points. (see Section 4.4.6).

**(17) Error invalid station setting function**

This setting function prevents the modules that may be powered off in the system configuration from being treated as “data link fault stations” on the master and local stations.

This function is set in Network parameters.

However, caution is required since errors are no longer detected (see Section 4.4.7).



(18) Scan synchronous function

This function synchronizes the link scan to the sequence scan (see Section 4.4.8).

(19) Temporary error invalid station setting function

With this function, the module specified by the GX Developer will not be treated as a "data link faulty station" by the master or local station while in online. The module can be replaced without detecting an error in online (see Section 4.4.9).

(20) Data link stop/restart

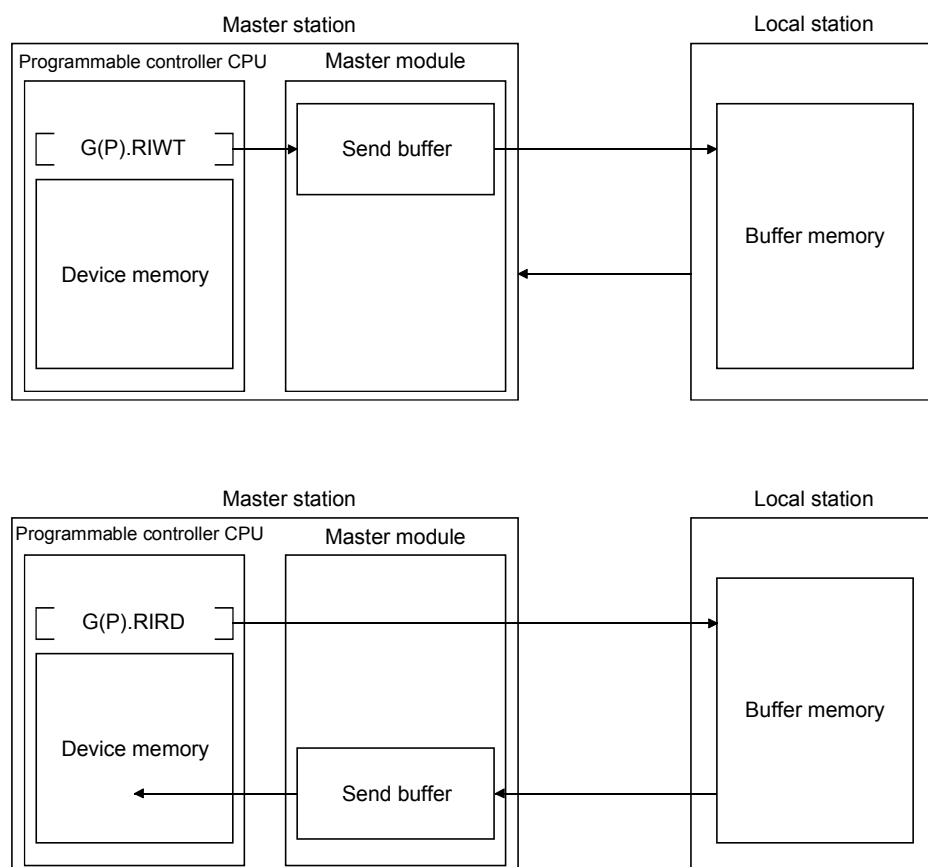
The data link can be stopped and restarted while it is being used (see Section 4.4.10).

(21) Station number overlap checking function

This function checks the status of the connected stations to see if the number of occupied stations is overlapping or if there is more than one station with the station number setting of 0 in the system (see Section 4.4.11).

(22) Transient transmission

With this method of transmission, the counterpart is specified and 1:1 communication is performed at an arbitrary timing (see Section 4.5).



(23) Compatibility with conventional module

The QJ61BT11N achieves complete compatibility with the conventional module (QJ61BT11) in the remote net ver. 1 mode.

Select the remote net ver. 1 mode when the number of cyclic points need not be increased or when the QJ61BT11N is used to replace the conventional module as a maintenance product.

(24) Cyclic points increase

Selection of the remote net ver. 2 mode or remote net additional mode allows RX/RX to be increased to up to 8192 points and RWr/RWw to up to 2048 words per network by making expanded cyclic setting (single, double, quadruple, octuple).

Also, RX/RX can be increased to up to 224 points and RWr/RWw to up to 32 words per station. (See Section 4.4.14.)

(25) Remote I/O station points setting

Set the number of I/O points of a remote I/O station.

This setting minimizes CPU device assignment and reduces the reserved points of remote input RX and remote output RX for remote I/O stations. (See Section 4.4.13.)

(26) Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP

Set whether output data to the remote, local, intelligent device and standby master stations will be refreshed or compulsorily cleared when the programmable controller CPU comes to STOP. (See Section 4.3.5.)

(27) Block guarantee of cyclic data per station (First 5 digits of serial number are 08032 or later)

The cyclic data are guaranteed for each slave station according to the setting of parameters. (Refer to Section 4.3.8.)

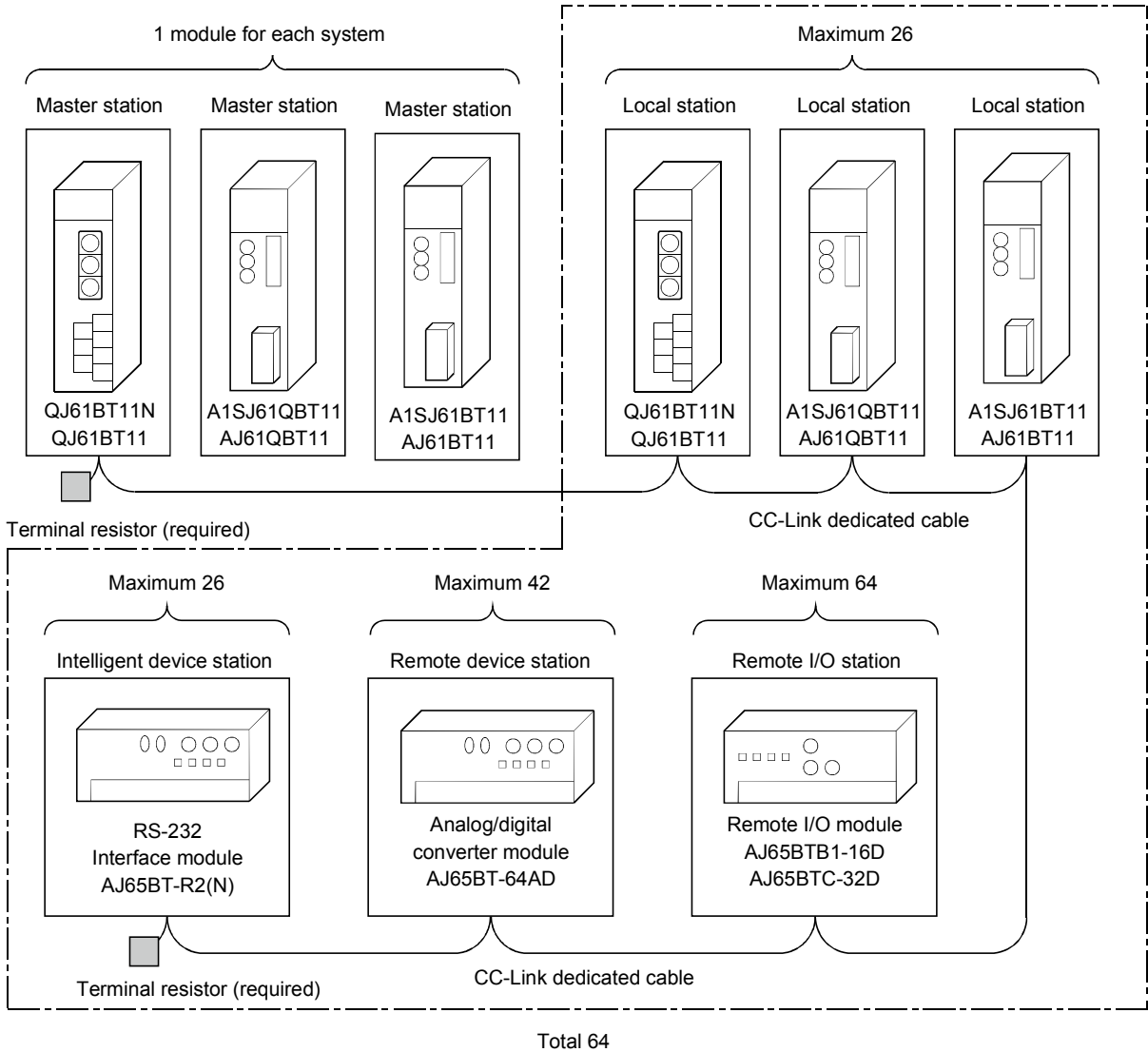
2 SYSTEM CONFIGURATION

The system configuration for the CC-Link is described below.

2.1 System Configuration

- (1) Remote net ver. 1 mode
- A total of 64 remote I/O stations, remote device stations, local stations, standby master stations, or intelligent device stations can be connected to a single master station.
- However, the following conditions must all be satisfied.

Condition 1	$\{(1 \times a) + (2 \times b) + (3 \times c) + (4 \times d)\} \leq 64$	a: Number of modules occupying 1 station b: Number of modules occupying 2 stations c: Number of modules occupying 3 stations d: Number of modules occupying 4 stations
Condition 2	$\{(16 \times A) + (54 \times B) + (88 \times C)\} \leq 2304$	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

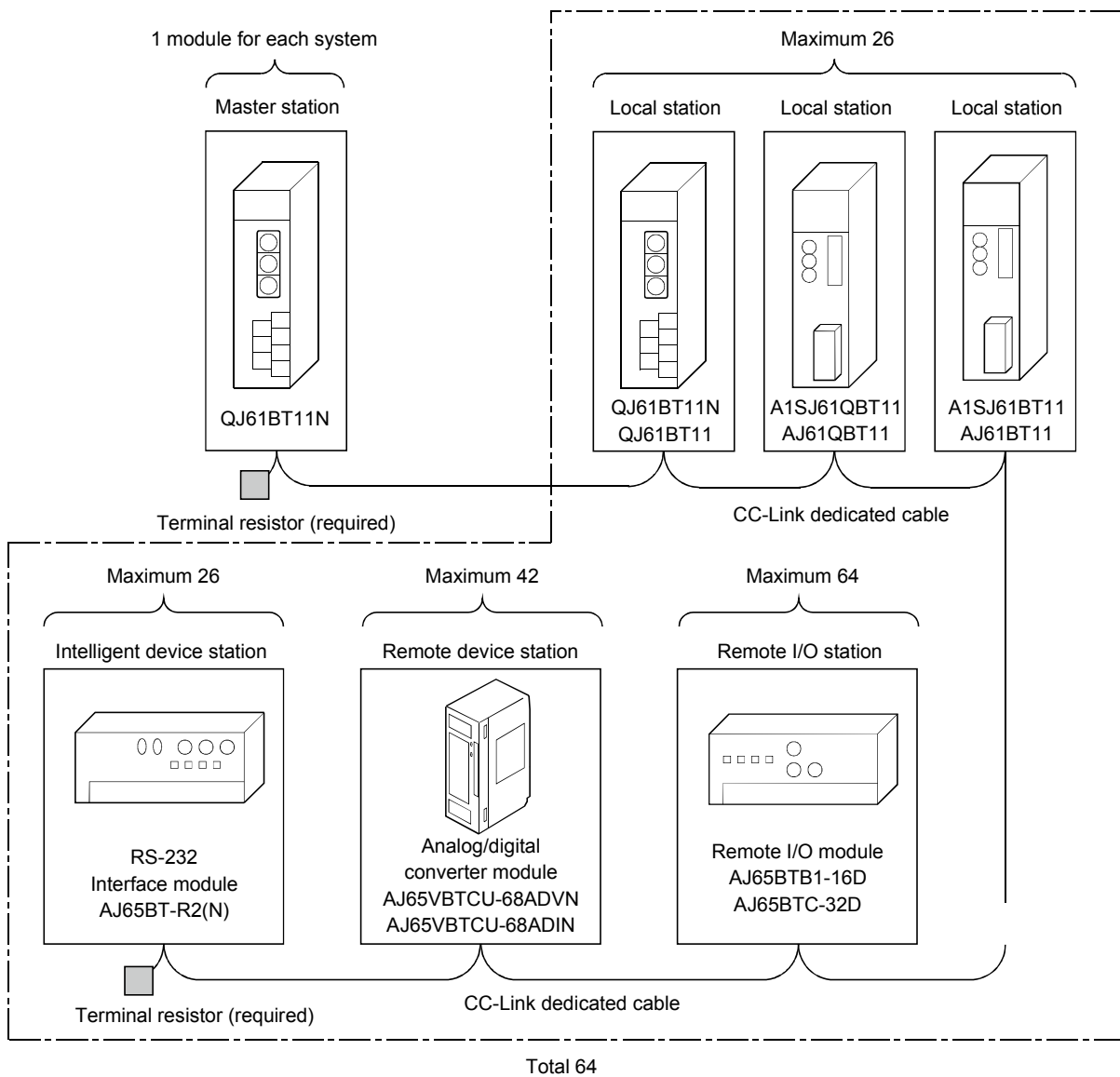


(2) Remote net ver. 2 mode, remote net additional mode

A total of 64 remote I/O stations, remote device stations, local stations, standby master stations, or intelligent device stations can be connected to a single master station.

However, the following conditions must all be satisfied.

Condition 1	$\{(a + a2 + a4 + a8) + (b + b2 + b4 + b8) \times 2 + (c + c2 + c4 + c8) \times 3 + (d + d2 + d4 + d8) \times 4\} \leq 64$	a: The total number of ver.1 compatible slave stations that occupy 1 station, and ver.2 compatible slave stations that occupy 1 station which are set to "Single". b: The total number of ver.1 compatible slave stations that occupy 2 stations, and ver.2 compatible slave stations that occupy 2 stations which are set to "Single". c: The total number of ver.1 compatible slave stations that occupy 3 stations, and ver.2 compatible slave stations that occupy 3 stations which are set to "Single". d: The total number of ver.1 compatible slave stations that occupy 4 stations, and ver.2 compatible slave stations that occupy 4 stations which are set to "Single".
Condition 2	$\{[(a \times 32) + (a2 \times 32) + (a4 \times 64) + (a8 \times 128)] + [(b \times 64) + (b2 \times 96) + (b4 \times 192) + (b8 \times 384)] + [(c \times 96) + (c2 \times 160) + (c4 \times 320) + (c8 \times 640)] + [(d \times 128) + (d2 \times 224) + (d4 \times 448) + (d8 \times 896)]\} \leq 8192$	a2: The number of ver.2 compatible stations that occupy 1 station which are set to "Double". b2: The number of ver.2 compatible stations that occupy 2 stations which are set to "Double". c2: The number of ver.2 compatible stations that occupy 3 stations which are set to "Double". d2: The number of ver.2 compatible stations that occupy 4 stations which are set to "Double".
Condition 3	$\{[(a \times 4) + (a2 \times 8) + (a4 \times 16) + (a8 \times 32)] + [(b \times 8) + (b2 \times 16) + (b4 \times 32) + (b8 \times 64)] + [(c \times 12) + (c2 \times 24) + (c4 \times 48) + (c8 \times 96)] + [(d \times 16) + (d2 \times 32) + (d4 \times 64) + (d8 \times 128)]\} \leq 2048$	a4: The number of ver.2 compatible stations that occupy 1 station which are set to "Quadruple". b4: The number of ver.2 compatible stations that occupy 2 stations which are set to "Quadruple". c4: The number of ver.2 compatible stations that occupy 3 stations which are set to "Quadruple". d4: The number of ver.2 compatible stations that occupy 4 stations which are set to "Quadruple". a8: The number of ver.2 compatible stations that occupy 1 station which are set to "Octuple". b8: The number of ver.2 compatible stations that occupy 2 stations which are set to "Octuple". c8: The number of ver.2 compatible stations that occupy 3 stations which are set to "Octuple". d8: The number of ver.2 compatible stations that occupy 4 stations which are set to "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



2.2 Applicable System

Applicable programmable controller CPUs and notes on the system configuration are described below.

2.2.1 Applicable modules and number of mountable modules

(1) Mountable modules, No. of mountable modules, and mountable base unit

(a) When mounting to CPU module

The following shows the mountable CPU modules, No. of mountable modules, and mountable base unit of the QJ61BT11N module.

Power shortage may occur depending on the combination with other mounted modules or the number of mounted modules.

When mounting modules, pay attention to the power supply capacity.

When the power shortage occurs, review the combination of modules to be mounted.

Mountable CPU module			No. of mountable modules (* ¹)		Base unit (* ²)	
CPU type		CPU model name	When setting parameters by software package	When setting parameters by dedicated instructions	Main base unit	Extension base unit
Programmable controller CPU	Basic model QCPU	Q00JCPU	Up to 2	Up to 2	○	○
		Q00CPU				
		Q01CPU				
	High Performance model QCPU	Q02CPU	Up to 8(* ³)	Up to 64	○	○
		Q02HCPU				
		Q06HCPU				
		Q12HCPU				
		Q25HCPU				
	Process CPU	Q02PHCPU	Up to 8(* ³)	Up to 64	○	○
		Q06PHCPU				
		Q12PHCPU				
		Q25PHCPU				
	Redundant CPU	Q12PRHCPU	Up to 4(* ⁴)(* ⁵)(* ⁶)	Not mountable	○(* ⁷)	○(* ⁷)
		Q25PRHCPU				
	Universal model QCPU	Q00UJCPU	Up to 2	Up to 8	○	○
		Q00UCPU	Up to 2	Up to 24		
		Q01UCPU		Up to 24		
		Q02UCPU	Up to 4	Up to 36	○	○
		Q03UDCPU	Up to 8	Up to 64		
		Q04UDHCPU				
Q06UDHCPU						
Q10UDHCPU						
Q13UDHCPU						
Q20UDHCPU						
Q26UDHCPU						
Q03UDECPU						

○: Mountable, ×: Not mountable

Mountable CPU module			No. of mountable modules (* ¹)		Base unit (* ²)	
CPU type		CPU model name	When setting parameters by software package	When setting parameters by dedicated instructions	Main base unit	Extension base unit
Programmable controller CPU	Universal model QCPU	Q04UDEHCPU	Up to 8	Up to 64	○	○
		Q06UDEHCPU				
		Q10UDEHCPU				
		Q13UDEHCPU				
		Q20UDEHCPU				
		Q26UDEHCPU				
C Controller module		Q06CCPU-V	Up to 8	Not mountable	○ (* ⁷)	○ (* ⁷)
		Q06CCPU-V-B				
		Q12DCCPU-V				

○: Mountable, ×: Not mountable

- *1 Limited to the range of the number of I/O points in the CPU module.
- *2 Mountable on any I/O slot of the base unit.
- *3 When the number of mountable modules is set to "8", use a CPU module whose serial No. (first 5 digits) is "08032" or later.
Operation cannot be guaranteed when an incompatible Programmable Controller CPU is used.
When a CPU module whose first 5 digits of serial number are "08031" or earlier is used, the number of mountable modules is four.
- *4 For use in a redundant system, select the QJ61BT11N whose serial No. (first 5 digits) is "06052" or later.
When any incompatible QJ61BT11N is used, the operation cannot be guaranteed.
- *5 The number of QJ61BT11N modules on the either system is counted.
Example: When one QJ61BT11N module is mounted on the system A and the system B respectively, the number of modules is counted as one.
- *6 When setting 8 for the number of modules, use CPU modules whose serial No. (first 5 digits) is 09102 or later for both systems.
If an incompatible programmable controller CPU is used, proper operation is not guaranteed.
For a CPU module whose serial No. (first 5 digits) is 09101 or earlier, up to four modules can be mounted.
- *7 Not applicable when parameters are set by dedicated instructions.

REMARK

For using with a C Controller module, refer to the C Controller Module User's Manual.

(b) When mounting to remote I/O station of MELSECNET/H

The following shows the mountable network modules, No. of mountable modules, and mountable base unit of the QJ61BT11N module.

Power shortage may occur depending on the combination with other mounted modules or the number of mounted modules.

When mounting modules, pay attention to the power supply capacity.

When the power shortage occurs, review the combination of modules to be mounted.

1) When performing the parameter setting with GX Developer

Mountable network module	No. of mountable modules (*1)	Mountable base unit (*2)	
		Main base unit of remote I/O station	Extension base unit of remote I/O station
QJ72LP25-25	Up to 4	○	○
QJ72LP25G			
QJ72LP25GE			
QJ72BR15			

○: Mountable, ×: Not mountable

*1 Limited to the range of the number of I/O points in the CPU module.

*2 Mountable on any I/O slot of the mountable base unit.

REMARK

Basic model QCPUs and C Controller modules cannot create a MELSECNET/H remote I/O network.

(2) CPU modules for additional functions and availability of network modules

To use the additional functions of the QJ61BT11N, use CPU modules and network modules (for MELSECNET/H remote I/O stations) that support them. Operation cannot be guaranteed when an incompatible programmable controller CPU or network module is used.

The versions of CPU modules and network modules that support additional functions are listed in the table below.

Applicable module		QJ61BT11N additional functions			
		Issue of event for interrupt program	Remote net additional mode	Data link startup function by standby master station (QJ61BT11N with first 5 digits of serial No. 07112 or later)	Block guarantee of cyclic data per station (QJ61BT11N with first 5 digits of serial No. 08032 or later)
CPU module	Q00JCPU Q00CPU Q01CPU	○ (CPU module function version B or later)	○ (CPU module with first 5 digits of serial No. 06112 or later)	○	×
	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	○	○ (CPU module with first 5 digits of serial No. 05032 or later)	○	○ (CPU module with first 5 digits of serial No. 08032 or later)
	Q02PHCPU Q06PHCPU	○	○	○	○
	Q12PHCPU Q25PHCPU	○	○ (CPU module with first 5 digits of serial No. 07032 or later)	○	○ (CPU module with first 5 digits of serial No. 08032 or later)
	Q00UJCPU Q00UCPU Q01UCPU Q02UCPU Q03UDCPU Q04UDHCPU Q06UDHCPU Q10UDHCPU Q13UDHCPU Q20UDHCPU Q26UDHCPU Q03UDECPU Q04UDEHCPU Q06UDEHCPU Q10UDEHCPU Q13UDEHCPU Q20UDEHCPU Q26UDEHCPU	○	○	○	○

○: Available, ×: Not available

Applicable module		QJ61BT11N additional functions			
		Issue of event for interrupt program	Remote net additional mode	Data link startup function by standby master station (QJ61BT11N with first 5 digits of serial No. 07112 or later)	Block guarantee of cyclic data per station (QJ61BT11N with first 5 digits of serial No. 08032 or later)
C Controller module	Q06CCPU-V Q06CCPU-V-B Q12DCCPU-V	○	○	○	○
Network module	QJ72LP25-25 QJ72LP25G QJ72BR15	×	×	×	×

○: Available, ×: Not available

Remarks

For the functional upgrade of the QJ61BT11N, refer to Appendix 7.

(3) Support of the multiple CPU system

When using the QJ61BT11N in a multiple CPU system, refer to the QCPU User's Manual (Multiple CPU System) first.

(a) Compatible QJ61BT11N

The function version of the first released QJ61BT11N is B, and it supports multiple CPU systems.

(b) Network parameters

Network parameters must be set to the control CPU of the QJ61BT11N.

(4) Applicable software package

The software package available for the QJ61BT11N is listed below:

Manual name	Model name	Remarks
GX Developer	SWnD5C-GPPW-E *5	Required MELSEC programmable controller programming software. "n" in the model name is 4 or greater.

*5 The versions of GX Developer that support additional functions are listed below.

Additional functions	GX Developer version
Remote net Ver.2 mode	Version 8.03D or later
Remote net additional mode	
Number of mountable modules: 8	Version 8.32J or later
Block guarantee of cyclic data per station	

(5) Usable slave stations

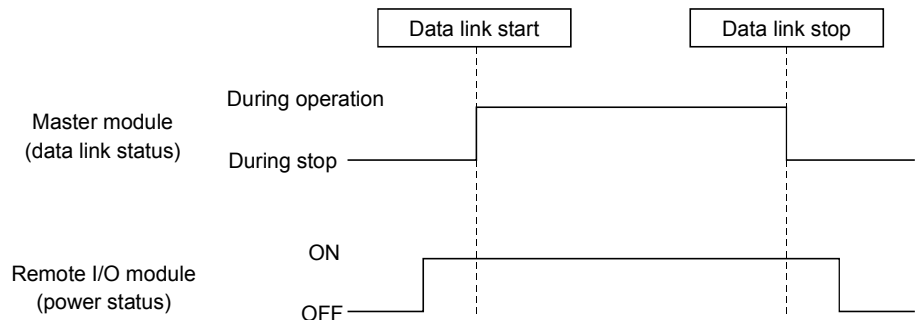
Any of ver.1 compatible slave stations and ver.2 compatible slave stations is usable.

2.2.2 Notes on the system configuration

The system should be designed with the following considerations to prevent mis-input from the remote I/O modules:

(1) When powering on and off

Start the data link after turning on the power to the remote I/O modules. Turn off the power to the remote I/O modules after stopping the data link.



(2) During momentary power failure of the remote I/O modules

When a momentary power failure occurs in the power (24 V DC) being supplied to the remote I/O modules, mis-input may occur.

(a) Cause for mis-input due to a momentary power failure

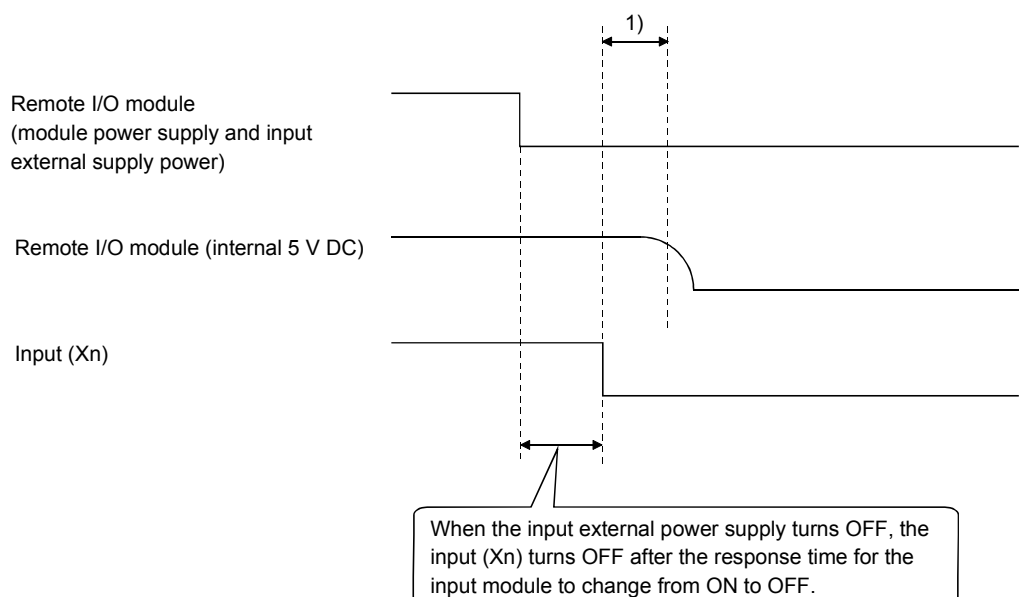
The remote I/O module hardware uses the power by internally converting the module power (24 V DC) to 5 V DC.

When a momentary power failure occurs in a remote I/O module, the following condition occurs:

(Time for the 5 V DC power in the remote I/O module to turn off) >

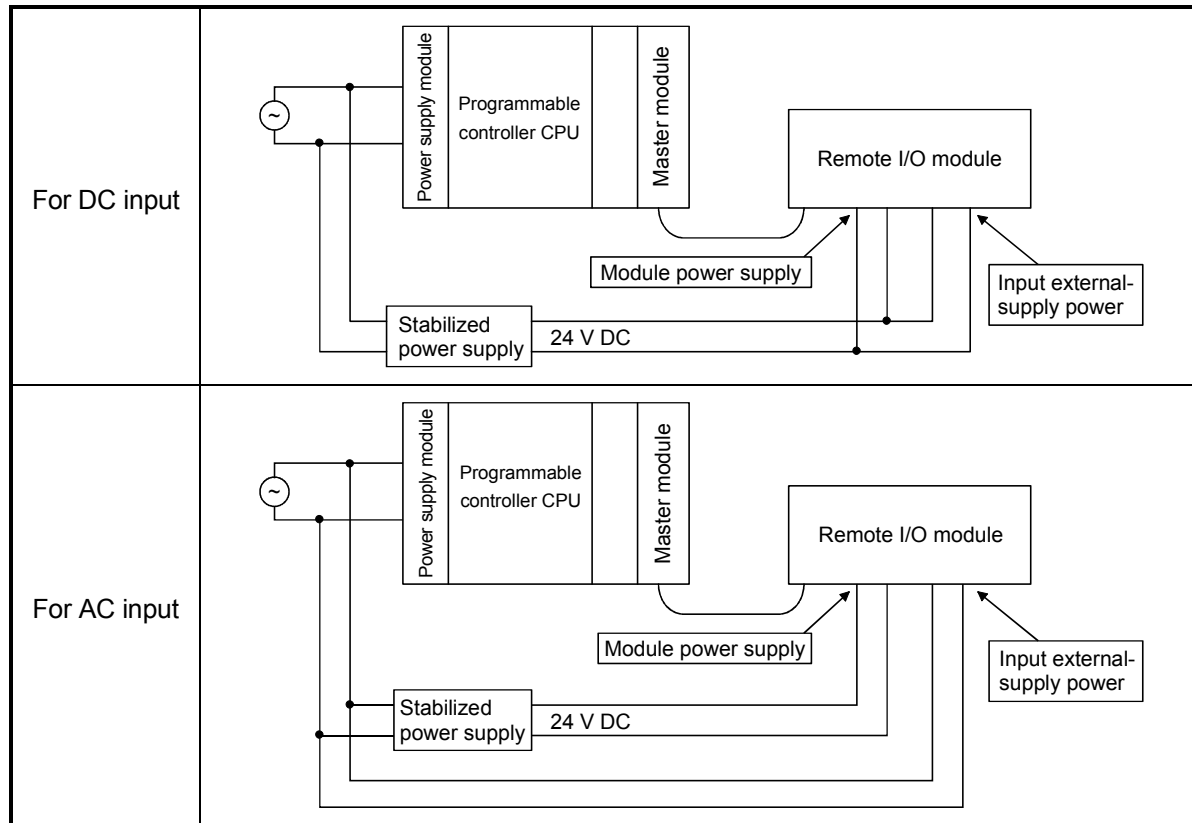
(Response time for input module on → off)

Therefore, mis-input occurs when a refresh is performed within the time indicated by 1) in the figure below.



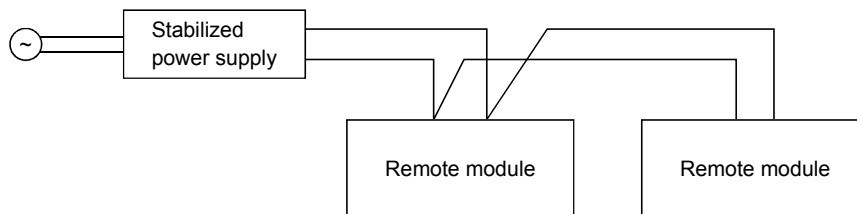
(b) Countermeasure for mis-input

For the power supply module, the stabilized power supply and the input external supply power of AC input, wire the power cables from the same power source.

**REMARK**

When supplying power from a single power source to multiple remote I/O modules, select the proper type of cable and perform the wiring in consideration of the voltage decline.

Connections can be established if the receiving port voltage at the remote I/O module is within the specified range of the remote I/O module to be used.



(3) Access to station No.64

- (a) To a local station of No. 64, other station access from GX Developer or GOT is not allowed. If the station No. is changed to other than 64, other station access is executable.
- (b) The CC-Link board is not allowed to access a local station or intelligent device station whose station No. is 64. If the station No. is changed to other than 64, other station access is executable.

(4) Precautions for use on MELSECNET/H remote I/O stations

Pay attention to the following for use on MELSECNET/H remote I/O stations:

- Interrupt setting of network parameters is not available.
- Use of dedicated instructions is not allowed.

(5) Precautions on the retry count setting for use of dedicated instructions

The following QJ61BT11N supports the retry count setting for use of dedicated instructions.

- QJ61BT11N whose first 5 digits of serial No. is 08102 or later

Note that some dedicated instructions are not applicable to the retry count setting. For details, refer to Appendix 2.1 (3).

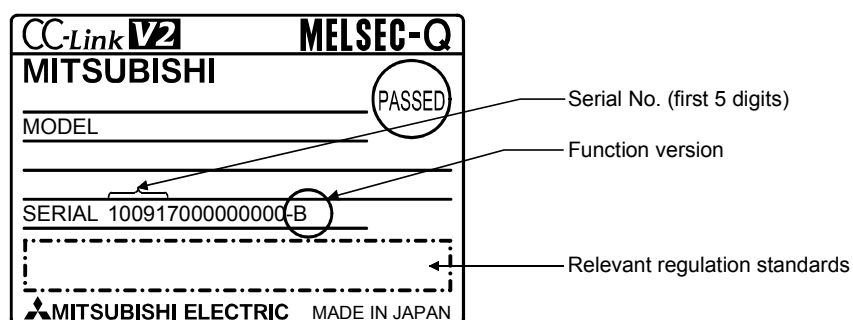
For the retry count setting for use of dedicated instructions, there are no restrictions on CPU module models.

2.2.3 How to confirm the function version and serial No.

The serial No. and function version of the QJ61BT11N can be confirmed on the rating plate, on the front of the module, and from the System Monitor window of GX Developer.

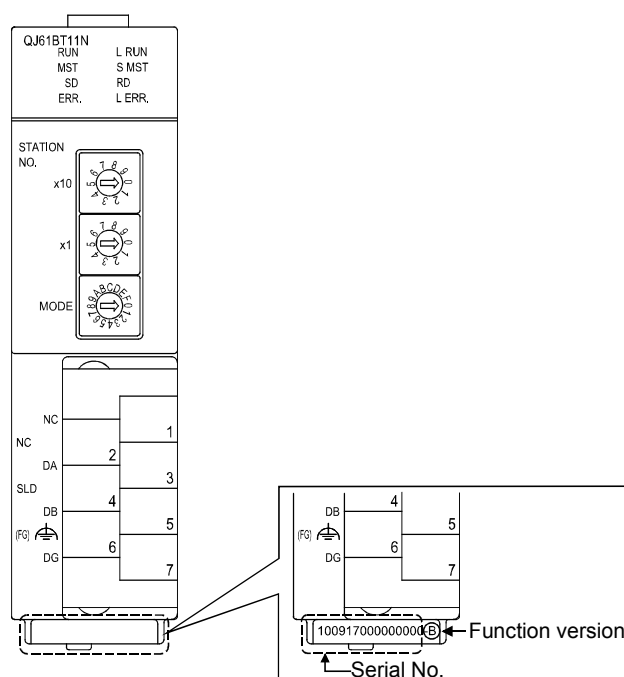
(1) How to check the function version and serial No. of the QJ61BT11N

- (a) Checking the "SERIAL" section of the rating plate, which is located on the side of the module.



- (b) Checking on the front of the module

The serial No. and function version on the rating plate are also indicated on the lower front of the module.



REMARK

Serial No. labelling on the front of the module was started from August in 2008.
Note that, however, some of the modules manufactured around the time of change may not have the serial No. label attached.

- (c) Confirming from the System Monitor window (Product Information List)
In GX Developer, select [Diagnostics] → [System monitor...] and click the **Product Inf. List** button.

Function version
Serial No. Production number

Slot	Type	Series	Model name	Points	I/O No.	Master PLC	Serial No.	Ver.	Product No.
PLC	PLC	Q	Q03UDCPU	-	-	-	0904200000000000	B	090421091210001-B
0-0	Intelli.	Q	QJ61BT11N	32pt	0000	-	1012200000000000	B	-
0-1	-	-	None	-	-	-	-	-	-
0-2	-	-	None	-	-	-	-	-	-
0-3	-	-	None	-	-	-	-	-	-
0-4	-	-	None	-	-	-	-	-	-

- 1) Production number display
Since the QJ61BT11N does not support the production number display, "-" is displayed.

POINT

The serial No. displayed in the Product Information List of GX Developer may be different from the one on the rating plate and the front of the module.

- The serial No. on the rating plate and the front of the module indicates the management information on the product.
- The serial No. in the Product Information List of GX Developer indicates the functional information on the product, which is updated when a new function is added.

2.2.4 CC-Link version

There are two different CC-Link versions: Ver.1 and Ver.2.

(1) Definitions of Ver.1.00 and Ver.1.10

Ver.1.10 is a version in which the station-to-station cable length was improved to 20 cm or more.

In contrast, the older version is defined as Ver.1.00.

See Section 3.1.2 for the maximum overall cable length of Ver.1.10.

The station-to-station cable length must be 20 cm or more when the following conditions are met:

- 1) All the modules that compose the CC-Link system are Ver.1.10 modules.
- 2) All the data link cables are CC-Link Ver.1.10-compatible cables.

(2) Definition of Ver.2

Modules supporting the extended cyclic transmission are defined as the Ver.2-compatible module.

Note that the specifications of the cable remain the same as Ver.1.10.

POINT

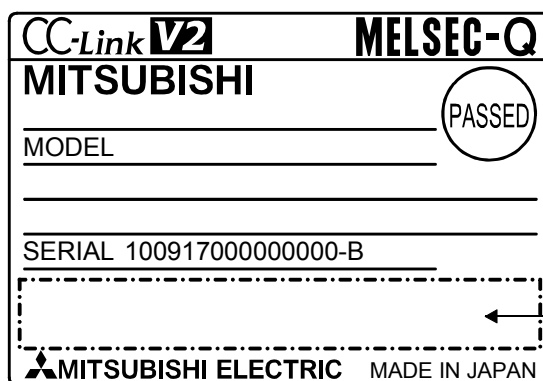
The specifications for Version 1.00 must be applied to the maximum cable overall length and station-to-station cable length if a system contains all of Ver.1.00, Ver.1.10, and Ver.2-compatible modules.

See Section 3.1.1 for the maximum overall cable length and station-to-station cable length of Ver.1.00.

(3) Checking the version

For Ver.1.10-compatible modules, the "CC-Link" logo is printed on the rating plate.

For Ver.2-compatible modules, the "V2" logo is printed on the rating plate.



Relevant regulation standards

3 SPECIFICATIONS

This section describes the specifications of the QJ61BT11N.

For the general specifications of the QJ61BT11N, refer to the user's manual for the CPU module to be used.

3.1 Performance Specifications

Table 3.1 lists the performance specifications of the QJ61BT11N.

Table 3.1 Performance specifications

Item	Specification
Transmission speed	Can select from 156 kbps/ 625 kbps/ 2.5 Mbps/ 5 Mbps/ 10 Mbps
Maximum overall cable distance (Maximum transmission distance)	Varies according to the transmission speed (See Section 3.1.1, 3.1.2)
Maximum number of connected stations (master station)	64 (See Section 2.1)
Number of occupied stations (local station)	1 to 4 stations The number of stations can be switched using the GX Developer parameter setting. * 1
Maximum number of link points per system * 1	Remote I/O (RX, RY) : 2048 points Remote register (RWw) : 256 points (master station → remote device station/local station/ intelligent device station/standby master station) Remote register (RWr) : 256 points (remote device station/local station/ intelligent device station/standby master station → master station)
Remote station/local station/intelligent device station/standby master station Number of link points per station * 1	Remote I/O (RX, RY) : 32 points (local station is 30 points) Remote register (RWw) : 4 points (master station → remote device station/local station/ intelligent device station/standby master station) Remote register (RWr) : 4 points (remote device station/local station/ intelligent device station/standby master station → master station)
Communication method	Broadcast polling method
Synchronous method	Frame synchronization method
Encoding method	NRZI method
Transmission path	Bus (RS-485)
Transmission format	Conforms to HDLC
Error control system	CRC ($X^{16} + X^{12} + X^5 + 1$)
Connection cable	CC-Link dedicated cable/ CC-Link dedicated high-performance cable/ Ver.1.10 compatible CC-Link dedicated cable * 2
RAS function	- Automatic return function - Slave station cut-off function - Error detection by the link special relay/register
Number of I/O occupied points	32 points (I/O assignment: Intelligent 32 points)
5 V DC internal current consumption	0.46 A
Weight	0.12 kg

*1 Indicates the number of link points for remote net ver.1 mode. For number of link points for remote net ver.2 mode/remote net additional mode. Refer to the table 3.2.

*2 Ver.1.10-compatible CC-Link dedicated cables, CC-Link dedicated cables (Ver.1.00) and CC-Link dedicated high-performance cables cannot be used together. If used together, correct data transmission will not be guaranteed. Also attach the terminating resistor which matches the kind of the cable. (Refer to section 7.5)

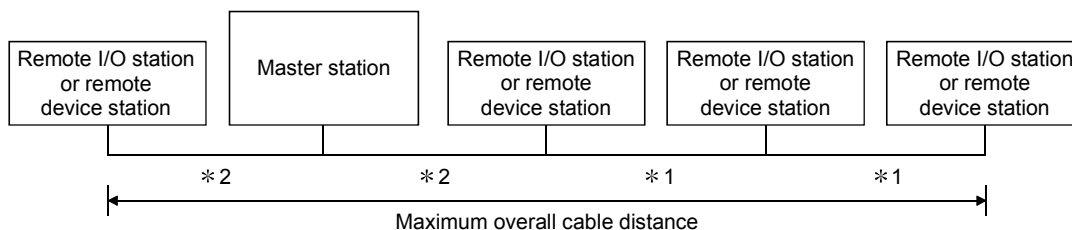
Table 3.2 Number of link points for remote net ver.2 mode/remote net additional mode

Item			Specifications			
Maximum No. of link points per system			Remote I/O (RX, RY) : 8192 points Remote register (RWw) : 2048 points (master station → remote device station/local station/intelligent device station/standby master station) Remote register (RWr) : 2048 points (remote device station/local station/intelligent device station/standby master station → master station)			
No. of link points per station	Expanded cyclic setting		Single	Double	Quadruple	Octuple
	Remote I/O (RX, RY)		32 points (30 points for local station)	32 points (30 points for local station)	64 points (62 points for local station)	128 points (126 points for local station)
	Remote register (RWw)		4 points	8 points	16 points	32 points
	Remote register (RWr)		4 points	8 points	16 points	32 points
Number of link points per number of occupied stations	Occupies 1 station	Remote I/O (RX, RY)	32 points	32 points	64 points	128 points
		Remote register (RWw)	4 points	8 points	16 points	32 points
		Remote register (RWr)	4 points	8 points	16 points	32 points
	Occupies 2 stations	Remote I/O (RX, RY)	64 points	96 points	192 points	384 points
		Remote register (RWw)	8 points	16 points	32 points	64 points
		Remote register (RWr)	8 points	16 points	32 points	64 points
	Occupies 3 stations	Remote I/O (RX, RY)	96 points	160 points	320 points	640 points
		Remote register (RWw)	12 points	24 points	48 points	96 points
		Remote register (RWr)	12 points	24 points	48 points	96 points
	Occupies 4 stations	Remote I/O (RX, RY)	128 points	224 points	448 points	896 points
		Remote register (RWw)	16 points	32 points	64 points	128 points
		Remote register (RWr)	16 points	32 points	64 points	128 points

3.1.1 Maximum overall cable distance (for Ver. 1.00)

The relationship between the transmission speed and the maximum overall cable distance is described below:

- (1) For a system consisting of only remote I/O stations and remote device stations



*1 Cable length between remote I/O stations or remote device stations.

*2 Cable length between the master station and the adjacent stations.

CC-Link dedicated cable (uses terminal resistor 110 Ω)

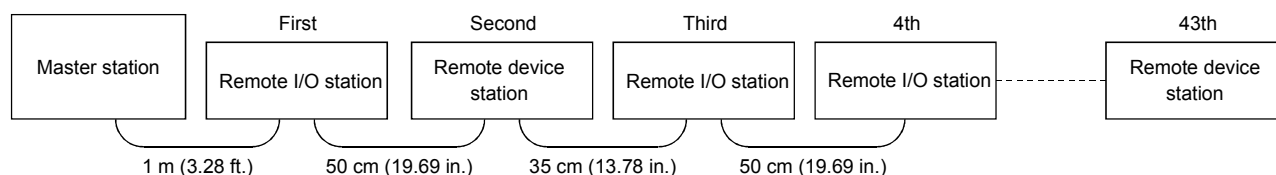
Transmission speed	Station-to-station cable length		Maximum overall cable distance
	* 1	* 2	
156 kbps	30 cm (11.81 in.) or more	1 m (3.28 ft.) or more	1200 m (3937.2 ft.)
625 kbps			600 m (1968.6 ft.)
2.5 Mbps			200 m (656.2 ft.)
5 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.) *		110 m (360.9 ft.)
	60 cm (23.62 in.) or more		150 m (492.15 ft.)
10 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.) *		50 m (164.1 ft.)
	60 cm (23.62 in.) to 99 cm (38.98 in.) *		80 m (262.5 ft.)
	1 m (3.28 ft.) or more		100 m (328.1 ft.)

CC-Link dedicated high performance cable (uses terminal resistor 130 Ω)

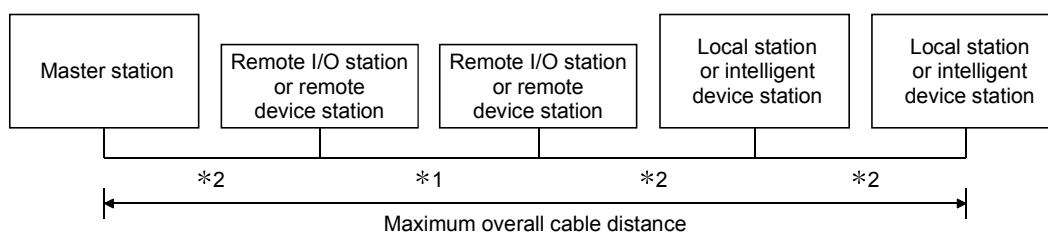
Transmission speed		Station-to-station cable length		Maximum overall cable distance
		* 1	* 2	
156 kbps		30 cm (11.81 in.) or more	1 m (3.28 ft.) or more	1200 m (3937.2 ft.)
625 kbps				900 m (2952.9 ft.)
2.5 Mbps				400 m (1312.4 ft.)
5 Mbps				160 m (524.96 ft.)
Number of connected stations: 1 to 32				100 m (328.1 ft.)
10 Mbps	Number of connected stations: 33 to 48	30 cm (11.81 in.) to 39 cm (15.35 in.) *	1 m (3.28 ft.) or more	80 m (262.5 ft.)
		40 cm (15.75 in.) or more		100 m (328.1 ft.)
	Number of connected stations: 49 to 64	30 cm (11.81 in.) to 39 cm (15.35 in.) *		20 m (65.52 ft.)
		40 cm (15.75 in.) to 69 cm (27.17 in.) *		30 m (98.43 ft.)
		70 cm (27.56 in.) or more		100 m (328.1 ft.)

* The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the maximum overall cable distance will be as indicated above.

(Example) When the transmission speed is 10 Mbps, and 43 remote I/O stations and remote device stations are connected using the CC-Link dedicated high performance cable, because the cable connecting the second and third stations is "35 cm (13.78 in.)", the maximum overall cable distance will be "80 cm (31.5 in.)".



(2) For a system consisting of remote I/O stations, remote device stations, local stations and intelligent device stations



*1 Cable length between remote I/O stations or remote device stations

*2 Cable length between the master station or the local or intelligent device station and the adjacent stations

CC-Link dedicated cable (uses terminal resistor 110 Ω)

Transmission speed	Station-to-station cable length		Maximum overall cable distance
	* 1	* 2	
156 kbps	30 cm (11.81 in.) or more	2 m (6.56 ft.) or more	1200 m (3937.2 ft.)
625 kbps			600 m (1968.6 ft.)
2.5 Mbps			200 m (656.2 ft.)
5 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.) *		110 m (360.9 ft.)
10 Mbps	60 cm (23.62 in.) or more		150 m (492.15 ft.)
	30 cm (11.81 in.) to 59 cm (23.23 in.) *		50 m (164.1 ft.)
	60 cm (23.62 in.) to 99 cm (38.98 in.) *		80 m (262.5 ft.)
	1 m (3.28 ft.) or more		100 m (328.1 ft.)

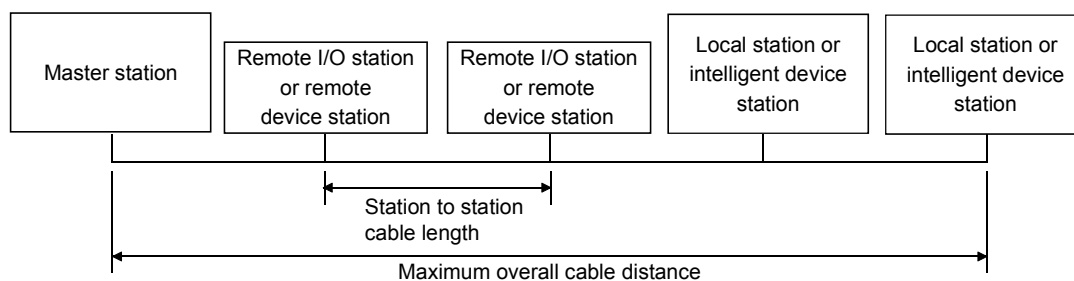
CC-Link dedicated high performance cable (uses terminal resistor 130 Ω)

Transmission speed	Station-to-station cable length		Maximum overall cable distance
	* 1	* 2	
156 kbps	30 cm (11.81 in.) or more	2 m (6.56 ft.) or more	1200 m (3937.2 ft.)
625 kbps			600 m (1968.6 ft.)
2.5 Mbps			200 m (656.2 ft.)
5 Mbps	30 cm (11.81 in.) to 59 cm (23.23 in.) *		110 m (360.9 ft.)
	60 cm (23.62 in.) or more		150 m (492.15 ft.)
10 Mbps	70 cm (27.56 in.) to 99 cm (38.98 in.) *		50 m (164.1 ft.)
	1 m (3.28 ft.) or more		80 m (262.5 ft.)

* The cable length between remote I/O stations or remote device stations is within this range and if even one location is wired, the maximum overall cable distance will be as indicated above.

3.1.2 Maximum overall cable distance (for Ver. 1.10)

The relation of the transmission speed and maximum overall cable distance when configuring the entire system with Version 1.10 modules and cable is shown below.



Version 1.10 compatible CC-Link dedicated cable (terminal 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

3.2 CC-Link Dedicated Cable

Use the CC-Link dedicated cables for the CC-Link system. If a cable other than the CC-Link dedicated cable is used, the performance of the CC-Link system cannot be guaranteed.

For the specifications of the CC-Link dedicated cables or any other inquiries, visit the following website:

CC-Link Partner Association: <http://www.cc-link.org/>

REMARK

For details, refer to the CC-Link cable wiring manual issued by CC-Link Partner Association.

4 FUNCTIONS

This chapter explains the functions of QJ61BT11N, dividing them into four sections: "Basic Functions", "Functions for Improving System Reliability", "Handy Functions" and "Transient Transmission Functions".

Some functions are unavailable depending on the mounted CPU.

Refer to Appendix 6 for details.

4.1 Function List

(1) Table 4.1 lists the "basic functions".

Table 4.1 List of the "basic functions"

Item	Description	Reference section
Communication with remote I/O station	Performs on/off data communication with remote I/O station.	Section 4.2.1
Communication with remote device station	Performs on/off data and numeric data communication with remote device station.	Section 4.2.2
Communication with local station	Performs on/off data and numeric data communication with local station.	Section 4.2.3
Communication with intelligent device station	Performs communication with intelligent device station, cyclic transmission, and transient transmission.	Section 4.2.4
Parameter setting with GX Developer	Sets the network parameter, automatic refresh parameter with the GX Developer.	Section 4.2.5
Parameter setting with dedicated instruction	Sets the network parameter with the G(P).RLPASET instruction.	Section 4.2.6

(2) Table 4.2 lists the "functions for improving system reliability".

Table 4.2 List of the "functions for improving system reliability"

Item	Description	Reference section
Slave station cut-off function	Disconnects the module that cannot continue the data link because of power off, and continues the data link with only the normal modules.	Section 4.3.1
Automatic return function	When a module, which has been disconnected from the data link because of power off, returns to the normal status, it automatically joins the data link.	Section 4.3.2
Data link status setting when the master station programmable controller CPU has an error	Sets the data link status when an error that stops the operation occurs at the master station programmable controller CPU.	Section 4.3.3
Setting the status of input data from a data link faulty station	Sets the status (clear/hold) of the input (receive) data from a station that became data link faulty because of power off.	Section 4.3.4
Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP	Sets whether output data to the slave stations will be refreshed or compulsorily cleared when the programmable controller CPU comes to STOP.	Section 4.3.5
Standby master function	Continues the data link by switching to the standby master station when a problem occurs in the master station.	Section 4.3.6
Data link start by standby master station	Starts data link when either of the master or standby master station is turned on.	Section 4.3.7
Block guarantee of cyclic data per station	Guarantees the cyclic data for each slave station.	Section 4.3.8

(3) Table 4.3 lists the "handy functions".

Table 4.3 List of the "handy functions"

Item	Description	Reference section
Remote device station initialization procedure registration function	Performs initial setting of remote device station using GX Developer.	Section 4.4.1
Event issuance for the interrupt program	Issues events when the conditions set by GX Developer are established and causes the programmable controller CPU to run an interrupt program.	Section 4.4.2
Automatic CC-Link startup	Starts the CC-Link automatically by turning the power on.	Section 4.4.3
Remote net mode	Performs communication with all stations (remote station, local station, intelligent device station, and standby master station).	Section 4.4.4
Remote I/O net mode	Shortens the link scan time for a system consisting only of the master station and remote I/O stations.	Section 4.4.5
Reserved station function	By assigning modules that will be connected in the future as reserved stations, they will not be treated as data link faulty stations. If any of the connected modules is specified, it cannot perform data link. The reserved stations can also be set as 0 points.	Section 4.4.6
Error invalid station setting function	Prevents modules that may be powered off in the system configuration from being treated as data link faulty stations by setting the network parameters.	Section 4.4.7
Scan synchronous function	Synchronous mode	Performs link scan by synchronizing with sequence scan.
	Asynchronous mode	Perform link scan without synchronizing with sequence scan.
Temporary error invalid station setting function	Prevents modules specified by GX Developer from being treated as data link faulty stations temporarily during online operation.	Section 4.4.9
Data link stop/restart	Stops or restarts the data link that is being executed.	Section 4.4.10
Station number overlap checking function	Checks for the overlapping of number of occupied stations and whether or not more than one module having a station number setting of 0 exists in the system.	Section 4.4.11
Multiple CPU system support	Allows monitoring and reading/writing programs from/to any CPU in a multiple CPU system mounted with the QJ61BT11N via AJ65BT-G4-S3 or other station CPUs.	Section 4.4.12
Remote I/O station points setting	Allows the I/O points of the remote I/O stations to be selected from among 8 points, 16 points and 32 points, reducing the number of reserved points.	Section 4.4.13
Cyclic points increase	Allows the number of cyclic points per module to be increased from 128 points for RX/RX and 16 points for RWr/RWw in the ver. 1 mode to up to 896 points for RX/RX and 128 points for RWr/RWw in the ver. 2 mode.	Section 4.4.14

(4) Table 4.4 lists the "functions for transient transmission".

Table 4.4 List of the "functions for transient transmission"

Item	Description	Reference section
Transient transmission	Specifies a counterpart and communicates at an arbitrary timing.	Section 4.5.1

4.2 Basic Functions

This section explains the basic functions of the QJ61BT11N.

4.2.1 Communication with the remote I/O stations

Two types of communication modes are available for the CC-Link system: remote net mode and remote I/O net mode.

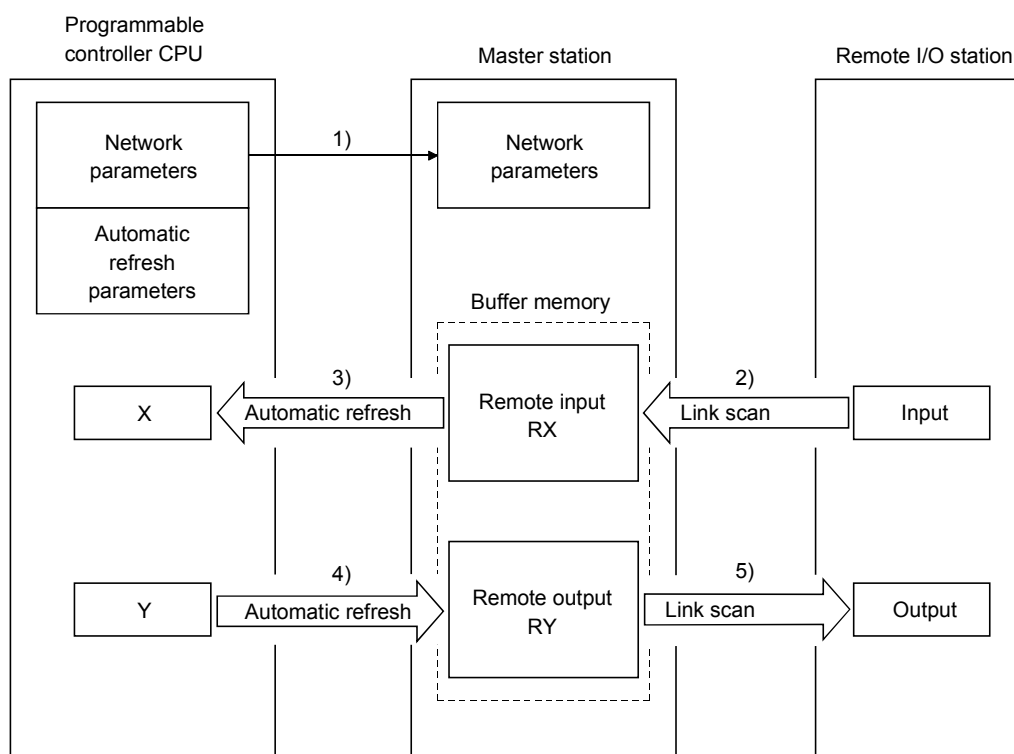
(1) Remote net mode

In this mode, it is possible to communicate with all stations (remote I/O station, remote device station, local station, intelligent device station, and standby master station). Thus, various systems can be configured according to their applications.

(2) Remote I/O net mode

In this mode, a high-speed cyclic transmission is performed for a system consisting only of the master station and remote I/O stations. Because of this, the link scan time can be shortened when compared to the remote net mode.

The following provides an overview of the communication between the master station and a remote I/O station using the remote I/O net mode. In the communication with the remote I/O station, the on/off data of the switches and indicator lamps are communicated through remote input RX and remote output RY.

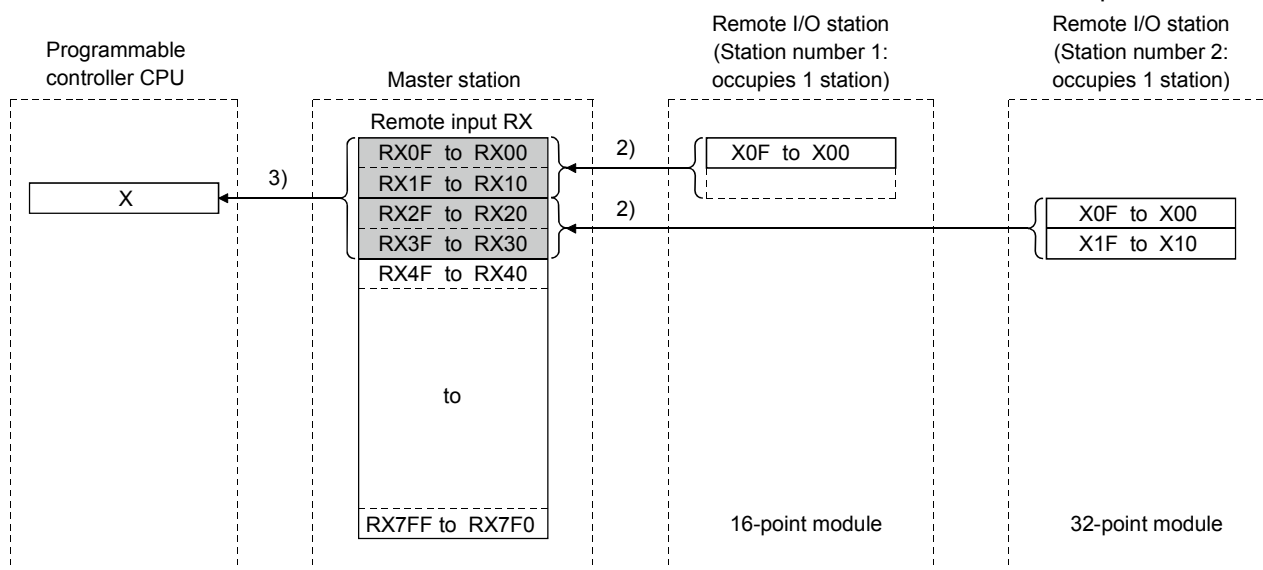


[Data link startup]

- 1) When the programmable controller system is powered on, the network parameters in the programmable controller CPU are transferred to the master station, and the CC-Link system automatically starts up.

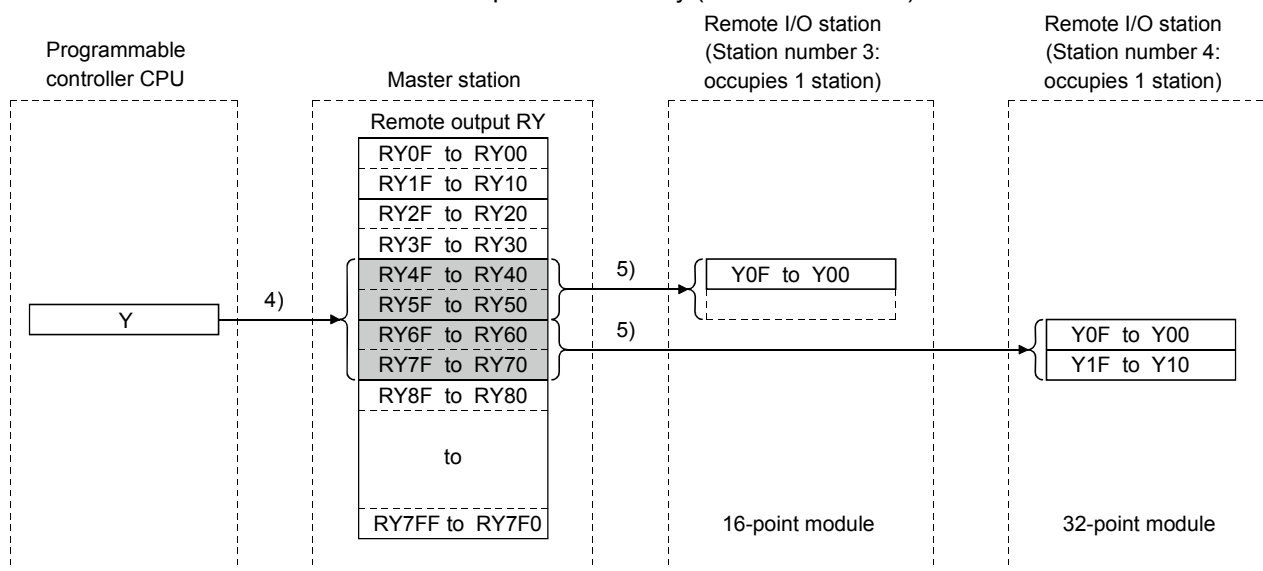
[Remote input]

- 2) The input status of a remote I/O station is stored automatically (for each link scan) in the master station's "remote input RX" buffer memory.
- 3) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters.



[Remote output]

- 4) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory.
- 5) The output status stored in the "remote output RY" buffer memory is output automatically (for each link scan) to remote I/O stations.

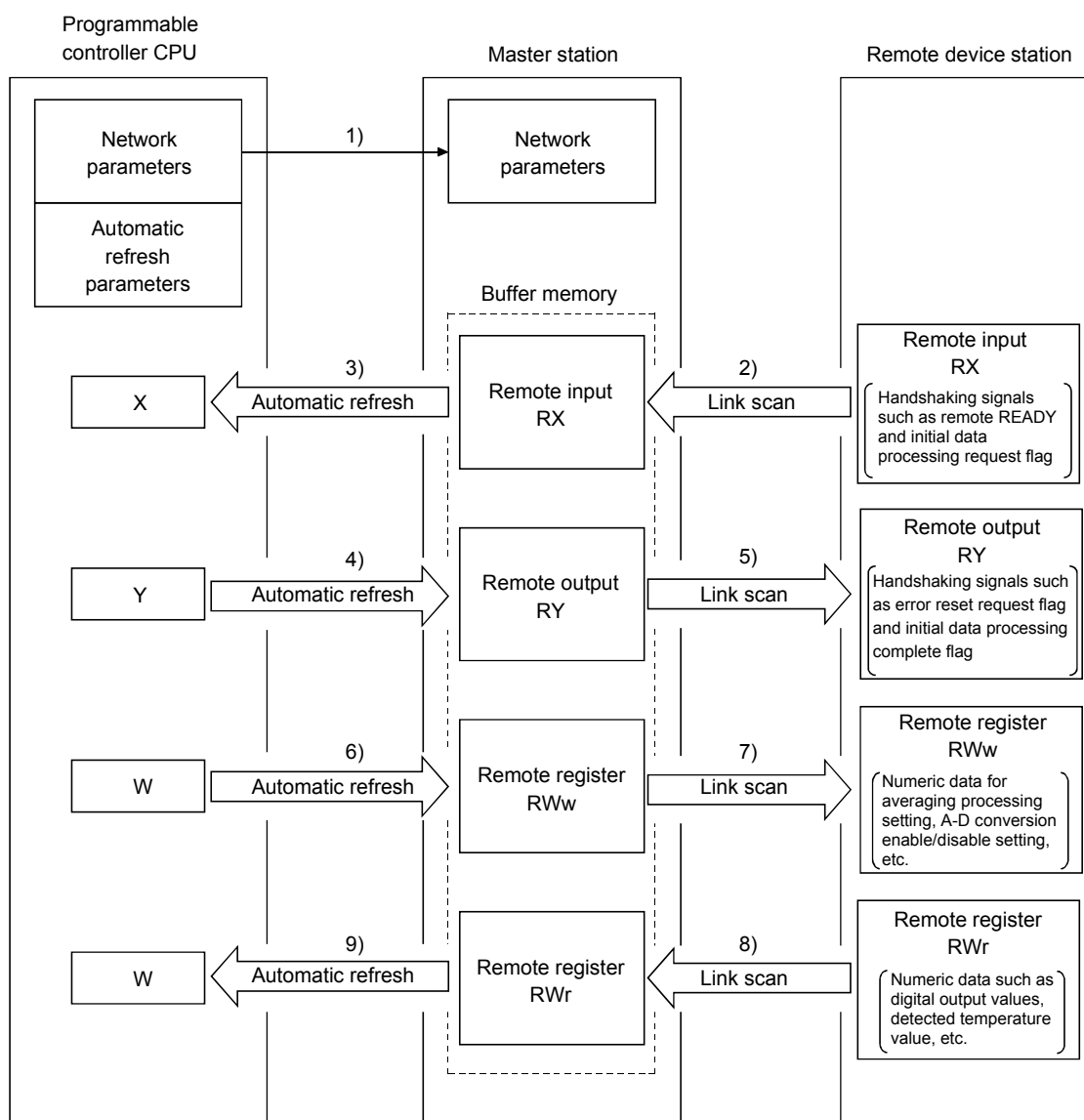


- When setting the automatic refresh parameters, it is recommended to specify "Y" as the remote output RY refresh device. If any device other than "Y" (e.g. M or L) is specified, parameter setting must be made to compulsorily clear the device status at a CPU STOP. If parameter setting is not made, the device status before a STOP is retained as is. For slave station compulsory clear in case of CPU STOP, see Section 4.3.5. For the method to stop a data link, see Section 4.4.10.

4.2.2 Communication with the remote device stations

This section explains an overview of the communication between the master and the remote device stations.

In the communication with remote device stations, the signals for handshaking with remote device stations (initial data request flag, error reset request flag, etc.) are communicated using remote input RX and remote output RX. Numeric data (averaging processing specification, digital output value, etc.) is communicated using remote register RWw and remote register RWr.

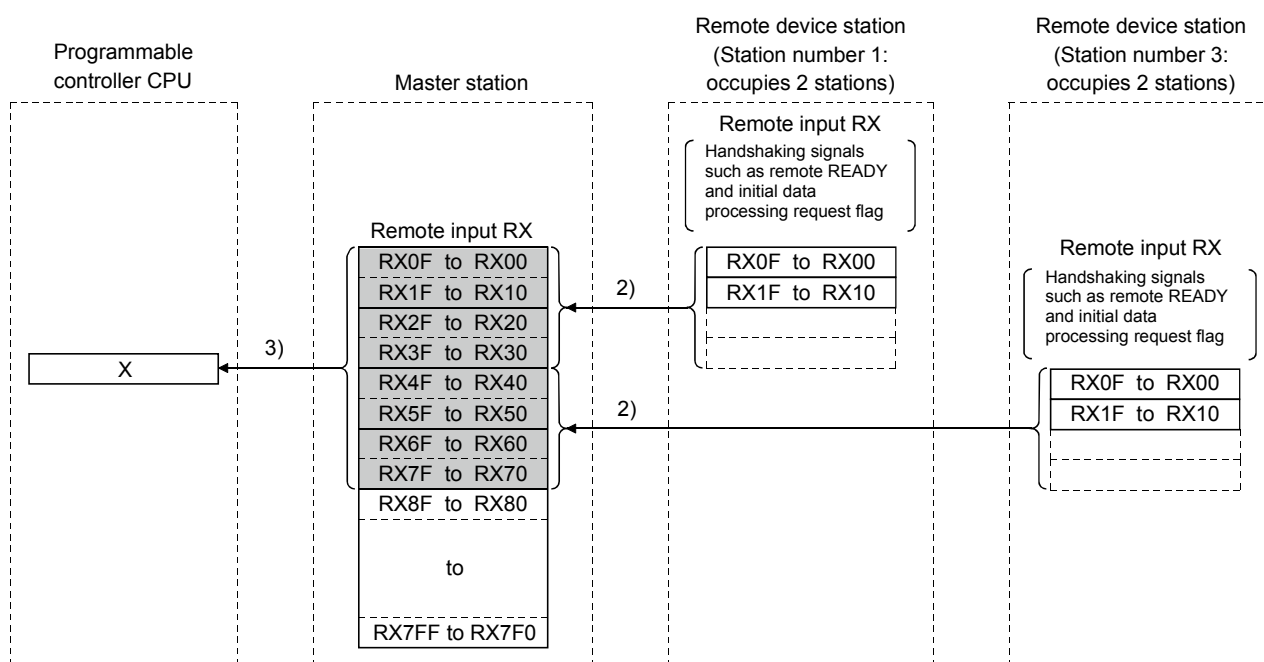


[Data link startup]

- 1) When the programmable controller system is powered on, the network parameters in the programmable controller CPU are transferred to the master station, and the CC-Link system automatically starts up.

[Remote input]

- 2) The remote input RX of a remote device station is stored automatically (for each link scan) in the master station's "remote input RX" buffer memory.
- 3) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters.

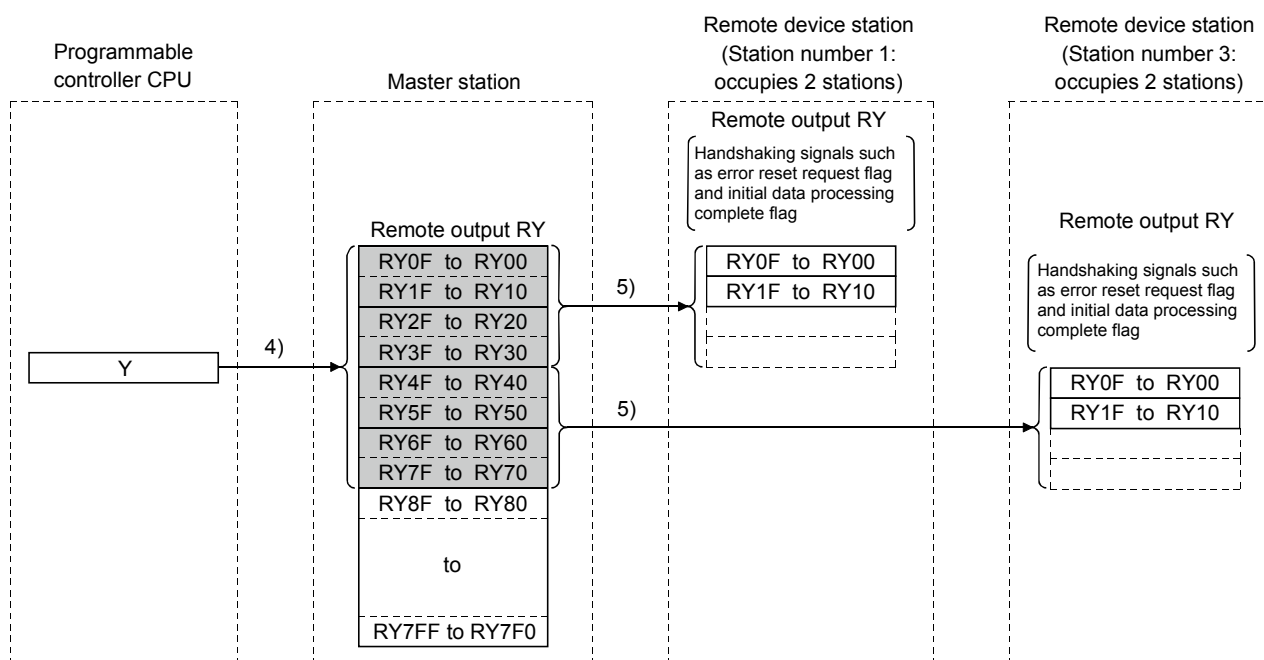


[Remote input RX when the AJ65BT-64AD is set to station number 1]

Signal direction: AJ65BT-64AD → Master module	
Device No.	Signal name
RX00	CH1 A-D conversion completed flag
RX01	CH2 A-D conversion completed flag
RX02	CH3 A-D conversion completed flag
RX03	CH4 A-D conversion completed flag
RX04 to RX17	Not used
RX18	Initial data processing request flag
RX19	Initial data setting complete flag
RX1A	Error status flag
RX1B	Remote READY
RX1C to RX1F	Not used

[Remote output]

- 4) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory.
- 5) Remote output RY is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.

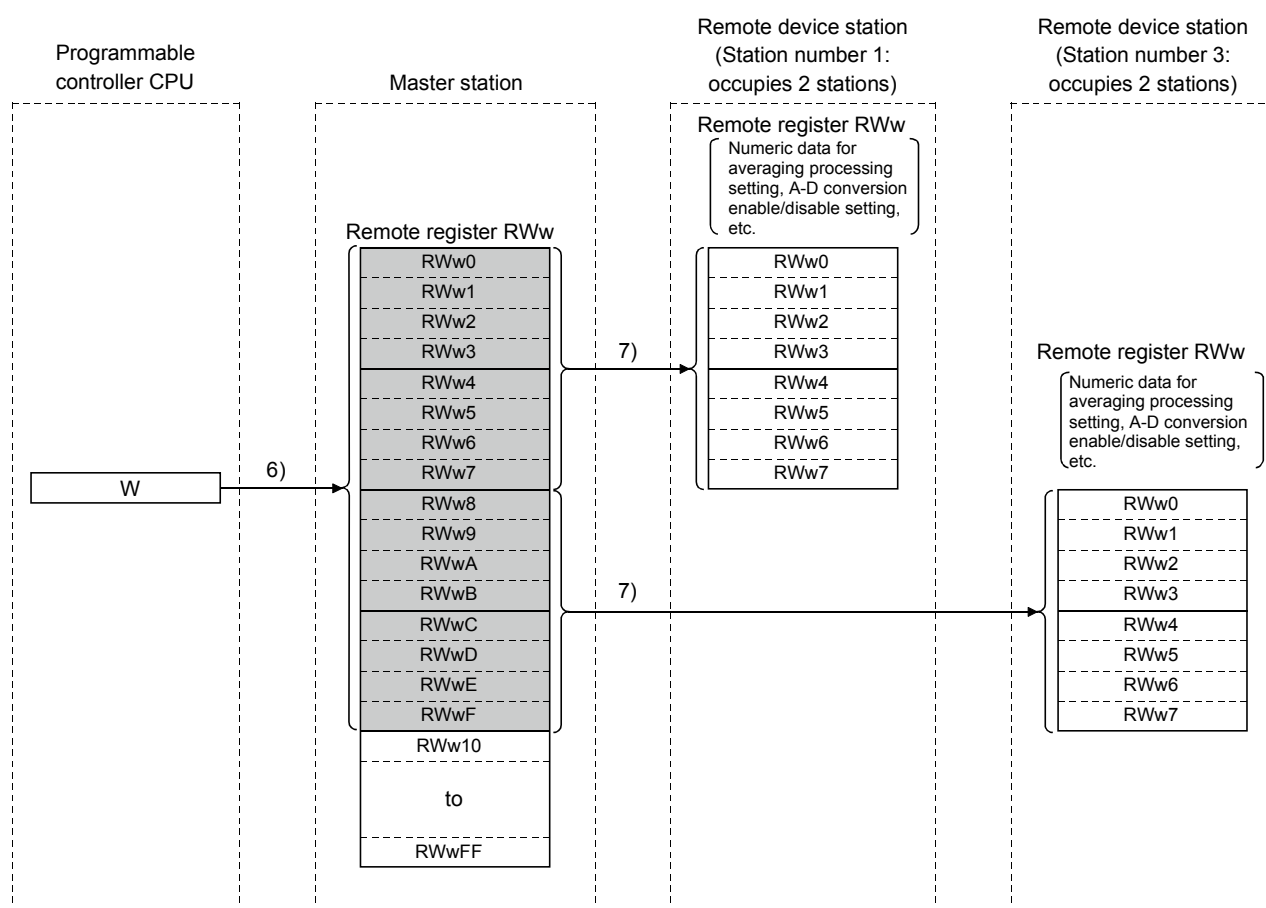


[Remote output RY when the AJ65BT-64AD is set to station number 1]

Signal direction: Master module → AJ65BT-64AD	
Device No.	Signal name
RY00	Selection of offset/gain values
RY01	Selection of voltage/current
RY02 to RY17	Not used
RY18	Initial data setting complete flag
RY19	Initial data setting request flag
RY1A	Error reset request flag
RY1B to RY1F	Not used

[Writing to the remote register RWw]

- 6) The transmission data of the CPU device set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory.
- 7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of each remote device station.



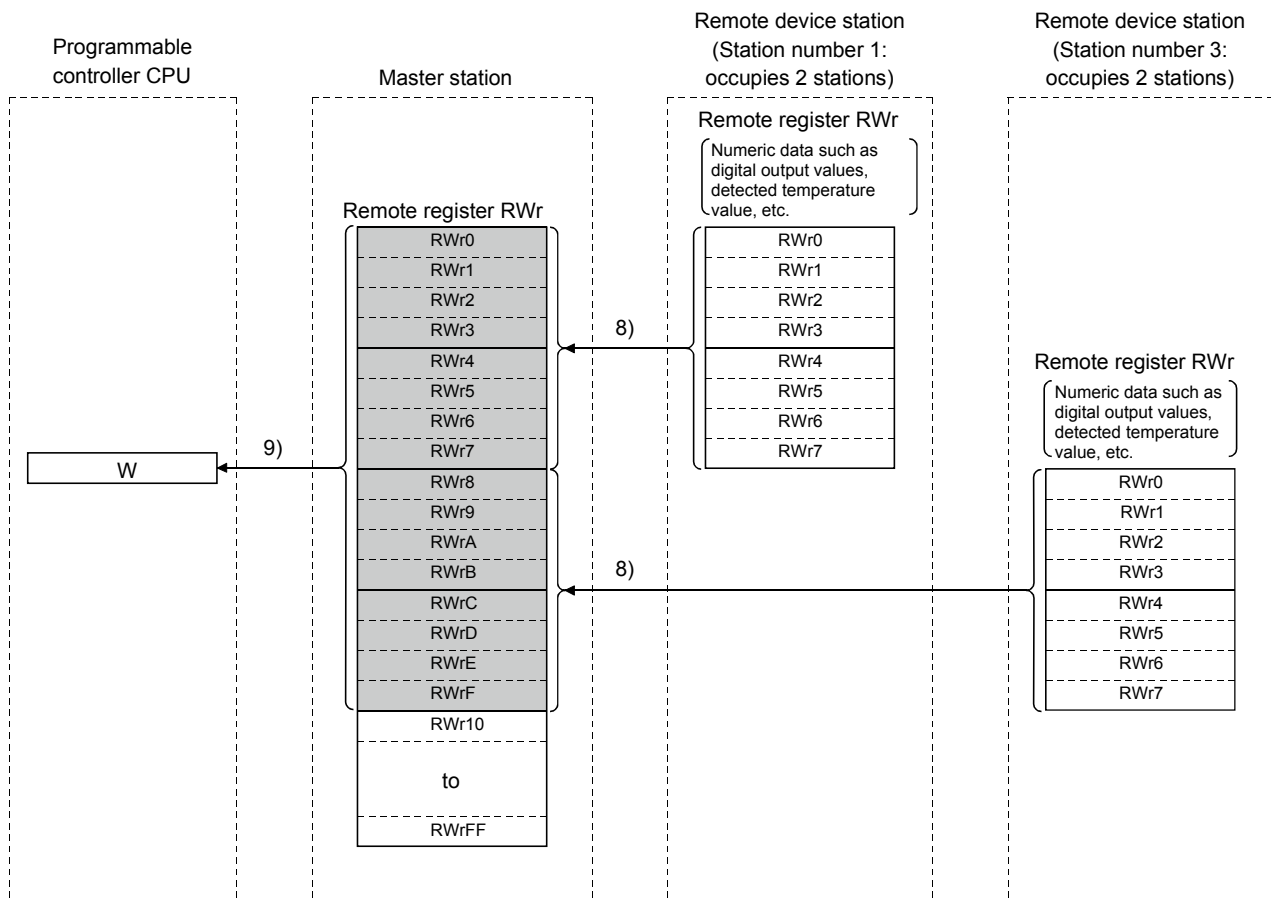
[Remote register RWw when the AJ65BT-64AD is set to station number 1]

Signal direction: master module → AJ65BT-64AD	
Address	Description
RWw0	Averaging process setting
RWw1	CH1 average time, number of times
RWw2	CH2 average time, number of times
RWw3	CH3 average time, number of times
RWw4	CH4 average time, number of times
RWw5	Data format
RWw6	A-D conversion enable/disable setting
RWw7	Not used

* The data content to be written to the remote registers RWw0 to RWwn is predefined for each remote device station.

[Reading from the remote register (RWr)]

- 8) The remote register RWr data of a remote device station is automatically stored in the "remote register RWr" buffer memory of the master station.
- 9) The remote register RWr data of a remote device station stored in the "remote register RWr" buffer memory is stored in the CPU device set with the automatic refresh parameters.



[Remote register RWr when the AJ65BT-64AD is set to station number 1]

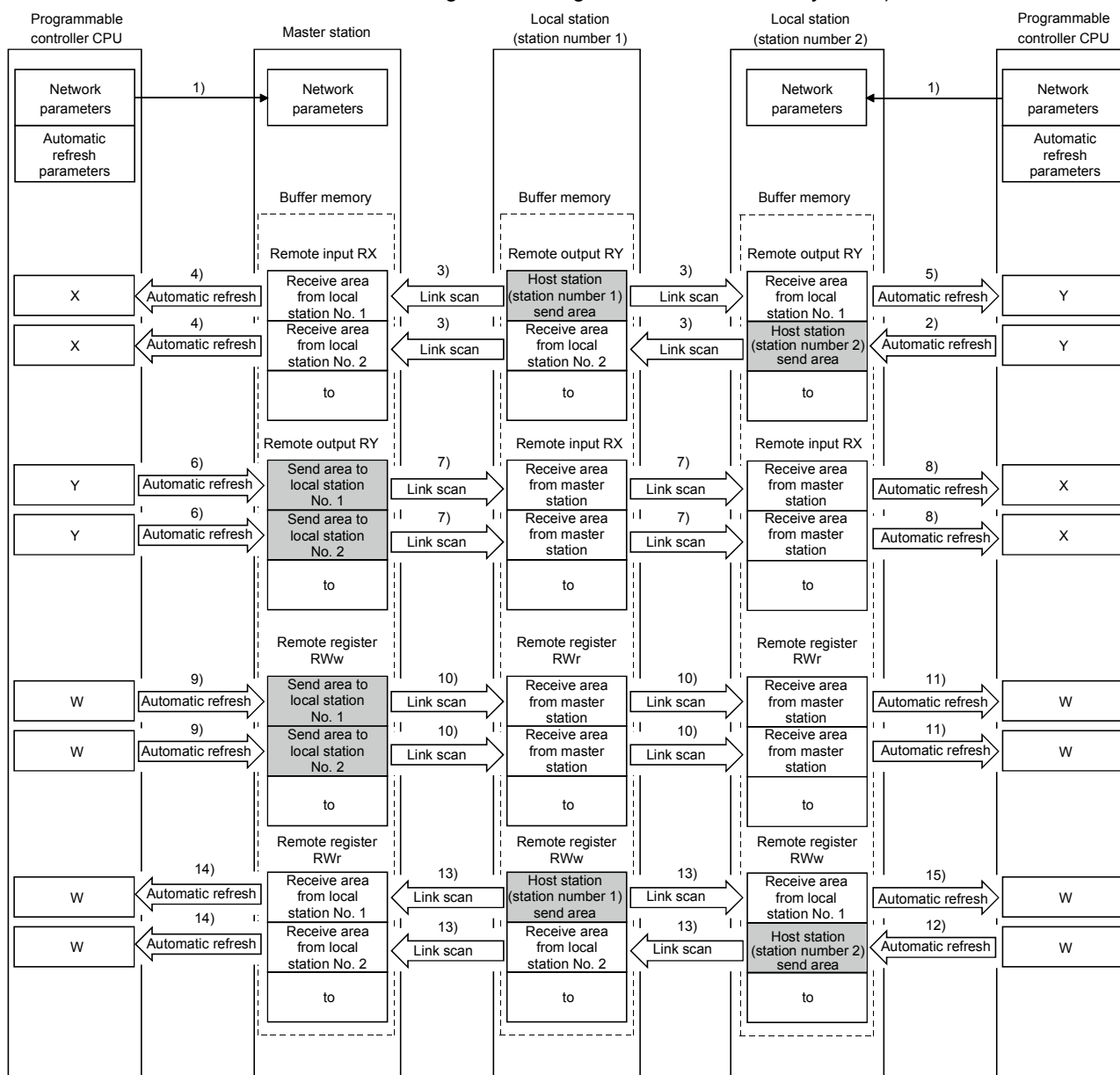
Signal direction: AJ65BT-64AD → Master module	
Address	Description
RWw0	CH1 digital output value
RWw1	CH2 digital output value
RWw2	CH3 digital output value
RWw3	CH4 digital output value
RWw4	Error code
RWw5	Not used
RWw6	
RWw7	

4.2.3 Communication with the local stations

This section explains an overview of the communication between the master and local stations.

(1) Communication between the master and local stations by cyclic transmission

Data communication between programmable controller CPUs can be performed in N:N mode using remote input RX and remote output RY (bit data used in local station systems) as well as remote register RWw and remote register RWr (word data for writing and reading used in local station systems).

**POINT**

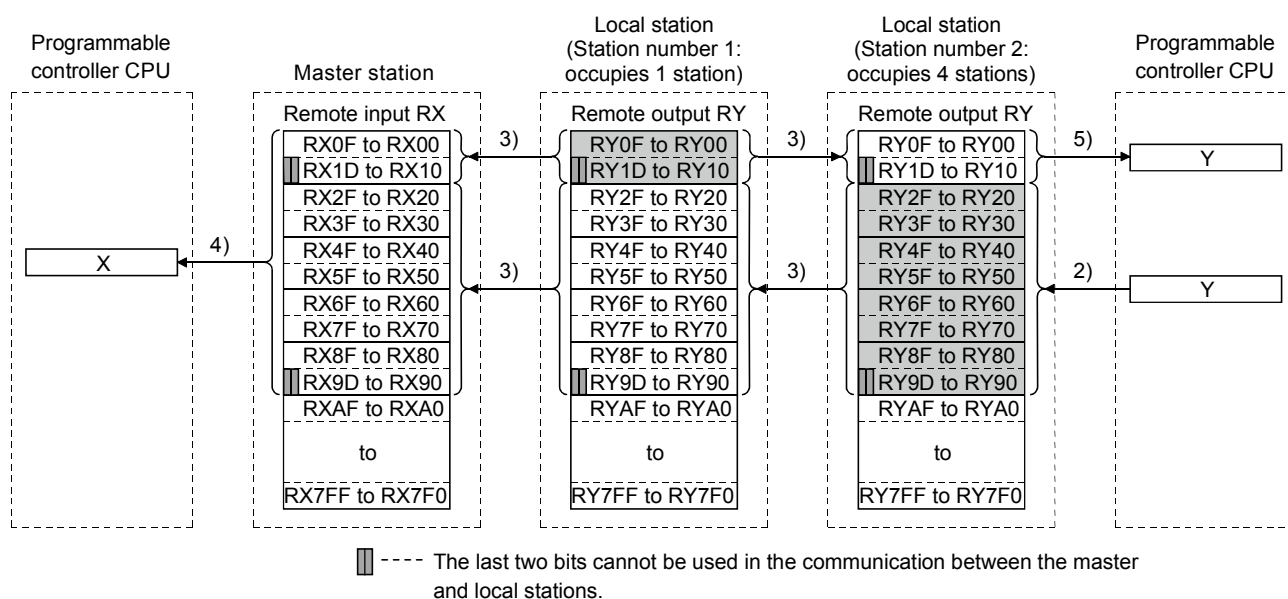
The master station sends only the data for the stations that have started the data link.
The data for the stations that have not started the data link are not sent.

[Data link startup]

- 1) When the programmable controller system is powered on, the network parameters in the programmable controller CPU are transferred to the master station and the CC-Link system starts up automatically.

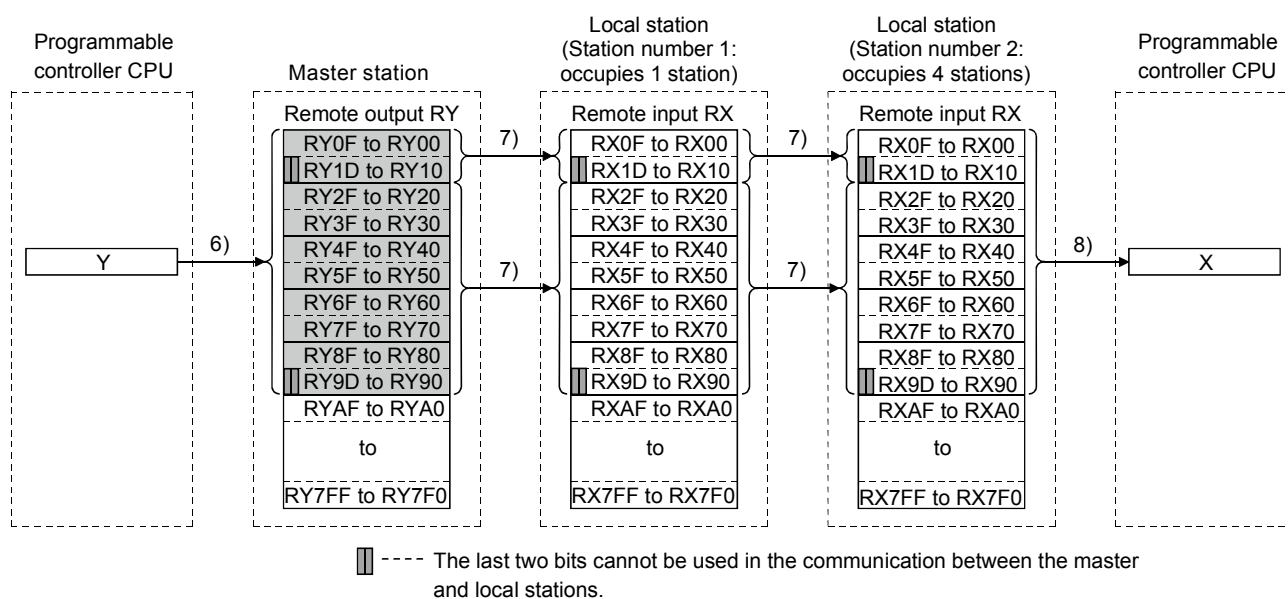
[On/off data from a local station to the master station or other local stations]

- 2) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory of the local station. The remote output RY is used as output data in local station systems.
- 3) The data in the "remote output RY" buffer memory of the local station is automatically stored (for each link scan) in the "remote input RX" buffer memory of the master station and the "remote output RY" buffer memory of other local stations.
- 4) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters. The remote input RX is used as input data in local station systems.
- 5) The input status stored in the "remote output RY" buffer memory is stored in the CPU device set with the automatic refresh parameters.



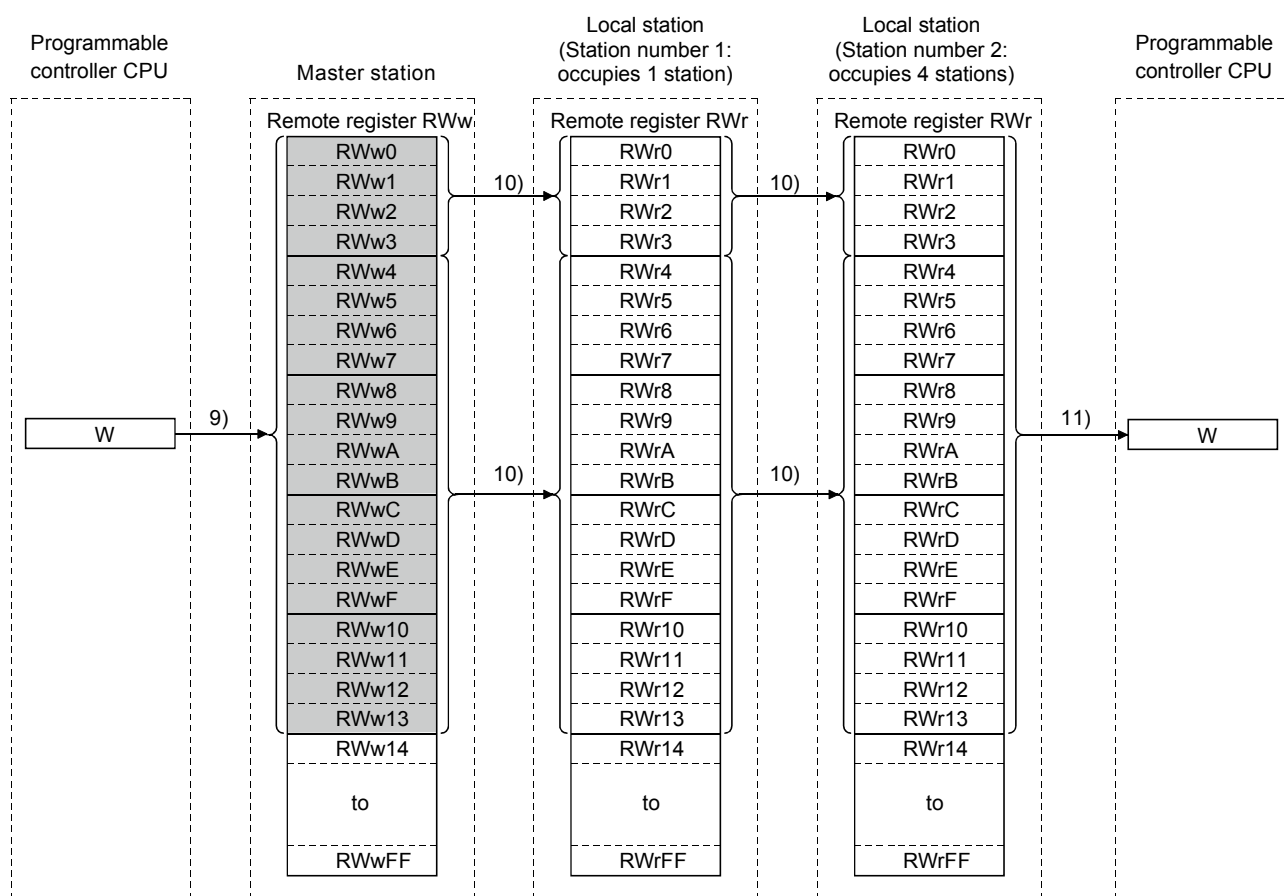
[On/off data from the master station to local stations]

- 6) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory of the master station.
- 7) The data in the "remote output RY" buffer memory is stored automatically (for each link scan) in the "remote input RX" buffer memory of the local station.
- 8) The input status stored in the buffer memory "remote input RX" is stored in the CPU device set with the automatic refresh parameters.



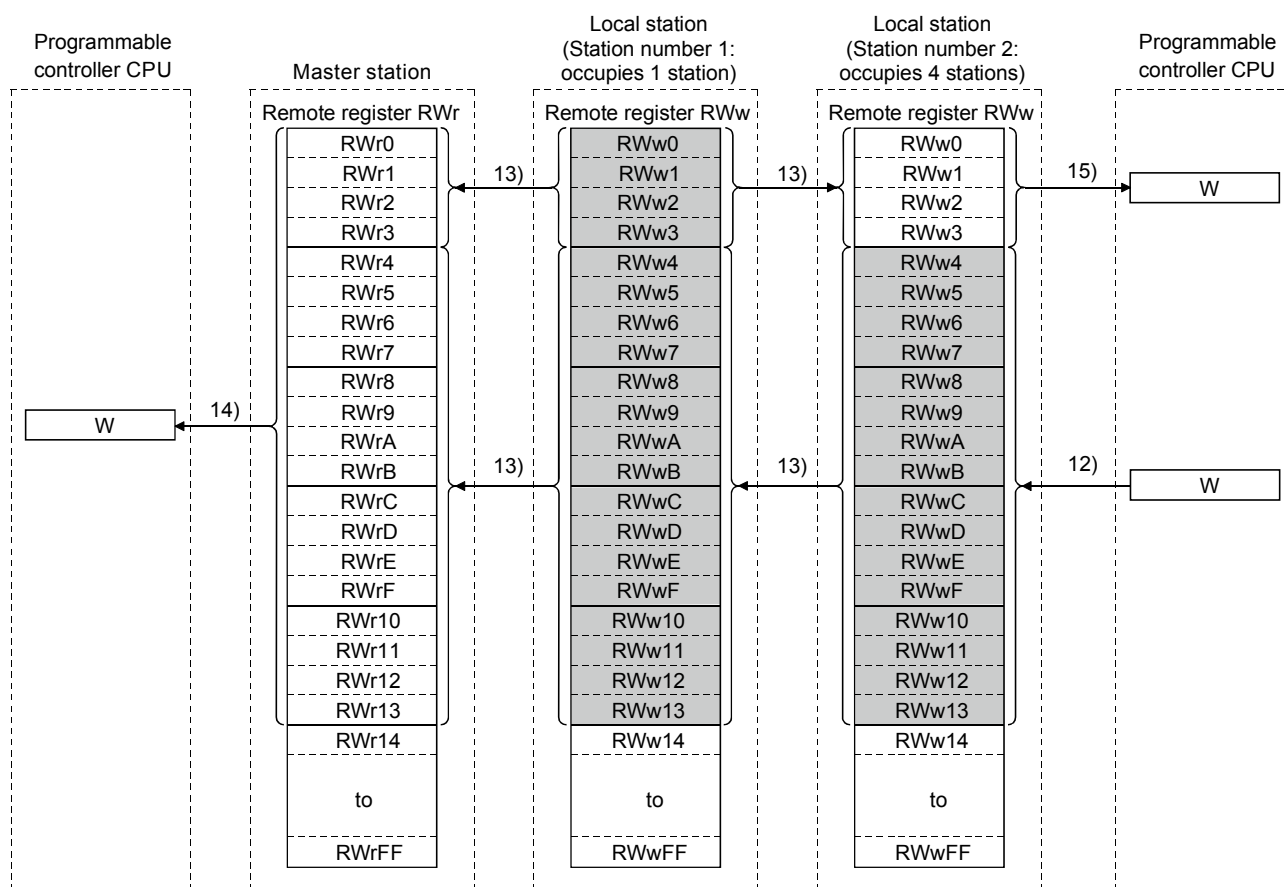
[Word data from the master station to all local stations]

- 9) The word data of the CPU device set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory of the master station. The remote register RWw is used as word data for writing in local station systems.
- 10) The data in the buffer memory "remote register RWw" is stored automatically (for each link scan) in the buffer memory "remote register RWr" of all local stations. The remote register RWr is used as word data for reading in local station systems.
- 11) The word data stored in the buffer memory "remote register RWr" is stored in the CPU device set with the automatic refresh parameters.



[Word data from a local station to the master and other local stations]

- 12) Word data set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory of the local station. However, the data is stored only in the area corresponding to its own station number.
- 13) The data in the "remote register RWw" buffer memory is stored automatically (for each link scan) in the "remote register RWr" of the master station and the "remote register RWw" of other local stations.
- 14) The word data stored in the "remote register RWr" buffer memory is stored in the CPU device set with the automatic refresh parameters.
- 15) The word data stored in the "remote register RWw" buffer memory is stored in the CPU device set with the automatic refresh parameters.

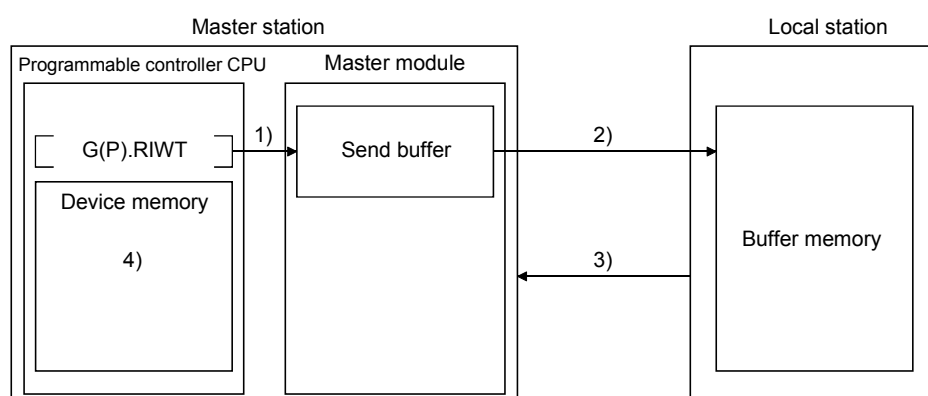


(2) Communication between the master and local stations by transient transmission

Transient transmission sends and receives data in 1 : 1 mode by specifying the opposite party at an arbitrary timing.

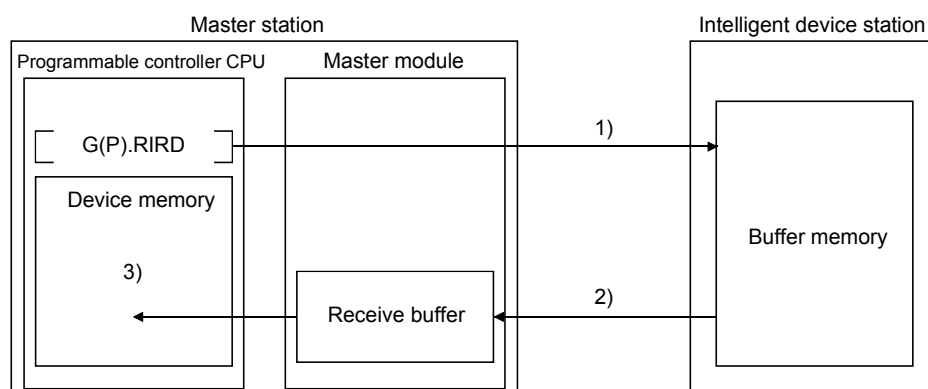
[Writing data to the buffer memory in a local station using the G(P).RIWT instruction]

- 1) Data to be written to the buffer memory in a local station is stored in the send buffer in the master module.
- 2) The data is written to the buffer memory in the local station.
- 3) The local station returns a writing complete response to the master station.
- 4) The devices specified with the G(P).RIWT instruction are turned on.



[Reading data from the buffer memory in a local station using the G(P).RIRD instruction]

- 1) The data in the buffer memory of the local station is accessed.
- 2) The data read is stored in the receive buffer of the master station.
- 3) The data is stored in the device memory of the programmable controller CPU and the devices specified with the G(P).RIRD instruction are turned on.



POINT

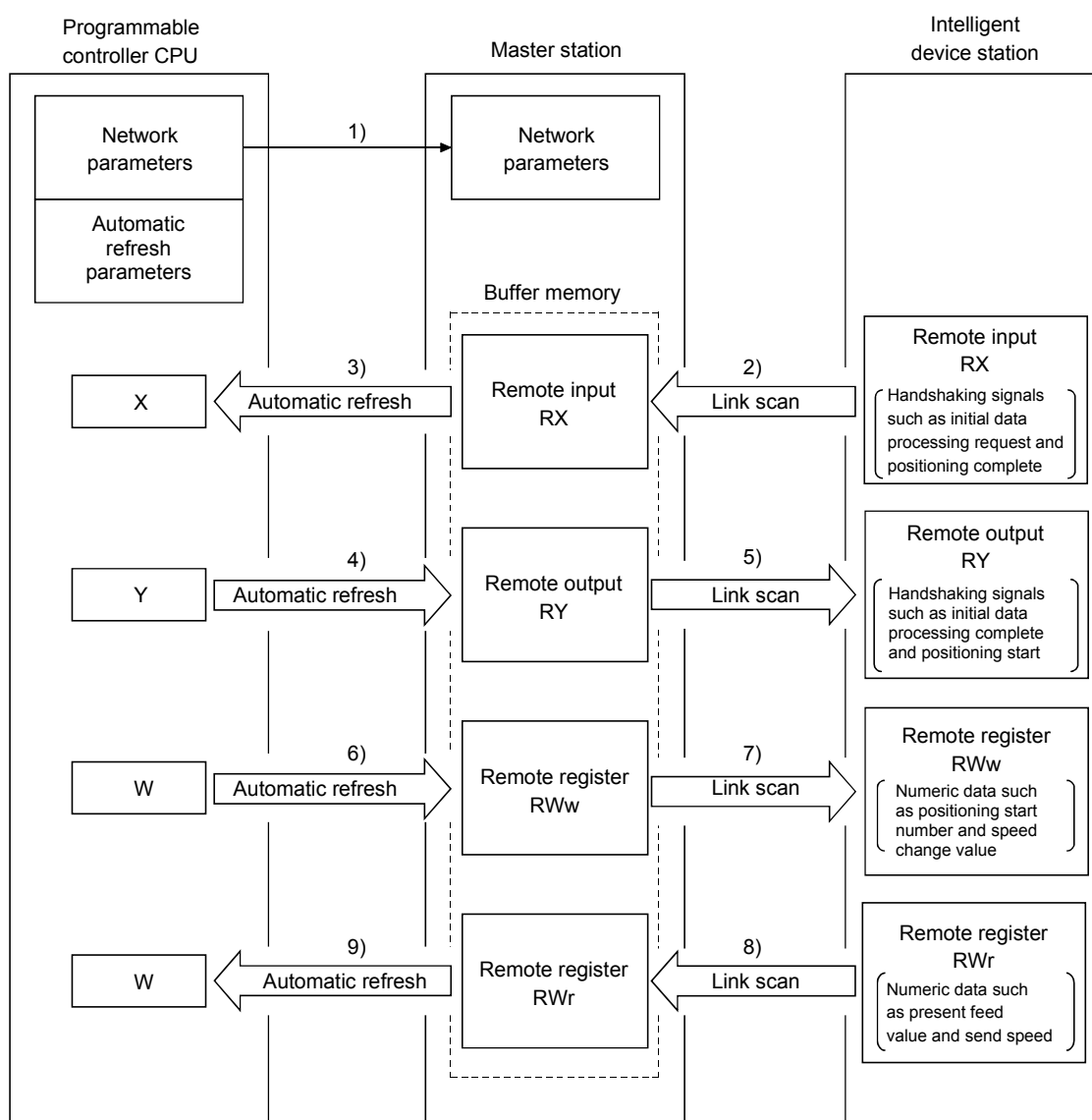
Before performing data communication using transient transmission, the sizes of the send and receive buffers must be set up in the buffer memory of the master station. For more details on setting the sizes of the send and receive buffers, see Section 6.2.

4.2.4 Communication with the intelligent device stations

This section explains an overview of the communication between the master and intelligent device stations.

(1) Communication between the master station and intelligent device stations by cyclic transmission

Handshaking signals with intelligent device stations (positioning complete, positioning start, etc.) are communicated using remote input RX and remote output RX. Numeric data (positioning start number, present feed value, etc.) is communicated using remote register RWw and remote register RWr.

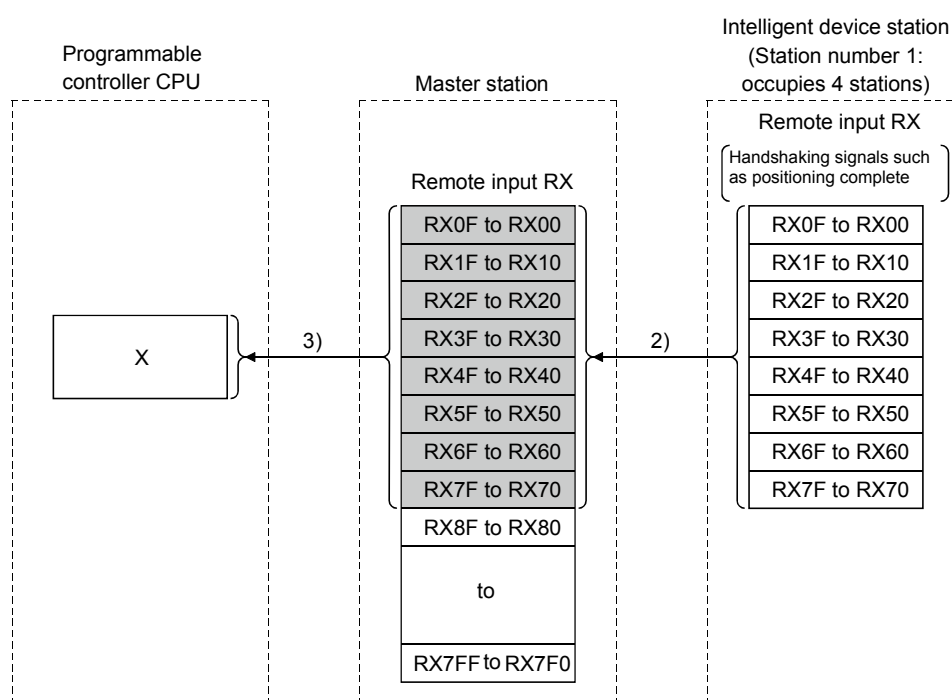


[Data link startup]

- 1) When the programmable controller system is powered on, the network parameters in the programmable controller CPU are transferred to the master station, and the CC-Link system automatically starts up.

[Remote input]

- 2) The remote input RX of an intelligent device station is stored automatically (for each link scan) in the master station's "remote input RX" buffer memory.
- 3) The input status stored in the "remote input RX" buffer memory is stored in the CPU device set with the automatic refresh parameters.

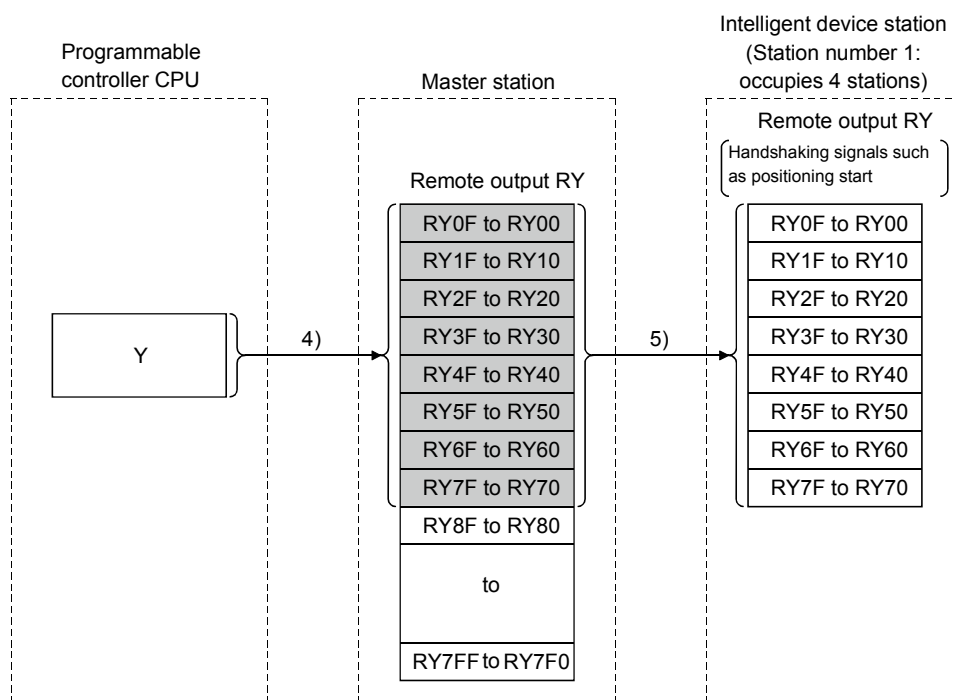


[Remote input RX when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: AJ65BT-D75P2-S3 → Master module	
Device No.	Signal name
RX00	D75P2 ready complete
RX01	Single-axis start complete
RX02	Dual-axis start complete
RX03	Use prohibited
RX04	Single-axis BUSY
RX05	Dual-axis BUSY
RX06	Use prohibited
RX07	Single-axis positioning complete
RX08	Dual-axis positioning complete
to	to

[Remote output]

- 4) The on/off data of the CPU device set with the automatic refresh parameters is stored in the "remote output RY" buffer memory.
- 5) Remote output RY of the intelligent device station is automatically set to on/off (for each link scan) according to the output status stored in the "remote output RY" buffer memory.

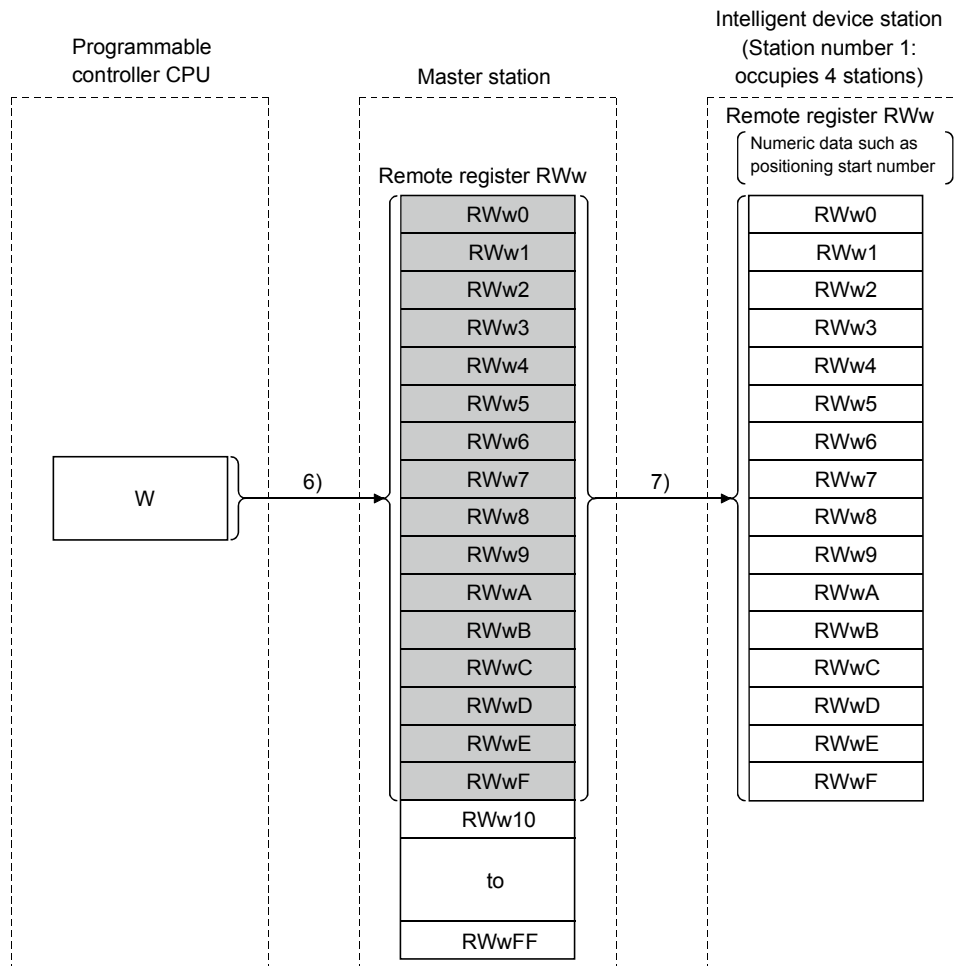


[Remote output RY when the AJ65BT- D75P2-S3 is set to station number 1]

Signal direction: AJ65BT-D75P2-S3 → Master module	
Address	Description
RY01 to RY0F	Use prohibited
RY10	Single-axis positioning start
RY11	Dual-axis positioning start
RY12	Use prohibited
RY13	Single-axis stop
RY14	Dual-axis stop
to	to

[Writing to the remote register (RWw)]

- 6) The transmission data of the CPU device set with the automatic refresh parameters is stored in the "remote register RWw" buffer memory.
- 7) The data stored in the "remote register RWw" buffer memory is automatically sent to the remote register RWw of the intelligent device station.



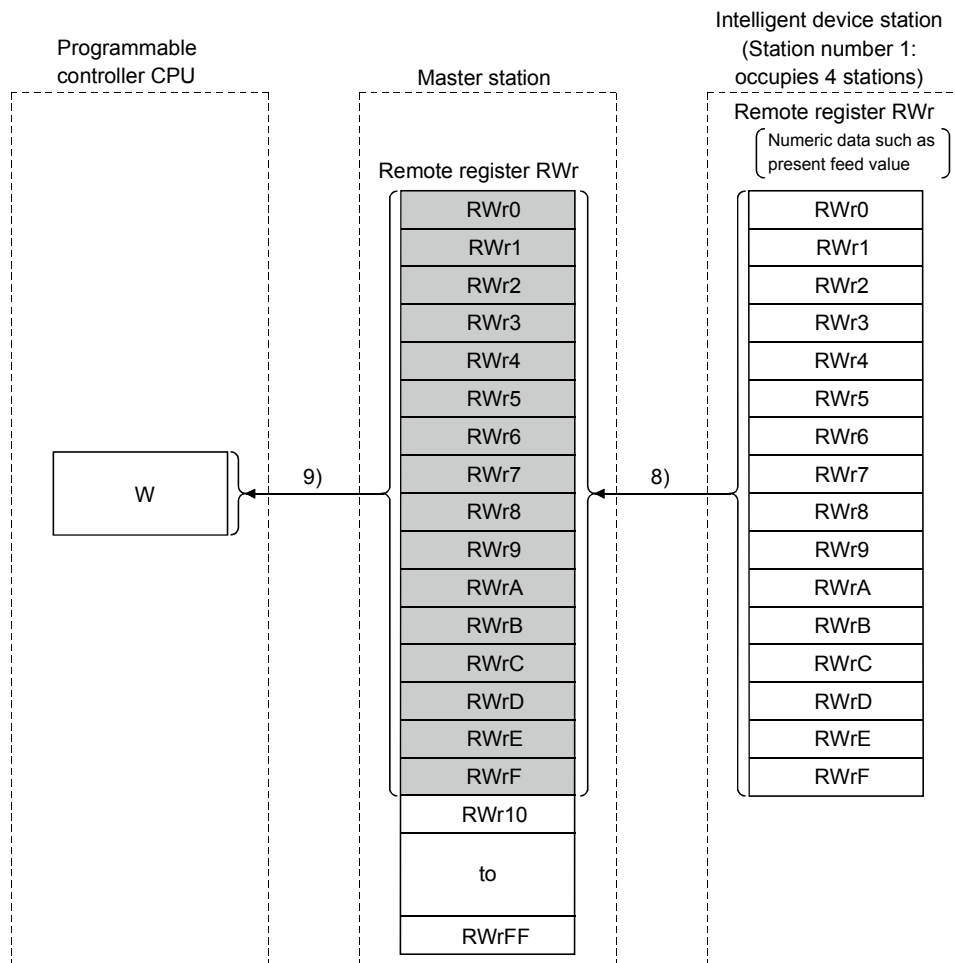
[Remote register RWw when the AJ65BT-D75P2-S3 is set to station number 1]

Signal direction: Master module → AJ65BT-D75P2-S3	
Address	Description
RWw0	Single-axis positioning start number
RWw1	Single-axis override
RWw2	Single-axis new present value
RWw3	
RWw4	Single-axis new speed value
RWw5	
RWw6	Single-axis JOG speed
RWw7	
to	to

* The data content to be written to the remote registers RWw0 to RWwn is predefined for each intelligent device station.

[Reading from the remote register (RWr)]

- 8) The remote register RWr data of the intelligent device station is automatically stored in the "remote register Rwr" buffer memory of the master station.
- 9) The remote register RWr data of the intelligent device station stored in the "remote register RWr" buffer memory is stored in the CPU device set with the automatic refresh parameters.



[Remote register RWr when the AJ65BT-D75P2-S3 is set to station number 1]

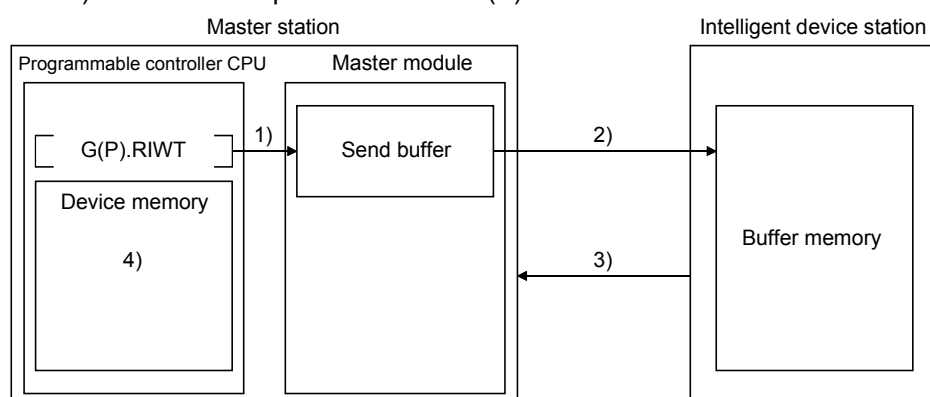
Signal direction: AJ65BT-D75P2-S3 → Master module	
Address	Description
RWr0	Single-axis present feed value
RWr1	
RWr2	
RWr3	
RWr4	Single-axis feed speed
RWr5	Single-axis valid M code
RWr6	Single-axis error number
RWr7	Single-axis warning number
to	Single-axis operating status
	to

(2) Communication between the master and intelligent device stations by transient transmission

Transient transmission sends and receives data in 1 : 1 mode by specifying the opposite party at an arbitrary timing.

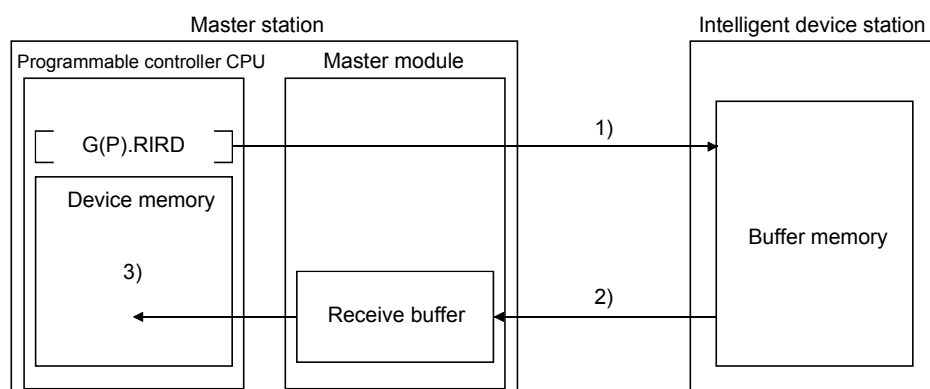
[Writing data to the buffer memory in the intelligent device station using the G(P).RIWT instruction]

- 1) Data to be written to the buffer memory in an intelligent device station is stored in the send buffer in the master module.
- 2) The data is written to the buffer memory in the intelligent device.
- 3) The intelligent device returns a writing complete response to the master station.
- 4) The devices specified with the G(P).RIWT instruction are turned on.



[Reading data from the buffer memory in the intelligent device station using the G(P).RIRD instruction]

- 1) The data in the buffer memory of an intelligent device station is accessed.
- 2) The data read is stored in the receive buffer of the master station.
- 3) The data is stored in the device memory of the programmable controller CPU and the devices specified with the G(P).RIRD instruction are turned on.



POINT

Before performing data communication using transient transmission, the sizes of the send and receive buffers must be set up in the buffer memory of the master station. For more details on setting the sizes of the send and receive buffers, see Section 6.2.

4.2.5 Parameter setting with GX Developer

Using GX Developer makes the setting of the network parameters and automatic refresh parameters easier.

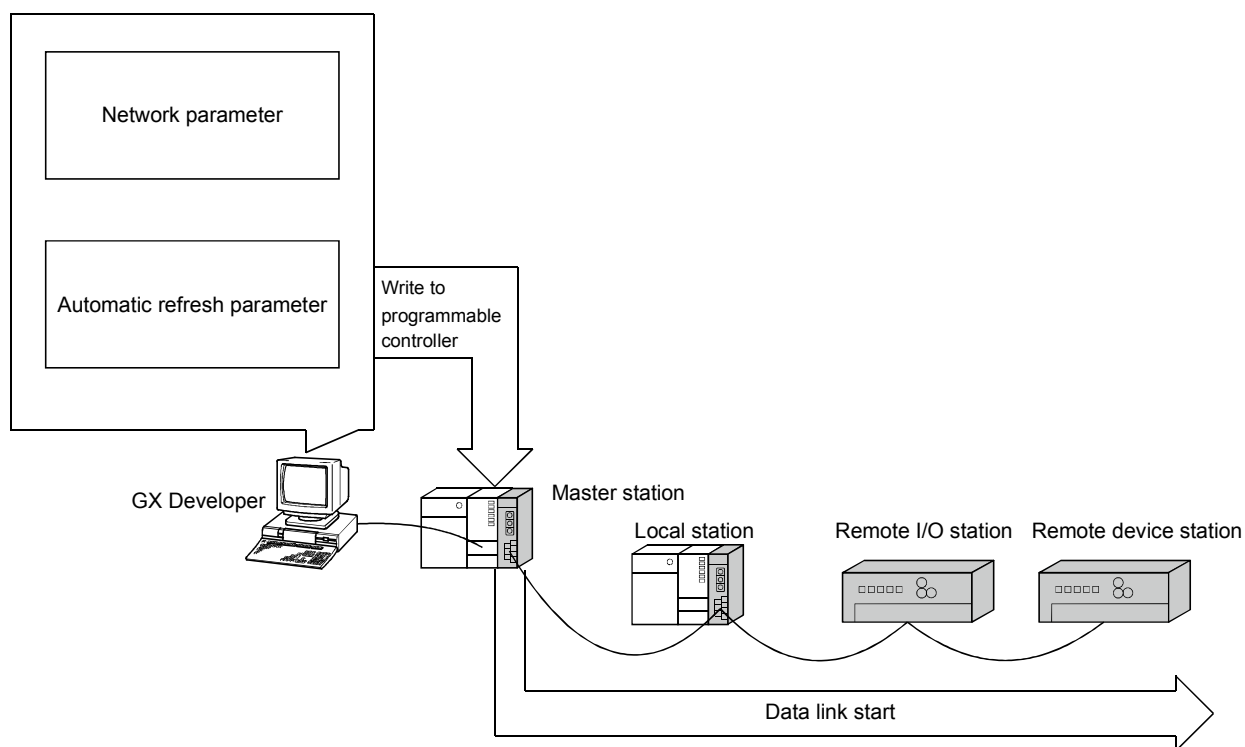
The data link is automatically started if GX Developer is used to set the parameters.

Using GX Developer to set the parameters has the following advantages:

- It is not necessary to write a program for setting the parameters.
- It is possible to perform automatic refresh in the system.

POINT

In case a system includes both a module for which the network parameters are set by GX Developer and a module for which the network parameters are set by the dedicated instruction (G(P).RLPASET), the module for which the network parameters are set by the G(P).RLPASET instruction should not be included in the "No. of boards in module" setting of GX Developer.

**[Setting method]**

For more details on the setting, see Sections 6.3 to 6.6.

4.2.6 Parameter setting with dedicated instruction

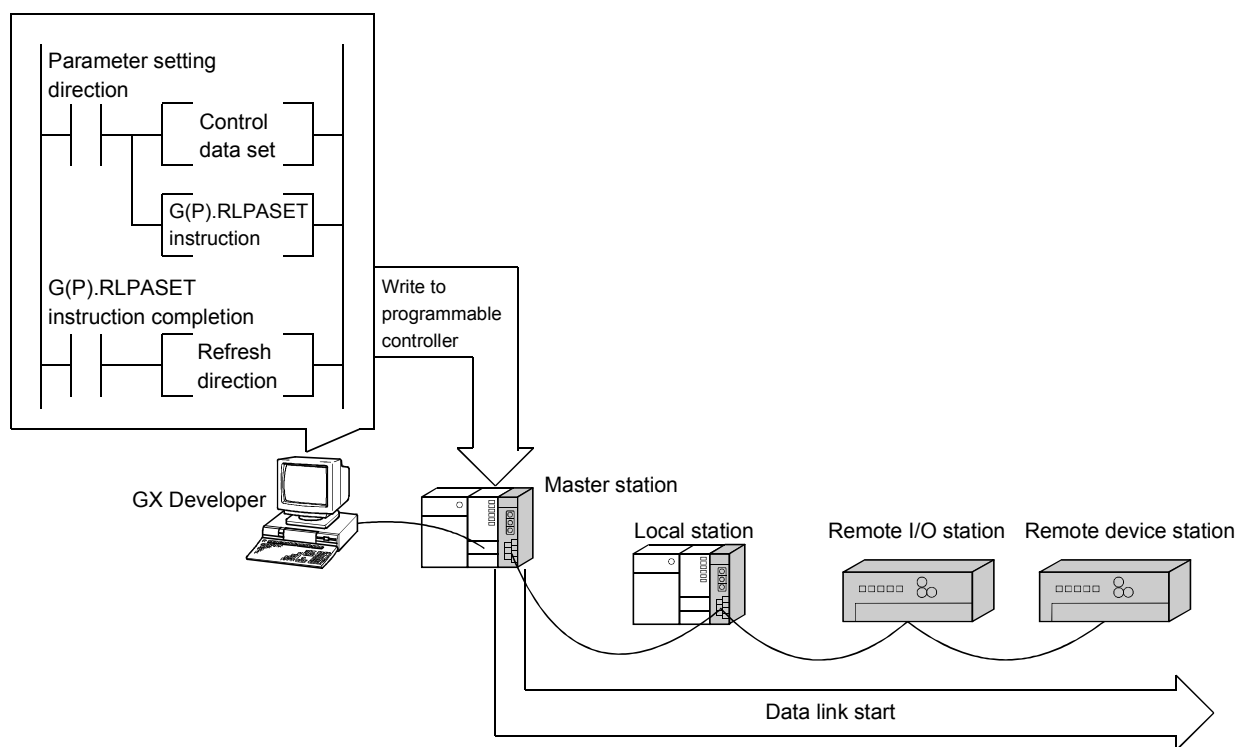
It is possible to use the G(P).RLPASET instruction to set the network parameters of the master station and start the data link.

Using the G(P).RLPASET instruction to set the parameters has the following advantages:

- It is possible to mount nine or more QJ61BT11N modules (see Section 2.2.1 for details about the number of CPUs that can be mounted).
- It is possible to change the network parameter settings while the programmable controller CPU is running.

POINT

It is recommended to use GX Developer to set the parameters when the number of QJ61BT11N mounted is 8 or less.



(1) Setting method

For more details on the setting, see Section 6.7.

For the G(P).RLPASET instruction, see Appendix 2.8.

(2) Precautions when using the G(P).RLPASET instruction to set the network parameters

- The remote I/O net mode cannot be used.
The module operates in remote net mode.
- If it is necessary to change the network parameters while the programmable controller CPU is running and the data link is being performed, the data link should be stopped once using SB0002 (data link stop).

- (c) It is necessary to set I/O assignments for modules whose network parameters are set by the G(P).RLPASET instruction.
In addition, do not use GX Developer to set the network parameters and automatic refresh parameters for modules whose network parameters are set by the G(P).RLPASET instruction.
If the G(P).RLPASET instruction is used to set network parameters for modules whose network parameters and automatic refresh parameters have been set by GX Developer, the G(P).RLPASET instruction will complete with an error and the network parameter settings performed by the G(P).RLPASET instruction become invalid.
- (d) If the switch setting of an intelligent functional module for which an I/O assignment is set, has not been performed or is wrong, the G(P).RLPASET instruction completes with an error.
However, the QJ61BT11N with the smallest head I/O number seen from the programmable controller CPU starts CC-Link automatically.
- (e) Do not use GX Developer for setting the network parameters, if the network parameters of all the modules are set by the G(P).RLPASET instruction.
Change the "No. of boards in module" setting to blank if the network parameters have been already set by GX Developer.
Moreover, in case a system includes both a module for which the network parameters are set by GX Developer and a module for which the network parameters are set by the G(P).RLPASET instruction, the module for which the network parameters are set by the G(P).RLPASET instruction should not be included in the "No. of boards in module" setting of GX Developer.
- (f) After executing the G(P).RLPASET instruction, turn on SB0003 (refresh instruction) to refresh cyclic data.
- (g) Automatic refresh is not performed.
The devices should be refreshed via the FROM/TO instruction or the G device.
- (h) It is not possible to set input status from a data link faulty station.
Inputs from a data link faulty station are cleared.
- (i) The standby master function is not available.

- (j) In order to change the parameter setting method, turn the power supply to the programmable controller system off and back on, or reset the programmable controller CPU.

The following table shows how the programmable controller CPU operates when changing the parameter setting method without turning the power supply to the programmable controller system off and back on, or resetting the programmable controller CPU.

Parameter setting method (before change)	Parameter setting method (after change)	Error notification method	Continuity of data link
Parameter setting with GX Developer	Parameter setting with the G(P).RLPASET instruction	The G(P).RLPASET instruction completes with an error.	Data link continues.
Parameter setting with the G(P).RLPASET instruction	Parameter setting with GX Developer	LINK.PARA.ERR occurs in the programmable controller CPU.	Data link stops. *

* Note that data link continues to be performed if the designation of operation at CPU down ((S1) + 5) of the G(P).RLPASET instruction is set to "Continue."

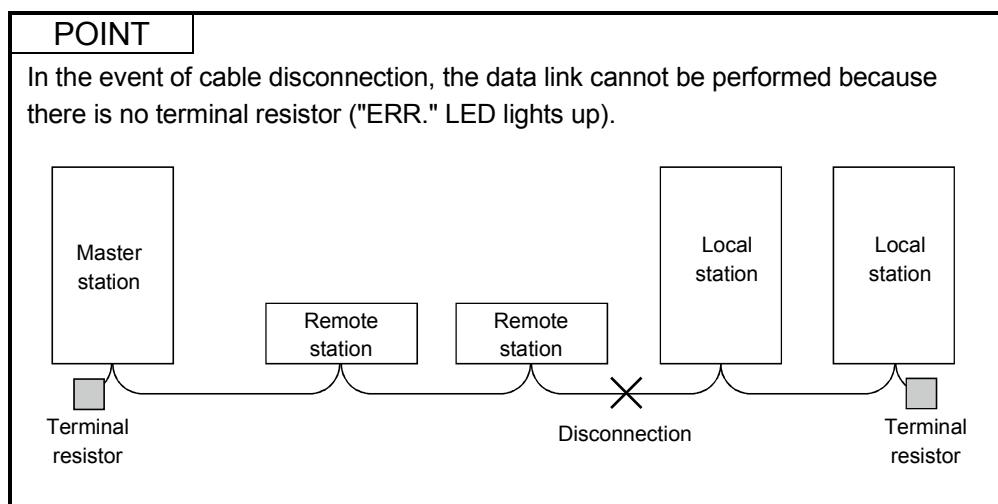
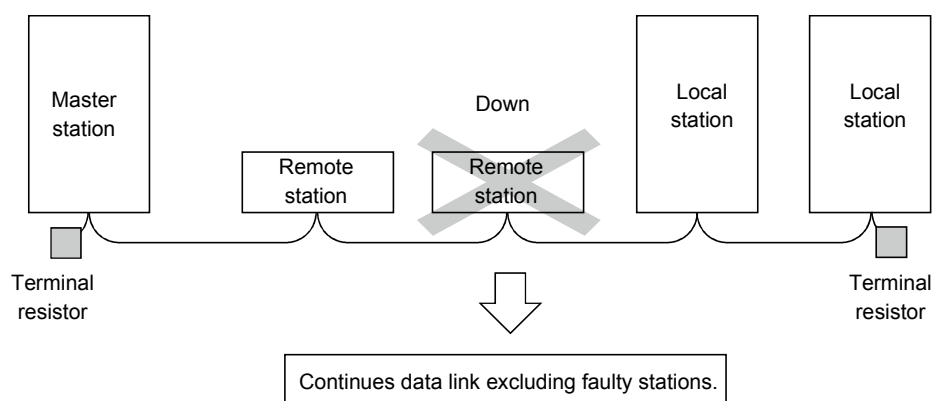
- (k) When the programmable controller CPU is switched from RUN to STOP, RY of the master station and outputs to the remote, local, intelligent device and standby master stations are retained (for the QJ61BT11N whose first 5 digits of serial number is "09111" or earlier).

4.3 Functions for Improving System Reliability

This section explains the functions for improving the reliability of the CC-Link system.

4.3.1 Disconnecting data link faulty stations and continuing the data link with only normal stations (Slave station cut-off function)

This function disconnects remote stations, local stations, intelligent device stations, and a standby master station that have become data link faulty due to power off, and continues the data link among normal remote stations, local stations, intelligent device stations, and standby master station (no setting is required).



4.3.2 Automatically reconnecting a disconnected data link faulty station when it returns to normal (Automatic return function)

This function allows remote stations, local stations, intelligent device stations, and a standby master station that have been disconnected from the data link due to power off to automatically reconnect to the data link when they return to the normal status.

[Setting method]

Set the "Automatic reconnection station count" value in the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.5.

4.3.3 Continuing the data link when an error occurs in the master station programmable controller CPU

(Data link status setting when the master station programmable controller CPU has an error)

This function sets the data link status when the master station programmable controller CPU falls into an error that stop the operation. It is possible to continue the data link among the local stations.

POINT
(1) The data link continues when the master station programmable controller CPU falls into an "error that stops the operation".
(2) If a standby master station is being set, the data link will not continue when the master station programmable controller CPU is down even when the data link status at CPU down is set to "Continue". The standby master function overrides and the data link control is transferred to the standby master station.

[Setting method]

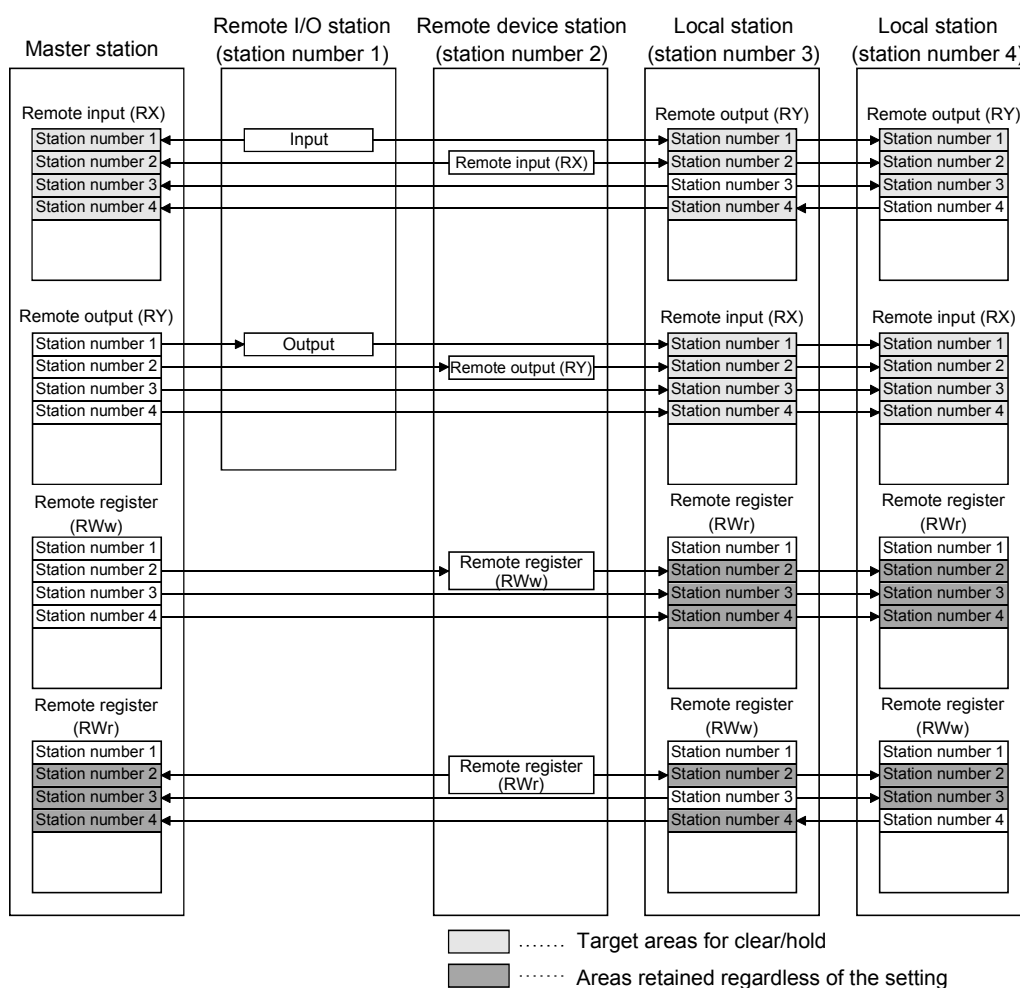
Set the above data link status with the "PLC down select" value in the network parameters using GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

4.3.4 Retaining the device status of a data link faulty station (Setting the status of input data from a data link faulty station)

This function sets the input (receiving) data from a data link faulty station.

(1) Applicable input (receiving) data

The following shows the applicable buffer memory areas.



The remote input RX in the master station and the remote input RX and remote output RY in local stations either clear or retain data from faulty stations according to the setting. The remote register RWr in the master station and the remote register RWw and remote register RWr in local stations retain data from faulty stations regardless of the setting.

POINT

When the data link faulty station is set as an error invalid station, input data (remote input RX) from that station is retained regardless of the setting.

(2) Setting method

Set the "Operational setting" value in the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

4.3.5 Clearing data in case of programmable controller CPU STOP (Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP)

This function compulsorily clears output (send) data to slave stations when the programmable controller CPU comes to STOP.

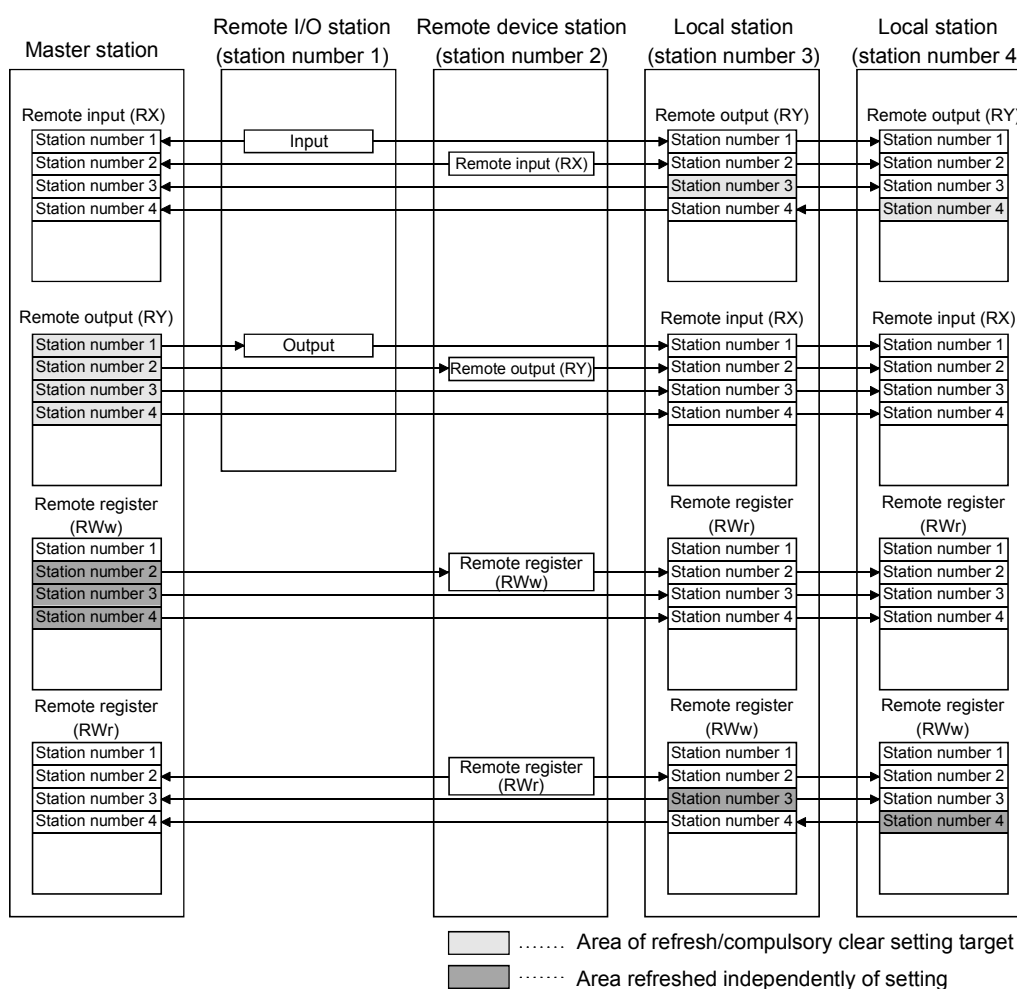
Remote output RY refresh device setting in the automatic refresh parameter dialog box provides the following choices.

- When "Y" is specified, the remote output RY is cleared regardless of the parameter setting.
- When specifying any device other than "Y" (e.g. M or L), make parameter setting whether the remote output RY will be refreshed or compulsorily cleared.

When using GX Developer for setting, use Version 8.03D or later.

(1) Target output (send) data

The following shows the applicable buffer memory areas.



The remote output RY is refreshed or compulsorily cleared according to the setting when the programmable controller CPUs for the master and local stations come to STOP.

The remote input RX, remote register RWw and remote register RWr are refreshed regardless of the setting when the programmable controller CPUs for the master and local stations come to STOP.

POINT
(1) Specifying compulsory clear disables compulsory output to slave stations at CPU STOP using GX Developer.
(2) This setting is also valid when the TO instruction is used for RY refresh.

(2) Setting method

Set the "Operational setting" value in the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

4.3.6 Continuing the data link even when the master station is faulty (Standby master function)

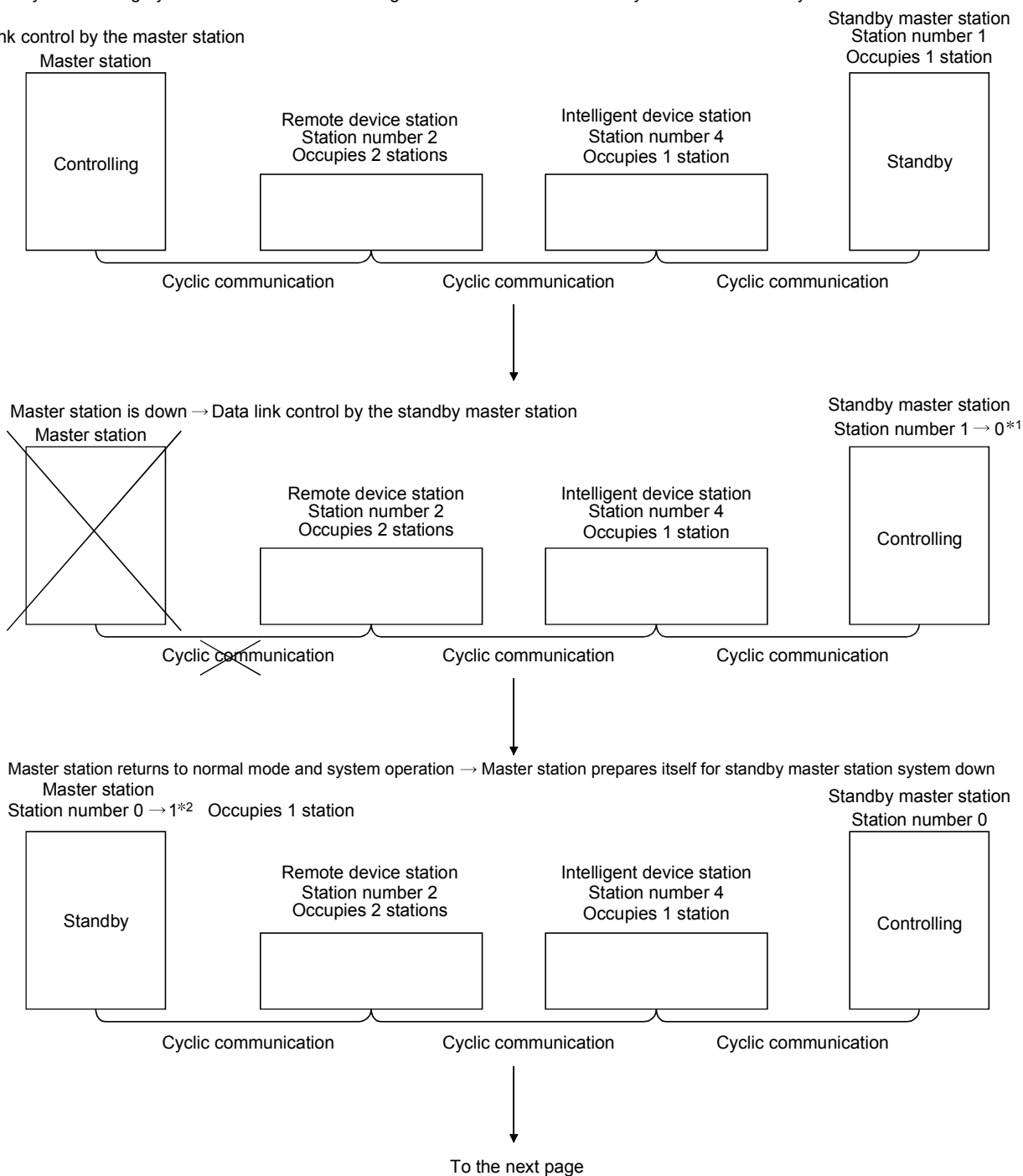
This function enables the data link to continue working by switching to a standby master station (meaning a backup station for the master station) if a system down occurs in the master station due to a malfunction in the programmable controller CPU or power supply.

The master station can return to normal mode and to system operation as the standby master station, even during data-link control by the standby master station, thus preparing itself for a standby master station system down (master station duplex function).

Controlling: Controlling the data link of the CC-Link system

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

Data link control by the master station

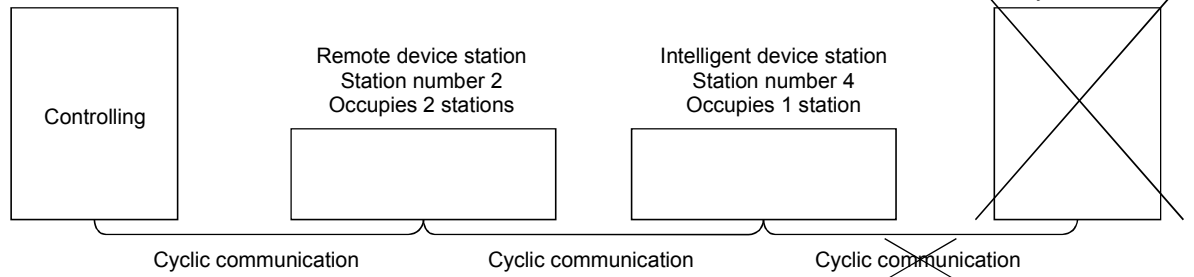


*1: When the master station becomes faulty and the data link control is transferred to the standby master station, the station number of the standby master station becomes "0".

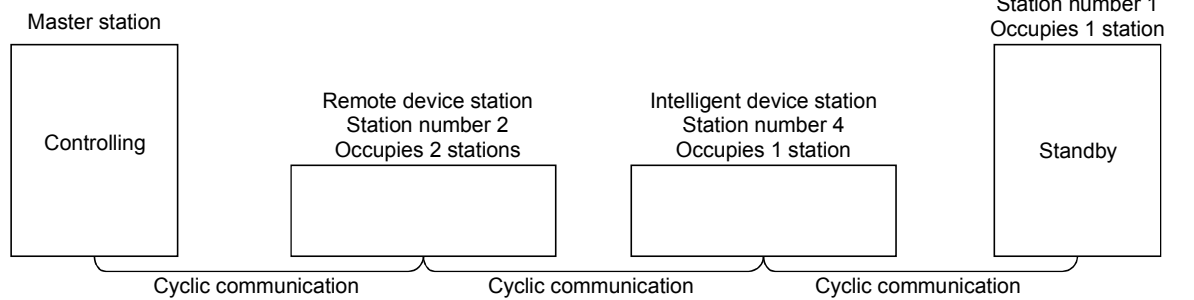
*2: When the master station returns to system operation as a standby master station, the station number of the master station becomes the one specified in the "Standby master station number" in the network parameters.

Continued from the previous page

Problem occurs in the standby master station → Data link control by the master station

Master station
Station number 1 → 0

Standby master station returns to normal mode and system operation → Standby master station prepares itself for master station system down

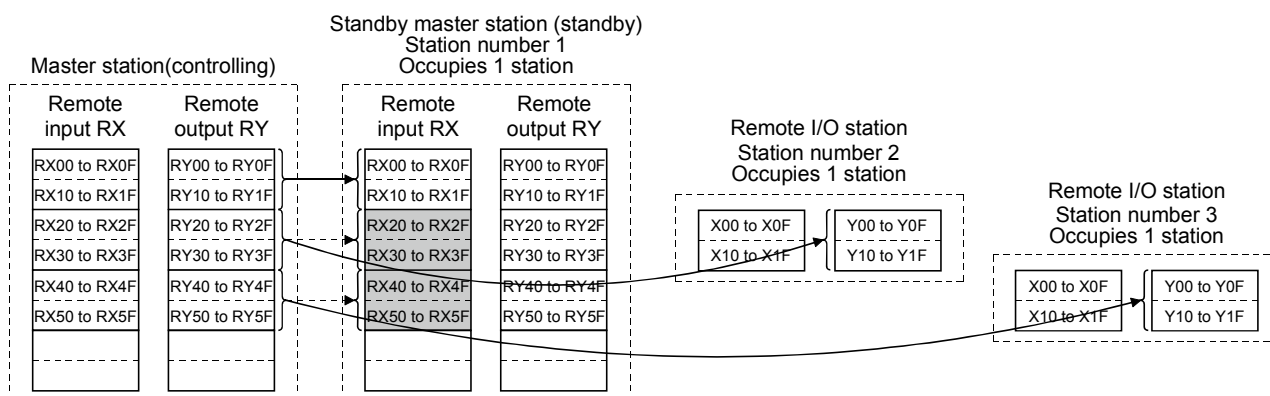


(1) Overview of link data transmission when the standby master function is used

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

(a) When the master station controls the data link

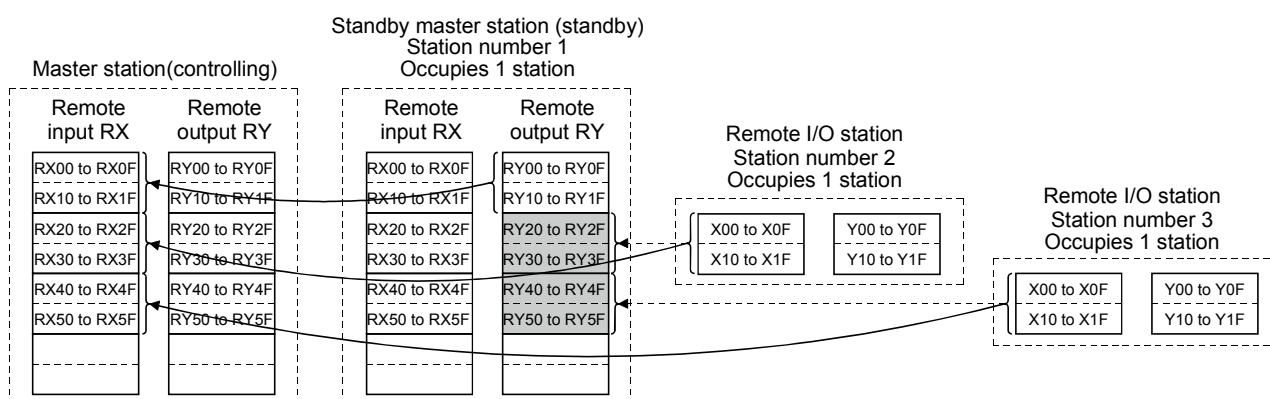
1) Master station output



Data sent from the master station to the remote input RX and remote register RWr in the standby master station (shown by the shaded areas in the figure above) is used as output data when the master station becomes faulty; it should be saved in another device using the sequence program.

When the master station becomes faulty, the saved data is transferred to the remote output RY and remote register RWw in the standby master station using the sequence program.

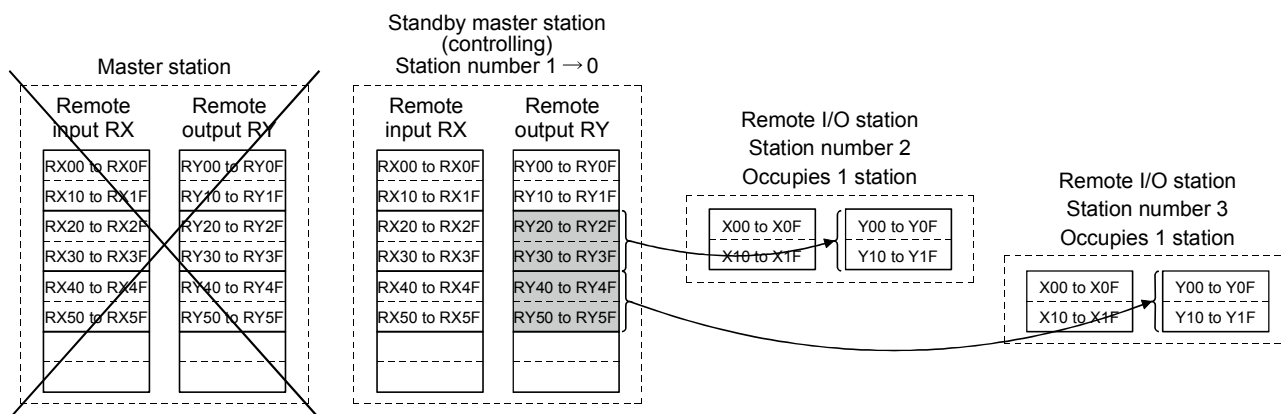
2) Master station input



Data sent to the remote output RY and remote register RWw in the standby master station is used as input data by the standby master station when local stations are operating; thus, it does not need to be saved in another device.

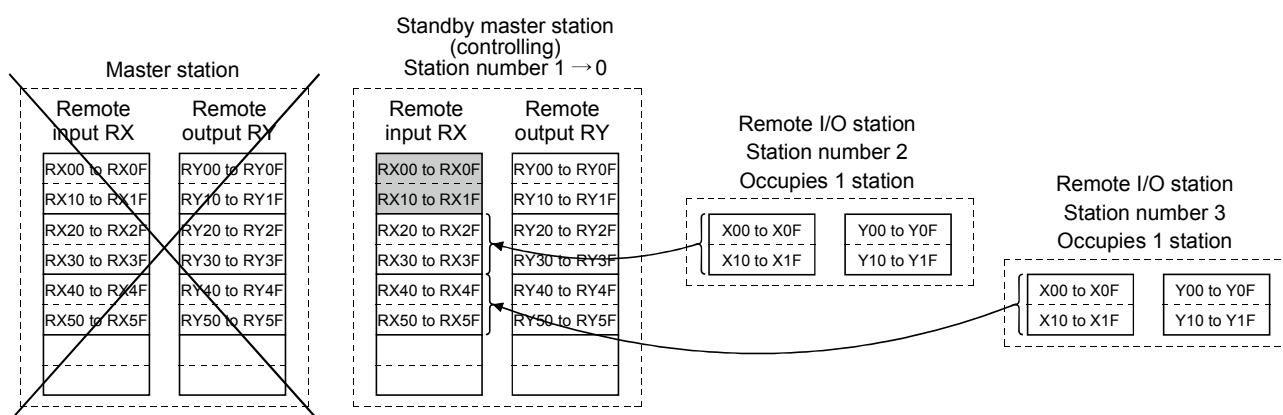
- (b) When the master station is faulty and the standby master station is controlling the data link

1) Standby master station output



Data sent to the remote output RY and remote register RWw in the standby master station by the sequence program is sent to other stations as output data.

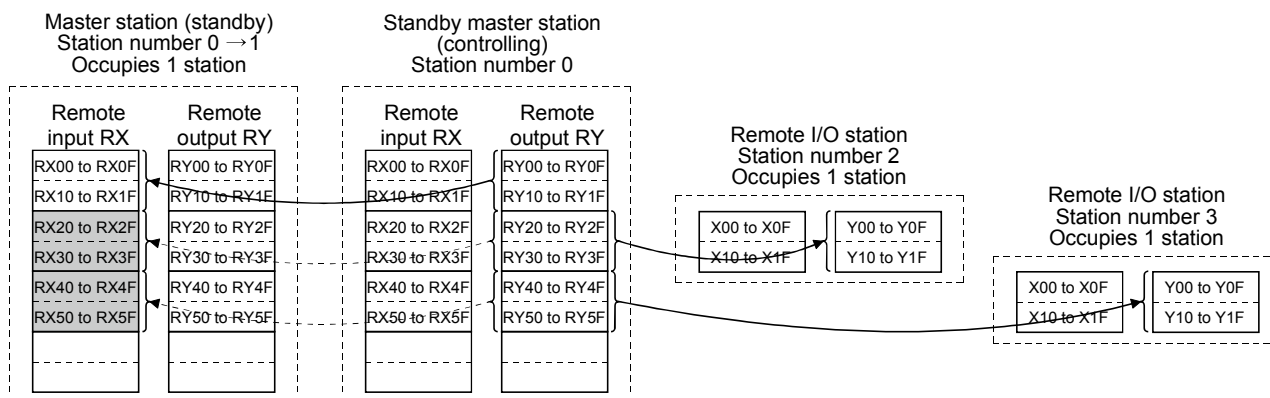
2) Standby master station input



Data in the shaded areas in the standby master station is either input or retained according to the "Data link faulty station setting" in the network parameters.

- (c) When the master station has returned to system operation and the standby master station is controlling the data link

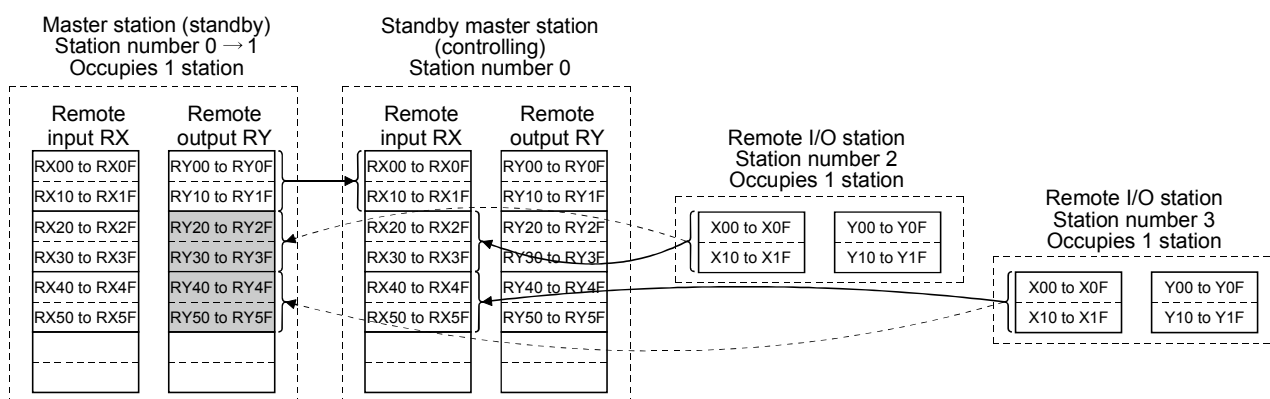
1) Standby master station output



Data sent from the standby master station to the remote input RX and remote register RW_r in the standby master station (shown by the shaded areas in the figure above) is used as output data when the master station becomes faulty; it should be saved in another device using the sequence program.

When the standby master station becomes faulty, the saved data is transferred to the remote output RY and remote register RW_w in the master station using the sequence program.

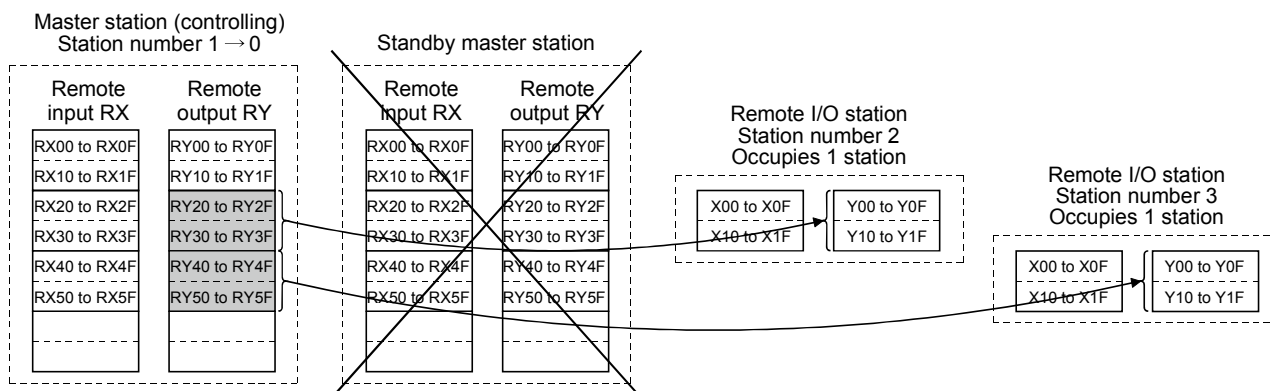
2) Standby master station input



Data sent to the remote output RY and remote register RW_w in the master station is being used as input data by the master station when local stations are operating; thus, it does not need to be saved in another device.

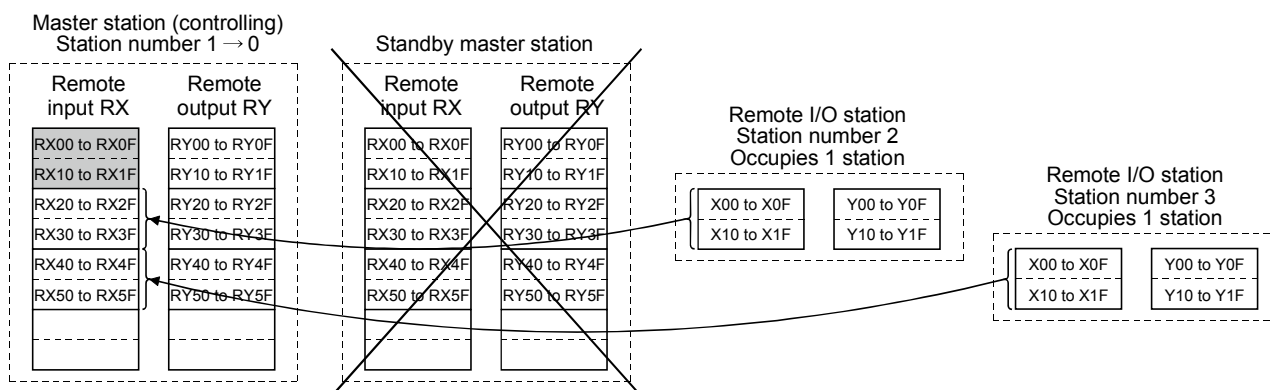
- (d) When the standby master station becomes faulty and the master station controls the data link

1) Master station output



Data sent to the remote output RY and remote register RWw in the master station by the sequence program is sent to other stations as output data.

2) Master station input



Data in the shaded areas in the master station is either input or retained according to the "Operational settings" in the network parameters.

(2) Setting method

Perform the setting using the GX Developer.

(a) Setting the master station

First, set "Type" in the network parameters.

Master station that was down returns to system operation: Master station (Duplex function)

Master station that was down does not return to system operation: Master station

Next, set the "Standby master station No." of the network parameter.

Setting range: 1 to 64 (blank means no specification for standby master station)

Default : blank (no specification for standby master station)

Start I/O No	1
Operational setting	Operational settings
Type	Master station(Duplex function) ▼
Master station data link type	PLC parameter auto start ▼
Mode	Remote net(Ver.1 mode) ▼
All connect count	3
Remote input(RX)	X1000
Remote output(RY)	Y1000
Remote register(RWri)	w0
Remote register(RWw)	w100
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWri)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(Sw)	Sw0
Retrv count	3
Automatic reconnection station count	1
Stand by master station No.	1
PLC down select	Stop ▼
Scan mode setting	Asynchronous ▼
Delay information setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

(b) Setting the standby master station

Set "Type" in the network parameters to "Standby master station".

Set the mode according to the mode setting of the master station.

Start I/O No	1
Operational setting	Operational settings
Type	Stand by master station ▼
Master station data link type	▼
Mode	Remote net(Ver.1 mode) ▼
All connect count	
Remote input(RX)	X1000
Remote output(RY)	Y1000
Remote register(RWri)	w0
Remote register(RWw)	w100
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWri)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(Sw)	Sw0
Retrv count	
Automatic reconnection station count	
Stand by master station No.	
PLC down select	▼
Scan mode setting	▼
Delay information setting	
Station information setting	
Remote device station initial setting	
Interrupt setting	Interrupt settings

(3) Precautions on using the standby master function

- (a) Only one standby master station exists in a single data link system.
- (b) If an error is detected at the master station in the initial status (before parameter communication starts), switching to the standby master station will not be executed.
- (c) When the master station becomes faulty, the data link control will automatically be transferred to the standby master station, but the refresh instruction of the cyclic data will not be issued. Specify the cyclic data refresh using the sequence program. Once specified, the information prior to the error detection at the master station will be output to each station.
- (d) When the data link is being controlled by the standby master station, the master station's parameters cannot be updated.
- (e) An error (error code: B39AH) occurs at the standby master station if there is a difference between the station number setting of the station number setting switches of the standby master station and the station number setting of the network parameter "standby master station number" of the master station. If an error has occurred, change the parameter setting of the master station or the station number setting switch setting of the standby master station, and then reset the programmable controller CPU of the standby master station.
- (f) If the terminal block of the master station is removed and then replaced in its original position without turning the power off when the master station is controlling the data link, both the master and standby master stations operate as master stations. An error occurs since the data link control has been transferred to the standby master station ("ERR." LED lights up).
- (g) When the master station becomes faulty and the data link control is transferred to the standby master station, the "ERR." LED of the standby master station flashes. (This is because the station number of the standby master station will change from the one set with a parameter to "0" and the standby station becomes nonexistent. Data link itself is performed normally.) To avoid this situation, set the standby master station to be an error invalid station.
- (h) The number and range of devices that will be saved by the sequence program among the data sent from (the station operating as) the master station to (the station operating as) the standby station may differ according to the system used.

(4) Link special relays/registers (SB and SW) relating to the standby master function

The following explains the link special relays and registers relating to the standby master function. These are stored in the buffer memory.

When the standby master station is controlling the data link, its applicability is basically identical to that of the master station. When the standby master station is operating as a local station, its applicability is identical to that of the local station.

(a) Link special relays (SB)

The link special relays (SB) relating to the standby master function are as follows : The figures in parentheses in the number column indicate buffer memory addresses and bit locations.

Example: When the buffer memory address is 5E0H and the bit location is 0: (5E0H, b0)

Table 4.5 List of link special relays relating to the standby master function (1/2)

Number	Name	Description	Applicability (○: Applicable, ×: Not applicable)		
			Master station	Local station	Offline
SB0001 (5E0H, b1)	Refresh instruction at standby master switching	Gives refresh instruction for cyclic data after the data link control is transferred to the standby master station. 0: No instruction 1: Instructed	○	×	×
SB000C (5E0H, b12)	Forced master switching	Forcefully transfers the data link control from the standby master station that controls the data link to the master station that stands by in case the standby master station becomes faulty. 0: No request 1: Requested	○	×	×
SB0042 (5E4H, b2)	Refresh instruction acknowledgement status at standby master switching	Indicates whether the refresh instruction at standby master switching has been acknowledged or not. 0: Not acknowledged 1: Instruction acknowledged	×	○	×
SB0043 (5E4H, b3)	Refresh instruction complete status at standby master switching	Indicates whether the refresh instruction at standby master switching is complete or not. 0: Not complete 1: Switching complete	×	○	×
SB0046 (5E4H, b6)	Forced master switching executable status	Indicates whether the forced master switching (SB000C) signal can be executed or not. OFF: Cannot be executed. ON: Can be executed.	○	×	×
SB005A (5E5H, b10)	Master switching request acknowledgement	Indicates the acknowledgement status of the standby master station when it has received a master switching request from the line. OFF: Not acknowledged ON: Request acknowledged	○	○	×
SB005B (5E5H, b11)	Master switching request complete	Indicates whether or not the switch from the standby master station to the master station is complete. OFF: Not complete ON: Complete	○	×	×
SB005C (5E4H, b12)	Forced master switching request acknowledgement	Indicates whether a forced master switching request has been acknowledged or not. 0: Not acknowledged 1: Instruction acknowledged	○	×	×

Table 4.5 List of link special relays relating to the standby master function (2/2)

Number	Name	Description	Applicability (○: Applicable, ×: Not applicable)		
			Master station	Local station	Offline
SB005D (5E5 _H , b13)	Forced master switching request complete	Indicates whether a forced master switching request acknowledgement is complete or not. 0: Not complete 1: Switching complete	○	×	×
SB0062 (5E6 _H , b2)	Host standby master station setting information	Indicates whether or not the standby master station setting exists for the host. 0: No setting 1: Setting exists	○	○	○
SB0070 (5E7 _H , b0)	Master station information	Shows the data link status. 0: Data link control by the master station 1: Data link control by the standby master station	○	○	×
SB0071 (5E7 _H , b1)	Standby master station information	Indicates whether or not there is a standby master station. 0: No standby master station 1: Standby master station exists	○	○	×
SB0079 (5E7 _H , b9)	Master station return specification information	Indicates whether the "Type" setting in the network parameters is set to "Master station" or "Master station (Duplex function)." OFF: Master station ON: Master station (Duplex function)	○	×	×
SB007B (5E7 _H , b11)	Host master/standby master operation status	Indicates whether the host operates as the master or standby master station. OFF: Operates as a master station (controlling data link) ON: Operates as a standby master station (standby)	○	○	×

(b) Link special registers (SW)

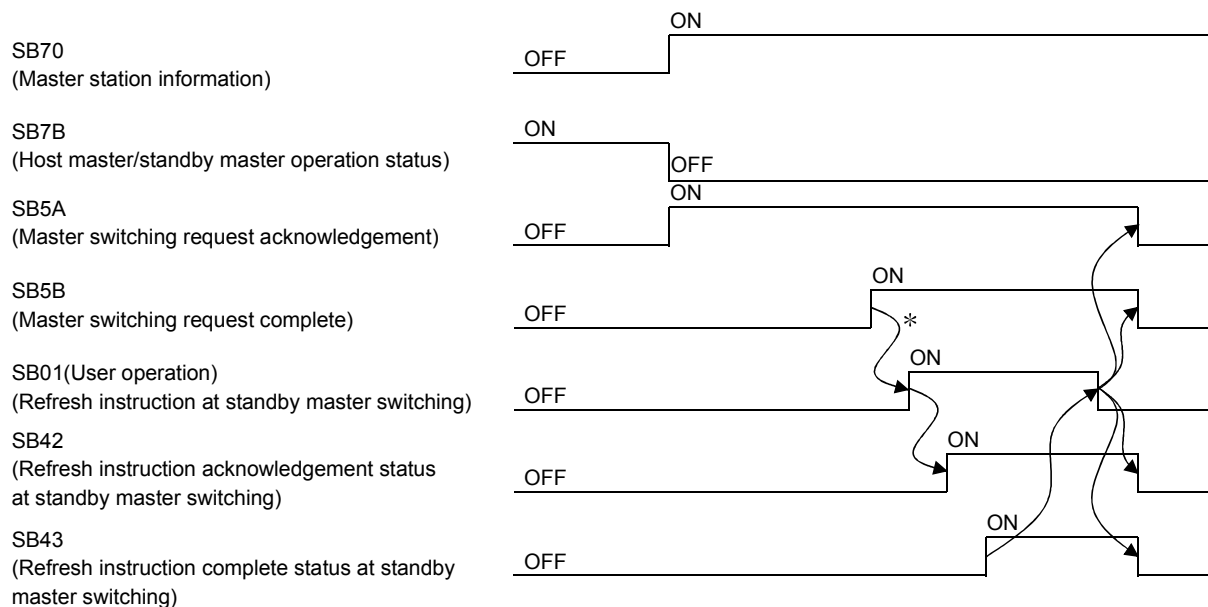
The following describes the link special registers (SW) relating to the standby master function. The figures in parentheses in the number column indicate buffer memory addresses.

Table 4.6 List of link special registers relating to the standby master function

Number	Name	Description	Applicability (○: Applicable, ×: Not applicable)		
			Master station	Local station	Offline
SW0043 (643 _H)	Refresh instruction at standby master switching result	Indicates the execution result of refresh instruction at standby master switching. 0 : Normal Other than 0: Stores the error code (see Section 13.3).	○	×	×
SW005D (65D _H)	Forced master switching instruction result	Stores the execution result of the forced master switching instruction with SB000C. 0 : Normal Other than 0: Stores the error code (see Section 13.3).	○	×	×
SW0073 (673 _H)	Standby master station number	Stores the station number of the standby master station. 1 to 64 (station)	○	○	×

(5) On/off timings of link special relays (SB) relating to the standby master function

The following shows the on/off timings of the link special relays (SB) relating to the standby master function.

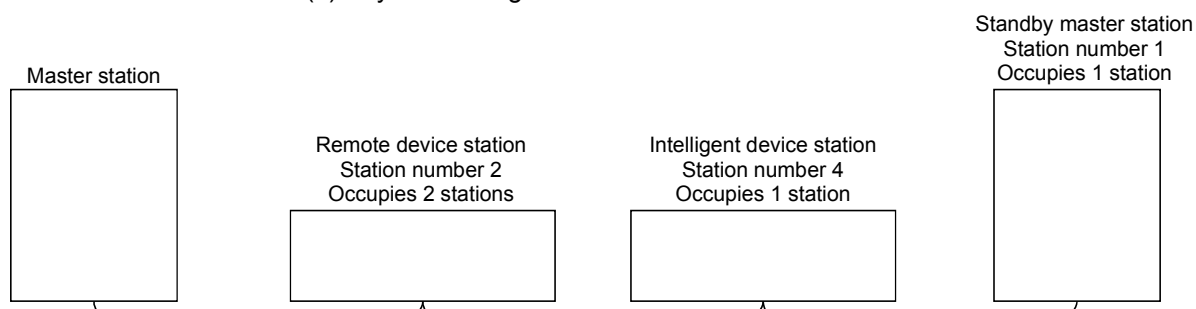


* When SB5B is turned on, the program switches RX to RY and RW_r to RW_w. In addition, the program turns SB01 on.

(6) Program example when the standby master function (master station duplex function) is used

A program example is created under the following conditions when the standby master function (master station duplex function) is used.

(a) System configuration



(b) Parameter settings of the master station

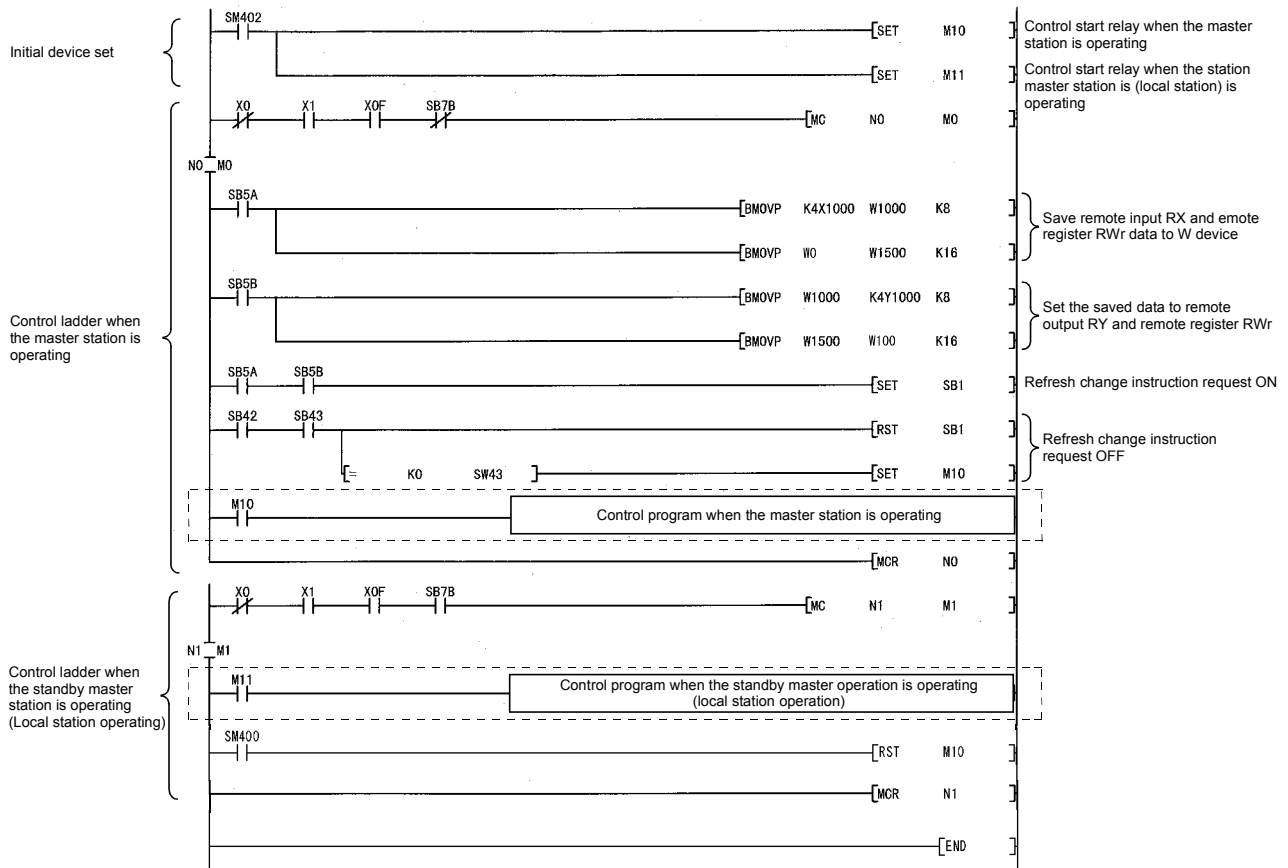
Start I/O No	1
Operational setting	Operational settings
Type	Master station(Duplex function) ▼
Master station data link type	PLC parameter auto start ▼
Mode	Remote net(Ver.1 mode) ▼
All connect count	3
Remote input(RX)	X1000
Remote output(RY)	Y1000
Remote register(RW/r)	w0
Remote register(RW/w)	w100
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RW/r)	
Ver.2 Remote register(RW/w)	
Special relay(SB)	SB0
Special register(Sw)	Sw0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	1
PLC down select	Stop ▼
Scan mode setting	Asynchronous ▼
Delay information setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

(c) Parameter settings of the standby master station

Start I/O No	1
Operational setting	Operational settings
Type	Stand by master station ▼
Master station data link type	▼
Mode	Remote net(Ver.1 mode) ▼
All connect count	
Remote input(RX)	X1000
Remote output(RY)	Y1000
Remote register(RW/r)	w0
Remote register(RW/w)	w100
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RW/r)	
Ver.2 Remote register(RW/w)	
Special relay(SB)	SB0
Special register(Sw)	Sw0
Retry count	
Automatic reconnection station count	
Stand by master station No.	
PLC down select	▼
Scan mode setting	▼
Delay information setting	
Station information setting	
Remote device station initial setting	
Interrupt setting	Interrupt settings

(d) Program example when standby master function (master station duplex function) is used

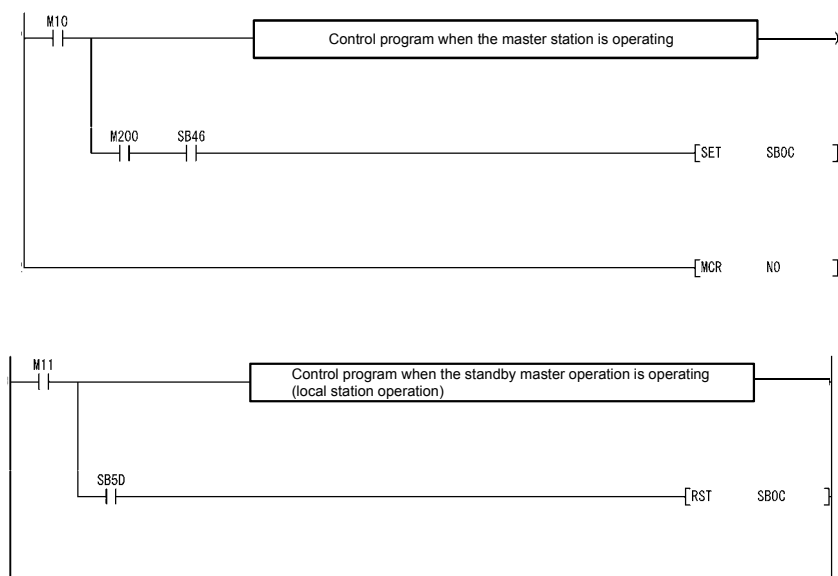
- Control start relay used when master station is operating.....M10
- Control start relay used when standby master station is operatingM11



(e) When forcibly switching the data link control right from the standby master station to the master station

The areas enclosed by the broken and dotted lines in the program example shown in (d) must be modified as shown below.

- Forced master switching request.....M200



4.3.7 Data link start by standby master station (First 5 digits of serial No. is 07112 or later)

This function allows data link to start by turning on either of the master or standby master station.

When the standby master station is turned on, even if no power is applied to the master station, data link will start.

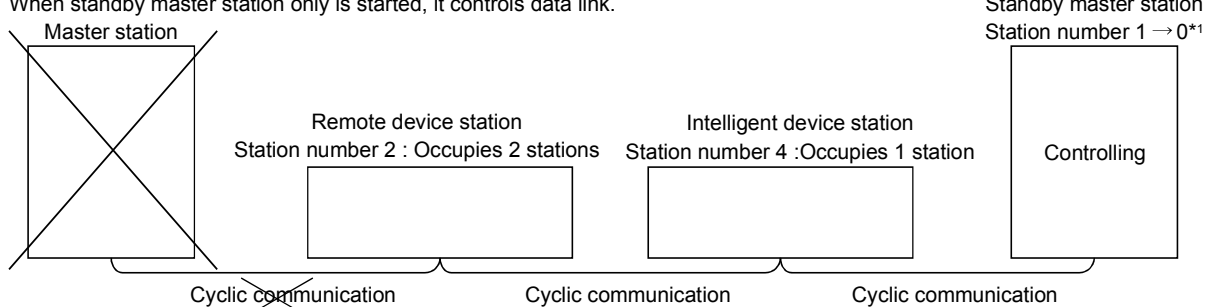
To enable this function, the same parameters and programs must be set to the master and standby master stations.

When using the standby station as a backup for the master station, utilize the standby master function explained in Section 4.3.6.

Controlling : Controlling the data link of the CC-Link system

Standby status : Standing by, waiting for a failure of the station controlling the data link of the CC-Link system

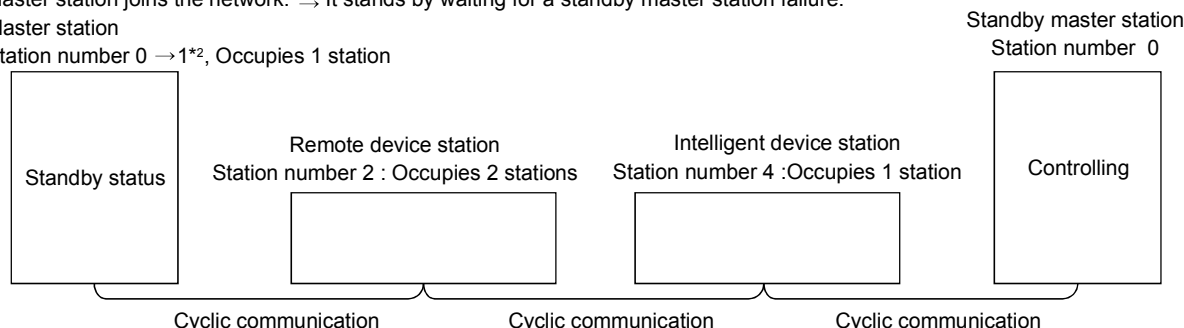
When standby master station only is started, it controls data link.



Master station joins the network. → It stands by waiting for a standby master station failure.

Master station

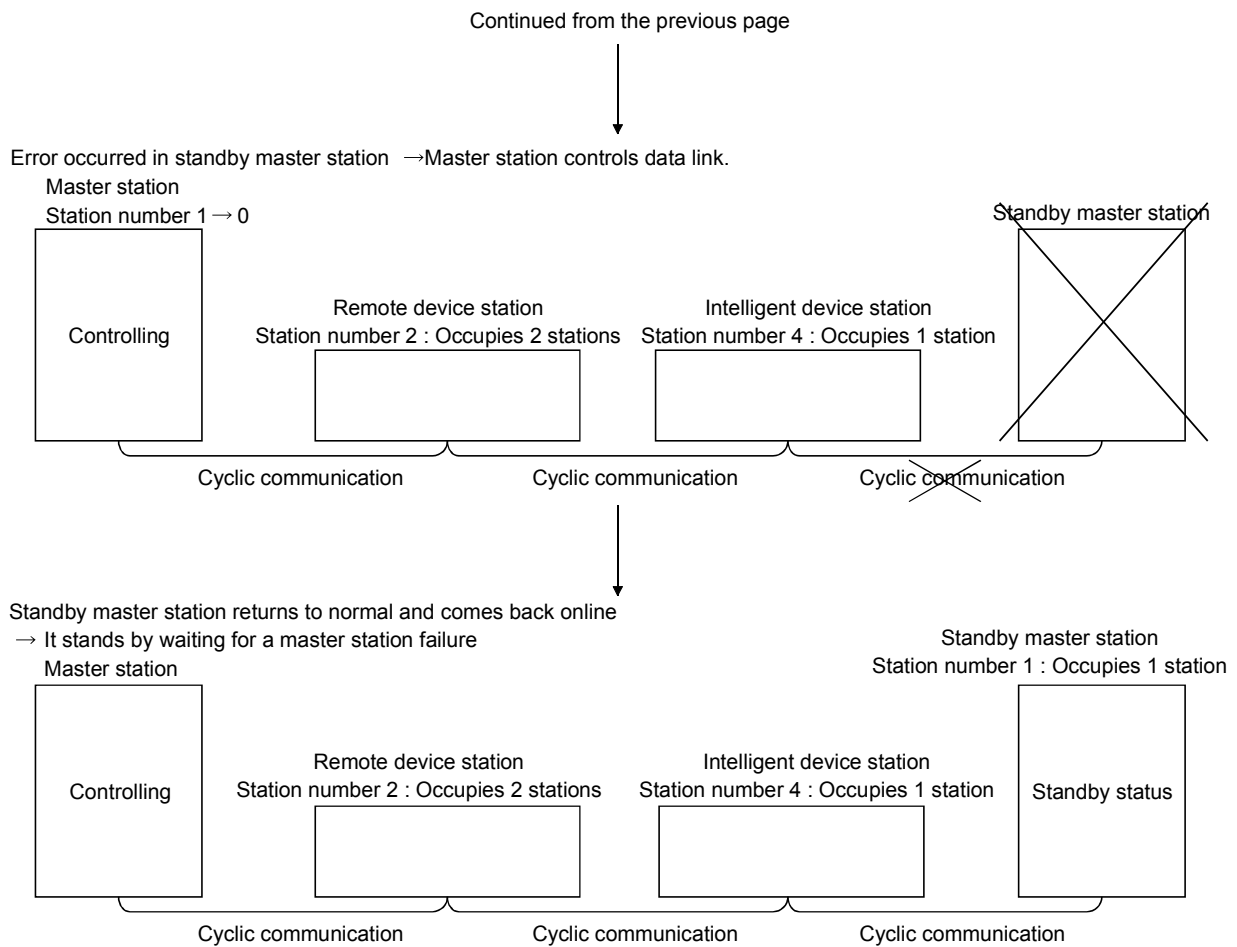
Station number 0 → 1*2, Occupies 1 station



To the next page

*1 When the master station becomes faulty and the standby master station takes over the data link control, the number of the standby master station is changed to "0".

*2 When the master station returns to the system as a standby master station, its station number is the one specified in the "Standby master station number" in the network parameters.



(1) Setting method

The following shows how to make settings.

- (a) Set station No.0 for the master station, and any of station 1 to 64 for the standby master station.
- (b) Configure the same system (the same programmable controller CPU, I/O modules, and/or intelligent function modules) for the master and standby master stations.
- (c) Select "Master station (Duplex function)" for "Type" in the network parameters on GX Developer.
- (d) Set other network parameter items.

Start I/O No.	1
Operational setting	Operational settings
Type	Master station(Duplex function) ▼
Master station data link type	PLC parameter auto start ▼
Mode	Remote net(Ver.1 mode) ▼
All connect count	3
Remote input(RX)	X1000
Remote output(RY)	Y1000
Remote register(RW/r)	W0
Remote register(RW/w)	W100
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RW/r)	
Ver.2 Remote register(RW/w)	
Special relay(SB)	S80
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	1
PLC down select	Stop ▼
Scan mode setting	Asynchronous ▼
Delay information setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

- (e) Write the same parameters and sequence programs to the master and standby master stations.

(2) Precautions when starting data link by the standby master station

- (a) Be sure to set the same parameters and programs to the master and standby master stations.
Otherwise, correct operation cannot be guaranteed.
- (b) When replacing the standby master station module, be sure to use a module whose first 5 digits of serial No. is 07112 or later. If it is 07111 or earlier, the LINK PARA.ERROR (Error code 3105) will be generated on the standby master station.
- (c) When data link has started by the standby master station, Line test 1 and 2 are not executable. To perform these line tests, use GX Developer.

4.3.8 Guaranteeing the cyclic data for each slave station (block guarantee of cyclic data per station)

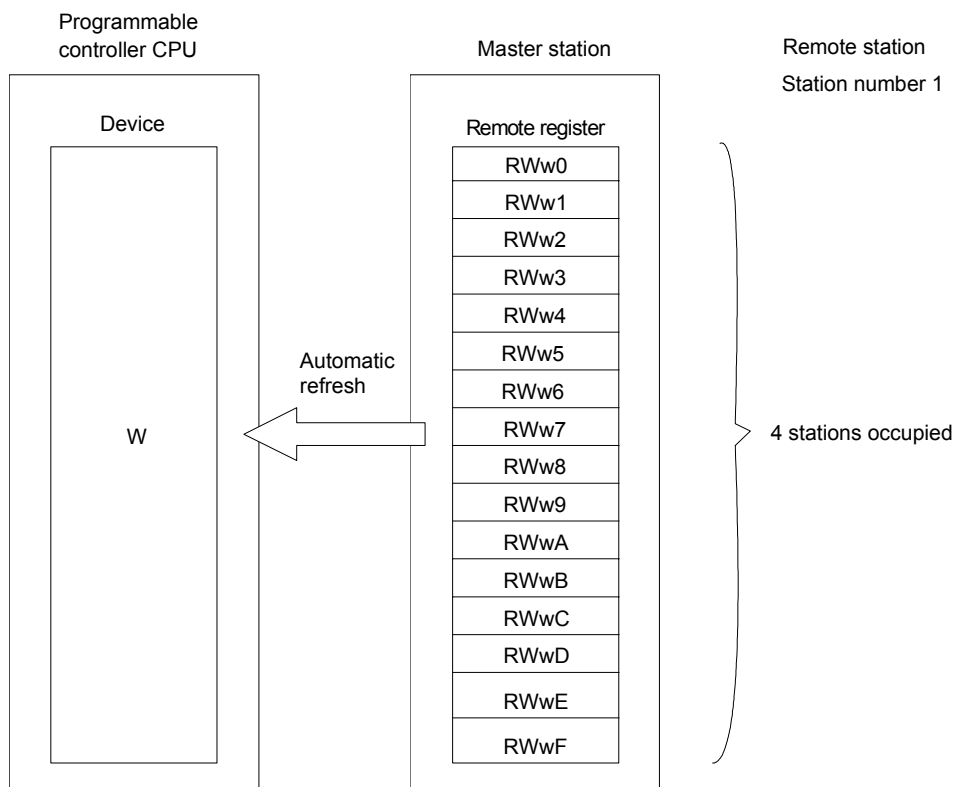
This function allows guaranteeing of the cyclic data for each slave station according to the parameter setting. (This function is supported by the QJ61BT11N with first 5 digits of serial No. 08032 or later. For compatible CPU module versions, refer to Section 2.2.1.)

Cyclic data could be separated into new data and old data in 2-word (32-bit) units depending on the auto refresh timing. Using this function guarantees the data consistency for each slave station.

Set this function to master stations, local stations and standby master stations.

Note that the consistency of 2-word data is also guaranteed in the QJ61BT11N whose first five digits of serial No. is 08031 or earlier. To ensure the consistency of data exceeding two words, use this function.

The following example shows the range in which data of remote register RWw is secured when this function is set in the remote net Ver.1 mode.

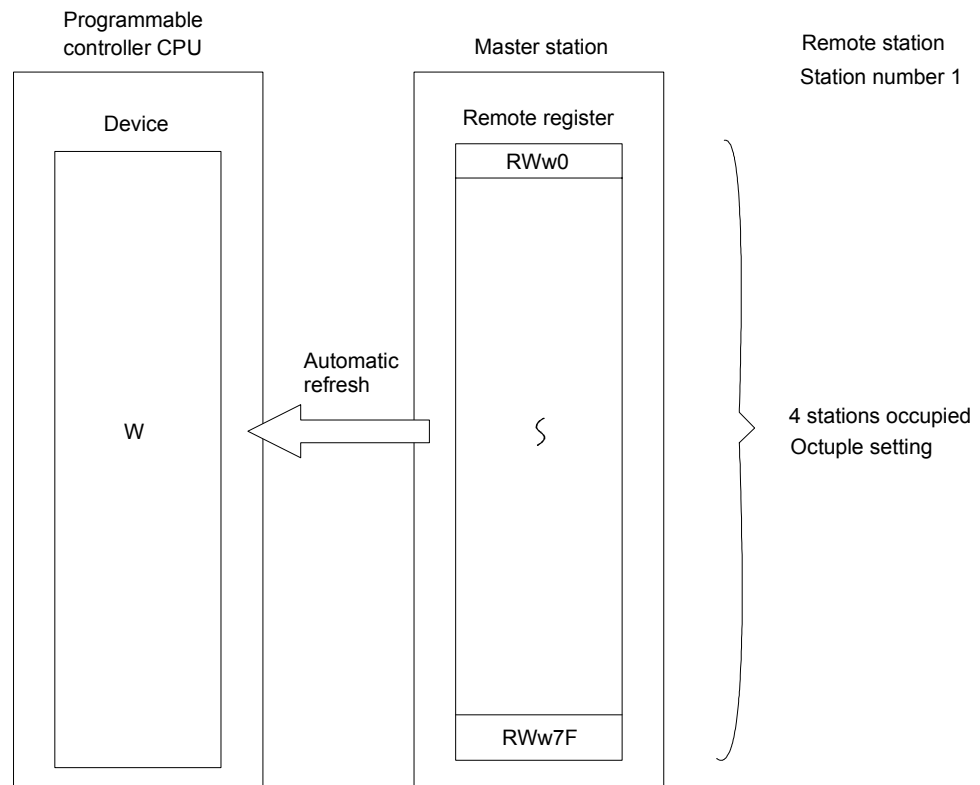


For slave station number 1 that has setting of "4 stations occupied" in the remote net Ver.1 mode, remote register data in the range RWw0 to RWwF are guaranteed.

Data are guaranteed in the same way for other remote devices (RX, RY and RWr).

They are also guaranteed for remote devices (RX, RY, RWr and RWw) in the remote I/O network mode.

The following example shows the range in which data of remote register RWw are guaranteed when this function is set in the remote net Ver.2 mode.



For slave station number 1 that has setting of "4 stations occupied" and "octuple" in the remote net Ver.2 mode, remote register data in the range RWw0 to RWw7F are guaranteed.

Data are guaranteed in the same way for other remote devices (RX, RY and RWr). They are also guaranteed for remote devices (RX, RY, RWr and RWw) in the remote net additional mode.

(1) Setting method

The following describes the setting method.

- (a) Click the Operational settings button for the network parameters in GX Developer.

	1
Start I/O No	
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.1 mode)
All connect count	64
Remote input(RX)	
Remote output(RY)	
Remote register(RW/r)	
Remote register(RW/w)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RW/r)	
Ver.2 Remote register(RW/w)	
Special relay(SB)	
Special register(SW)	
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay information setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

- (b) The [Operational settings] screen is displayed. Check the [Block guarantee of cyclic data per station] checkbox.

- (c) Make the auto refresh settings for each remote device.

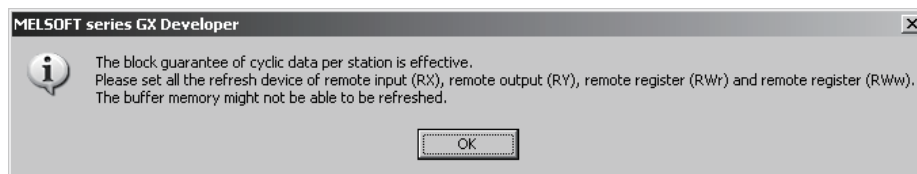
(2) Precautions when using the block guarantee of cyclic data per station

- (a) When using this function, be sure to make the auto refresh settings.

If the auto refresh settings have not been made for all devices, remote input (RX), remote output (RY) and remote registers (RW_r, RW_w) in the buffer memory may not be refreshed.

The following message is displayed if the auto refresh settings have not been completed.

If this message is displayed, check the settings.



- (b) When replacing the QJ61BT11N, use a module whose first 5 digits of the serial No. are 08032 or later.

When a QJ61BT11N whose first 5 digits of the serial No. are 08031 or earlier is used, the LINK PARA.ERROR (error code 3105) occurs on the programmable controller CPU after the network parameters are written to the programmable controller.

- (c) When this function is used, the transmission delay time increases (compared with when this function is not used).
When designing a new system by using an existing system as it is, confirm the delay time of the data from the remote station before starting the system.

POINT

For the formula for calculating the transmission delay time when the block guarantee of cyclic data per station is used, refer to Section 5.2.
--

The following shows examples of how to calculate the transmission delay time when this function is used and not used.

- 1) Maximum transmission delay time in input RX from remote I/O station
Conditions:

- Asynchronous mode
- Master station's sequence scan time, 20ms
- Link scan time, 3ms
- Remote I/O response time, 1.5ms

(When the block guarantee of cyclic data per station is used)

$$(SM \times n) + (LS \times 2) + Rio$$

$$= (20 \times 1) + (3 \times 2) + 1.5 = 27.5\text{ms}$$

(When the block guarantee of cyclic data per station is not used)

$$SM + (LS \times 2) + Rio$$

$$= 20 + (3 \times 2) + 1.5 = 27.5\text{ms}$$

The meanings of symbols in the formula are as follows:

SM: Master station sequence program scan time

LS : Link scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

Rio: Remote I/O response time

- 2) Maximum transmission delay time in output from master station to Ver.2-compatible local station

Conditions:

- Asynchronous mode
- Master station sequence scan time, 20ms
- Link scan time, 3ms
- Expanded cyclic setting, "double"
- Local station scan time, 10 ms

(When the block guarantee of cyclic data per station is used)

$$(SM \times n) + [LS \times \{(2 \times m) + 1\}] + \{SL \times (k + 1)\}$$

$$= (20 \times 1) + [3 \times \{(2 \times 3) + 1\}] + \{10 \times (1 + 1)\} = 61 \text{ ms}$$

(When the block guarantee of cyclic data per station is not used)

$$SM \times n + [LS \times \{(2 \times m) + 1\}] + \{SL \times (k + 1)\}$$

$$20 + [3 \times \{(2 \times 3) + 1\}] + 10 = 51 \text{ ms}$$

The meanings of symbols in the formula are as follows:

SM: Master station sequence program scan time

LS : Link scan time

SL : Local station sequence program scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

t : $LS \times m \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

k : $LS \div SL$ (Digits past the decimal point are rounded up to the nearest integer.)

m : Constant according to the extended cyclic setting

- (d) When this function is used, the link refresh time increases (compared with when this function is not used).

When designing a new system by using an existing system as it is, confirm the link refresh time before starting the system.

POINT	
--------------	--

For a formula for calculating the link refresh time when the block guarantee of cyclic data per station is used, refer to Section 5.4.
--

The following shows examples of how to calculate the link refresh time when this function is used and not used.

Conditions:

A Q06HCPU is used with the QJ61BT11N mounted on the main base and is defined as a master station in remote net Ver.1 mode.

Data of 2048 RX points, 2048 RY points, 256 RWw points, 256 RWr points, 512 SB points, and 512 SW points are refreshed to areas other than file registers.

(When the block guarantee of cyclic data per station is used)

$$\begin{aligned}
 & KM1 + KM2 \times \left(\frac{RX + RY + SB}{16} + RWw + RWr + SW \right) \\
 &= 0.24 + 0.00043 \times \left(\frac{2048 + 2048 + 512}{16} + 256 + 256 + 512 \right) \\
 &= 0.24 + 0.00043 \times 1312 \\
 &= 0.80416 \\
 &= 0.80 \text{ [ms]}
 \end{aligned}$$

(When the block guarantee of cyclic data per station is not used)

$$\begin{aligned}
 & KM1 + KM2 \times \left(\frac{RX + RY + SB}{16} + RWw + RWr + SW \right) \\
 &= 0.22 + 0.00043 \times \left(\frac{2048 + 2048 + 512}{16} + 256 + 256 + 512 \right) \\
 &= 0.22 + 0.00043 \times 1312 \\
 &= 0.78416 \\
 &= 0.78 \text{ [ms]}
 \end{aligned}$$

The meanings of symbols in the formula are as follows:

RX : Number of remote input (RX) points refreshed by the master station

RY : Number of remote output (RY) points refreshed by the master station

RWw : Number of remote register (RWw) points refreshed by master station

RWr : Number of remote register (RWr) points refreshed by master station

SB : Number of link special relay (SB) points refreshed by master station

SW : Number of link special register (SW) points refreshed by master station

KM1, KM2, KM3 : Constants

4.4 Handy Functions

This section explains some handy functions of the QJ61BT11N.

4.4.1 Simplifying the initialization procedure registration of remote device stations (Remote device station initialization procedure registration function)

The initial settings of remote device stations, which in previous models were done using the sequence program, can now be performed using the GX Developer for registration to the programmable controller CPU.

The QJ61BT11N instructs registration of remote device station initialization procedure, and then stores the number of the currently executing procedure to the buffer memory. For this reason, when processing has stopped, the relevant information such as the procedure number or target station number can be confirmed. For details on procedure numbers, refer to (1)(b)(9) in this section.

Also, if a running remote device station is replaced due to a failure, initial processing that has been done for all stations before can be performed for the replaced remote device station by specifying it. Remote device stations other than the specified station continue to operate.

Settings such as "A-D conversion enable/disable" and "Averaging processing specification" can be performed easily with the AJ65BT-64AD.

For an example of an initialization procedure using the GX Developer, see Sections 10.1.3, 10.2.3 and 10.3.3.

Check if this function is available for the remote device station to be used. The function is currently available for the following remote device stations. (As of November 2007)

- | | | |
|--------------------|--------------------|--------------------|
| • AJ65BT-64AD | • AJ65BT-64DAI | • AJ65BT-64DAV |
| • AJ65BT-64RD3 | • AJ65BT-64RD4 | • AJ65BT-68TD |
| • AJ65BT-D35ID2 | • AJ65SBT-62DA | • AJ65SBT-64AD |
| • AJ65VBTCU-68ADIN | • AJ65VBTCU-68ADVN | • AJ65VBTCU-68DAVN |

(1) Number of setting items for initialization procedures

Initial settings can be executed up to 16 items per remote device station.

If setting 17 items or more is necessary, execute initial setting with the sequence program.

Remote device station initialization procedure registration and initial settings with the sequence program cannot be executed at the same time.

If they are executed at the same time, remote device station may malfunction.

Initial settings can be executed up to 16 stations.

When 17 or more remote device stations are connected, execute the initial settings for the 17th and subsequent stations using the sequence program.

(2) Initialization procedure setting method

The initial settings are performed using the "Remote device station initial setting" in the network parameters.

- (a) In "Target", set the station number of a module for which the initial settings are to be performed.

Setting range: 1 to 64

	Target	No. of		Target	No. of	
1	3	2	Regist procedure	9		Regist procedure
2	5	1	Regist procedure	10		Regist procedure
3			Regist procedure	11		Regist procedure
4			Regist procedure	12		Regist procedure
5			Regist procedure	13		Regist procedure
6			Regist procedure	14		Regist procedure
7			Regist procedure	15		Regist procedure
8			Regist procedure	16		Regist procedure

Clear Check End setup Cancel

- (b) Set the initialization procedure in "Regist procedure".

1) Input format

Set the data input format for "Write data" in details of execution.

Setting range: DEC.

HEX.

Default: DEC.

2) Execute Flag

Set whether or not to execute the specified initialization procedure.

Setting range: Execute

Only set (use as a memo when the execution conditions are the same as when the execution flag is set as "Execute", but the content of execution is different.)

Default: Execute

3) Operational condition

Specify whether new settings or the previous settings are used for the initialization conditions.

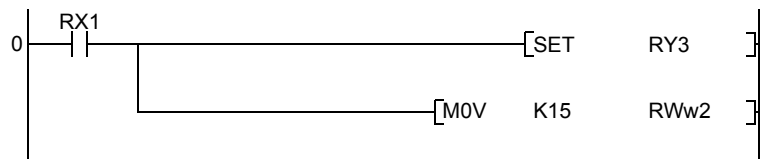
Setting range: Set new

Same as prev. set

Default: Set new

When "Same as prev. set" is selected, the processing is performed as follows:

Example)



4) Executional condition settings "Condition Device"

Set the device to be used for the initialization condition.

Setting range: RX

SB

5) Executional condition settings "Device Number"

Set the device number to be used for the initialization condition.

Even if the target station number is different, the same number must be set.

Setting range: When RX is selected 0 to 37F (H)

When SB is selected 0 to FF (H)

6) Executional condition settings "Execute Condition"

Set the conditions under which initialization is performed.

Setting range: ON

OFF

7) Details of execution "Write Device"

Set the device to which the contents of the initial setting are written.

Setting range: RY

RWw

8) Details of execution "Device Number"

Set the device number to which the contents of the initial settings are written.

Even if the target station number is different, the same number must be set.

Setting range: When RY is selected 0 to 37F (H)

When RWw is selected 0 to 0F (H)

9) Details of execution "Write Data"

Set the contents of the initial settings.

Setting range:	When RY is selected	ON/OFF
	When RWw is selected	0 to 65535 (Decimal), 0 to FFFF (Hexadecimal)

The following shows the procedure registration screen appeared after setting of (1) to (9).

For procedure numbers, the first line of the screen is regarded as procedure number 1.

Remote device station initial setting: Procedure registration unit 1: Target station 3

Input format: DEC.

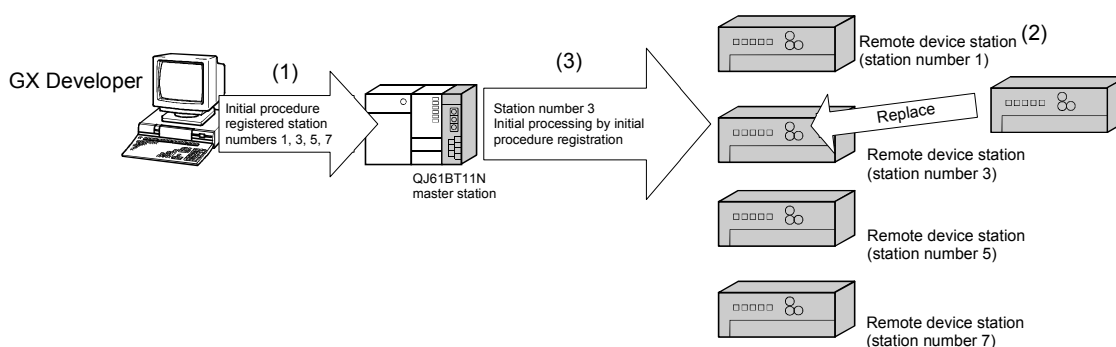
Item of procedure Item of procedure number2	Execute Flag	Operational condition	Executorial condition			Details of execution		
			Condition Device	Device Number	Execute Condition	Write Device	Device Number	Write Data
	Execute	Set new	RX	01	ON	RY	03	ON
	Execute	Same as prev.set	RX	01	ON	RWw	02	15
	Execute	Set new						
	Execute	Set new						
	Execute	Set new						
	Execute	Set new						
	Execute	Set new						
	Execute	Set new						
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	Execute	Set new						
	Execute	Set new						
	Execute	Set new						
	Execute	Set new						

Default Check End setup Cancel

(3) Method for initializing only a specified station (specification of remote device station to be initialized)

When a running remote device station is replaced due to a failure, initial processing that has been done for all stations conventionally can be performed for the replaced remote device station by specifying it. Remote device stations other than the specified station continue their operations. (This function is supported by the QJ61BT11N with first 5 digits of serial No. 08032 or later.)

The following shows an example in which remote device station number 3 is specified to be initialized.



- 1) First of all, register the initialization procedures for all remote device stations (station numbers 1, 3, 5, 7).
- 2) When a failure occurs on remote device station number 3 during operation, replace the failed remote device station.
- 3) Specify the replaced station number 3 as a remote device station to be initialized. Then, register the initialization procedure.
During initial processing of station number 3, control of the other stations (station numbers 1, 5, 7) is continued.

(a) How to specify the remote device station to be initialized

Set the station to be initialized in the "specification of remote device station to be initialized (SW0014 to SW0017)" in the link special register.

To set this, turn ON the bit corresponding to the specified station number within SW0014 to SW0017 (only the bit of the head station number).

When all bits are OFF, initial processing is performed on all stations that are set in the remote device station initial setting in the network parameters.

	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.

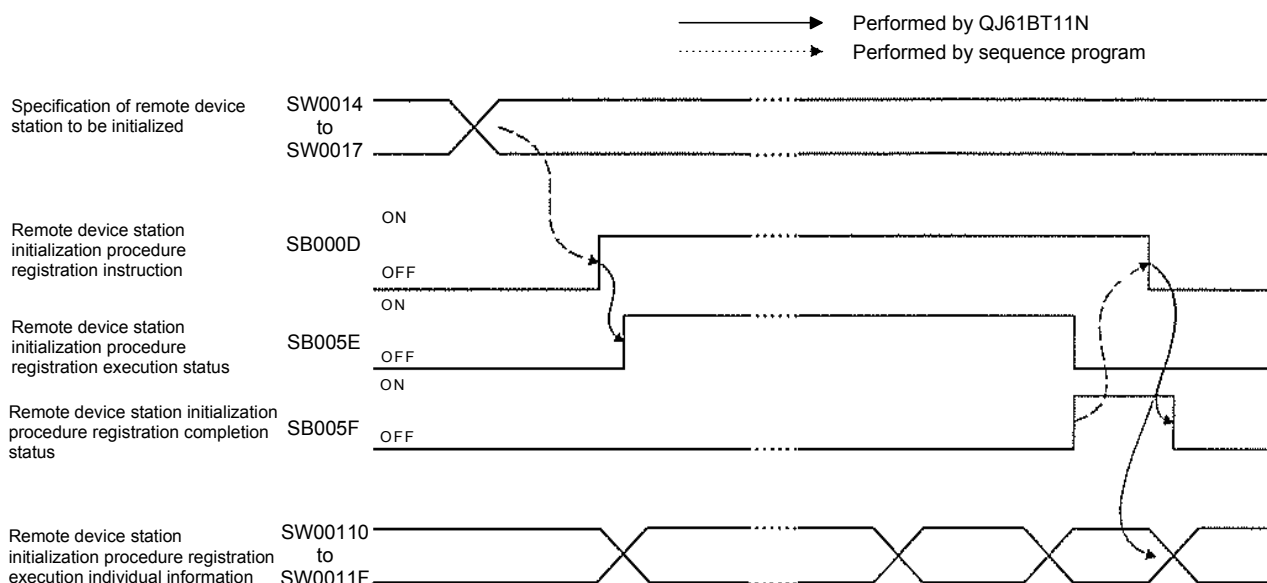
(4) Enable initial settings

Before creating a program for communication with remote device stations, create a program to enable the initial settings using SB000D (remote device station initialization procedure registration instruction) and SB005F (completion status of remote device station initialization procedure execution).
For details, refer to Sections 10.1.4, 10.2.4 and 10.3.4.

Procedure for the remote device station initialization procedure registration

- (a) Turn SB000D ON, and start initialization procedure registration.
During execution of initialization procedure registration, SB005E (remote device station initialization procedure execution status) stays ON.
Also, the execution procedure numbers and target station numbers of the registration are stored to SW0110 to SW011F (remote device station initialization procedure registration execution individual information).
- (b) When initial processing of all preset stations is completed, SB005F turns ON.
Also, the execution result is stored to SW005F (remote device station initialization procedure instruction result).
The execution procedure numbers in SW0110 to SW011F become FF00H.
- (d) When SB000D is turned OFF on completion of initial processing (SB005F : ON), SB005F, and SW0110 to SW011F are cleared.

The following shows operation of the link special relays and link special registers when remote device station initialization procedure registration is performed.



- (5) Preparation for communication with remote device stations
- 1) Register the network parameters and the created program in the programmable controller CPU.
 - 2) Reset the programmable controller CPU or turn the power from off to on.
 - 3) Instruct the master station to register the remote device station initialization procedure. (This instruction may not be necessary in some cases such as when the remote input RX is set as a startup condition.)

POINT
(1) Because one step is performed per link scan, as the number of settings increases the processing time will extend beyond that specified in the sequence program.
(2) While SB0D (remote device station initialization procedure registration instruction) is on, the refresh of the remote input/output and remote registers stops.
(3) When the remote device station initialization procedure registration instruction (SB000D) turns OFF after completion of the initial processing, all of RY signals that have turned ON during the registration turn OFF. Therefore, for signals that should be kept ON (e.g. CH.□ Conversion enable flag of the AJ65BT-64RD3/4), turn them ON in the sequence program.
(4) The remote device station initialization procedure registration completion status (SB005F) does not turn ON unless all of procedure registration for the stations specified in the remote device station initialization procedure registration station specification (SW0014 to SW0017) is completed normally. If any error station exists, turn OFF the remote device station initialization procedure registration instruction (SB000D) depending on the status of the other stations.
(5) The remote device station initialization procedure registration is not allowed for the standby master station. When replacing a remote device station while the standby master station is operating as a master, perform initial setting on the sequence program.

(6) Link special relays and registers (SB, SW) relating to remote device station initialization procedure registration

The following describes the link special relays and link special registers relating to remote device station initialization procedure registration.

The information of link special relays and link special registers is stored in the buffer memory.

(a) Link special relays (SB)

The following describes the link special relays (SB) relating to remote device station initialization procedure registration.

Numerical values in parentheses "()" under relay numbers indicate the buffer memory addresses and bit positions.

Example : Bit 13 of buffer memory address 5E0H
(5E0H, b13)

Table 4.7 List of link register relays relating to the remote device station initialization procedure registration function

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB000D (5E0H, b13)	Remote device station initialization procedure registration instruction	Starts the initial processing using the information registered during the initialization procedure registration. While SB000D is on, the refresh of the remote input/output and remote registers stops. OFF : Not instructed ON : Instructed	○ * 1	×	×
SB005E (5E5H, b14)	Execution status of remote device station initialization procedure	Indicates the execution status of the initialization procedure. OFF : Not executed ON : Being executed	○ * 1	×	×
SB005F (5E5H, b15)	Completion status of remote device station initialization procedure	Indicates the completion status of the initialization procedure execution. OFF : Not complete ON : Complete	○ * 1	×	×

* 1 Parameter setting is required in the case of a standby master station. (First 5 digits of serial No. must be 07112 or later.)

(b) Link special registers (SW)

The following describes the link special registers (SW) relating to remote device station initialization procedure registration.

Numerical values in parentheses "()" under register numbers indicate the buffer memory addresses.

Table 4.8 List of link special registers relating to the remote device station initialization procedure registration function (1/3)

Number	Name	Description	Availability (○: Available, ×: Not available)																																																																																						
			Online		Offline																																																																																				
			Master station	Local station																																																																																					
SW0014 (614 _H)	Specification of remote device station to be initialized	Specifies the station to be initialized using the information saved by initialization procedure registration. 0: Initial processing not performed 1: Initial processing performed	○ * 1	×	×																																																																																				
SW0015 (615 _H)		<table><tr><td></td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>SW0014</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0015</td><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0016</td><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0017</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>					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
		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																																																																									
SW0016 (616 _H)																																																																																									
SW0017 (617 _H)																																																																																									
		Numbers 1 to 64 in the above table indicate the station numbers. Not necessary to set for the number of occupied stations. Error invalid stations, reserved stations and station of number 65 or higher are not specified.																																																																																							
SW005F (65F _H)	Remote device station initialization procedure registration instruction result	Stores the execution result of the initialization procedure registration instruction of SB000D. 0 : Normal Other than 0 : Stores an error code (see Section 13.3).	○ * 1	×	×																																																																																				
SW0110 (710 _H)	Remote device station initialization procedure registration execution individual information (target 1)	Stores the execution information of initialization procedure registration. High: Next execution procedure number (FF _H at completion) Low: Targeted station number	○ * 1	×	×																																																																																				
SW0111 (711 _H)	Remote device station initialization procedure registration execution individual information (target 2)																																																																																								
SW0112 (712 _H)	Remote device station initialization procedure registration execution individual information (target 3)																																																																																								

Table 4.8 List of link special registers relating to the remote device station initialization procedure registration function (2/3)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0113 (713 _H)	Remote device station initialization procedure registration execution individual information (target 4)	Stores the execution information of initialization procedure registration. High: Next execution procedure number (FF _H at completion) Low: Targeted station number	○ * 1	×	×
SW0114 (714 _H)	Remote device station initialization procedure registration execution individual information (target 5)				
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 (718 _H)	Remote device station initialization procedure registration execution individual information (target 8)				
SW0118 (718 _H)	Remote device station initialization procedure registration execution individual information (target 9)				
SW0119 (719 _H)	Remote device station initialization procedure registration execution individual information (target 10)				
SW011A (71A _H)	Remote device station initialization procedure registration execution individual information (target 11)				

* 1 Parameter setting is required in the case of a standby master station. (First 5 digits of serial No. must be 07112 or later.)

Table 4.8 List of link special registers relating to the remote device station initialization procedure registration function (3/3)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW011B (71B _H)	Remote device station initialization procedure registration execution individual information (target 12)	Stores the execution information of initialization procedure registration. High: Next execution procedure number (FF _H at completion) Low: Targeted station number	○ * 1	×	×
SW011C (71C _H)	Remote device station initialization procedure registration execution individual information (target 13)				
SW011D (71D _H)	Remote device station initialization procedure registration execution individual information (target 14)				
SW011E (71E _H)	Remote device station initialization procedure registration execution individual information (target 15)				
SW011F (71F _H)	Remote device station initialization procedure registration execution individual information (target 16)				

* 1 Parameter setting is required in the case of a standby master station. (First 5 digits of serial No. must be 07112 or later.)

(6) Replacing a faulty QJ61BT11N

When replacing a faulty QJ61BT11N with a new one, do not use any of the modules whose first five digits of serial number is 08031 or earlier.

Doing this by mistake and specifying a remote device station to be initialized may result in the following operation behavior:

Master/Remote device station	Operation behavior
Master station	Ignores the specification of remote device station to be initialized (SW0014 to SW0017) and initializes all of the remote device stations that are set in the network parameter setting.
Remote device station	● The remote device station replacing a faulty one completes the initial processing. ● Normally operating remote device stations may not complete their initial processing. If this happens, check the remote device station initialization procedure registration execution individual information (SW0110 to SW011F).

4.4.2 Performing high-speed processing (Event issuance for the interrupt program)

This function issues events (signals to execute an interrupt program) according to factors such as the on/off status of specified RX, RY and SB devices and the match/mismatch status of specified RWr and SW device data, in order to allow the programmable controller CPU to execute the interrupt program.

Because the conditions for issuing the events are set using the GX Developer, the number of program steps is reduced, thus shortening the scan time.

Events can be issued for all stations.

A maximum of 16 event issuance conditions can be set.

(1) Event issuance conditions

Events are issued under the following conditions:

On/off status of specified RX, RY and SB devices

Match/mismatch status of specified RWr and SW device data

When the link scan is completed

(2) Event issuance condition setting method

(a) First, set the "Interrupt setting" in the network parameters.

1) Input format

Set the data input format for "Word device".

Setting range: DEC.

HEX.

Default: DEX.

2) Device code

Set the device to be used for the event issuance conditions.

Setting range: RX

SB

RY

RWr

SW

Scan completed

3) Device No.

Set the device number to be used for the event issuance conditions.

Setting range: When RX or RY is selected 0 to 1FFF (H)

When SB or SW is selected 0 to 01FF (H)

When RWr is selected 0 to 00FF (H)

4) Detection method

Set the detection method for the event issuance conditions.

Setting range: Edge detect (Issues event only at rise and fall.)

Level detect (Issues each link scan event when the event issuance conditions are established.)

- 5) Interrupt condition
Set the conditions under which events are issued.
Setting range: When RX, SB or RY is selected ON/OFF
When RWr or SW is selected Equal/Unequal
- 6) Word device
Set the conditions under which events are issued when RWr or SW is selected.
Setting range: 0 to 65535 (Decimal)
0 to FFFF (Hexadecimal)
- 7) Interrupt (SI) No.
Set the intelligent function module interrupt pointer number.
(SI is an interrupt pointer for an intelligent function module and not a device used in an actual program.)
Setting range: 0 to 15

Input format: DEC

	Device code	Device No.	Detection method	Interrupt condition	Word device	Board No.	Interrupt (SI) No.
1	RX	0001	Edge detect	DN			0
2	RWr	0004	Level detect	Unequal	150		1
3	Scan completed						2
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

Buttons: Clear, Check, End setup, Cancel

POINT

Only one event issuance condition can be set for each interrupt program.

- (b) Set the "PLC parameter" -- "PLC system" -- "Intelligent function module setting" -- "Interrupt pointer settings".
- "Interrupt pointer start No." on the PLC side.
Set the interrupt pointer start number for the CPU.
Setting range: 50 to 255
 - "Interrupt pointer No. of units" on the PLC side
Set the number of event issuance conditions specified in the "Interrupt settings" of the Network parameters
Setting range: 1 to 16
 - "Start I/O No." on the Intelli. unit side
Set the start input/output number for the intelligent function module for which the interrupt setting was performed.
Setting range: 0 to 0FF0 (H)

- 4) "Start SI No." on the intelli. unit side

Set the smallest number for intelligent function module interrupt pointers specified in "Interrupt (SI) No." of the "Interrupt settings" in the Network parameters.

Setting range: 0 to 15

The screenshot shows a software window titled "Intelligent function module interrupt pointer setting". The window contains two main tables side-by-side, separated by a vertical column of double-headed arrows.

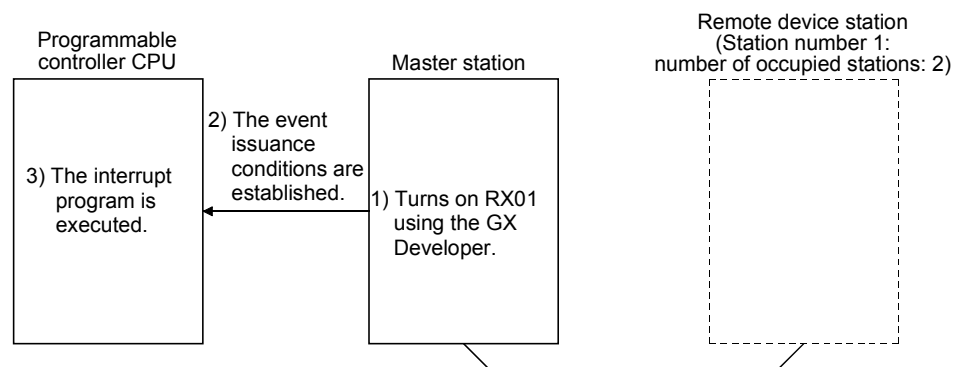
PLC side			Intelli. unit side	
Interrupt pointer Start No.	Interrupt pointer No.of units		Start I/O No.	Start SI No.
50	3	↕	0000	0
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		
		↕		

At the bottom of the window are three buttons: "Check", "End setup", and "Cancel".

(3) Simulation of the interrupt program

When the event issuance conditions are established in the master station using the GX Developer, the interrupt program is executed even when the corresponding modules are not connected, and then the interrupt program can be simulated.

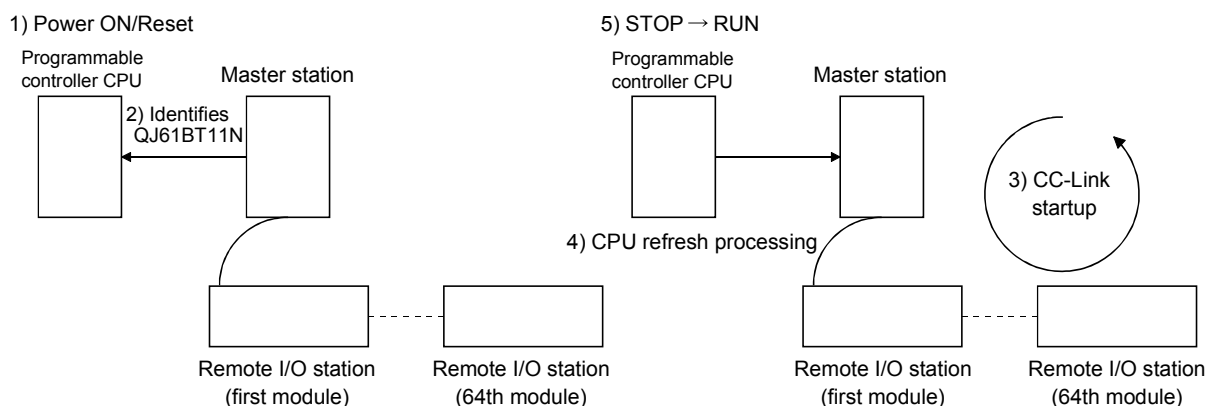
(Example) A case where an event is issued when RX01 turns on, and then an interrupt program is executed.



4.4.3 Enabling the data link simply by powering on (Automatic CC-Link startup)

When the QJ61BT11N is used in a system configuration including not only remote I/O stations but also remote device stations and intelligent device stations, the CC-Link startup and data refresh are performed only by powering up the system and without creating sequence programs.

Use this function to make an operation check when constructing a system. When performing control, always set the network parameters.



(1) Contents of default parameter settings at automatic CC-Link startup

The following lists the contents of the default automatic refresh parameter settings and network parameter settings when the automatic CC-Link starts up.

Content of default automatic refresh parameter settings

QCPU (Q mode) side (Except Q00J/Q00/Q01CPU)	Direction	Master station/ local station side	Q00J/Q00/Q01CPU side	Direction	Master station/ local station side
X1000 to X17FF	←	RX0000 to RX07FF	X400 to X7FF	←	RX000 to RX3FF
Y1000 to Y17FF	→	RY0000 to RY07FF	Y400 to Y7FF	→	RY000 to RY3FF
W1E00 to W1EFF	←	RWr00 to RWrFF	W600 to W67F	←	RWr00 to RWr7F
W1F00 to W1FFF	→	RWw00 to RWwFF	W700 to W77F	→	RWw00 to RWw7F
SB0600 to SB07FF	←	SB0000 to SB01FF	SB200 to SB3FF	←	SB0000 to SB01FF
SW0600 to SW07FF	←	SW0000 to SW01FF	SW200 to SW3FF	←	SW0000 to SW01FF

Content of default network parameter settings

Mode setting	Remote net ver.1 mode
Total number of connected stations	64 stations
Number of retries	3 times
Number of automatic return modules	1 module
Standby master station number	No standby master station specified.
CPU down specification	Data link stop when a master station CPU error occurs
Scan mode setting	Asynchronous
Delay time setting	0

Content of buffer memory size specification for intelligent device station

Send buffer	64 words
Receive buffer	64 words
Automatic update buffer	128 words

POINT	
(1)	Perform an automatic CC-Link startup in the remote net ver. 1 mode.
(2)	When the automatic CC-Link startup is executed on a local station, the local station operates occupying 1 station.
(3)	Make sure to perform line tests for all stations if an automatic CC-Link startup is performed and changes such as replacement of a module, etc. are made to the system during data link operation. Stations whose data link has already been established (only stations whose station numbers overlap) may also go down if stations with overlapping head station numbers return to the system.
(4)	If an automatic CC-Link startup was performed, a temporary error invalid station cannot be used.
(5)	In case of a multiple CPU system where each CPU controls several QJ61BT11N modules, the automatic CC-Link startup is performed on the QJ61BT11N that has the smallest head I/O number.
(6)	In the Q00J/Q00/Q01CPU, automatic refresh is performed for stations No.1 to 32 only. Because automatic refresh is not performed for station No. 33 or higher, use FROM/TO instructions to read/write data.

(2) Execution conditions

- (a) When the parameters are not set, the automatic CC-Link startup function is applicable only to one "QJ61BT11N". Even when more than one QJ61BT11N is mounted on the base unit, the automatic CC-Link startup function is applicable only to the first one. It is applied to the QJ61BT11N that has the smallest start I/O number, as seen from the programmable controller CPU side.
- (b) In the case of automatic CC-Link startup, the total number of CC-Link IE controller network modules and MELSECNET/H modules that are connectable to the master station's CPU is as follows:

Number of CC-Link IE controller network modules + MELSECNET/H modules ≤ 3

4.4.4 Communicating with intelligent device stations (Remote net mode)

The remote net mode allows communication with all stations (remote I/O stations, remote device stations, local stations, intelligent device stations, and standby master stations). Furthermore, it allows not only cyclic transfer, but also transient transmission, which transfers data at an arbitrary timing, to intelligent and local stations.

[Setting method]

Set the remote net mode in "Mode" of the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.5.

4.4.5 Speeding up the response from remote I/O stations (Remote I/O net mode)

The remote I/O net mode can be used for a system consisting of only the master station and remote I/O stations. The remote I/O net mode allows cyclic transmission at high speed, thus shortening the link scan time.

The table below lists the link scan times for both the remote I/O net mode and the remote net mode.

Table 4.9

Number of stations	Remote I/O net mode	Remote net mode
8	0.61 ms	1.2 ms
16	0.94 ms	1.6 ms
32	1.61 ms	2.3 ms
64	2.94 ms	3.8 ms

(Transmission speed: at 10 Mbps)

[Setting method]

Set the remote I/O net mode in "Mode" of the network parameters using GX Developer. For more details on the setting, see Section 6.6.

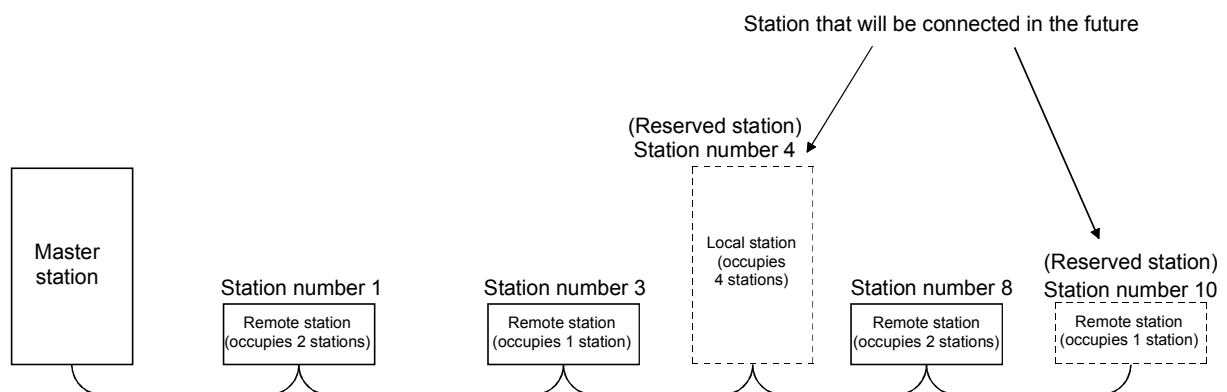
4.4.6 Creating a program that contains modules to be added in the future (Reserved station function)

This function prevents remote stations, local stations, intelligent device stations, and a standby master station that are not actually connected (but to be connected in the future) from being treated as "data link faulty stations" by the master station and local stations.

When the master station is placed in the remote net ver.2 mode, points for reserved stations can be set to 0.

Use GX Developer to set 0 points for reserved stations.

Although dedicated instructions are not usable for this setting, if reading from or writing to reserved stations is disabled when refreshing cyclic data with FROM/TO instructions, the same result is obtained.



POINT

If a connected remote station, local station, intelligent device station, or standby master station is specified as a reserved station, data link with the specified station becomes disabled.

[Setting method]

Set the reserved function in "Station information setting" of the network parameters using the GX Developer.

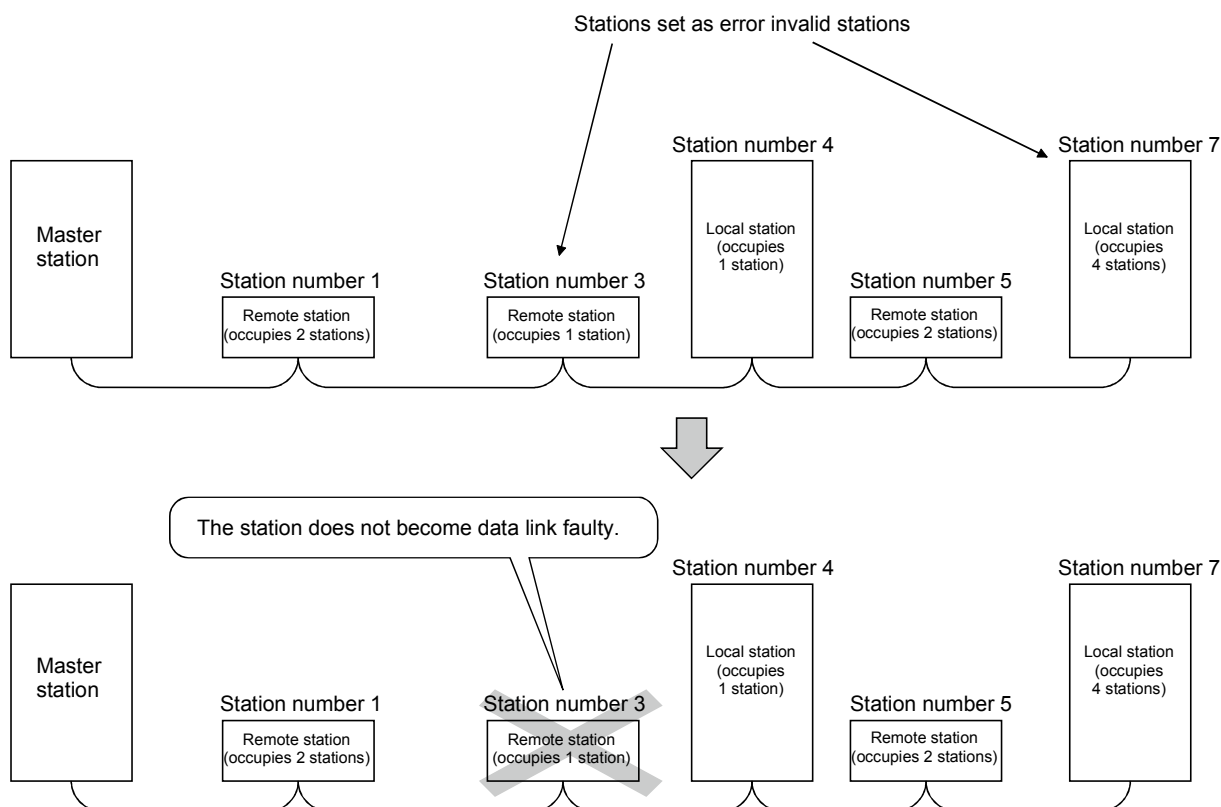
- Make reserved station setting by choosing "Station information setting" - "Reserve/invalid station select".
- Make 0 points setting for the reserved station by choosing "Station information setting" - "Remote station points".

For more details on the setting, see Sections 6.3 to 6.5.

4.4.7 Powering off a station in operation without error detection (Error invalid station setting function)

This function prevents remote stations, local stations, intelligent device stations, and a standby master station that are powered off in the system configuration from being treated as "data link faulty stations" by the master station and local stations, using the network parameter settings.

Note that if a station is set as an error invalid station, problems occurring in that station can no longer be detected. In addition, the error invalid station settings cannot be changed while online because they are set with the network parameters.



POINT

- (1) If a remote station, a local station, an intelligent device station or the standby master station that is set as an error invalid station is "specified as a reserved station," the reserved station function overrides the error invalid station setting function.
- (2) If errors are generated at all the stations when they are set as error-invalid stations, the "ERR." LED will light.

[Setting method]

Set the error invalid station setting function in "Station information setting" of the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

4.4.8 Synchronizing the link scan with the sequence scan (Scan synchronous function)

This function selects whether or not the link scan should be synchronized with the sequence scan.

(1) Synchronous mode

Performs data linking using the scan that is synchronized with the sequence program.

(The sequence scan and link scan start at the same time.)

In the synchronous mode, the link scan interval becomes longer when the sequence scan takes long because the link scan is synchronized with the sequence scan.

IMPORTANT

While in the synchronous mode, the sequence scan time must not exceed the time specified for the corresponding transmission speed, as listed below. If the scan time exceeds the specified time, a time out error occurs at each station.

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

POINT

- (1) The asynchronous mode is recommended for a mixed system of local stations A(1S)J61BT11 and A(1S)J61QBT11 when the QJ61BT11N is used as the master station. When using the synchronous mode, make sure to observe the restrictions in (2) and (3) below.
- (2) When using a system consisting of the QJ61BT11N as the master station in the synchronous mode and both the A(1S)J61BT11 and A(1S)J61QBT11 as local stations, set the sequence scan time of the local station CPU to be shorter than ST. For more details on "ST," see Section 5.1.
- (3) When using a system consisting of the QJ61BT11N as the master station in the synchronous mode and both the A(1S)J61BT11 and A(1S)J61QBT11 as local stations, use XnC as an interlock of the FROM/TO instructions on the local station CPU side.
- (4) When operating in the synchronous mode, the "L RUN" LED may be lit dimly.

(2) Asynchronous mode

Performs data linking without synchronizing with the sequence program.

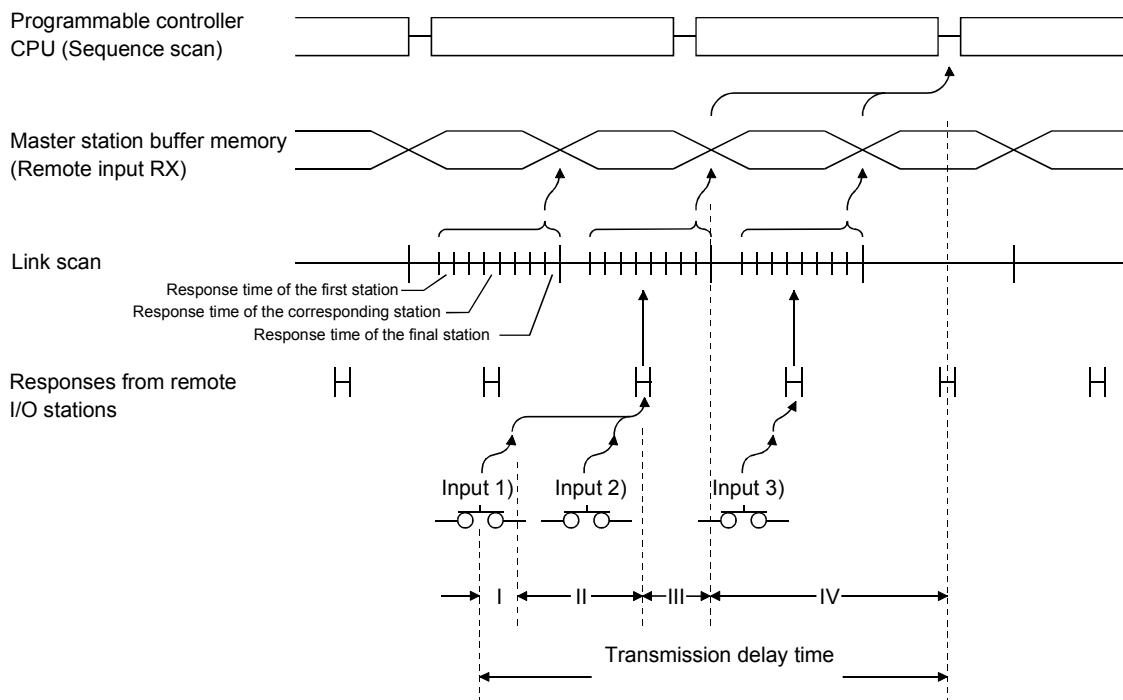
(3) Setting method

Set the scan synchronous function in "Scan mode setting" of the network parameters using the GX Developer. For more details on the setting, see Sections 6.3 to 6.6.

(4) Data flows in synchronous and asynchronous modes

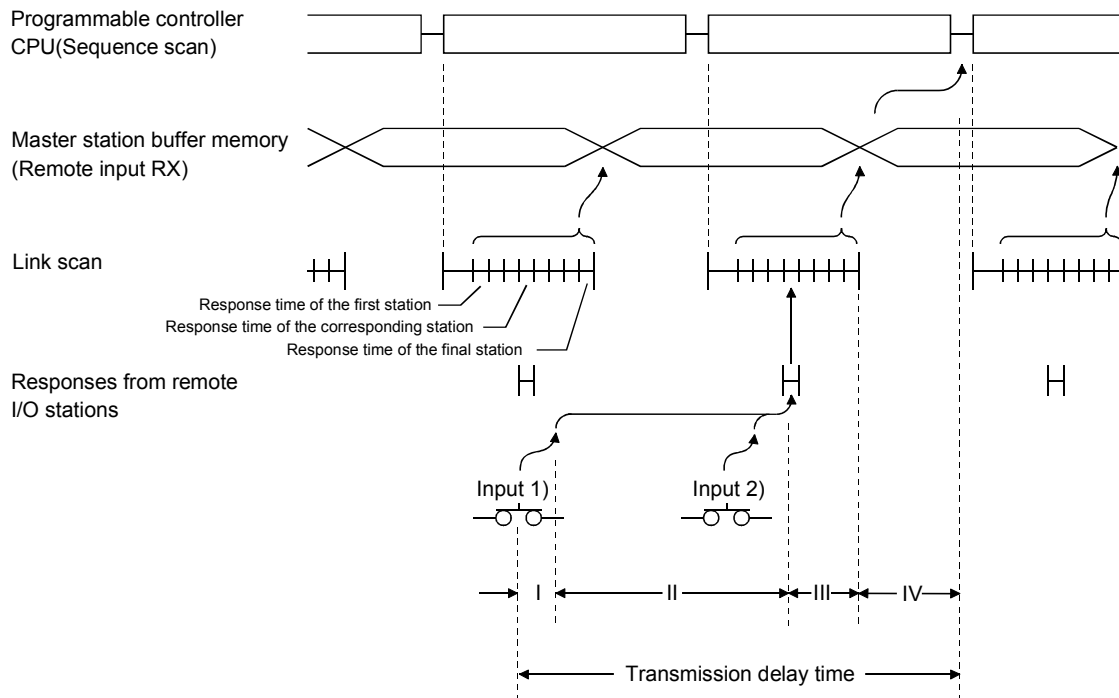
The data flows in both the synchronous and asynchronous modes are explained using examples of communications between the master station and remote I/O stations.

(a) Data flow in the asynchronous mode



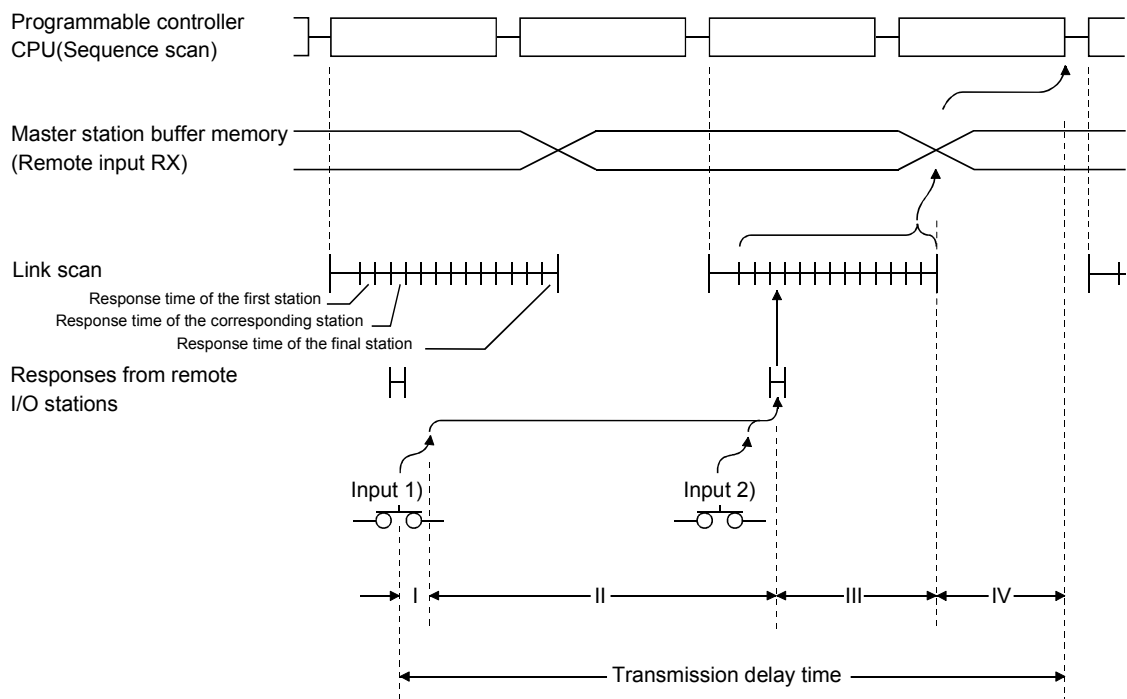
- I: Delay time due to response delay of remote I/O station
- II: Delay time of transmission from the remote I/O station to the master station
- III: Delay time from reception by the master station to storage in the buffer memory
- IV: Delay time until the master station's information is refreshed in the programmable controller CPU

(b) Data flow in the synchronous mode

1) Sequence scan $\geq$ Link scan

- I: Delay time due to response delay of remote I/O station
- II: Delay time of transmission from the remote I/O station to the master station
- III: Delay time from reception by the master station to storage in the buffer memory
- IV: Delay time until the master station's information is refreshed in the programmable controller CPU

2) Sequence scan < Link scan



- I: Delay time due to response delay of remote I/O station
- II: Delay time of transmission from the remote I/O station to the master station
- III: Delay time from reception by the master station to storage in the buffer memory
- IV: Delay time until the master station's information is refreshed in the programmable controller CPU

4.4.9 Replacing modules without error detection (Temporary error invalid station setting function)

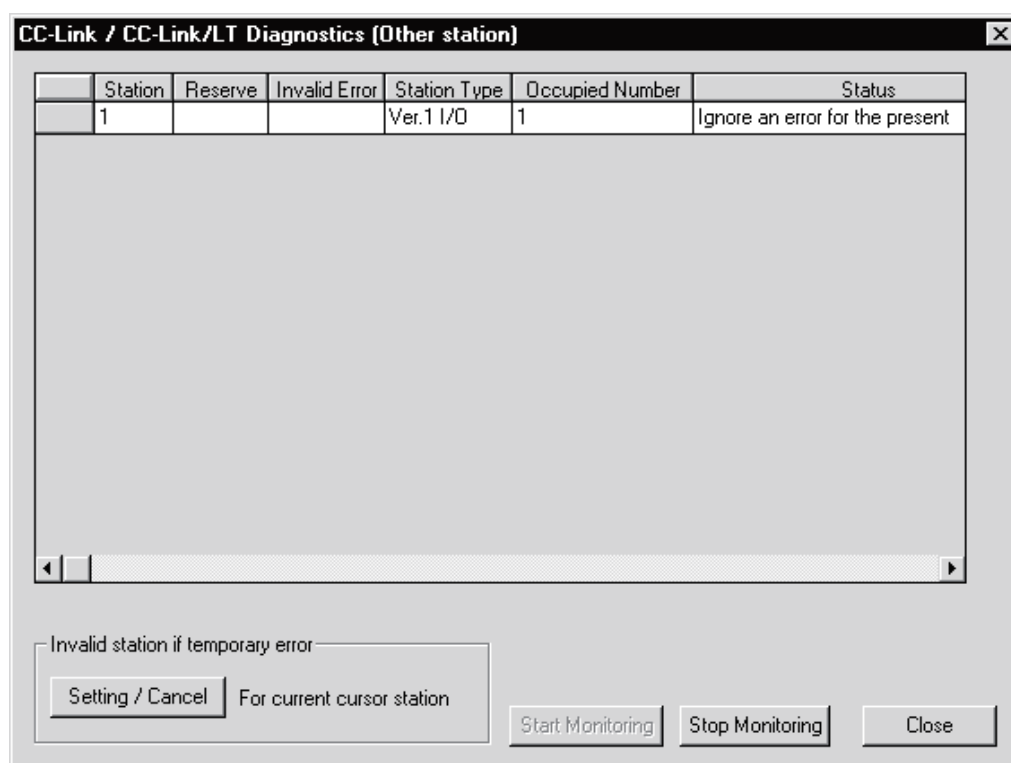
This function prevents remote stations, local stations, intelligent device stations, and the standby master station that are specified with the GX Developer from being treated as "data link faulty stations" while online. It allows the replacement of modules while online without error detection.

(1) Input/output status at temporary error invalid station setting

All the cyclic transmission data of the stations set as temporary error-invalid stations is refreshed. However, when a station set as a temporary error-invalid station becomes faulty, the input is retained and the output switches off.

(2) Setting method

Set the "Diagnostics" - "CC-Link / CC-Link/LT Diagnostics" - "Monitoring other station ..." - "Invalid station if temporary error" using the GX Developer. Place the cursor at the station to be set as a temporary error invalid station and click "Setting/Cancel".



4.4.10 Checking operations for each local station (Data link stop/restart)

This function stops and restarts local data links. If the data link of the master station is stopped, the data link of the entire system stops.

[Setting method]

Set the "CC-Link / CC-Link/LT Diagnostics" in "Diagnostics" using the GX Developer.

(a) Specifying applicable module

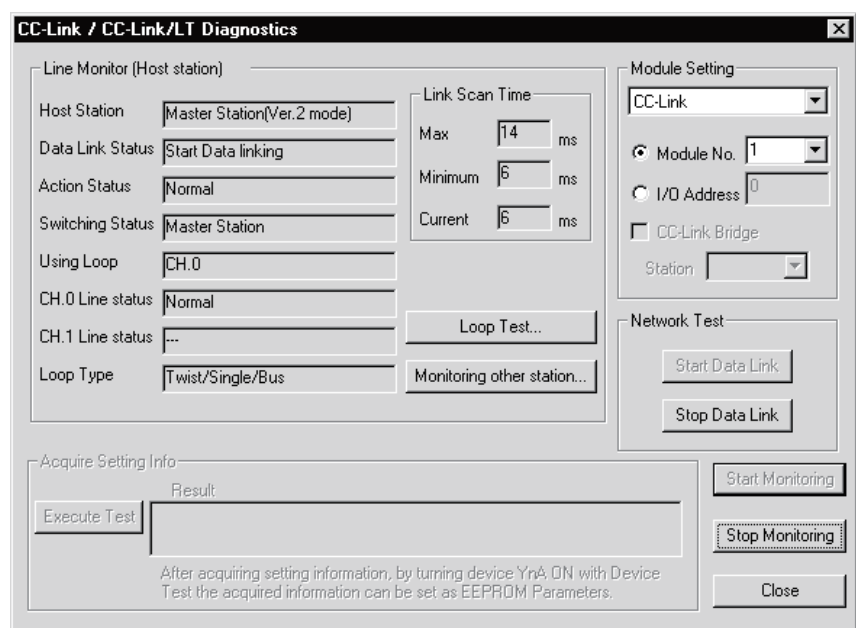
Specify the module whose data link is stopped or restarted in "Module setting".

Specification method: Module No.

I/O Address

(b) Execution of data link stop/restart

Perform these operations by setting "Start Data Link" or "Stop Data Link" in the network test.



4.4.11 Station number overlap checking function

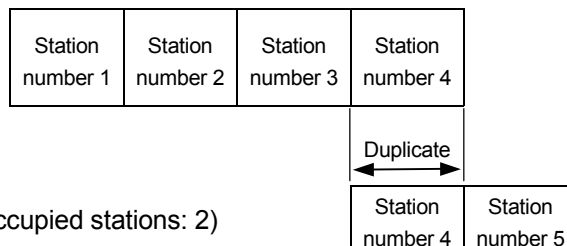
This function investigates the status of connected stations and checks for the overlapping numbers of number of occupied stations and whether or not more than one station whose station number setting is 0 exists in the system.

(1) Number of occupied station number overlap checking

Checks whether or not occupied station numbers duplicate.

(Example)

Local station (station number 1,
number of occupied stations: 4)

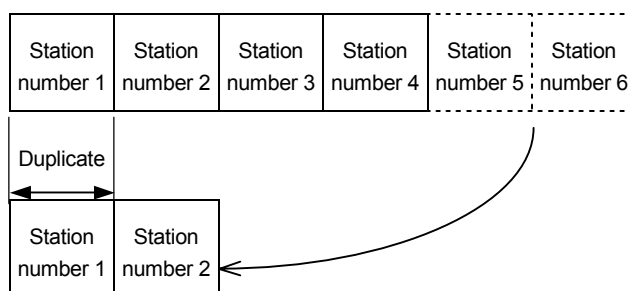


- 1) When there is an duplicate, the "ERR." LED flashes, and the duplicate status is stored in SW0098 to SW009B (Station number overlap status).
- 2) Even if an overlap exists, the data link continues with the remaining normally functioning stations.
- 3) By correcting the switch setting to normal and resetting the programmable controller CPU of the master station, the "ERR." LED is turned off and the data in SW0098 to SW009B can be cleared.

However, if the starting station number overlaps, it is excluded from the overlap checking.

(Example)

Local station (station
number 1, number of
occupied stations: 4)



Check the other station data link status (SW0080 to SW0083) for a data link error. The station number setting of the station where a data link error has occurred may be wrong.

(2) Station number 0 station overlap checking

Checks whether or not more than one station whose station number setting is 0 exists in the system.

- 1) When duplicating, the "ERR." LED lights up, an error code is stored in SW006A (switch setting status), and SB006A (switch setting status) turns on.
- 2) By correcting the switch setting to normal and restarting the data link, the "ERR." LED is turned off and the data in SW006A can be cleared.

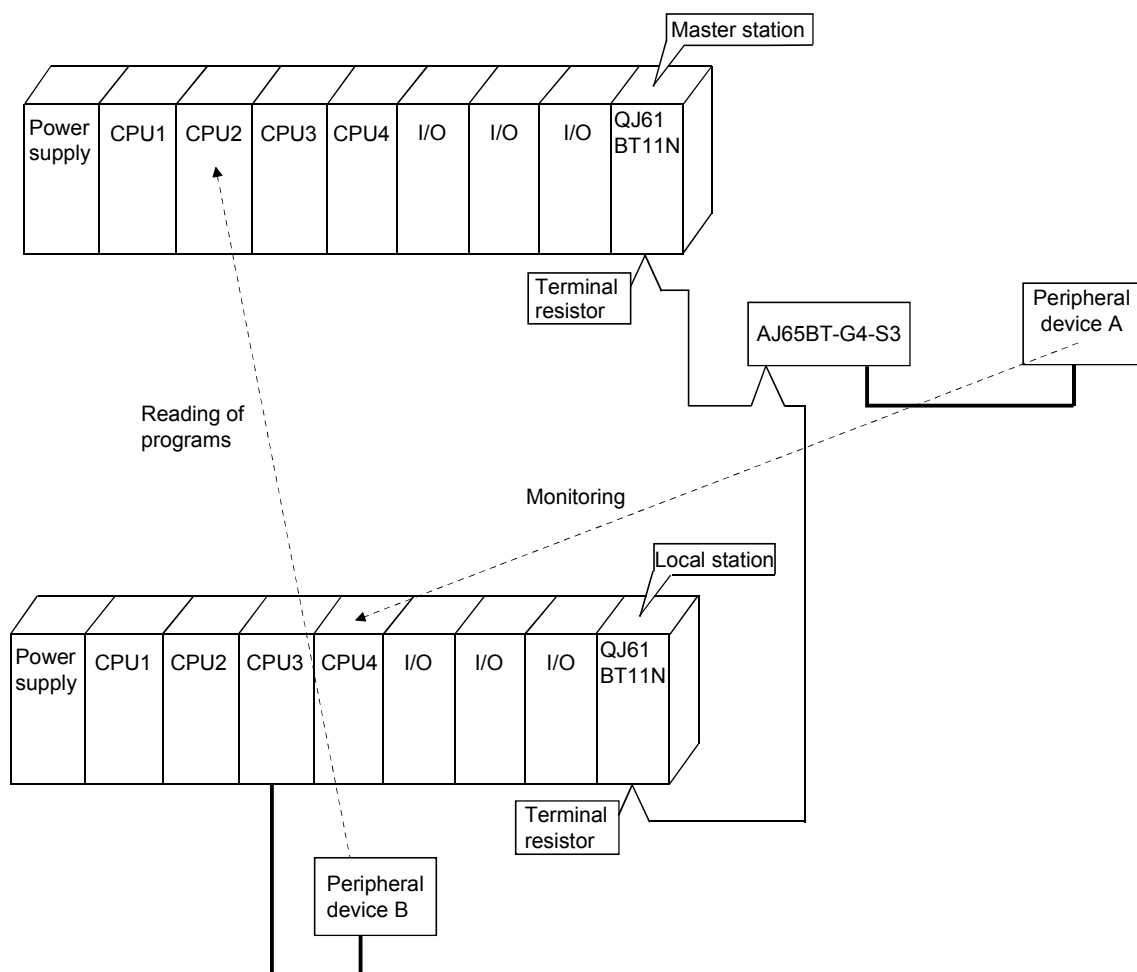
4.4.12 Multiple CPU system support

This function allows monitoring and reading/writing programs from/to any CPU in a multiple CPU system mounted with the QJ61BT11N via AJ65BT-G4-S3 or other station CPUs.

This is illustrated by the following example.

It is possible to monitor CPU4 of the local station from peripheral device A connected to the AJ65BT-G4-S3 and read the programs of CPU2 of the master station from peripheral device B connected to CPU3 of the local station.

This function cannot be used with function version A.

**POINT**

Access source CPUs must be control CPUs in order to make an access.

4.4.13 Reducing the reserved points of the remote I/O stations (Remote I/O station points setting)

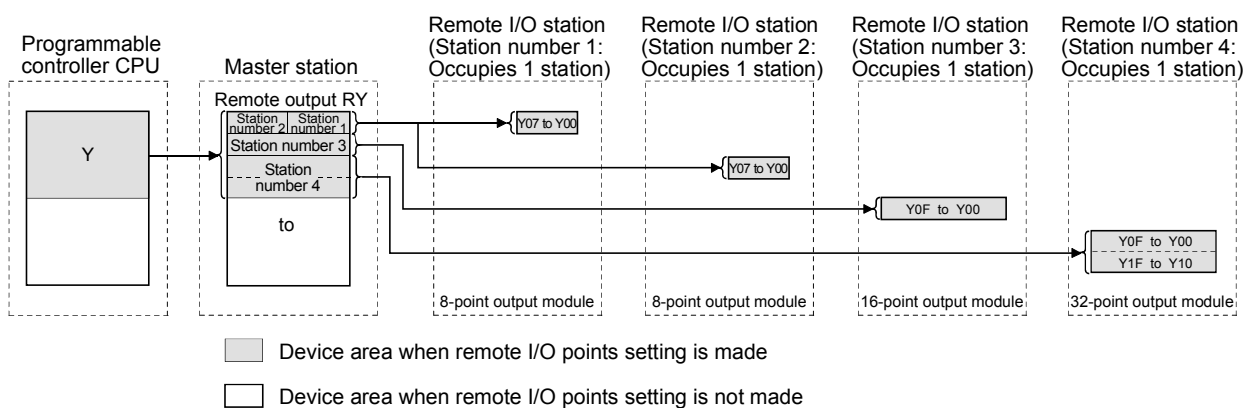
The points of each remote I/O station can be set to 8, 16 or 32 points.

This saves the refresh device points of the programmable controller CPU.

The remote I/O station points setting can be used in the remote net ver. 2 mode only.

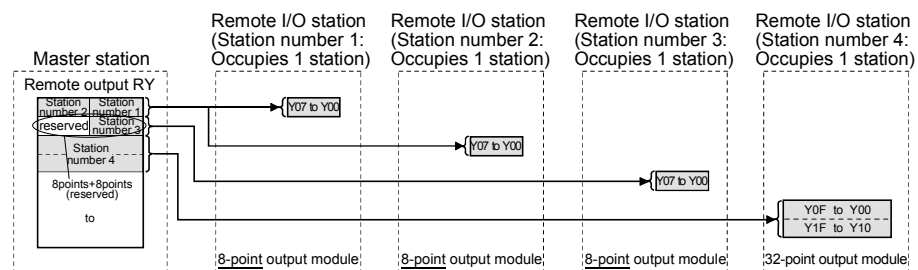
For parameter setting, use GX Developer of version 8.03D or later.

This function cannot be executed if the dedicated instruction is used for parameter setting. This function can be executed when read/write from/to the CPU devices is performed according to the I/O points of each station at cyclic data refresh using the FROM/TO instruction.

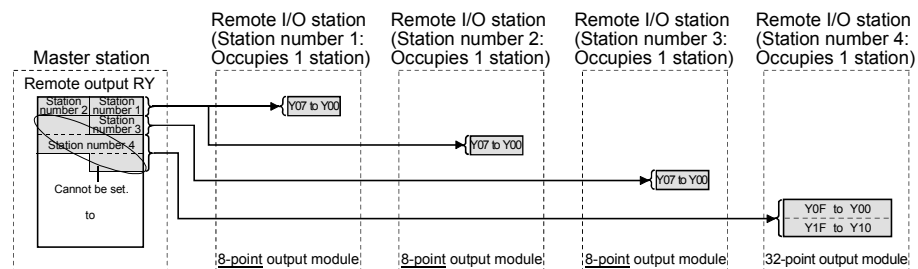


POINT

Set points to even-numbered 8-point setting remote I/O stations consecutively. If points are set to odd-numbered 8-point setting remote stations, select 8 points + 8 points reserved in the "remote station points" setting of the last of the consecutive remote I/O stations.



Odd-numbered 8-point setting remote stations cannot be set for 8 remote station points.



Refer to Section 6.4 for parameter setting.

[Setting method]

Using GX Developer, make setting by choosing "Station information setting" - "Remote station points" in the network parameter dialog box. For more details on the setting, see Section 6.4.

(1) Precautions for setting the remote I/O station points

The number of parameter-set remote I/O station points should be equal to or greater than the number of I/O points of the mounted remote I/O stations. If it is less than the number of I/O points of the mounted remote I/O stations, the inputs/outputs after the set number of points will not operate normally.

4.4.14 Increasing the number of cyclic points (Remote net ver.2 mode)

This function increases the number of cyclic points.

When increasing the number of cyclic points, select one from the following two modes.

- Remote net ver.2 mode Mode suitable for configuring a new system
- Remote net additional mode..... Mode suitable for adding a ver. 2 compatible slave station to the existing ver. 1 system

In the remote net ver. 1 mode, the number of cyclic points cannot be increased.

When using GX Developer for setting, use Version 8.03D or later.

The number of cyclic points per module can be increased as indicated in the following table.

Table 4.10

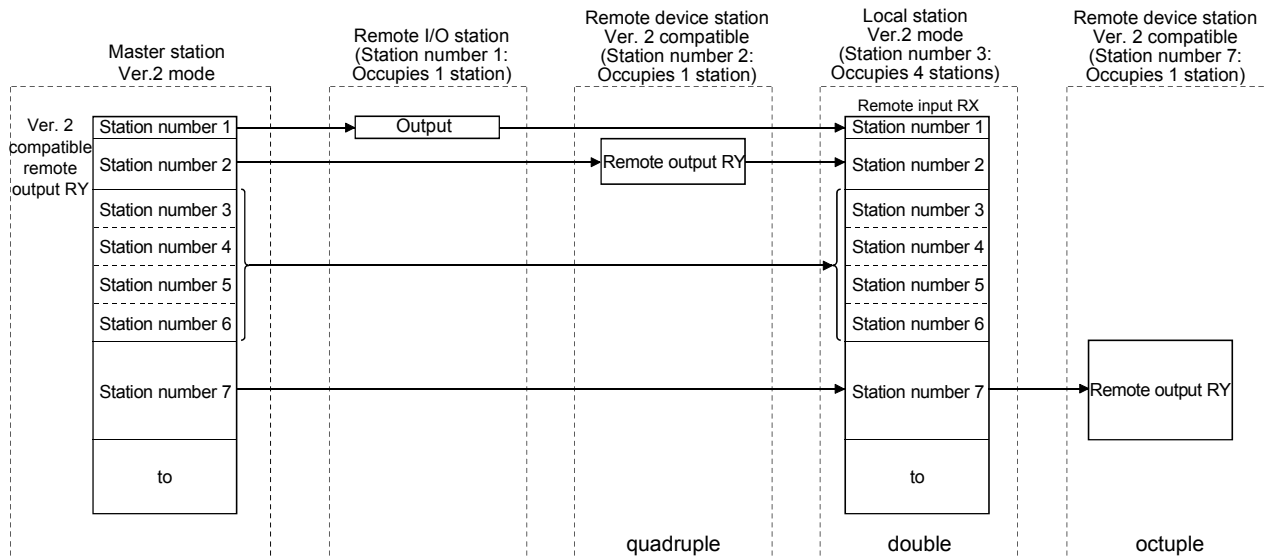
		Expanded cyclic setting			
		single	double	quadruple	octuple
Occupies 1 station	Remote I/O (RX, RY)	32 points	32 points	64 points	128 points
	Remote register (RWw , RWr)	4 points	8 points	16 points	32 points
Occupies 2 stations	Remote I/O (RX, RY)	64 points	96 points	192 points	384 points
	Remote register (RWw , RWr)	8 points	16 points	32 points	64 points
Occupies 3 stations	Remote I/O (RX, RY)	96 points	160 points	320 points	640 points
	Remote register (RWw , RWr)	12 points	24 points	48 points	96 points
Occupies 4 stations	Remote I/O (RX, RY)	128 points	224 points	448 points	896 points
	Remote register (RWw , RWr)	16 points	32 points	64 points	128 points

(1) Remote net ver.2 mode

This mode is designed to configure a new system.

The number of cyclic points can be increased as indicated below.

- Per station, RX/RX can be increased to up to 128 points and RWw/RWw to up to 32 points.
- Per CC-Link network, RX/RX can be increased to up to 8192 points and RWw/RWw to up to 2048 points.

**POINT**

- (1) In the remote net ver. 2 mode, the remote registers of the remote I/O station are set to 0 points.
- (2) When the ver. 2 compatible slave station is added or deleted, the refresh devices of the programmable controller CPU will vary by the number of points set to the added or deleted slave station in the slave stations of the station numbers after the added or deleted slave station. Confirm the varying number of points in Table 4.8.

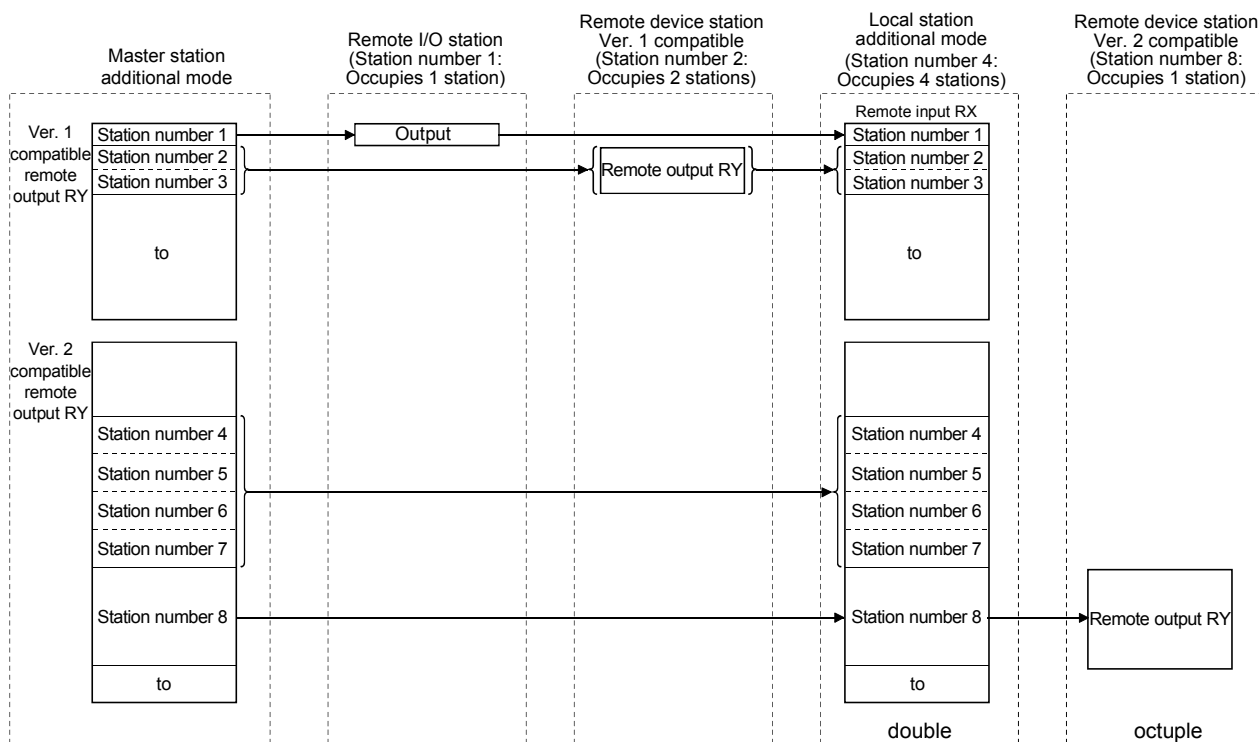
[Setting method]

Using GX Developer, set the network parameters.
For more details on the setting, see Section 6.4.

(2) Remote net additional mode

This mode is designed for use when slave stations including a ver. 2 compatible station is added to the existing ver. 1 system.

The program of the existing system can be used as is.

**POINT**

- (1) Set the station numbers of the slave stations to be added after the last station number used in the existing system.
In the above example, the slave stations are added to and after station No. 4 since the existing system uses up to station No. 3.
- (2) When the ver. 2 compatible slave station is added or deleted, the refresh devices of the programmable controller CPU will vary by the number of points set to the added or deleted slave station in the slave stations of the station numbers after the added or deleted slave station. Confirm the varying number of points in Table 4.8.
- (3) In the remote net additional mode, the ver. 2 compatible slave station must be placed in the latter half as described in (1).
When there is a possibility that ver. 1 compatible slave stations will be added in the future in the remote net additional mode, set multiple reserved stations after the ver. 1 compatible slave station to ensure ease of expanding the system.
- (4) For the system that includes a standby master station, it is recommended to change for the remote net ver. 2 mode.
When the remote net additional mode is used, the sequence program for the standby master station must be corrected.

[Setting method]

Using GX Developer, set the network parameters.
For more details on the setting, see Section 6.5.

(3) Precautions for cyclic points increase setting

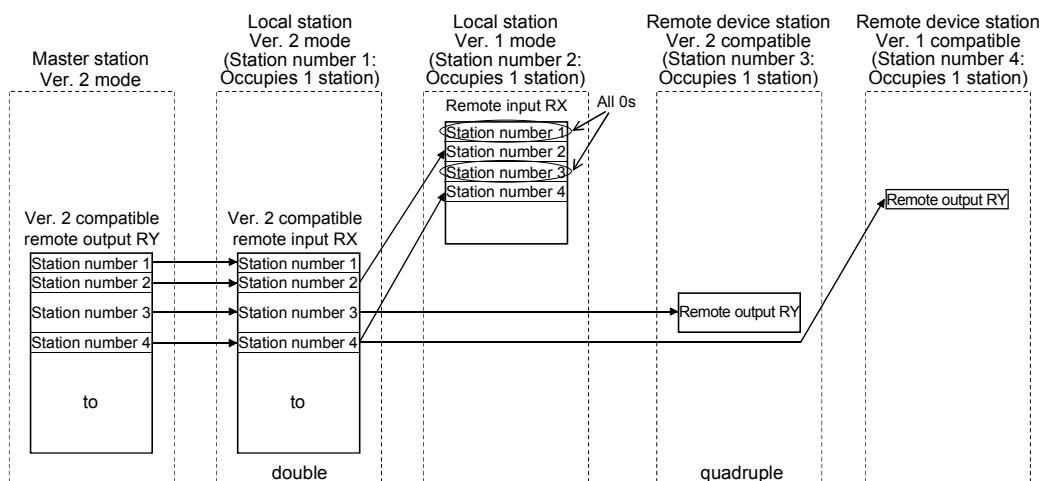
(a) Whether system can be configured or not

The following table indicates whether cyclic transmission can be made or not in each station.

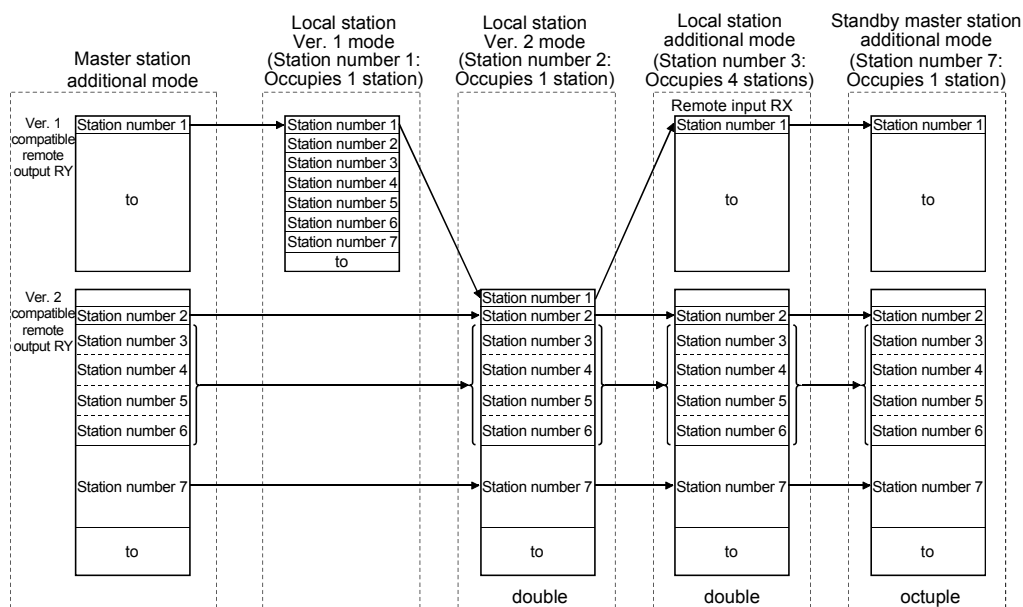
Slave station Master station		QJ61BT11N						QJ61BT11 * 3 AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11, A80BD-J61BT11, A80BD-J61BT13		Intelligent device station		Remote station		
		Local station			Standby master station			Local station	Standby master station			Remote device station		Remote I/O station
		Ver.2 mode	Additional mode	Ver.1 mode	Ver.2 mode	Additional mode	Ver.1 mode	Ver.1 mode	Ver.1 mode	Ver.2 compatible	Ver.1 compatible	Ver.2 compatible	Ver.1 compatible	Ver.1 compatible
QJ61BT11N	Ver.2 mode	○	×	△ * 1	○	×	×	△ * 1	×	○	○	○	○	○
	Additional mode	○ * 2	○	△ * 1	×	○	×	△ * 1	×	○	○	○	○	○
	Ver.1 mode	×	×	○	×	×	○	○	○	×	○	×	○	○
QJ61BT11 * 3	Ver.1 mode	×	×	○	×	×	○	○	○	×	○	×	○	○

○: Cyclic transmission enabled, △: Cyclic transmission enabled on condition, ×: Cyclic transmission disabled

*1 When the master station is the QJ61BT11N in remote net Ver.2 mode or remote net additional mode, and when the local station is the QJ61BT 11N in remote net Ver.1 mode or the QJ61BT11, the local station can communicate with the master station. However, Ver.2 compatible stations are recognized as faulty so that data of these stations cannot be confirmed.



- *2 When the master station is in the remote net additional mode of the QJ61BT11N and the local station is in the remote net ver. 2 mode of the QJ61BT11N, a link is performed as shown in the following areas.



- *3 The remote net ver. 2 mode and remote net additional mode cannot be used with the QJ61BT11.

- *4 Data link is not available when the version set in the station type of the master station information is different from that of the remote station.
- For example, when the station type of the master station information is set as "Ver.1 remote device station" although the actual remote device station is set to "Ver.2 remote device station", data link cannot be performed with the "ERR." LED on the master station flashing and the "L RUN" LED on the remote device station turned OFF.

(b) Whether send/receive is enabled or not

The following table indicates whether send/receive of cyclic data is enabled or not.

Receive station Send station				QJ61BT11N					
				Master station					
				Ver.2 mode		Additional mode		Ver.1 mode	
				Ver. 2 compatible area	Ver. 1 compatible area	Ver. 2 compatible area	Ver. 1 compatible area	Ver. 2 compatible area	Ver. 1 compatible area
QJ61BT11N	Master station	Ver.2 mode	Ver. 2 compatible area	—	—	—	—	—	—
			Ver. 1 compatible area	—	—	—	—	—	—
		Additional mode	Ver. 2 compatible area	—	—	—	—	—	—
			Ver. 1 compatible area	—	—	—	—	—	—
		Ver.1 mode	Ver. 2 compatible area	—	—	—	—	—	—
			Ver. 1 compatible area	—	—	—	—	—	—
	Local station	Ver.2 mode	Ver. 2 compatible area	○	—	○	×	—	×
			Ver. 1 compatible area	—	—	—	—	—	—
		Additional mode	Ver. 2 compatible area	—	—	○	×	—	—
			Ver. 1 compatible area	—	—	—	—	—	—
		Ver.1 mode	Ver. 2 compatible area	—	—	—	—	—	—
			Ver. 1 compatible area	○	—	×	○	—	○
QJ61BT11	Master station	Ver.1 compatible		—	—	—	—	—	—
	Local station	Ver.1 compatible		○	—	×	○	—	○
Intelligent device station		Ver.2 compatible		○	—	○	×	—	×
		Ver.1 compatible		○	—	×	○	—	○
Remote device station		Ver.2 compatible		○	—	○	×	—	×
		Ver.1 compatible		○	—	×	○	—	○
Remote I/O station		Ver.1 compatible		○	—	×	○	—	○

QJ61BT11N						QJ61BT11		Intelligent device station		Remote device station		Remote I/O station
Local station						Master station	Local station					
Ver.2 mode		Additional mode		Ver1 mode		Ver.1 compatible	Ver.1 compatible	Ver.2 compatible	Ver.1 compatible	Ver.2 compatible	Ver.1 compatible	Ver.1 compatible
Ver. 2 compatible area	Ver. 1 compatible area	Ver. 2 compatible area	Ver. 1 compatible area	Ver. 2 compatible area	Ver. 1 compatible area							
○	—	—	—	—	○	—	○	○	○	○	○	○
—	—	—	—	—	—	—	—	—	—	—	—	—
○	—	○	×	—	—	—	×	○	×	○	×	×
○	—	×	○	—	○	—	○	×	○	×	○	○
—	—	—	—	—	—	—	—	—	—	—	—	—
×	—	—	—	—	○	—	○	—	○	—	○	○
○	—	○	—	—	×	×	×	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
○	—	○	×	—	×	×	×	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—
○	—	×	○	—	○	○	○	—	—	—	—	—
×	—	×	×	—	○	—	○	×	○	×	○	○
○	—	×	○	—	○	○	○	—	—	—	—	—
○	—	○	×	—	×	×	×	—	—	—	—	—
○	—	×	○	—	○	○	○	—	—	—	—	—
○	—	○	×	—	×	×	×	—	—	—	—	—
○	—	×	○	—	○	○	○	—	—	—	—	—
○	—	×	○	—	○	○	○	—	—	—	—	—

○: Cyclic transmission enabled, ×: Cyclic transmission disabled, —:Prohibited

(4) Mismatch in number of points between parameter-set expanded cyclic setting and installation status

If there is a mismatch in the number of points between the parameter-set expanded cyclic setting and installation status, the QJ61T11N stores the error code into SW0069. Also, it stores the matching status of each station into SW009C.

(5) Precautions for modes between the master and local/standby master stations

At any of the following settings, an error (error code: B3A0H) will occur at the local station/standby master station.

If the error has occurred, correct the mode in the parameter of the master station/local station/standby master station, and reset the programmable controller CPU.

- The mode set at the master station differs from the mode set at the standby master station.
- When the master station is set to the remote net ver. 1 mode, the local station is set to the remote net ver. 2 mode or remote net additional mode.
- When the master station is set to the remote net ver. 2 mode, the local station is set to remote net additional mode.

(6) Automatic refresh setting

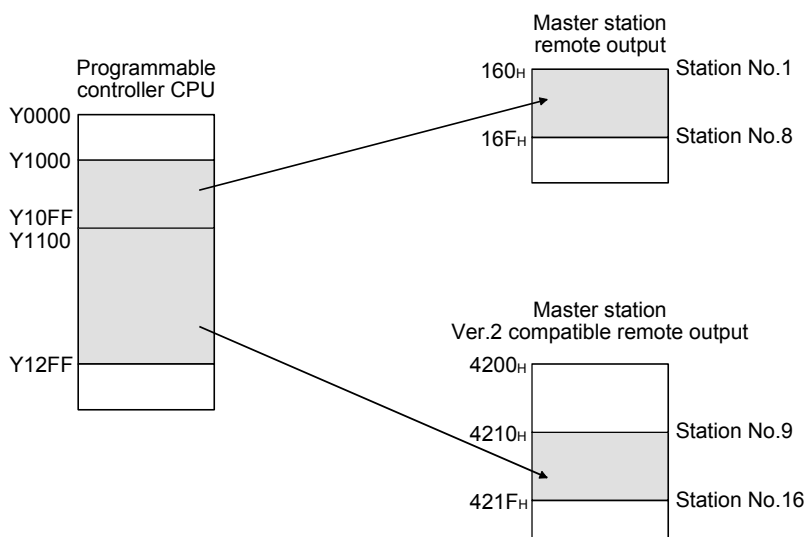
- (a) By specifying refresh devices, automatic refresh is performed in the END processing of the programmable controller CPU.

The automatic refresh covers the areas from station No.1 to the station No. set with the network parameter (including occupied stations).

- (b) When the remote net additional mode is selected, data of station No.1 to the last Ver.1 compatible station (including occupied stations) and data of Ver.2 compatible stations from its first station No. (the last Ver.1 compatible station No. +1) to the last station No. are automatically refreshed to devices specified in the first and last halves respectively.

- (c) In the Ver.2 compatible remote register, data in the area up to the last remote device or intelligent device station No. are refreshed.

(Example) In the case where the remote net additional mode, Ver.1 compatible station: No. 1 to 8, Ver.2 compatible station: No. 9 to 16 (occupying 1 station, quadruple setting), refresh devices (first half): Y1000, and refresh devices (last half): Y1100 are set



4.5 Transient Transmission Functions

This section explains the transient transmission functions.

4.5.1 Performing transient transmission (Dedicated instructions)

The following dedicated instructions can be used for transient transmission.

Applicable station	Instruction	Description	Reference section
Master station Local station	G(P).RIRD	Reads data from the buffer memory of a specified station or a programmable controller CPU device of a specified station.	Appendix 2.2
	G(P).RIWT	Writes data to the buffer memory of a specified station or a programmable controller CPU device of a specified station.	Appendix 2.3
Intelligent device station	G(P).RIRD	Reads data from the buffer memory of a specified station.	Appendix 2.2
	G(P).RIWT	Writes data to the buffer memory of a specified station.	Appendix 2.3
	G(P).RIRCV	Automatically performs a handshake with the specified station and reads data from that station's buffer memory. Available for modules that have handshake signals (e.g. AJ65BT-R2(N)).	Appendix 2.4
	G(P).RISEND	Automatically performs a handshake with the specified station and writes data to that station's buffer memory. Available for modules that have handshake signals (e.g. AJ65BT-R2(N)).	Appendix 2.5
	G(P).RIFR	Reads data from the automatic update buffer of a specified station. Available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).	Appendix 2.6
	G(P).RITO	Writes data to the automatic update buffer of a specified station. Available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).	Appendix 2.7

5 DATA LINK PROCESSING TIME

This chapter explains the data link processing time such as the link scan time and transmission delay time.

5.1 Link Scan Time

This section explains the CC-Link scan time. The following describes the method for calculating the normal value and maximum value for the remote net mode or remote I/O net mode.

[Link scan time (LS)]

(1) For remote net mode

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

BT: Constant (transmission speed)

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BT	51.2	12.8	3.2	1.6	0.8

NI: The final station number in A, B and C

(It includes the number of dedicated stations but excludes the reserved stations, and must be a multiple of 8.)

A: Last station number of remote I/O stations

B: Last station number of remote device stations (including the number of occupied stations)

C: Last station number of local, standby master and intelligent device stations (including the number of occupied stations)

NW: The final station number in B and C

(Includes the number of dedicated stations but excludes the reserved stations, and must be a multiple of 8.)

Final station number	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 stations (excluding reserved stations)

ni: a + b + c (excluding reserved stations)

a: Total number of occupied stations for remote I/O stations

b: Total number of occupied stations for remote device stations

c: Total number of occupied stations for local stations, standby master station and intelligent device stations

nw: b + c (excluding reserved stations)

ST: Constant

(The largest value found in 1) to 3) below. However, 2) is disregarded when B = 0 and 3) is disregarded when C = 0)

1) $800 + (A \times 15)$

2) $900 + (B \times 50)$

3) For $C \leq 26$: $1200 + (C \times 100)$

For $C > 26$: $3700 + \{(C - 26) \times 25\}$

EX: Constant (only when remote net ver. 2 mode or remote net additional mode is used)

50 + total in the following table

Number of occupied stations Expanded cyclic setting	Occupies 1 station	Occupies 2 stations	Occupies 3 stations	Occupies 4 stations
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	$110 \times \text{Number of stations}$	$160 \times \text{Number of stations}$	$210 \times \text{Number of stations}$	$260 \times \text{Number of stations}$

F: Return processing time {only when there is a faulty station (including error invalid and temporary error invalid stations)}

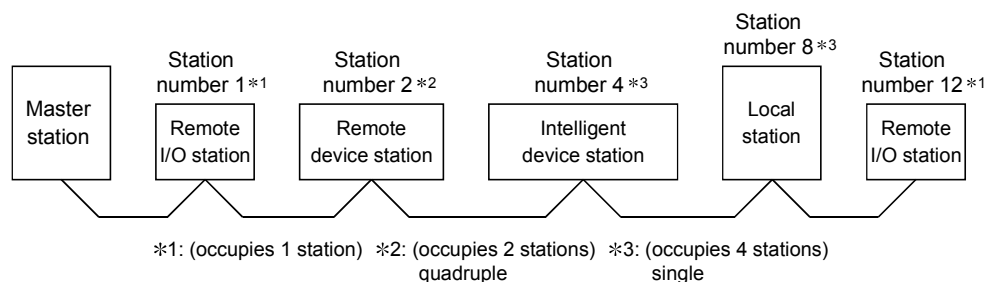
Number of faulty stations $\times 118 \times \text{BT} \times (1 + \text{number of retries})$

TR: Transient processing time (only when a transient request is made)

- When there is a transient request from the master station
 $180 \times \text{BT}$

- When there is a transient request from the local station
 $40.8 \times \text{BT} \times \text{number of transient transmission stations}$

(Example) Using the following system configuration when the transmission speed is 10 Mbps (assuming that there is no faulty station or transient transmission.)



BT = 0.8

NI = 12 $\rightarrow$ 16

NW = 11 $\rightarrow$ 16

N = 5

ni = 12

nw = 10

LS = $0.8 \{27 + (16 \times 4.8) + (16 \times 9.6) + (5 \times 30) + (12 \times 4.8) + (10 \times 9.6)\} + 2300 + 160$
 $= 2908.8 [\mu\text{s}]$
 $= 2.91 [\text{ms}]$

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) For remote I/O net mode

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

BT: Constant (transmission speed)

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BT	51.2	12.8	3.2	1.6	0.8

NI: NI: Final station number (must be a multiple of 8)

Final station number	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

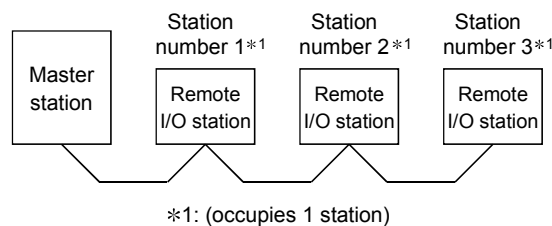
ST: Constant

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

F: Return processing time {only when there is a faulty station (including error invalid and temporary error invalid stations)}

$$\text{Number of faulty stations} \times 118 \times BT \times (1 + \text{number of retries})$$

(Example) Using the following system configuration when the transmission speed is 10 Mbps (assuming that there is no faulty station)



$$BT = 0.8$$

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

$$NI = 3 \rightarrow 8$$

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

$$N = 3$$

$$= 280$$

$$ni = 3$$

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

$$= 415.84 [\mu s]$$

$$= 0.42 [ms]$$

5.2 Transmission Delay Time

This section explains the transmission delay time (the time until data is transmitted).

5.2.1 Master station ↔ Remote I/O station

(1) Master station (RX) ← Remote I/O station (input)

This indicates the time from the moment a signal is input to a remote I/O station until the corresponding CPU device turns ON (OFF).

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

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	$(SM \times n) + (LS \times 2) + Rio$	$\{(SM \times n) \times 2\} + Rio$	$SM + (LS \times 2) + Rio$	$\{(SM \times n) \times 2\} + Rio$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms and remote I/O response time of 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

(2) Master station (RY) → Remote I/O station (output)

This indicates the time from the moment a CPU device turns ON (OFF) until a remote I/O station output turns ON (OFF).

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

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	$(SM \times n) + (LS \times 2) + Rio$	$(SM \times n) + (LS \times 2) + Rio$	$SM + (LS \times 2) + Rio$	$(SM \times n) + (LS \times 2) + Rio$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms and remote I/O response time of 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

5.2.2 Master station ↔ Remote device station (Ver. 1 compatible slave station)

(1) Master station (RX) ← Remote device station (RX),(RW_r)

This indicates the time from when a signal is input to a remote device station until the corresponding CPU device turns ON (OFF) or CPU device data is changed.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

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

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms and remote device station processing time of 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

(2) Master station (RY) → Remote device station (RY),(RW_r)

This indicates the time from when the CPU device turns ON (OFF) until the remote device station output turns ON (OFF), or the time from when data are set to a CPU device until the corresponding data on the remote device station is changed.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

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	$(SM \times n) + (LS \times 2) + Rd$	$(SM \times n) + (LS \times 2) + Rd$	$SM + (LS \times 2) + Rd$	$(SM \times n) + (LS \times 2) + Rd$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms and remote device station processing time of 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

5.2.3 Master station ↔ Remote device station (Ver. 2 compatible slave station)

(1) Master station (RX) ← Remote device station (RX),(RW_r)

This indicates the time from when a signal is input to a remote device station until the corresponding CPU device turns ON (OFF) or CPU device data is changed.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

t : $LS \times m \div SM$ (Digits the past decimal point are rounded up to the nearest integer.)

Rd : Remote device station processing time

m : Constant set in 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	$(SM \times n) + (LS \times 2 \times m) + Rd$	$\{(SM \times t) \times 2\} + Rd$	$SM + (LS \times 2 \times m) + Rd$	$\{(SM \times t) \times 2\} + Rd$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms, and the expanded cyclic setting "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	$(20 \times 1) + (3 \times 1 \times 3) + 1.5$ = 30.5ms	$\{(20 \times 1) \times 1\} + 1.5$ = 21.5ms	$20 + (3 \times 1 \times 3) + 1.5$ = 30.5ms	$\{(20 \times 1) \times 1\} + 1.5$ = 21.5ms
Max. value	$(20 \times 1) + (3 \times 2 \times 3) + 1.5$ = 39.5ms	$\{(20 \times 1) \times 2\} + 1.5$ = 41.5ms	$20 + (3 \times 2 \times 3) + 1.5$ = 39.5ms	$\{(20 \times 1) \times 2\} + 1.5$ = 41.5ms

(2) Master station (RY) → Remote device station (RY),(RW_r)

This indicates the time from when a CPU device turns ON (OFF) until a remote device station output turns ON (OFF), or the time from when data is set to a CPU device until the corresponding data on the remote device station is changed.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

t : $LS \times m \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

Rd : Remote device station processing time

m : Constant set in 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	$(SM \times n) + [LS \times \{(2 \times m) + 1\}] + Rd$	$(SM \times t) + (LS \times m) + Rd$	$SM + [LS \times \{(2 \times m) + 1\}] + Rd$	$(SM \times t) + (LS \times m) + Rd$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms and the expanded cyclic setting "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	$(20 \times 1) + [3 \times \{(1 \times 3) + 1\}] + 1.5$ = 33.5ms	$(20 \times 1) + (3 \times 3) + 1.5$ = 30.5ms	$20 + [3 \times \{(1 \times 3) + 1\}] + 1.5$ = 33.5ms	$(20 \times 1) + (3 \times 3) + 1.5$ = 30.5ms
Max. value	$(20 \times 1) + [3 \times \{(2 \times 3) + 1\}] + 1.5$ = 42.5ms	$(20 \times 1) + (3 \times 3) + 1.5$ = 30.5ms	$20 + [3 \times \{(2 \times 3) + 1\}] + 1.5$ = 42.5ms	$(20 \times 1) + (3 \times 3) + 1.5$ = 30.5ms

5.2.4 Master station ↔ Local station (Ver. 1 compatible slave station)

(1) Master station (RX) ← Local station (RY), Master station (RW_r) ← Local station (RW_w)

This indicates the time from the moment a local station CPU device turns ON (OFF) until the corresponding master station CPU device turns ON (OFF).

Or, it indicates the time from when data is set in a local station CPU device until data is stored to a master station CPU device.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

SL : Local station sequence program scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

k : $LS \div SL$ (Digits past the decimal point are rounded up to the nearest integer.)

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	$(SM \times n) + (LS \times 3) + \{SL \times (k+1)\}$	$\{(SM \times n) \times 3\} + LS + \{SL \times (k+1)\}$	$SM + (LS \times 3) + SL$	$\{(SM \times n) \times 3\} + LS + SL$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms and local station sequence scan time of 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	$(20 \times 1) + (3 \times 2) + \{10 \times (1+1)\}$ = 46ms	$\{(20 \times 1) \times 2\} + \{10 \times (1+1)\}$ = 60ms	$20 + (3 \times 2) + 10$ = 36ms	$\{(20 \times 1) \times 2\} + 10$ = 50ms
Max. value	$(20 \times 1) + (3 \times 3) + \{10 \times (1+1)\}$ = 49ms	$\{(20 \times 1) \times 3\} + \{10 \times (1+1)\}$ = 80ms	$20 + (3 \times 3) + 10$ = 39ms	$\{(20 \times 1) \times 3\} + 10$ = 70ms

(2) Master station (RY) → Local station (RX), Master station (RWw) → Local station (RWr)

This indicates the time from the moment a master station CPU device turns ON (OFF) until the corresponding local station CPU device turns ON (OFF).

Or, it indicates the time from when data is set to a master station CPU device until data is stored in the corresponding local station CPU device.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

SL : Local station sequence program scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

k : $LS \div SL$ (Digits past the decimal point are rounded up to the nearest integer.)

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	$(SM \times n) + (LS \times 3) + \{SL \times (k+1)\}$	$(SM \times n) + (LS \times 2) + \{SL \times (k+1)\}$	$SM + (LS \times 3) + SL$	$(SM \times n) + (LS \times 2) + SL$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms and local station sequence scan time of 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	$(20 \times 1) + (3 \times 2) + \{10 \times (1+1)\}$ =46ms	$(20 \times 1) + (3 \times 2) + \{10 \times (1+1)\}$ =46ms	$20 + (3 \times 2) + 10$ =36ms	$(20 \times 1) + (3 \times 2) + 10$ =36ms
Max. value	$(20 \times 1) + (3 \times 3) + \{10 \times (1+1)\}$ =49ms	$(20 \times 1) + (3 \times 2) + \{10 \times (1+1)\}$ =46ms	$20 + (3 \times 3) + 10$ =39ms	$(20 \times 1) + (3 \times 2) + 10$ =36ms

5.2.5 Master station ↔ Local station (Ver. 2 compatible slave station)

(1) Master station (RX) ← Local station (RY), Master station (RW_r) ← Local station (RW_w)

This indicates the time from the moment a local station CPU device turns ON (OFF) until the corresponding master station CPU device turns ON (OFF).

Or, it indicates the time from when data is set to a local station CPU device until the data is stored to the corresponding master station CPU device.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

SL : Local station sequence program scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

t : $LS \times m \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

k : $LS \div SL$ (Digits past the decimal point are rounded up to the nearest integer.)

m : Constant set in 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	$(SM \times n) + [LS \times \{(2 \times m) + 1\}] + \{SL \times (k + 1)\}$	$\{(SM \times t) \times 3\} + \{SL \times (k + 1)\}$	$SM + [LS \times \{(2 \times m) + 1\}] + SL$	$(SM \times t) \times 3$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms, expanded cyclic setting of "double", and local station sequence scan time of 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	$\{(20 \times 1) \times 2\} + \{10 \times (1 + 1)\}$ =60ms	$20 + [3 \times \{(1 \times 3) + 1\}] + 10$ =41ms	$(20 \times 1) \times 2$ =40ms
Max. value	$(20 \times 1) + [3 \times \{(2 \times 3) + 1\}] + \{10 \times (1 + 1)\}$ =61ms	$\{(20 \times 1) \times 3\} + \{10 \times (1 + 1)\}$ =80ms	$20 + [3 \times \{(2 \times 3) + 1\}] + 10$ =51ms	$(20 \times 1) \times 3$ =60ms

(2) Master station (RY) → Local station (RX), Master station (RWw) → Local station (RWr)

This indicates the time from the moment a master station CPU device turns ON (OFF) until the corresponding local station CPU device turns ON (OFF).

Or, it indicates the time from when data is set to a master station CPU device until the data is stored to the corresponding local station CPU device.

[Expression]

The meanings of symbols in the table are as follows:

SM : Master station sequence program scan time

LS : Link scan time

SL : Local station sequence program scan time

n : $LS \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

t : $LS \times m \div SM$ (Digits past the decimal point are rounded up to the nearest integer.)

k : $LS \div SL$ (Digits past the decimal point are rounded up to the nearest integer.)

m : Constant set in 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	$(SM \times n) + [LS \times \{(2 \times m) + 1\}] + \{SL \times (k + 1)\}$	$\{(SM \times t) \times 2\} + \{SL \times (k + 1)\}$	$SM + [LS \times \{(2 \times m) + 1\}] + SL$	$\{(SM \times t) \times 2\} + SL$

Calculation example:

Master station sequence scan time of 20ms, link scan time of 3ms, expanded cyclic setting of "double", and local station sequence scan time of 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

5.2.6 Master station ↔ Intelligent device station

The transmission delay time between the master station and an intelligent device station varies by the type of intelligent device station used.

See the User's Manual for the intelligent device module to be used.

5.3 Processing Time for Dedicated Instructions

This indicates the dedicated instruction processing time (the time from the moment an instruction is issued until a response is received).

5.3.1 Master station ↔ Local station

(1) Master station ↔ local station

This indicates the time from the moment an instruction is issued by the master station until a response from the local station is received.

[Expression]

[Maximum value]

(a) G(P).RIRD instruction

$$OT + LS \times [BC + \{(read\ points + 16)/16\} *^1 \times 1.067] + SL + (WT \times RT \times 1000) *^2 [ms]$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

SL: Local station sequence program scan time
(0 when reading buffer memory in the CC-Link)

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5 ms, the read points are 20 words (buffer memory in the CC-Link), the monitoring time is 10 s, and the number of retries is zero.

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

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

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

$$= 76.505$$

$$= 76.5 [ms]$$

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

(b) G(P).RIWT instruction

$$OT + LS \times [BC + \{(write\ points + 16)/72\} *^1 \times 1.13] + SL + (WT \times RT \times 1000) *^2 [ms]$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

SL: Local station sequence program scan time

(0 when writing buffer memory in the CC-Link)

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5 ms, the write points are 20 words (buffer memory in the CC-Link), the monitoring time is 10 s, and the number of retries is zero.

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

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

(2) Local station → Master station

This indicates the time from the moment an instruction is issued by the local station until a response from the master station is received.

[Expression]

[Maximum value]

(a) G(P).RIRD instruction

$$OT + LS \times [BC + \{(read\ points + 16)/72\} *^1 \times 1.13] + SM + (WT \times RT \times 1000) *^2 [ms]$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

SM: Master station sequence program scan time

(0 when reading buffer memory in the CC-Link)

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5 ms, the read points are 20 words (buffer memory in the CC-Link), the monitoring time is 10 s, and the number of retries is zero.

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

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

(b) G(P).RIWT instruction

$$OT + LS \times [BC + \{(write\ points + 16)/16\} *^1 \times 1.067] + SM + (WT \times RT \times 1000) *^2 [ms]$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

SM: Master station sequence program scan time

(0 when writing buffer memory in the CC-Link)

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5ms, the write points are 20 words (buffer memory in the CC-Link), the monitoring time is 10 s, and the number of retries is zero.

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

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

5.3.2 Local station ↔ Local station

(1) Local station → Local station

This indicates the time from the moment an instruction is executed by one local station until a response from another local station is received.

[Expression]

[Maximum value]

(a) G(P).RIRD instruction

$$OT + LS \times [BC + \{(read\ points + 16)/16\} *^1 \times 1.067] + SL + (WT \times RT \times 1000) *^2 [ms]$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

SL: Target station sequence program scan time

(0 when reading buffer memory in the CC-Link)

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5 ms, the read points are 20 words (buffer memory in the CC-Link), the monitoring time is 10 s, and the number of retries is zero.

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

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

(b) G(P).RIWT instruction

$$OT + LS \times [BC + \{(write\ points + 16)/16\} *^1 \times 1.067] + SL + (WT \times RT \times 1000) *^2 [ms]$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

SL: Target station sequence program scan time

(0 when writing buffer memory in the CC-Link)

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5 ms, the write points are 20 words (buffer memory in the CC-Link), the monitoring time is 10 s, and the number of retries is zero.

$$OT + LS \times [BC + \{(write\ points + 16)/16\} *^1 \times 1.067] + SL + (WT \times RT \times 1000) [ms]$$

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

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

$$= 76.505$$

$$= 76.5 [ms]$$

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

5.3.3 Master station ↔ Intelligent device station

(1) Master station → Intelligent device station

This indicates the time from the moment an instruction is issued by the master station and a response from an intelligent device station is received.

[Expression]

[Maximum value]

(a) G(P).RIRD instruction

$$OT + LS \times [BC + \{(read\ points + 16)/16\} *^1 \times 1.067] + (WT \times RT \times 1000) *^2 \text{ [ms]}$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5 ms, the read points are 20 words, the monitoring time is 10 s, and the number of retries is zero..

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

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

(b) G(P).RIWT instruction

$$OT + LS \times [BC + \{(write\ points + 16)/72\} *^1 \times 1.13] + (WT \times RT \times 1000) *^2 \text{ [ms]}$$

OT: QCPU (Q mode) dedicated instruction processing time

Basic model QCPU, Q02CPU: 1 [ms]

QCPU (Q mode) (except Basic model QCPU, Q02CPU): 0.5 [ms]

LS: Link scan time (see Section 5.1)

BC: Constant

Transmission speed	156 kbps	625 kbps	2.5 Mbps	5 Mbps	10 Mbps
BC	6	7	9	11	12

WT: Monitoring time set in SW0009 (see Section 8.4.2.)

RT: Number of retries set in SW000B (see Section 8.4.2.)

(Example) When the programmable controller CPU type is Q06HCPU, the transmission speed is 10 Mbps, the link scan time is 5 ms, the write points are 20 words, the monitoring time is 10 s, and the number of retries is zero.

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

*1: Round up below the decimal point

*2: Time elapsed when retries of a dedicated instruction occur

5.4 Link Refresh Time

This section indicates link refresh time (increase of END processing time at the programmable controller CPU).

5.4.1 Master station/local station

This section indicates the link refresh time of the master/local station.

(1) Remote net ver. 1 mode, remote net ver. 2 mode

[Expression]

$$KM1 + (KM2 + KM3) \times \alpha E + (\text{No. of CC-Link modules} - 1) \times KM4 \text{ [ms]}$$

$$\alpha E = \frac{RX + RY + SB}{16} + RWw + RWr + SW$$

RX : Total points of the remote input (RX) refreshed by the master/local station

RY : Total points of the remote output (RY) refreshed by the master/local station

RWw : Total points of the remote register (RWw) refreshed by the master/local station

RWr : Total points of the remote register (RWr) refreshed by the master/local station

SB : Total points of the link special relay (SB) refreshed by the master/local station

SW : Total points of the link special register (SW) refreshed by the master/local station

KM1 : Constant

1) Master station

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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	0.25	—	0.13

—: Does not support the block guarantee of cyclic data per station.

2) Local station *1

CPU type \ Constant	KM1	
	With block guarantee of cyclic data per station function set	Without block guarantee of cyclic data per station function not set
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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	0.43	0.30

—: Does not support the block guarantee of cyclic data per station.

*1 For the Q12PRHCPU and Q25PRHCPU, local station setting is not available.

KM2, KM3, KM4 : Constant

Not influenced by the block guarantee of cyclic data per station

1) When QJ61BT11N is mounted on main base unit

CPU type \ Constant	KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		KM4
		When file register on memory card is used	When file register on memory card is 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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	0.23	0.03	—	0.2

2) When QJ61BT11N is mounted on extension base unit

CPU type	Constant	KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		KM4
			When file register on memory card is used	When file register on memory card is 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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU		0.90	0.03	—	0.2

(Example)

When the programmable controller CPU type is the Q06HCPU, the QJ61BT11N is mounted on the main base and used as the master station, and 2048 points of RX, 2048 points of RY, 256 points of RWw, 256 points of RWr, 512 points of SB and 512 points of SW are refreshed besides the file register.

(a) When the block guarantee of cyclic data per station is enabled

$$\begin{aligned}
 \alpha E &= \left(\frac{RX+RY+SB}{16} + RWw+RWr+SW \right) \\
 &= \left(\frac{2048+2048+512}{16} + 256+256+512 \right) \\
 &= 1312
 \end{aligned}$$

$$\begin{aligned}
 &KM1+(KM2+KM3) \times \alpha E + (\text{No. of CC-Link modules}-1) \times KM4 \\
 &= 0.24 + (0.00043+0) \times 1312 + (1-1) \times 0.2 \\
 &= 0.80416 \\
 &= 0.80 \text{ [ms]}
 \end{aligned}$$

(b) When the block guarantee of cyclic data per station is not enabled

$$\begin{aligned}
 &KM1+(KM2+KM3) \times \alpha E + (\text{No. of CC-Link modules}-1) \times KM4 \\
 &= 0.22 + (0.00043+0) \times 1312 + (1-1) \times 0.2 \\
 &= 0.78416 \\
 &= 0.78 \text{ [ms]}
 \end{aligned}$$

(2) Remote net additional mode

[Expression]

$$KM1 + (KM2 + KM3) \times \alpha E + (\text{No. of CC-Link modules} - 1) \times KM4 \text{ [ms]}$$

$$\alpha E = \frac{RX + RX2 + RY + RY2 + SB}{16} + RWw + RWw2 + RWr + Rwr2 + SW$$

RX : Points of the remote input (RX) refreshed by the master/local station

RX2 : Points of the ver. 2 remote input (RX) refreshed by the master/local station

RY : Points of the remote output (RY) refreshed by the master/local station

RY2 : Points of the ver. 2 remote output (RY) refreshed by the master/local station

RWw : Points of the remote register (RWw) refreshed by the master/local station

RWw2 : Points of the ver. 2 remote register (RWw) refreshed by the master/local station

RWr : Points of the remote register (RWr) refreshed by the master/local station

RWr2 : Points of the ver. 2 remote register (RWr) refreshed by the master/local station

SB : Points of the link special relay (SB) refreshed by the master/local station

SW : Points of the link special register (SW) refreshed by the master/local station

KM1 : Constant

1) Master station

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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	0.25	0.17

—: Does not support the block guarantee of cyclic data per station.

2) Local station*¹

CPU type \ Constant	KM1	
	With block guarantee of cyclic data per station function set	Without block guarantee of cyclic data per station function not set
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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	0.47	0.35

—: Does not support the block guarantee of cyclic data per station.

*1 For the Q12PRHCPU and Q25PRHCPU, local station setting is not available.

KM2, KM3, KM4 : Constant

Not influenced by the block guarantee of cyclic data per station function

1) When QJ61BT11N is mounted on main base unit

CPU type \ Constant	KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		KM4
		When file register on memory card is used	When file register on memory card is 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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU	0.23	0.03	—	0.2

2) When QJ61BT11N is mounted on extension base unit

CPU type	Constant	KM2 ($\times 10^{-3}$)	KM3 ($\times 10^{-3}$)		KM4
			When file register on memory card is used	When file register on memory card is 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
Q03UDCPU, Q04UDHCPU, Q06UDHCPU, Q10UDHCPU, Q13UDHCPU, Q20UDHCPU, Q26UDHCPU, Q03UDEHCPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU		0.90	0.03	—	0.2

(Example)

When the programmable controller CPU type is the Q06HCPU, the QJ61BT11N is mounted on the main base and used as the master station, and 1024 points of RX, 896 points of RX2, 1024 points of RY, 896 points of RY2, 128 points of RWw, 128 points of RWw2, 128 points of RWr, 128 points of RWr2, 512 points of SB and 512 points of SW are refreshed besides the file register.

(a) When the block guarantee of cyclic data per station is enabled

$$\begin{aligned}
 \alpha E &= \frac{RX+RX2+RY+RY2+SB}{16} + RWw+RWw2+RWr+RWr2+SW \\
 &= \frac{1024+896+1024+896+512}{16} + 128+128+128+128+512 \\
 &= 1296
 \end{aligned}$$

$$\begin{aligned}
 &KM1+(KM2+KM3) \times \alpha E + (\text{No. of CC-Link modules}-1) \times KM4 \\
 &= 0.30+(0.00043+0) \times 1296+(1-1) \times 0.2 \\
 &= 0.85728 \\
 &= 0.86 \text{ [ms]}
 \end{aligned}$$

(b) When the block guarantee of cyclic data per station is not enabled

$$\begin{aligned}
 &KM1+(KM2+KM3)+\alpha E+(\text{No. of CC-Link modules}-1) \times KM4 \\
 &= 0.28+(0.00043+0) \times 1296+(1-1) \times 0.2 \\
 &= 0.83728 \\
 &= 0.84 \text{ [ms]}
 \end{aligned}$$

5.5 Station Status at Error Occurrence

This section explains the status of each station at error occurrence.

5.5.1 Status of the master station, standby master station (when the master station is operating) and remote I/O station at error occurrence

Table 5.1 lists the operation of the master station, standby master station (when the master station is operating) and remote I/O station upon the occurrence of an error.

Table 5.1 The status of the master station, standby master station (when the master station is operating) and remote I/O station at error occurrence

Data link status			Master station, standby master station (when the master station is operating)				Remote I/O station	
			Remote input (RX)	Remote output (RY)	Remote register (RWw)	Remote register (RWr)	Input	Output
When data link is stopped due to an error generated by the master station programmable controller CPU (data link continue)			Continue	* 1	Continue	Hold	Continue	* 1
When data link is stopped due to an error generated by the local station programmable controller CPU (data link continue)			* 2	Continue	Continue	Continue	Continue	Continue
When data link for the entire system is stopped	The GX Developer data link faulty station is set (master station setting)	Clear	Clear	Undefined	Undefined	Hold	By external signals	All points OFF
		Hold	Hold					
When a communication error (power off, etc.) occurs in a remote I/O station	The GX Developer data link faulty station is set (master station setting)	Clear	Clears the receive area from the remote I/O station having a communication error	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	Retains the receive area from the remote I/O station with a communication error					
When a communication error (power off, etc.) occurs in a remote device station	The GX Developer data link faulty station is set (master station setting)	Clear	Clears the receive area from the remote device station with a communication error	Continue	Continue	Retains the receive area from the remote device station with a communication error	Continue (Not affected by the communication status of the remote device station)	Continue (Not affected by the communication status of the remote device station)
		Hold	Retains the receive area from the remote device station with a communication error.					
When a communication error (power off, etc.) occurs in a local station	The GX Developer data link faulty station is set (master station setting)	Clear	Clears the receive area from the local station with a communication error	Continue	Continue	Retains the receive area from the local station with a communication error	Continue (Not affected by the communication status of the local station)	Continue (Not affected by the communication status of the local station)
		Hold	Retains the receive area from the local station with a communication error					

*1: If parameter setting has been made using the dedicated instructions, the data is held. If parameter setting has been made using GX Developer, the data is cleared when the RY refresh device is set to Y, the data is cleared or held when the RY refresh device is set to other than Y. (See Section 4.3.5.)

*2: When the RY refresh device is set to "Y" for the local station that has stopped, only the receive area is cleared from the stopped local station ; the receive area is retained or cleared when the RY refresh device is set to other than Y. (See Section 4.3.5.) Operation continues for the receive areas from other stations.

5.5.2 Status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence

Table 5.2 lists the status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence.

Table 5.2 The status of the remote device station, local station, standby master station (when the local station is operating) and intelligent device station at error occurrence

Data link status			Remote device station, intelligent device station				Local station, standby master station (when local station is operating)			
			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 data link is stopped due to an error generated by the master station programmable controller CPU (data link continue)			Continue	* 1	Continue	Continue	Clear	Continue	Continue	Continue
When data link is stopped due to an error generated by the local station programmable controller CPU (data link continue)			Continue	Continue	Continue	Continue	Continue	* 3	Continue	Continue
When data link for the entire system is stopped	The GX Developer data link faulty station is set (local station setting)	Clear	Undefined	All points OFF	Undefined	Undefined	Clear	Clears the receive areas from other stations	Retains the receive area from other stations	Hold
		Hold					Hold	Retains the receive areas from other stations		
When a communication error (power off, etc.) occurs in a remote I/O station	The GX Developer data link faulty station is set (local station setting)	Clear	Continue	Continue	Continue	Continue	Continue	Clears the receive area from a remote I/O station with a communication error	Continue	Continue
		Hold						Retains the receive area from a remote I/O station with a communication error		
When a communication error (power off, etc.) occurs in a remote device station	The GX Developer data link faulty station is set (local station setting)	Clear	Undefined	Undefined	Undefined	Undefined	Continue	Clears the receive area from a remote device station with a communication error	Retains the receive area from a remote device station with a communication error	Continue
		Hold						Retains the receive area from a remote device station with a communication error		
When a communication error (power off, etc.) occurs in a local station	The GX Developer data link faulty station is set (local station setting)	Clear	Continue	Continue	Continue	Continue	Continue	Clears the receive area from a local station with a communication error	Retains the receive area from a local station with a communication error	Continue
		Hold						Retains the receive area from a local station with a communication error		

*1: If parameter setting has been made using the dedicated instructions, the data is held. If parameter setting has been made using GX Developer, the data is clear when the RY refresh device is set to Y, the data is cleared or held when the RY refresh device is set to other than Y. (See Section 4.3.5.)

*2: When the RY refresh device is set to "Y" for the local station that has stopped, only the receive area is cleared from the stopped local station; the receive area is retained or cleared when the RY refresh device is set to other than Y. (See Section 4.3.5.) Operation continues for the receive areas from other stations.

6 PARAMETER SETTINGS

This chapter explains the parameter settings that are required to perform data link with the CC-Link.

6.1 Procedure from Parameter Settings to Data Link Startup

The following explains the procedure from setting the parameters to starting the data link.

6.1.1 CPU parameter area and master module parameter memory

The following explains the relationship between the CPU parameter area and the master station's parameter memory.

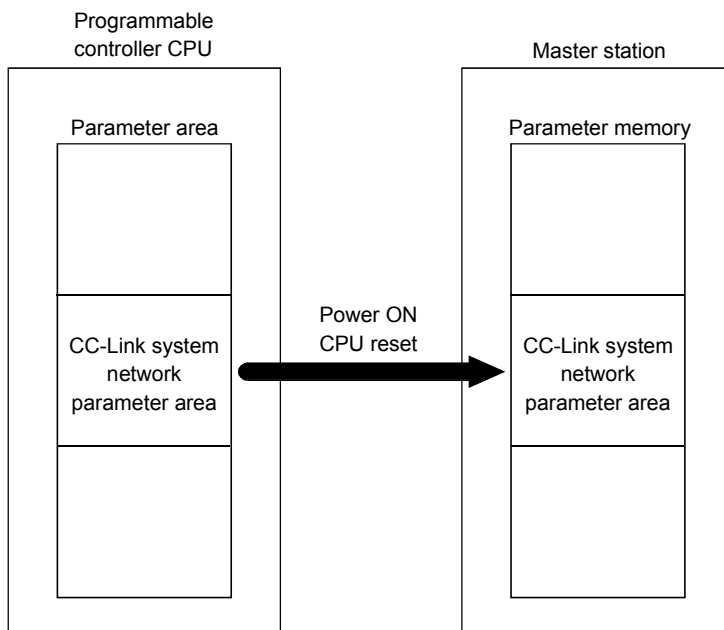
(1) CPU parameter area

This area is used to set the basic values for controlling the programmable controller system and the network parameters that control the CC-Link system.

(2) Master station parameter memory

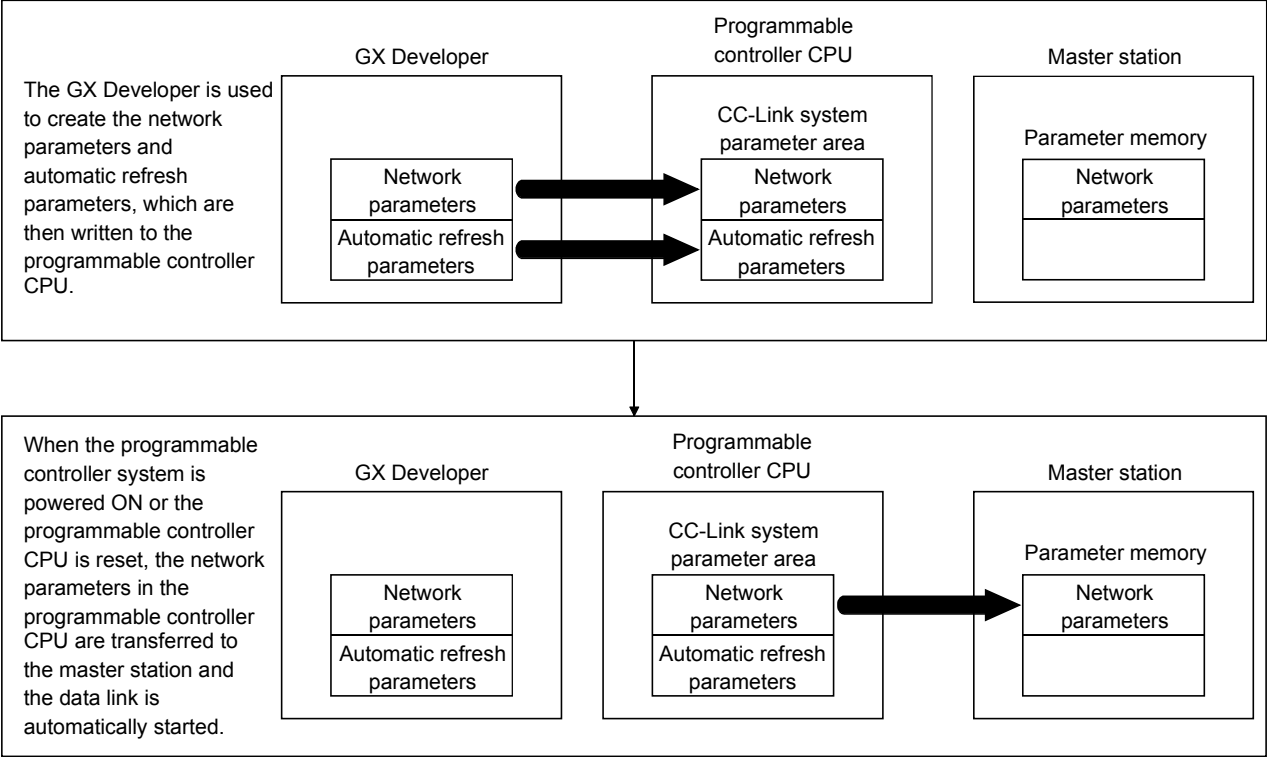
This area stores the network parameters for the CC-Link system.

When the module is powered off or the programmable controller CPU is reset, the network parameters are erased.



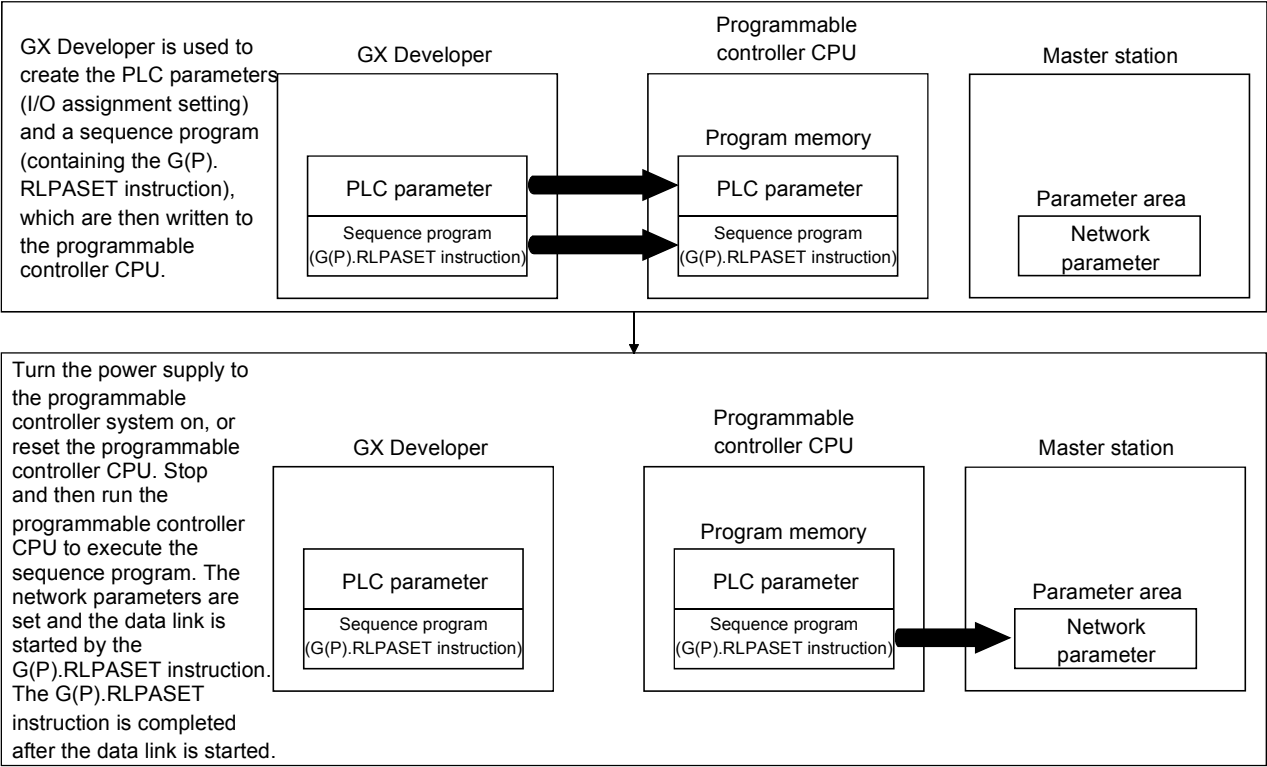
6.1.2 Procedure from parameter settings to data link startup with GX Developer

Follow the procedure below from parameter settings to data link startup:



6.1.3 Procedure from parameter settings to data link startup with dedicated instruction

Follow the procedure below from parameter settings to data link startup:



6.2 Parameter Setting Items

Table 6.1 lists the items to be stored in the master station parameter memory.

Table 6.1 Parameter setting items (1/2)

Setting item	Description	Reference section	Master station	Local station	Standby master station
Data link disorder station setting	Sets the input data status from the data link disorder station. Default value : Clear Setting range : Hold input data : Clear	Section 4.3.4	○	○	○
Case of CPU STOP setting	Sets whether slave stations will be refreshed or compulsorily cleared in case of programmable controller CPU STOP. Default value : Refresh Setting range : Refresh : Clears compulsorily	Section 4.3.5	○	○	○
Block guarantee of cyclic data per station	Specifies whether or not to secure cyclic data on a per-station basis. Default value : Disable Setting range : Disable Enable	Section 4.3.8	○	○	○
Number of occupied stations *	Sets the number of occupied local and standby master stations. Default value : Occupies 1 station Setting range : Occupies 1 to 4 stations	—	×	○	○
Expanded cyclic setting	Makes the expanded cyclic setting of the local station. Default value : single Setting range : single, double, quadruple, octuple	Section 4.4.14	×	○	○
Number of connected modules	Sets the total number of remote stations, local stations, intelligent device stations and standby master station that are connected to the master station (including reserved stations). Default value : 64 (modules) Setting range : 1 to 64 (modules)	—	○	×	×
Number of retries	Sets the number of retries when a communication error occurs. Default value : 3 (times) Setting range : 1 to 7 (times)	—	○	×	×
Number of automatic return modules	Sets the total number of remote stations, local stations, intelligent device stations and standby master station that can be returned to system operation by a single link scan. Default value : 1 (module) Setting range : 1 to 10 (modules)	Section 4.3.2	○	×	×
Standby master station specification	Specifies the station number of the standby master station. Default value : Blank (no standby master station specified) Setting range : Blank, 1 to 64 (Blank: No standby master station specified)	Section 4.3.6	○	×	×
Operation specification when CPU is down	Specifies the data link status when a master station programmable controller CPU error occurs. Default value : Stop Setting range : Stop : Continue	Section 4.3.3	○	×	×
Scan mode specification	Specifies either the synchronous or asynchronous mode for sequence scan. Default value : Asynchronous Setting range : Asynchronous : Synchronous	Section 4.4.8	○	×	×
Delay time setting	Set 0 for the delay time.	—	○	×	×
Reserved station specification	Specifies the reserved station. Default value : Not specified Setting range : Not specified : Specified	Section 4.4.6	○	×	×
Error invalid station specification	Specifies the error invalid station. Default value : Not specified Setting range : Not specified : Specified	Section 4.4.7	○	×	×

* "Number of exclusive stations" on the screen is described as "Number of occupied stations" in this manual.
"Exclusive station 1" on the screen is described as "Occupies 1 station" in this manual.

Table 6.1 Parameter setting items (2/2)

Setting item	Description	Reference section	Master station	Local station	Standby master station
Station information	Set the station information according to the connected remote station, local station, intelligent device station and standby master station. Default value : Ver.1 remote I/O station, occupies 1 station, station number 1 to Ver.1 remote I/O station, occupies 1 station, station number 64 Setting range : Remote I/O station, remote device station, intelligent device station/Ver.1, Ver.2 (single, double, quadruple, octuple) Station type Number of occupied stations : 1 to 4 Station number : 1 to 64	—	○	×	×
Assignments of communication buffer and automatic update buffer	Specifies the assignments of buffer memory sizes during transient transmission to a local station, a standby master station and an intelligent device station. Default values Send buffer size : 40H (64) (word) Receive buffer size : 40H (64) (word) Automatic update buffer size : 80H (128) (word) Setting range - Communication buffer size : 0H (0) (word) (Not specified), or 40H (64) (word) to 1000H (4096) (word) However, the total communication buffer size must be 1000H (4096) (word) or less. - Automatic update buffer : 0H (0) (word) (Not specified), or 80H (128) (word) to 1000H (4096) (word) However, the total automatic buffer size must be 1000H (4096) (word) or less.	—	○	×	×

POINT

- (1) For the communication buffer size, specify the size that is calculated by adding seven words to the data size to be sent or received.
For the automatic update buffer size, specify the size required for each intelligent device station.
- (2) The network parameters other than operational settings and mode setting are also made valid when the programmable controller CPU is switched from STOP to RUN.
- (3) When changing the parameters and settings of master station or slave station, stop the data link by the master station and then make the changes.
- (4) When changing the parameters and settings of slave station, change the parameters of master station along with the slave station change.

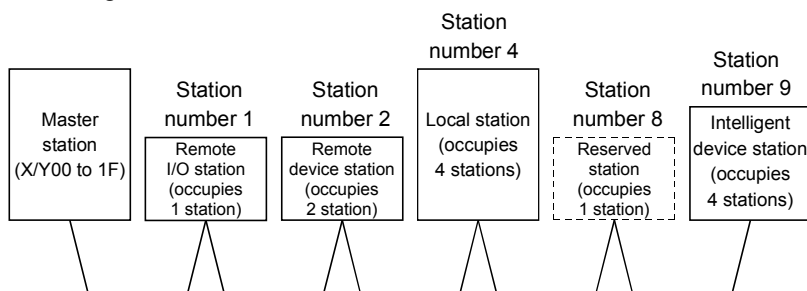
Table 6.2 indicates the reference sections for the detailed explanation of the parameter setting methods.

Table 6.2

	Mode	Reference section
Parameter setting with GX Developer	Remote net ver.1 mode	Section 6.3
	Remote net ver.2 mode	Section 6.4
	Remote net additional mode	Section 6.5
	Remote I/O net mode	Section 6.6
Parameter setting with dedicated instruction	Remote net ver.1 mode	Section 6.7
	Remote net ver.2 mode	
	Remote net additional mode	

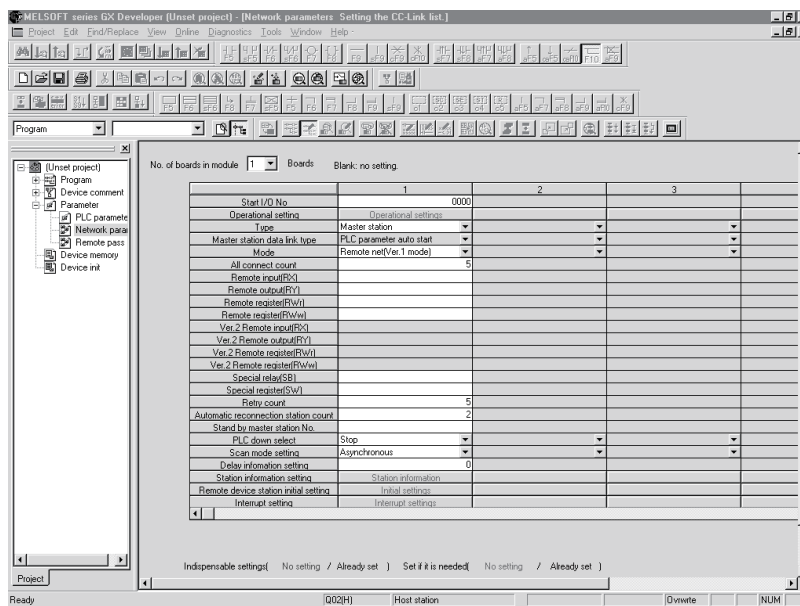
6.3 Example of Parameter Settings with GX Developer (Remote net ver.1 mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual. The explanations in this section are based on the following example of the system configuration.



6.3.1 Master station network parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the network parameters using the following procedure.

- (a) Set the "No. of boards in module" for which the network parameters are to be set.

Default value: None

Setting range: 0 to 8 (Boards)*

* Modules for the parameter setting with the G(P).RLPASET instruction should not be included in the setting for "No. of boards in module".

Example) Set 1 (Board).

- (b) Set the "Start I/O No." for the master station.

Default value: None

Setting range: 0000 to 0FE0

Example) Set 0000.

- (c) Set the Parameter name in "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkM".

- (d) Set the input status for the data link error station in "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).

- (e) Set the slave station refresh/compulsory clear setting at programmable controller CPU STOP in "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).

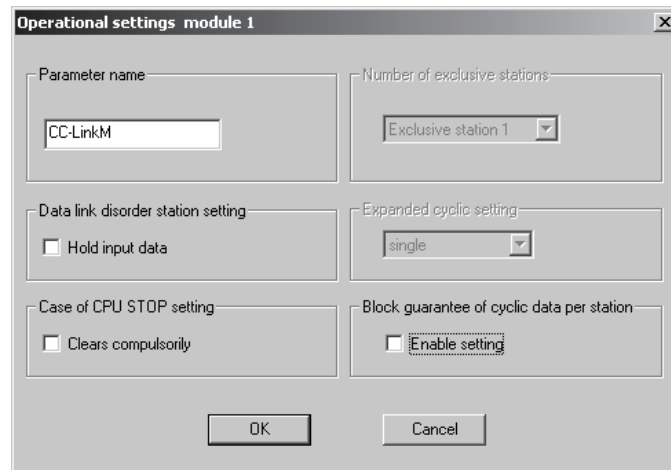
- (f) Set the block guarantee of cyclic data per station in "Operational settings".

Default value: Disable ("Enable setting" not checked)

Setting range: Disable ("Enable setting" not checked)

Enable ("Enable setting" checked)

Example) Set to Disable ("Enable setting" not checked).



- (g) Set the station type for "Type".

Default value: Master station

Setting range: Master station

Master station (Duplex function)

Local station

Standby master station

Example) Set to Master station.

- (h) Set the CC-Link mode for "Mode".

Default value: Remote net(Ver.1 mode)

Setting range: Remote net(Ver.1 mode)

Remote net(Ver.2 mode)

Remote net(Additional mode)

Remote I/O net mode

Off line

Example) Set to Remote net (Ver.1 mode).

- (i) Set the total number of connected stations in the CC-Link system including reserved stations for "All connect count".

Default value: 64 (modules)

Setting range: 1 to 64 (modules)

Example) Set to 5 (modules).

- (j) Set the number of retries for "Retry count", when a communication error occurs.

Default value: 3 (times)

Setting range: 1 to 7 (times)

Example) Set to 5 (times).

- (k) Set the number of modules that can return to system operation by a single link scan for "Automatic reconnection station count".
Default value: 1 (module)
Setting range: 1 to 10 (modules)
Example) Set to 2 (modules).
- (l) Set the station number for the standby master station for "Standby master station No.".
Default value: Blank (No standby master station specified)
Setting range: Blank, 1 to 64 (Blank: No standby master station specified)
Example) Set to blank (No standby master station specified).
- (m) Set the data link status for "PLC down select", when a master station programmable controller CPU error occurs.
Default value: Stop
Setting range: Stop
Continue
Example) Set to Stop.
- (n) Set whether the link scan for the sequence scan is synchronous or asynchronous for "Scan mode setting".
Default value: Asynchronous
Setting range: Asynchronous
Synchronous
Example) Set to Asynchronous.
- (o) Set 0 for the delay time.

(p) Set the station data for "Station information settings".

Default value: Remote I/O station, single, Occupies 1 station, 32 points, or no setting for reserved stations/error invalid.

Setting range: Station type - No setting

Remote I/O station

Remote device station

Intelligent device station (including local station and standby master station)

Expanded cyclic setting (cannot be changed)-
single

Number of occupied stations -

No setting

Occupies 1 station

Occupies 2 stations

Occupies 3 stations

Occupies 4 stations

Remote station points (cannot be changed)-

32 points [when occupies 1 station]

64 points [when occupies 2 stations]

96 points [when occupies 3 stations]

128 points [when occupies 4 stations]

Reserved/invalid station select -

No setting

Reserved station

Invalid station (error invalid station)

Intelligent buffer select (word) -

No setting

Send 0, 64 to 4096

Receive 0, 64 to 4096

Automatic 0, 128 to 4096

Example) Set the station data according to the system configuration specified in Section 6.3.

CC-Link station information, Module 1

Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word)		
						Send	Receive	Automatic
1/1	Remote I/O station	single	Exclusive station 1	32 points	No setting			
2/2	Remote device station	single	Exclusive station 2	64 points	No setting			
3/4	Intelligent device station	single	Exclusive station 4	128 points	No setting	64	64	128
4/8	Remote I/O station	single	Exclusive station 1	32 points	Reserve station			
5/9	Intelligent device station	single	Exclusive station 4	128 points	No setting	64	64	128

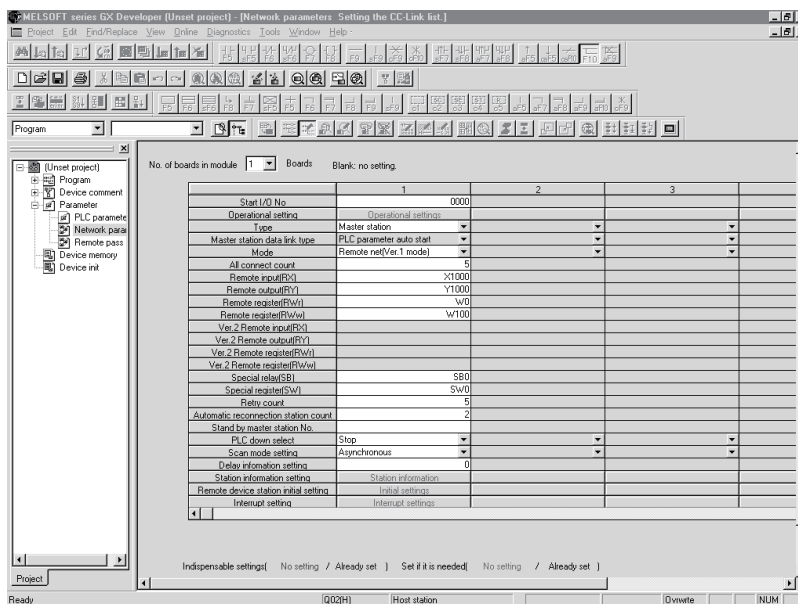
Default Check End Cancel

(3) The following shows the results of the communication buffer and automatic update buffer assignments.

1000 _H	First module (station number 4)	2000 _H	First module (station number 4)
⋮	Intelligent device station	⋮	Intelligent device station
103F _H	Send buffer	207F _H	Automatic update buffer
1040 _H	First module(station number 4)	2080 _H	Second module (station number 9)
⋮	Intelligent device station	⋮	Intelligent device station
107F _H	Receive buffer	20FF _H	Automatic update buffer
1080 _H	Second module (station number 9)		
⋮	Intelligent device station		
10BF _H	Send buffer		
10C0 _H	Second module (station number 9)		
⋮	Intelligent device station		
10FF _H	Receive buffer		

6.3.2 Master station automatic refresh parameter settings

- (1) The following shows an example of the parameter settings. See (2) for actual settings.



- (2) Set the automatic refresh parameters using the following procedure.

- (a) Set the remote input (RX) refresh device for "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

- (b) Set the remote output (RY) refresh device for "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

- (c) Set the remote register (RW) refresh device for "Remote register (RW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

- (d) Set the remote register (RWw) refresh device for "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W100.

- (e) Set the link special relay (SB) refresh device for "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

- (f) Set the link special register (SW) refresh device for "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

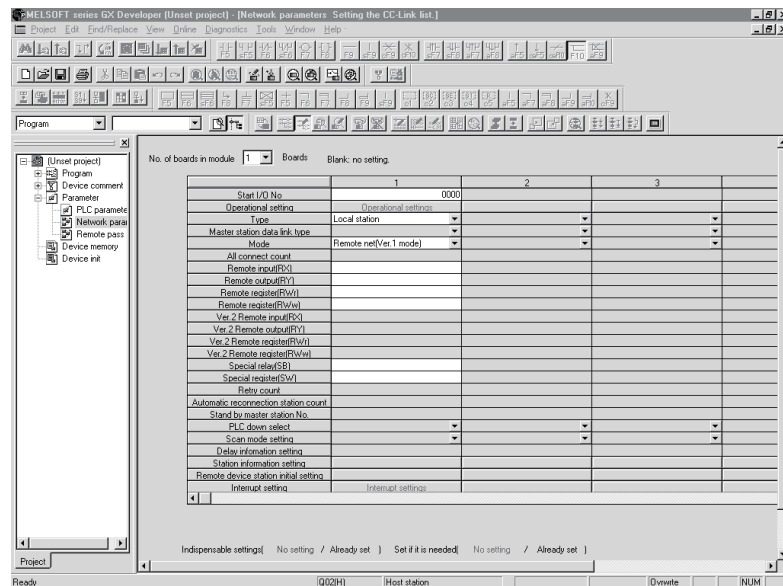
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

POINT
(1) For the automatic refresh parameter setting, set the start device only. Devices are automatically assigned until the last station number including reserved stations and occupied stations. In the example of the system configuration in this section, the last station number is "12". Therefore, total of remote I/O points is 384 points (32 x 12 = 384) and total of remote register points is 48 points (4 x 12 = 48). If refresh device of remote input (RX) is set to "X1000" and that of remote register (RW) is set to "W0", the end devices will be "X117F" and "W2F" respectively. (2) When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

6.3.3 Local station network parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the network parameters using the following procedure.

- (a) Set the "No. of boards in module " for which the network parameters are to be set.

Default value: None

Setting range: 0 to 8 (Boards)

Example) Set 1 (Board).

- (b) Set the "Start I/O No." for the local station.

Default value: None

Setting range: 0000 to 0FE0

Example) Set 0000.

- (c) Set the station type for "Type".

Default value: Master station

Setting range: Master station

Master station (Duplex function)

Local station

Standby master station

Example) Set to Local station.

- (d) Set the Parameter name in "Operational settings". (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkL".

- (e) Set the input status for the data link error station in "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).

- (f) Set the slave station refresh/compulsory clear setting at programmable controller CPU STOP in "Operational settings".

Default value: Refresh ("Clears compulsorily" not checked)

Setting range: Refresh ("Clears compulsorily" not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily" not checked).

- (g) Set the number of occupied local stations in "Number of occupied stations".

Default value: Occupies 1 station

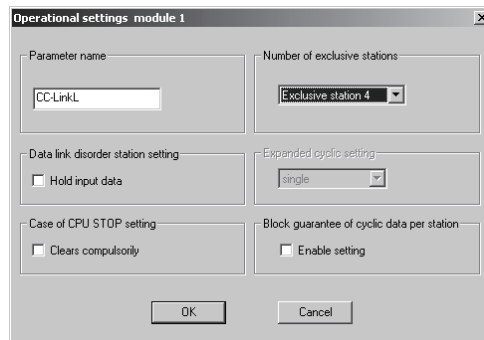
Setting range: Occupies 1 station

Occupies 2 stations

Occupies 3 stations

Occupies 4 stations

Example) Set to Occupies 4 stations



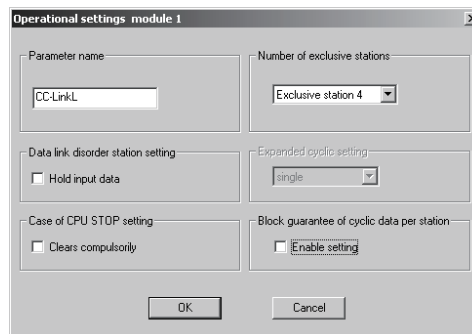
- (h) Set the block guarantee of cyclic data per station in "Operational settings".

Default value: Disable ("Enable setting" not checked)

Setting range: Disable ("Enable setting" not checked)

Enable ("Enable setting" checked)

Example) Set to Disable ("Enable setting" not checked).



- (i) Set the CC-Link mode for "Mode".

Default value: Remote net(Ver.1 mode)

Setting range: Remote net(Ver.1 mode)

Remote net(Ver.2 mode)

Remote net(Additional mode)

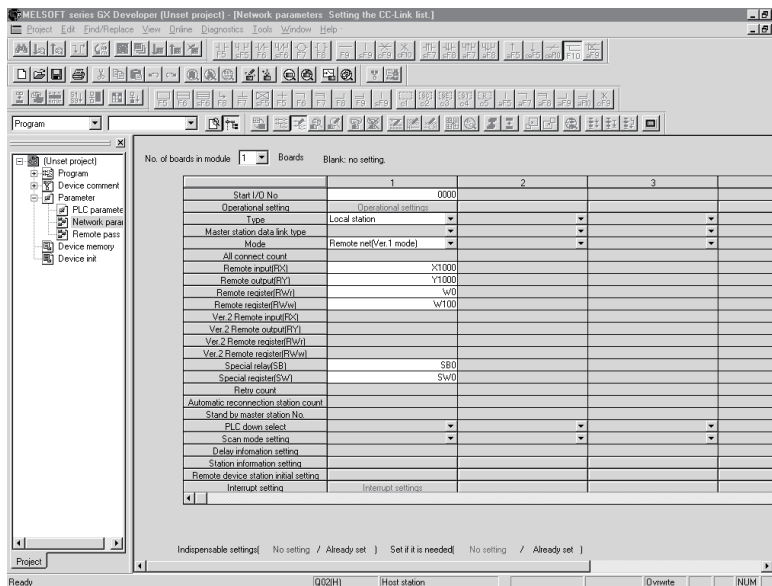
Remote I/O net mode

Off line

Example) Set to Remote net (Ver.1 mode).

6.3.4 Local station automatic refresh parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the automatic refresh parameters using the following procedure.
- Set the remote input (RX) refresh device for "Remote input (RX)".
 Default value: None
 Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to X1000.
 - Set the remote output (RY) refresh device for "Remote output (RY)".
 Default value: None
 Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to Y1000.
 - Set the remote register (RW) refresh device for "Remote register (RW)".
 Default value: None
 Setting range: Device name - Select from M, L, B, D, W, R, or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to W0.

- (d) Set the remote register (RWw) refresh device for "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W100.

- (e) Set the link special relay (SB) refresh device for "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

- (f) Set the link special register (SW) refresh device for "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

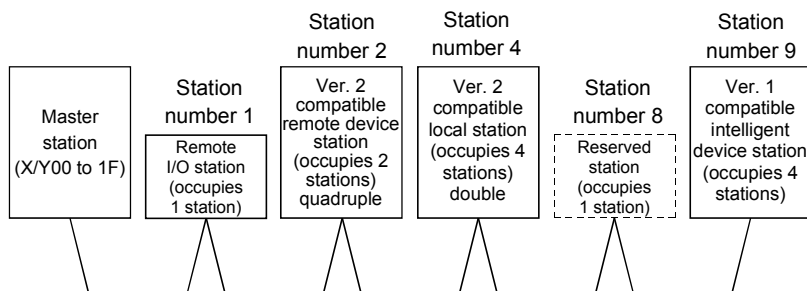
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

POINT
(1) For the automatic refresh parameter setting, set the start device only. Devices are automatically assigned until the last station number including reserved stations and occupied stations. In the example of the system configuration in this section, the last station number is "12". Therefore, total of remote I/O points is 384 points (32 x 12 = 384) and total of remote register points is 48 points (4 x 12 = 48). If refresh device of remote input (RX) is set to "X1000" and that of remote register (RW) is set to "W0", the end devices will be "X117F" and "W2F" respectively. (2) When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

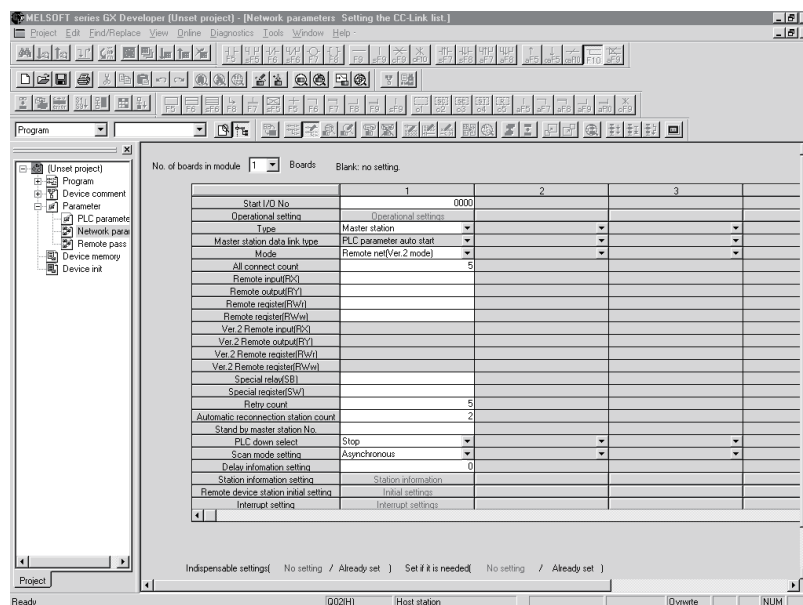
6.4 Example of Parameter Settings with GX Developer (Remote net ver.2 mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual. The explanations in this section are based on the following example of the system configuration.



6.4.1 Master station network parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the network parameters using the following procedure.

- (a) Set the "No. of boards in module " for which the network parameters are to be set.

Default value: None

Setting range: 0 to 8 (Boards)*

* Modules for the parameter setting with the G(P).RLPASET instruction should not be included in the setting for "No. of boards in module".

Example) Set 1 (Board).

- (b) Set the "Start I/O No." for the master station.

Default value: None

Setting range: 0000 to 0FE0

Example) Set 0000.

- (c) Set the Parameter name in "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkM".

- (d) Set the input status for the data link error station in "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).

- (e) Set the slave station refresh/compulsory clear setting at programmable controller CPU STOP in "Operational settings".

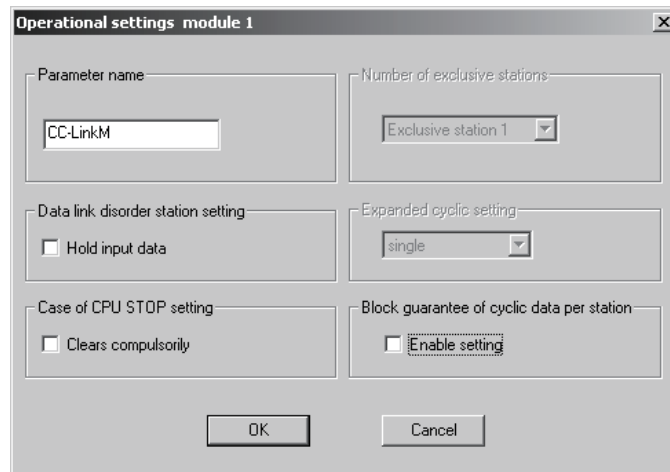
Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).

- (f) Set the block guarantee of cyclic data per station in "Operational settings".
 Default value: Disable ("Enable setting" not checked)
 Setting range: Disable ("Enable setting" not checked)
 Enable ("Enable setting" checked)
 Example) Set to Disable ("Enable setting" not checked).



- (g) Set the station type for "Type".
 Default value: Master station
 Setting range: Master station
 Master station (Duplex function)
 Local station
 Standby master station
 Example) Set to Master station.
- (h) Set the CC-Link mode for "Mode".
 Default value: Remote net(Ver.1 mode)
 Setting range: Remote net(Ver.1 mode)
 Remote net(Ver.2 mode)
 Remote net(Additional mode)
 Remote I/O net mode
 Off line
 Example) Set to Remote net (Ver.2 mode).
- (i) Set the total number of connected stations in the CC-Link system including reserved stations for "All connect count".
 Default value: 64 (modules)
 Setting range: 1 to 64 (modules)
 Example) Set to 5 (modules).
- (j) Set the number of retries for "Retry count", when a communication error occurs.
 Default value: 3 (times)
 Setting range: 1 to 7 (times)
 Example) Set to 5 (times).

- (k) Set the number of modules that can return to system operation by a single link scan for "Automatic reconnection station count".
 - Default value: 1 (module)
 - Setting range: 1 to 10 (modules)
 - Example) Set to 2 (modules).
- (l) Set the station number for the standby master station for "Standby master station No.".
 - Default value: Blank (No standby master station specified)
 - Setting range: Blank, 1 to 64 (Blank: No standby master station specified)
 - Example) Set to blank (No standby master station specified).
- (m) Set the data link status for "PLC down select", when a master station programmable controller CPU error occurs.
 - Default value: Stop
 - Setting range: Stop
Continue
 - Example) Set to Stop.
- (n) Set whether the link scan for the sequence scan is synchronous or asynchronous for "Scan mode setting".
 - Default value: Asynchronous
 - Setting range: Asynchronous
Synchronous
 - Example) Set to Asynchronous.
- (o) Set 0 for the delay time.

(p) Set the station data for "Station information settings".

Default value: Ver.1 Remote I/O station, single, Occupies 1 station, 32 points, or no setting for reserved stations/error invalid.

Setting range: Station type - No setting

Ver.1 Remote I/O station

Ver.1 Remote device station

Ver.1 Intelligent device station (Local and standby master stations included)

Ver.2 Remote device station

Ver.2 Intelligent device station (Local and standby master stations included)

Expanded cyclic setting -

[When station type is ver. 1 compatible station]
single (cannot be changed)

[When station type is ver. 2 compatible station]
single
double
quadruple
octuple

Number of occupied stations -

No setting
Occupies 1 station
Occupies 2 stations
Occupies 3 stations
Occupies 4 stations

Remote station points -

[When station type is ver. 1 remote I/O station]
0 points (reserve station)
8 points
8points+8points(reserved)
16 points
32 points

[When station type is other than ver. 1 remote I/O station]

0 points (reserve station)

n points

n : Calculated automatically by GX Developer according to the number of occupied stations and expansion cyclic setting. Refer to Section 3.1 for the number of points.

Reserved/invalid station select -

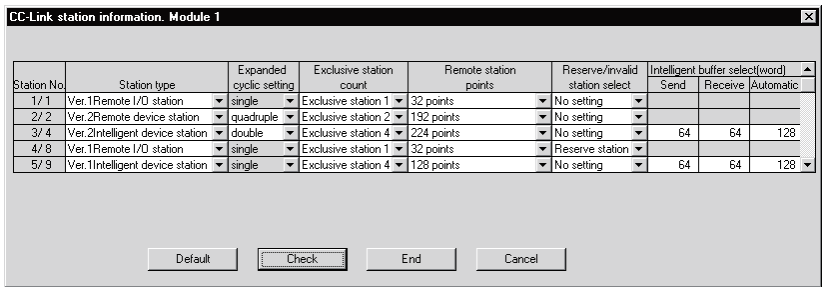
No setting

Reserved station

Invalid station (error invalid station)

Intelligent buffer select (word) -
No setting
Send 0, 64 to 4096
Receive 0, 64 to 4096
Automatic 0, 128 to 4096

Example) Set the station data according to the system configuration specified in Section 6.4.

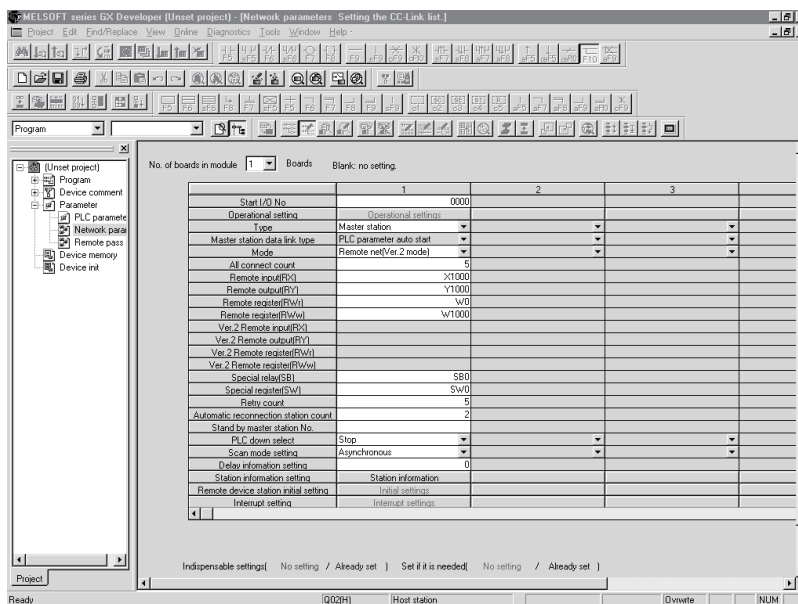


(3) The following shows the results of the communication buffer and automatic update buffer assignments.

1000 _H	First module (station number 4)	2000 _H	First module (station number 4)
⋮	Intelligent device station	⋮	Intelligent device station
103F _H	Send buffer	207F _H	Automatic update buffer
1040 _H	First module(station number 4)	2080 _H	Second module (station number 9)
⋮	Intelligent device station	⋮	Intelligent device station
107F _H	Receive buffer	20FF _H	Automatic update buffer
1080 _H	Second module (station number 9)		
⋮	Intelligent device station		
10BF _H	Send buffer		
10C0 _H	Second module (station number 9)		
⋮	Intelligent device station		
10FF _H	Receive buffer		

6.4.2 Master station automatic refresh parameter settings

- (1) The following shows an example of the parameter settings. See (2) for actual settings.



- (2) Set the automatic refresh parameters using the following procedure.

- (a) Set the remote input (RX) refresh device for "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

- (b) Set the remote output (RY) refresh device for "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

- (c) Set the remote register (RW) refresh device for "Remote register (RW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

- (d) Set the remote register (RWw) refresh device for "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W1000.

- (e) Set the link special relay (SB) refresh device for "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

- (f) Set the link special register (SW) refresh device for "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

POINT

- (1) For the automatic refresh parameter setting, set the start device only. Devices are automatically assigned until the last station number including reserved stations and occupied stations.

In the example of the system configuration in this section, total of remote I/O points is 608 points and total of remote register points is 88 points.

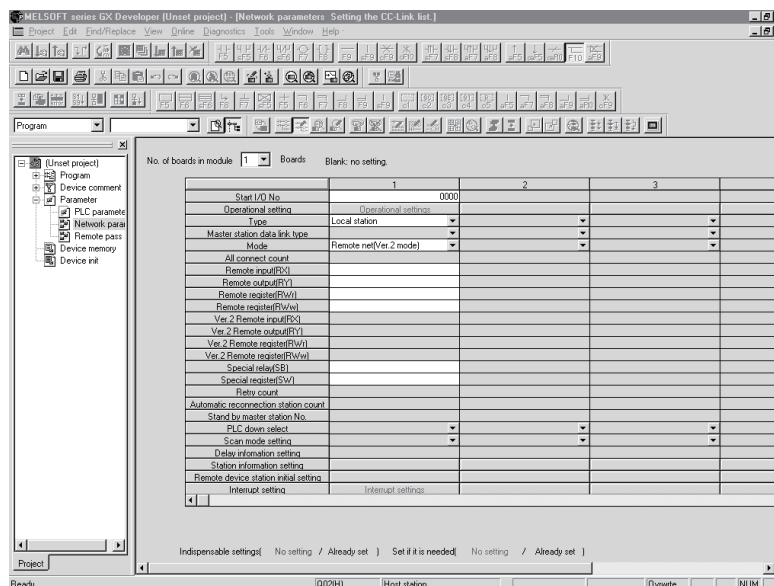
If refresh device of remote input (RX) is set to "X1000" and that of remote register (RWr) is set to "W0", the end devices will be "X125F" and "W57" respectively.

For link points of each station, refer to the table 3.2.

- (2) When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

6.4.3 Local station network parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the network parameters using the following procedure.

- (a) Set the "No. of boards in module" for which the network parameters are to be set.

Default value: None

Setting range: 0 to 8 (Boards)

Example) Set 1 (Board).

- (b) Set the "Start I/O No." for the local station.

Default value: None

Setting range: 0000 to 0FE0

Example) Set 0000.

- (c) Set the station type for "Type".

Default value: Master station

Setting range: Master station

Master station (Duplex function)

Local station

Standby master station

Example) Set to Local station.

- (d) Set the Parameter name in "Operational settings". (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkL".

- (e) Set the input status for the data link error station in "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).

- (f) Set the slave station refresh/compulsory clear setting at programmable controller CPU STOP in "Operational settings".

Default value: Refresh ("Clears compulsorily" not checked)

Setting range: Refresh ("Clears compulsorily" not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily" not checked).

- (g) Set the number of occupied local stations in "Number of occupied stations".

Default value: Occupies 1 station

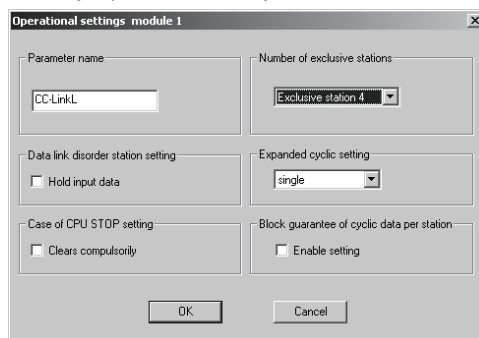
Setting range: Occupies 1 station

Occupies 2 stations

Occupies 3 stations

Occupies 4 stations

Example) Set to Occupies 4 stations



- (h) Set the expanded cyclic setting of the local station in "Expanded cyclic setting".

Default value: single

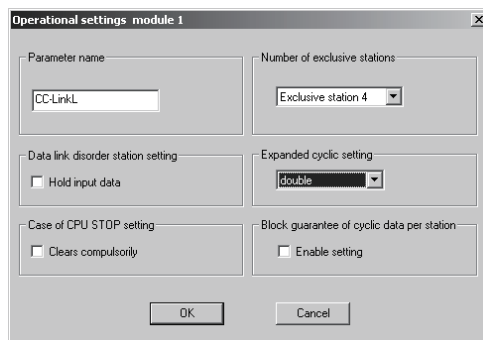
Setting range: single

double

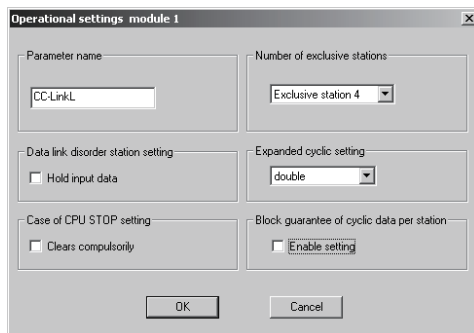
quadruple

octuple

Example) Set to double.



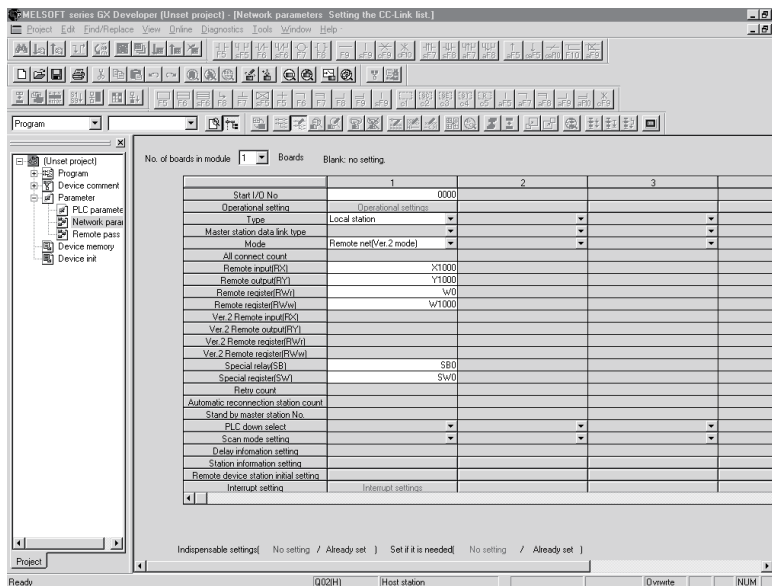
- (i) Set the block guarantee of cyclic data per station in "Operational settings".
Default value: Disable ("Enable setting" not checked)
Setting range: Disable ("Enable setting" not checked)
Enable ("Enable setting" checked)
Example) Set to Disable ("Enable setting" not checked).



- (j) Set the CC-Link mode for "Mode".
Default value: Remote net(Ver.1 mode)
Setting range: Remote net(Ver.1 mode)
Remote net(Ver.2 mode)
Remote net(Additional mode)
Remote I/O net mode
Off line
Example) Set to Remote net (Ver.2 mode).

6.4.4 Local station automatic refresh parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the automatic refresh parameters using the following procedure.
- Set the remote input (RX) refresh device for "Remote input (RX)".
 Default value: None
 Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to X1000.
 - Set the remote output (RY) refresh device for "Remote output (RY)".
 Default value: None
 Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to Y1000.
 - Set the remote register (RW) refresh device for "Remote register (RW)".
 Default value: None
 Setting range: Device name - Select from M, L, B, D, W, R, or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to W0.

- (d) Set the remote register (RWw) refresh device for "Remote register (RWw)".

Default value: None

Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W1000.

- (e) Set the link special relay (SB) refresh device for "Special relay (SB)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to SB0.

- (f) Set the link special register (SW) refresh device for "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

POINT

- (1) For the automatic refresh parameter setting, set the start device only. Devices are automatically assigned until the last station number including reserved stations and occupied stations.

In the example of the system configuration in this section, total of remote I/O points is 608 points and total of remote register points is 88 points.

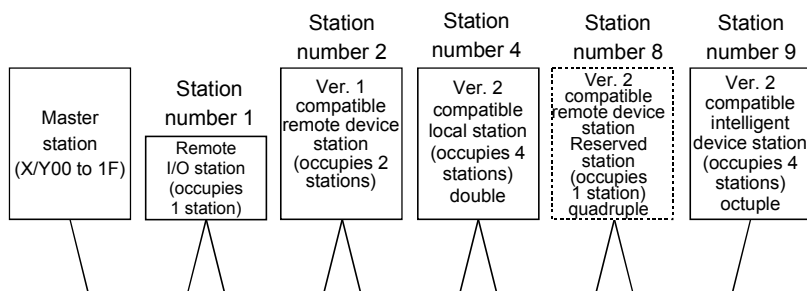
If refresh device of remote input (RX) is set to "X1000" and that of remote register (RWr) is set to "W0", the end devices will be "X125F" and "W57" respectively.

For link points of each station, refer to the table 3.2.

- (2) When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

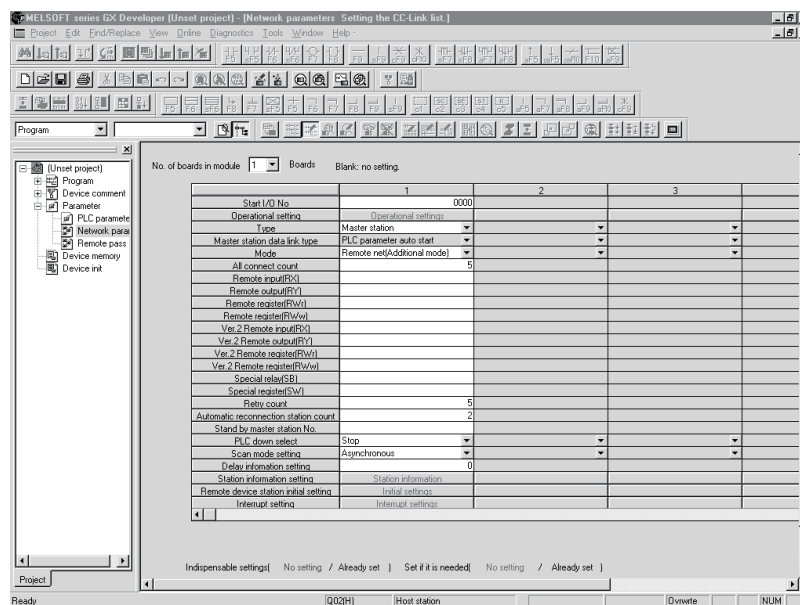
6.5 Example of Parameter Settings with GX Developer (Remote net additional mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual. The explanations in this section are based on the following example of the system configuration.



6.5.1 Master station network parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the network parameters using the following procedure.

- (a) Set the "No. of boards in module" for which the network parameters are to be set.

Default value: None

Setting range: 0 to 8 (Boards)*

* Modules for the parameter setting with the G(P).RLPASET instruction should not be included in the setting for "No. of boards in module".

Example) Set 1 (Board).

- (b) Set the "Start I/O No." for the master station.

Default value: None

Setting range: 0000 to 0FE0

Example) Set 0000.

- (c) Set the Parameter name in "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkM".

- (d) Set the input status for the data link error station in "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).

- (e) Set the slave station refresh/compulsory clear setting at programmable controller CPU STOP in "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).

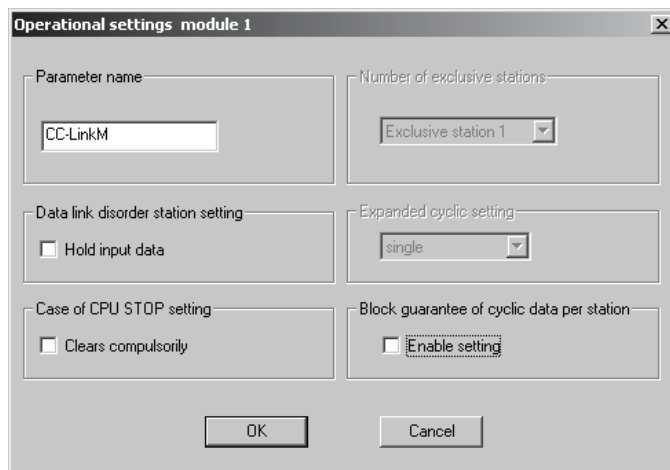
- (f) Set the block guarantee of cyclic data per station in "Operational settings".

Default value: Disable ("Enable setting" not checked)

Setting range: Disable ("Enable setting" not checked)

Enable ("Enable setting" checked)

Example) Set to Disable ("Enable setting" not checked).



- (g) Set the station type for "Type".

Default value: Master station

Setting range: Master station

Master station (Duplex function)

Local station

Standby master station

Example) Set to Master station.

- (h) Set the CC-Link mode for "Mode".

Default value: Remote net(Ver.1 mode)

Setting range: Remote net(Ver.1 mode)

Remote net(Ver.2 mode)

Remote net(Additional mode)

Remote I/O net mode

Off line

Example) Set to Remote net (Additional mode).

- (i) Set the total number of connected stations in the CC-Link system including reserved stations for "All connect count".

Default value: 64 (modules)

Setting range: 1 to 64 (modules)

Example) Set to 5 (modules).

- (j) Set the number of retries for "Retry count", when a communication error occurs.

Default value: 3 (times)

Setting range: 1 to 7 (times)

Example) Set to 5 (times).

- (k) Set the number of modules that can return to system operation by a single link scan for "Automatic reconnection station count".
Default value: 1 (module)
Setting range: 1 to 10 (modules)
Example) Set to 2 (modules).
- (l) Set the station number for the standby master station for "Standby master station No.".
Default value: Blank (No standby master station specified)
Setting range: Blank, 1 to 64 (Blank: No standby master station specified)
Example) Set to blank (No standby master station specified).
- (m) Set the data link status for "PLC down select", when a master station programmable controller CPU error occurs.
Default value: Stop
Setting range: Stop
Continue
Example) Set to Stop.
- (n) Set whether the link scan for the sequence scan is synchronous or asynchronous for "Scan mode setting".
Default value: Asynchronous
Setting range: Asynchronous
Synchronous
Example) Set to Asynchronous.
- (o) Set 0 for the delay time.

(p) Set the station data for "Station information settings".

Default value: Ver.1 Remote I/O station, single, Occupies 1 station, 32 points, or no setting for reserved stations/error invalid.

Setting range: Station type - No setting

Ver.1 Remote I/O station

Ver.1 Remote device station

Ver.1 Intelligent device station (Local and standby master stations included)

Ver.2 Remote device station

Ver.2 Intelligent device station (Local and standby master stations included)

Expanded cyclic setting -

[When station type is ver. 1 compatible station]
single (cannot be changed)

[When station type is ver. 2 compatible station]
single
double
quadruple
octuple

Number of occupied stations -

No setting

Occupies 1 station

Occupies 2 stations

Occupies 3 stations

Occupies 4 stations

Remote station points -

[When station type is ver. 1 remote I/O station]
0 points (reserve station)
8 points
8points+8points(reserved)
16 points
32 points

[When station type is other than ver. 1 remote I/O station]

0 points (reserve station)

n points

n : Calculated automatically by GX Developer according to the number of occupied stations and expansion cyclic setting. Refer to Section 3.1 for the number of points.

Reserved/invalid station select -

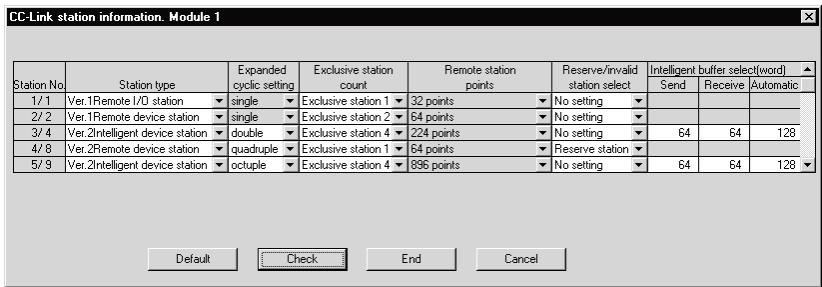
No setting

Reserved station

Invalid station (error invalid station)

Intelligent buffer select (word) -
No setting
Send 0, 64 to 4096
Receive 0, 64 to 4096
Automatic 0, 128 to 4096

Example) Set the station data according to the system configuration specified in Section 6.5.

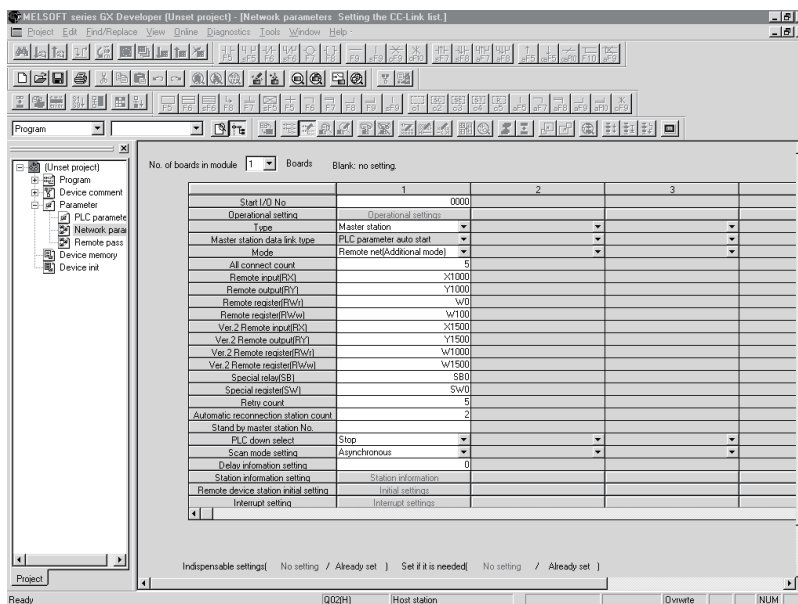


(3) The following shows the results of the communication buffer and automatic update buffer assignments.

1000 _H	First module (station number 4)	2000 _H	First module (station number 4)
...	Intelligent device station	...	Intelligent device station
103F _H	Send buffer	207F _H	Automatic update buffer
1040 _H	First module(station number 4)	2080 _H	Second module (station number 9)
...	Intelligent device station	...	Intelligent device station
107F _H	Receive buffer	20FF _H	Automatic update buffer
1080 _H	Second module (station number 9)		
...	Intelligent device station		
10BF _H	Send buffer		
10C0 _H	Second module (station number 9)		
...	Intelligent device station		
10FF _H	Receive buffer		

6.5.2 Master station automatic refresh parameter settings

- (1) The following shows an example of the parameter settings. See (2) for actual settings.



- (2) Set the automatic refresh parameters using the following procedure.

- (a) Set the remote input (RX) refresh device for "Remote input (RX)".

Default value: None

Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to X1000.

- (b) Set the remote output (RY) refresh device for "Remote output (RY)".

Default value: None

Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to Y1000.

- (c) Set the remote register (RWr) refresh device for "Remote register (RWr)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, or ZR.

Device number - Within the range of the device points that the CPU has.

Example) Set to W0.

- (d) Set the remote register (RWw) refresh device for "Remote register (RWw)".
Default value: None
Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W100.
- (e) Set the ver. 2 compatible remote input (RX) refresh device for "Ver. 2 remote input (RX)".
Default value: None
Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to X1500.
- (f) Set the ver. 2 compatible remote output (RY) refresh device for "Ver. 2 remote output (RY)".
Default value: None
Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to Y1500.
- (g) Set the ver. 2 compatible remote register (RWr) refresh device for "Ver. 2 remote register (RWr)".
Default value: None
Setting range: Device name - Select from M, L, B, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W1000.
- (h) Set the ver. 2 compatible remote register (RWw) refresh device for "Ver. 2 remote register (RWw)".
Default value: None
Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W1500.
- (i) Set the link special relay (SB) refresh device for "Special relay (SB)".
Default value: None
Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to SB0.

- (j) Set the link special register (SW) refresh device for "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

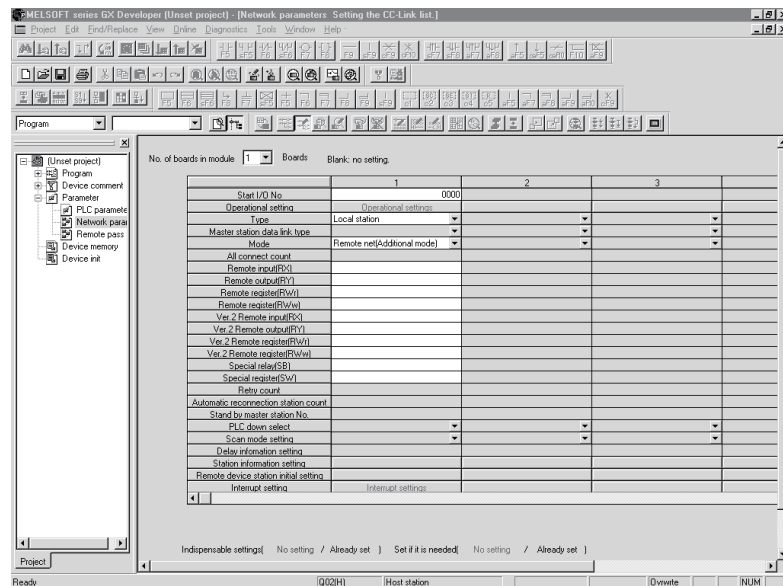
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

POINT
(1) For the automatic refresh parameter setting, set the start device only. Devices are automatically assigned until the last station number including reserved stations and occupied stations. In the example of the system configuration in this section, total of remote I/O points is 96 points, total of remote register points is 12 points, total of Ver.2 compatible remote I/O points is 1184 points, and total of Ver.2 compatible remote register points is 176 points. If refresh devices of remote input (RX), remote register (RWr), Ver.2 compatible remote input (RX) and Ver.2 compatible remote register (RWr) are set to "X1000", "W0", "X1500", and "W1000" respectively, the end devices will be "X105F", "WB", "X199F", and "W10AF". For link points of each station, refer to the table 3.2. (2) When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

6.5.3 Local station network parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the network parameters using the following procedure.

- (a) Set the "No. of boards in Boards" for which the network parameters are to be set.

Default value: None

Setting range: 0 to 8 (Boards)

Example) Set 1 (Board).

- (b) Set the "Start I/O No." for the local station.

Default value: None

Setting range: 0000 to 0FE0

Example) Set 0000.

- (c) Set the station type for "Type".

Default value: Master station

Setting range: Master station

Master station (Duplex function)

Local station

Standby master station

Example) Set to Local station.

- (d) Set the Parameter name in "Operational settings". (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkL".

- (e) Set the input status for the data link error station in "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).

- (f) Set the slave station refresh/compulsory clear setting at programmable controller CPU STOP in "Operational settings".

Default value: Refresh ("Clears compulsorily" not checked)

Setting range: Refresh ("Clears compulsorily" not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily" not checked).

- (g) Set the number of occupied local stations in "Number of occupied stations".

Default value: Occupies 1 station

Setting range: Occupies 1 station

Occupies 2 stations

Occupies 3 stations

Occupies 4 stations

Example) Set to Occupies 4 stations

- (h) Set the expanded cyclic setting of the local station in "Expanded cyclic setting".

Default value: single

Setting range: single

double

quadruple

octuple

Example) Set to double.

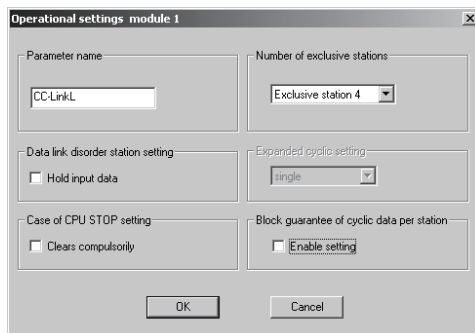
- (h) Set the block guarantee of cyclic data per station in "Operational settings".

Default value: Disable ("Enable setting" not checked)

Setting range: Disable ("Enable setting" not checked)

Enable ("Enable setting" checked)

Example) Set to Disable ("Enable setting" not checked).



- (i) Set the CC-Link mode for "Mode".

Default value: Remote net(Ver.1 mode)

Setting range: Remote net(Ver.1 mode)

Remote net(Ver.2 mode)

Remote net(Additional mode)

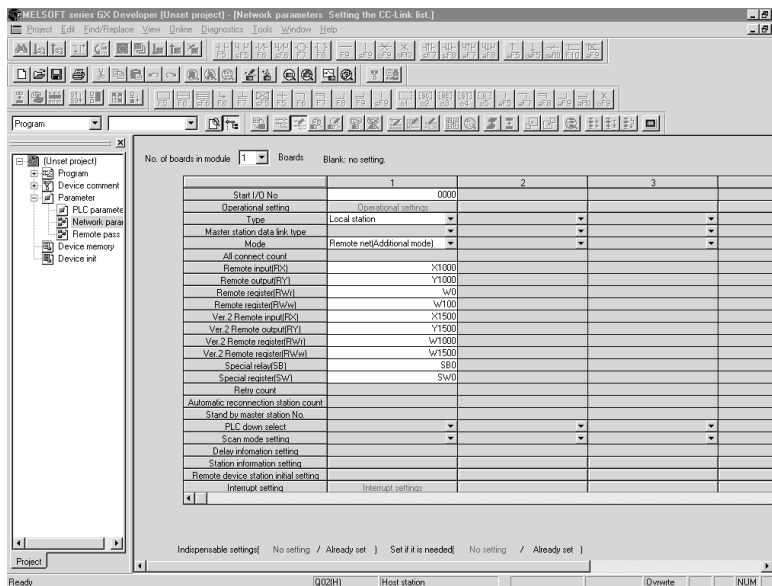
Remote I/O net mode

Off line

Example) Set to Remote net (Additional mode).

6.5.4 Local station automatic refresh parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the automatic refresh parameters using the following procedure.
- Set the remote input (RX) refresh device for "Remote input (RX)".
 Default value: None
 Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to X1000.
 - Set the remote output (RY) refresh device for "Remote output (RY)".
 Default value: None
 Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to Y1000.
 - Set the remote register (RW) refresh device for "Remote register (RW)".
 Default value: None
 Setting range: Device name - Select from M, L, B, D, W, R, or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to W0.

- (d) Set the remote register (RWw) refresh device for "Remote register (RWw)".
Default value: None
Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W100.
- (e) Set the ver. 2 compatible remote input (RX) refresh device for "Ver. 2 remote input (RX)".
Default value: None
Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to X1500.
- (f) Set the ver. 2 compatible remote output (RY) refresh device for "Ver. 2 remote output (RY)".
Default value: None
Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to Y1500.
- (g) Set the ver. 2 compatible remote register (RWr) refresh device for "Ver. 2 remote register (RWr)".
Default value: None
Setting range: Device name - Select from M, L, B, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W1000.
- (h) Set the ver. 2 compatible remote register (RWw) refresh device for "Ver. 2 remote register (RWw)".
Default value: None
Setting range: Device name - Select from M, L, B, T, C, ST, D, W, R, or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to W1500.
- (i) Set the link special relay (SB) refresh device for "Special relay (SB)".
Default value: None
Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
Device number - Within the range of the device points that the CPU has.
Example) Set to SB0.

- (j) Set the link special register (SW) refresh device for "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

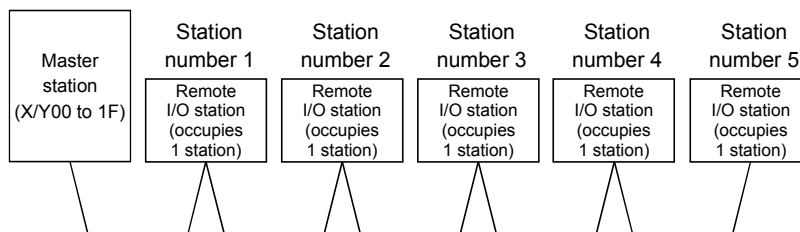
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

POINT
(1) For the automatic refresh parameter setting, set the start device only. Devices are automatically assigned until the last station number including reserved stations and occupied stations. In the example of the system configuration in this section, total of remote I/O points is 96 points, total of remote register points is 12 points, total of Ver.2 compatible remote I/O points is 1184 points, and total of Ver.2 compatible remote register points is 176 points. If refresh devices of remote input (RX), remote register (RWr), Ver.2 compatible remote input (RX) and Ver.2 compatible remote register (RWr) are set to "X1000", "W0", "X1500", and "W1000" respectively, the end devices will be "X105F", "WB", "X199F", and "W10AF". For link points of each station, refer to the table 3.2. (2) When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

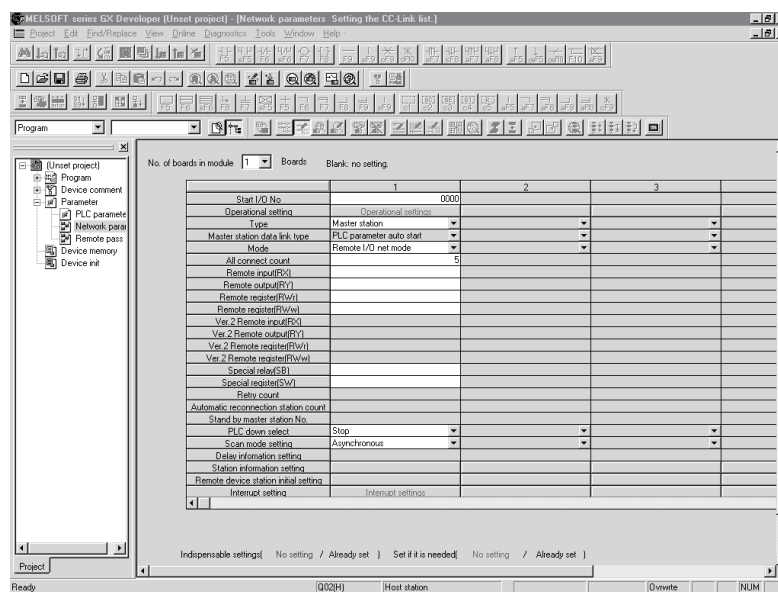
6.6 Example of Parameter Settings with GX Developer (Remote I/O net mode)

This section explains the parameter settings using the GX Developer. For more details on the GX Developer operation, refer to the GX Developer Operating Manual. The explanations in this section are based on the following example of the system configuration.



6.6.1 Master station network parameter settings

- (1) The following describes an example of the parameter settings. See (2) for actual settings.



- (2) Set the network parameters using the following procedure.

- (a) Set the "No. of boards in module" for which the network parameters are to be set.

Default value: None

Setting range: 0 to 8 (Boards)*

* Modules for the parameter setting with the G(P).RLPASET instruction should not be included in the setting for "No. of boards in module".

Example) Set 1 (Board).

- (b) Set the "Start I/O No." for the master station.

Default value: None

Setting range: 0000 to 0FE0

Example) Set 0000.

- (c) Set the Parameter name in "Operational settings." (Even if the Parameter name is not set, this will not affect the operation of the CC-Link system).

Default value: None

Setting range: 8 characters or less

Example) Set "CC-LinkM".

- (d) Set the input status for the data link error station in "Operational settings".

Default value: Clear ("Hold input data" not checked)

Setting range: Hold ("Hold input data" checked)

Clear ("Hold input data" not checked)

Example) Set to Clear ("Hold input data" not checked).

- (e) Set the slave station refresh/compulsory clear setting at programmable controller CPU STOP in "Operational settings".

Default value: Refresh ("Clears compulsorily " not checked)

Setting range: Refresh ("Clears compulsorily " not checked)

Clears compulsorily ("Clears compulsorily" checked)

Example) Set to Refresh ("Clears compulsorily " not checked).

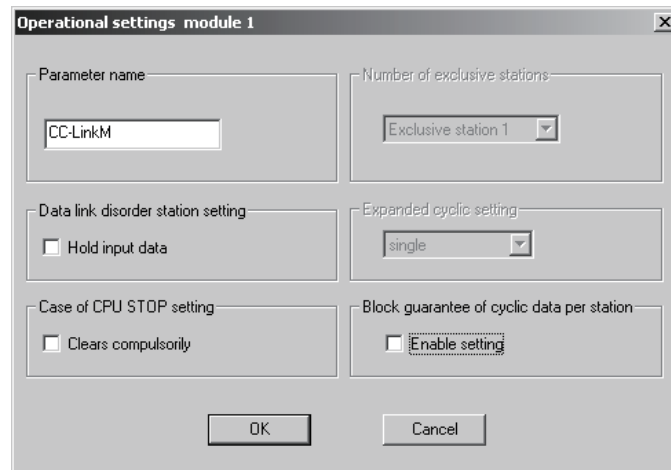
- (f) Set the block guarantee of cyclic data per station in "Operational settings".

Default value: Disable ("Enable setting" not checked)

Setting range: Disable ("Enable setting" not checked)

Enable ("Enable setting" checked)

Example) Set to Disable ("Enable setting" not checked).



- (g) Set the station type for "Type".

Default value: Master station

Setting range: Master station

Master station (Duplex function)

Local station

Standby master station

Example) Set to Master station.

- (h) Set the CC-Link mode for "Mode".

Default value: Remote net(Ver.1 mode)

Setting range: Remote net(Ver.1 mode)

Remote net(Ver.2 mode)

Remote net(Additional mode)

Remote I/O net mode

Off line

Example) Set to Remote I/O net mode.

- (i) Set the data link status for "PLC down select", when a master station programmable controller CPU error occurs.

Default value: Stop

Setting range: Stop

Continue

Example) Set to Stop.

- (j) Set whether the link scan for the sequence scan is synchronous or asynchronous for "Scan mode setting".

Default value: Asynchronous

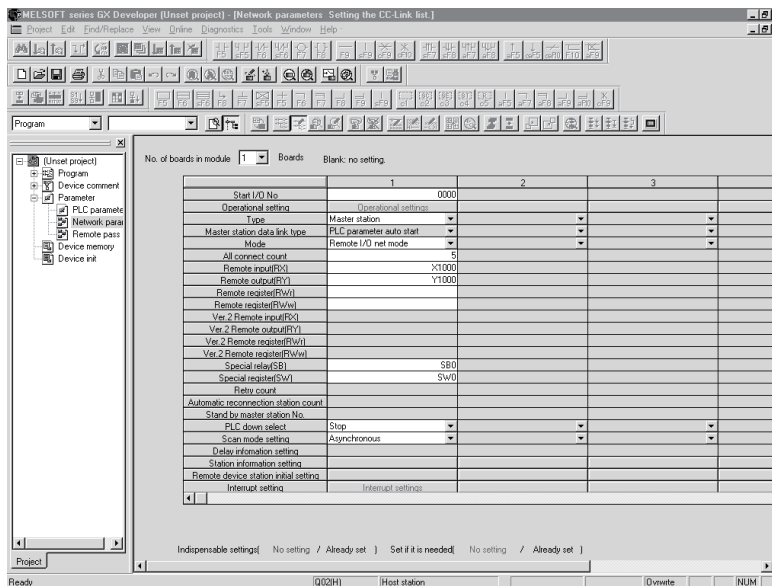
Setting range: Asynchronous

Synchronous

Example) Set to Asynchronous.

6.6.2 Master station automatic refresh parameter settings

- (1) The following shows an example of the parameter settings. See (2) for actual settings.



- (2) Set the automatic refresh parameters using the following procedure.
- Set the remote input (RX) refresh device for "Remote input (RX)".
 Default value: None
 Setting range: Device name - Select from X, M, L, B, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to X1000.
 - Set the remote output (RY) refresh device for "Remote output (RY)".
 Default value: None
 Setting range: Device name - Select from Y, M, L, B, T, C, ST, D, W, R or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to Y1000.
 - Set the link special relay (SB) refresh device for "Special relay (SB)".
 Default value: None
 Setting range: Device name - Select from M, L, B, D, W, R, SB or ZR.
 Device number - Within the range of the device points that the CPU has.
 Example) Set to SB0.

- (d) Set the link special register (SW) refresh device for "Special register (SW)".

Default value: None

Setting range: Device name - Select from M, L, B, D, W, R, SW or ZR.

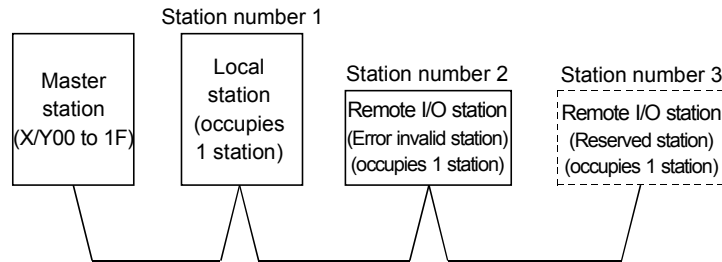
Device number - Within the range of the device points that the CPU has.

Example) Set to SW0.

POINT
(1) For the automatic refresh parameter setting, set the start device only. Devices are automatically assigned until the last station number. In the example of the system configuration in this section, the last station number is "5". Therefore, total of remote I/O points is 160 points ($32 \times 5 = 160$). If refresh device of remote input (RX) is set to "X1000", the end device will be "X109F". For link points of each station, refer to the table 3.2. (2) When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

6.7 Example of Parameter Setting with Dedicated Instruction

This section explains the parameter setting with the G(P).RLPASET instruction. For more details on the GX Developer operation, refer to the GX Developer Operational Manual. The explanations in this section are based on the following example of the system configuration.

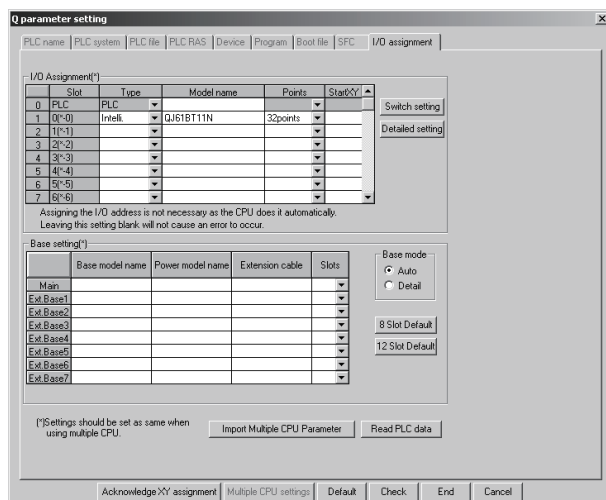


POINT

Do not use GX Developer for setting the network parameters, if the network parameters of all the modules are set by the G(P).RLPASET instruction. Change the "No. of boards in module" setting to blank if the network parameters have been already set by GX Developer.

Moreover, in case a system includes both a module for which the network parameters are set by GX Developer and a module for which the network parameters are set by the G(P).RLPASET instruction, the module for which the network parameters are set by the G(P).RLPASET instruction should not be included in the "No. of boards in module" setting of GX Developer.

(1) PLC parameter setting



(a) I/O assignment setting screen

Set the following for the slot in which the master module is mounted.

The type setting is required; set other items as needed.

Type : Select "intelli."

Model name : Enter the module model name.

Points : Select 32 points

Start XY : Enter the start I/O number for the master module.

(b) Intelligent function module switch setting

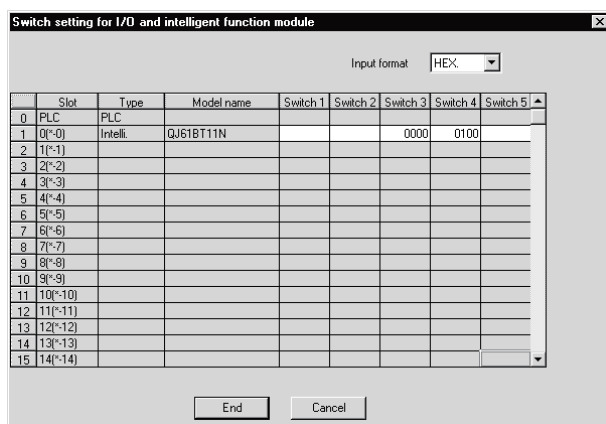
Click the Switch Setting button in the I/O assignment setting screen to display the screen shown to the left.

Set the input format to hexadecimal and enter values for switches 3, 4. The switch settings are indicated in the following table.

* If switches 3, 4 have not been set or the settings are not as indicated in the following table, the G(P).RLPASET instruction is completed with an error.

In this case, the QJ61BT11N with the smallest start I/O number seen from the programmable controller CPU starts CC-Link automatically. Do not make any settings for other than switches 3, 4.

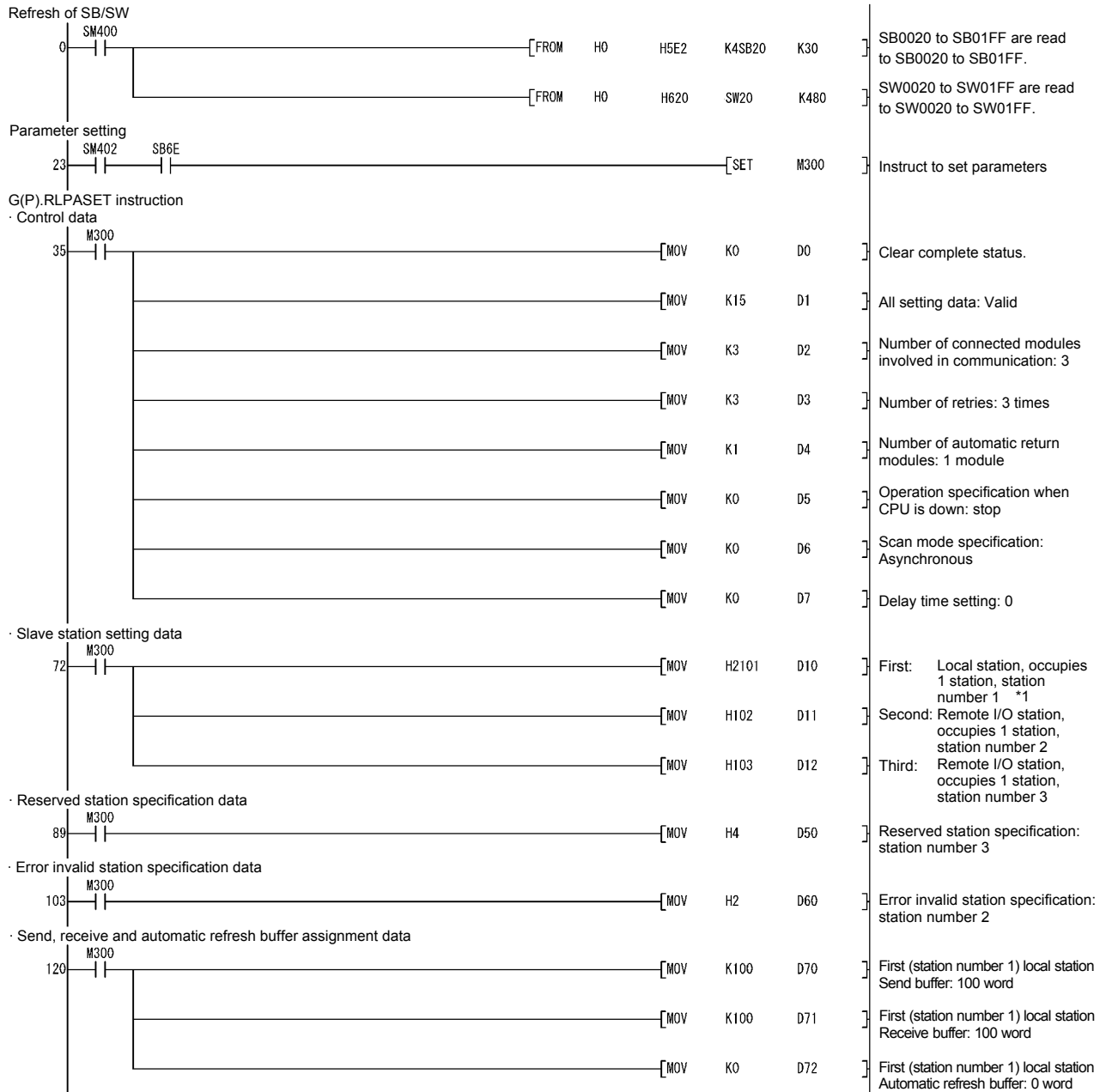
Normal operation cannot be guaranteed if settings other than for switch 4 are made.



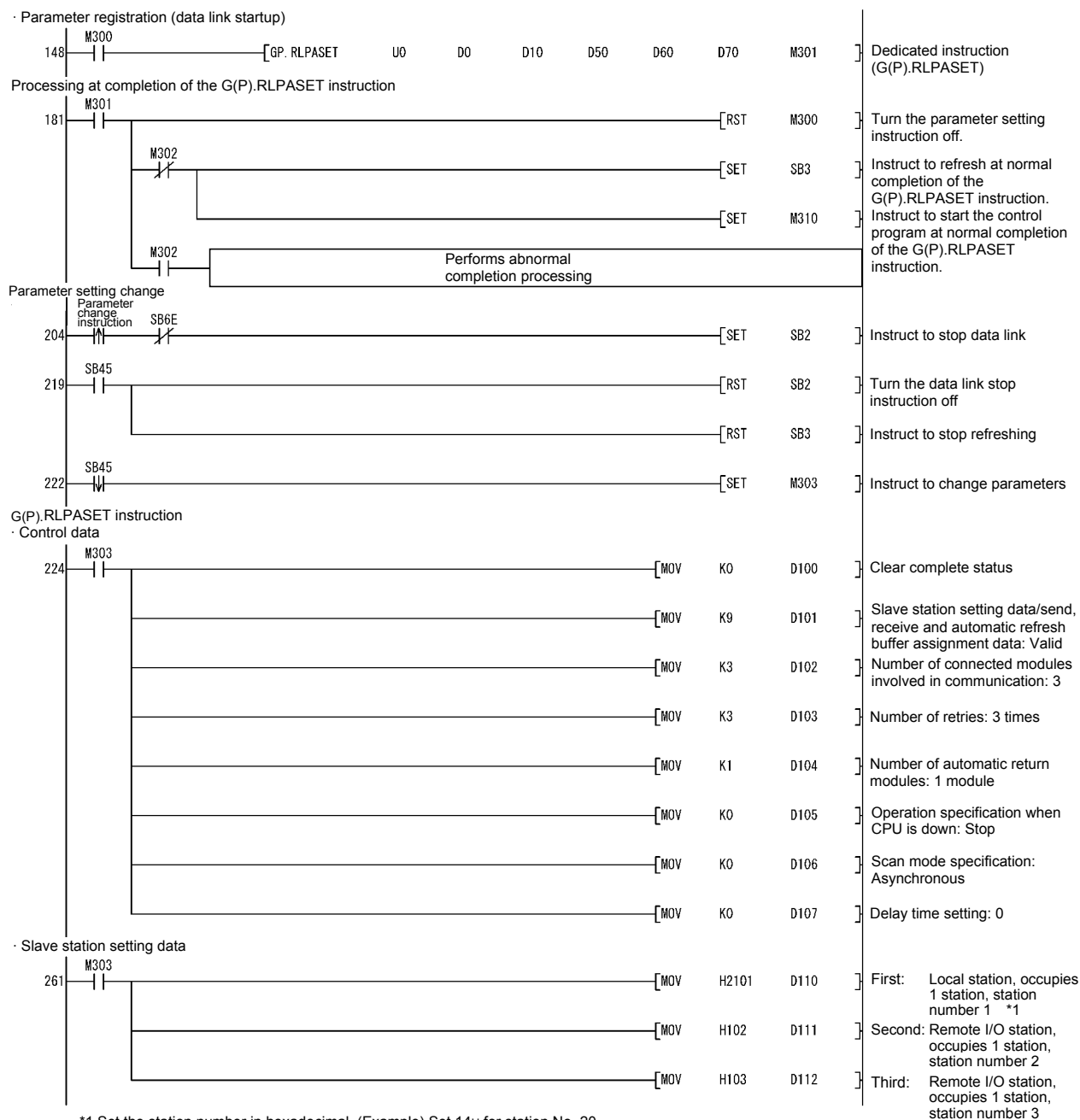
Mode	Setting in case of CPU STOP ^{*1}	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5
Remote net ver.2 mode	Refresh			0200	0100	
	Clears compulsorily			0200	0300	
Remote net additional mode	Refresh			0100	0100	
	Clears compulsorily			0100	0300	
Remote net ver.1 mode	Refresh			0000 or blank	0100	
	Clears compulsorily			0000 or blank	0300	

*1 "Clears compulsorily" for the case of CPU STOP setting (Setting of "Refresh" or "Clears compulsorily" for slave station in case of Programmable Controller CPU STOP) can be set in the QJ61BT11N whose first 5 digits of serial number is "09112" or later.

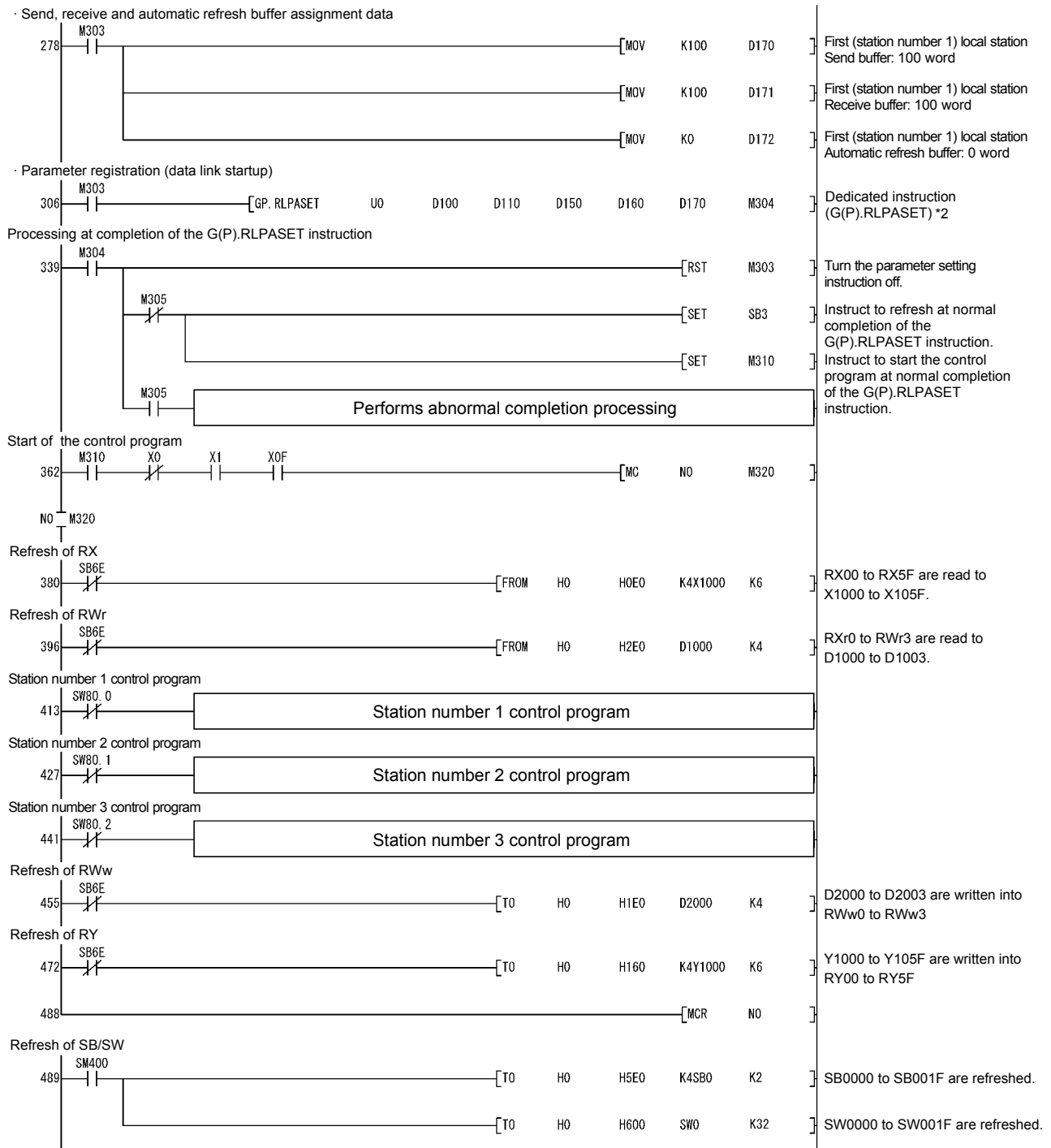
(2) Program example



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



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



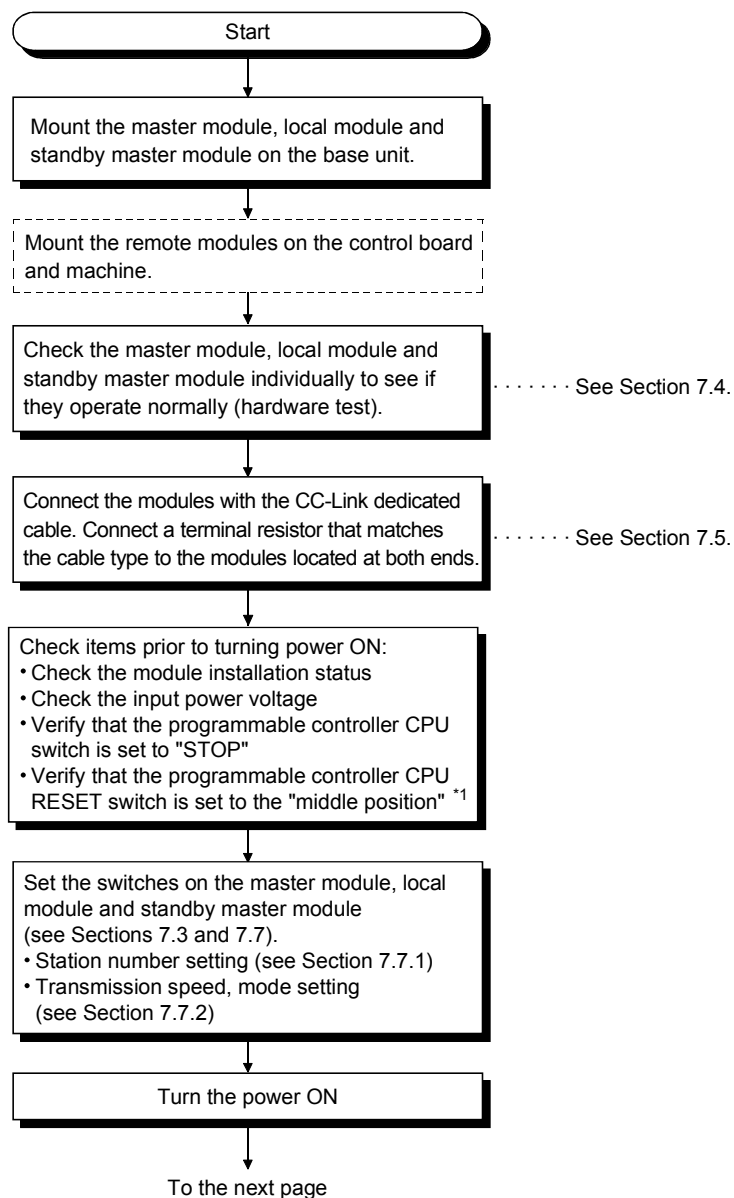
*2 D150 and D160 are dummy devices.

7 PROCEDURE BEFORE STARTING THE DATA LINK

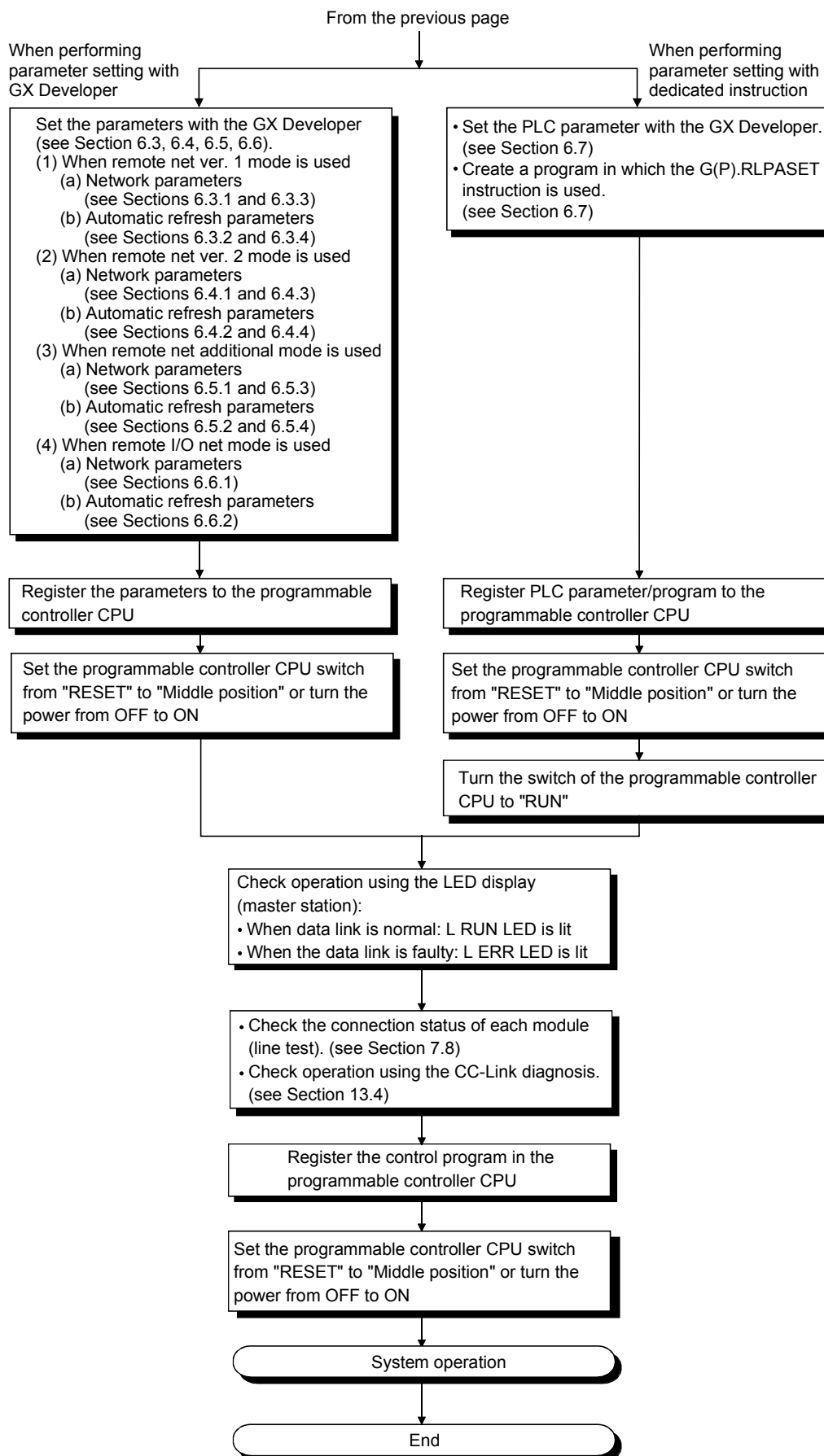
This chapter explains the procedure from the module installation to the data link startup.

7.1 Procedure Before Starting the Data Link

The following describes the procedure from the module installation to the CC-Link data link startup.



*1 Only for the High Performance model QCPU and Process CPU.



7.2 Installation

The following section explains the precautions when handling the master and local modules, from the time they are unpacked until they are installed.

For more details on the module installation, see the user's manual for the CPU module used.

7.2.1 Handling precautions

- (1) Do not drop the module case or subject it to heavy impact since it is made of resin.
- (2) Do not remove the PCB of each module from its case. This may cause a failure in the module.
- (3) Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- (4) 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 this film until the wiring is complete. Remove it for heat dissipation before system operation.
- (5) Solderless terminals with insulation sleeve cannot be used for the terminal block. It is recommended that the wiring connecting sections of the solderless terminals will be covered with a marking tube or an insulation tube.
- (6) 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.
- (7) Tighten the module fixing screws and terminal screws within the following torque ranges.

Screw location	Tightening torque range
Module fixing screws (M3 screws) ^{*1}	0.36 to 0.48 N · m
Terminal block screws (M3 screws)	0.42 to 0.58 N · m
Terminal block mounting screws (M3.5 screws)	0.66 to 0.89 N · m

^{*1} The module can be easily fixed onto the base unit using the hook at the top of the module. However, it is recommended to secure the module with the module fixing screw if the module is subject to significant vibration or shock.

- (8) 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. Improper installation may result in a module malfunction, or may cause the module to fall off.

POINT

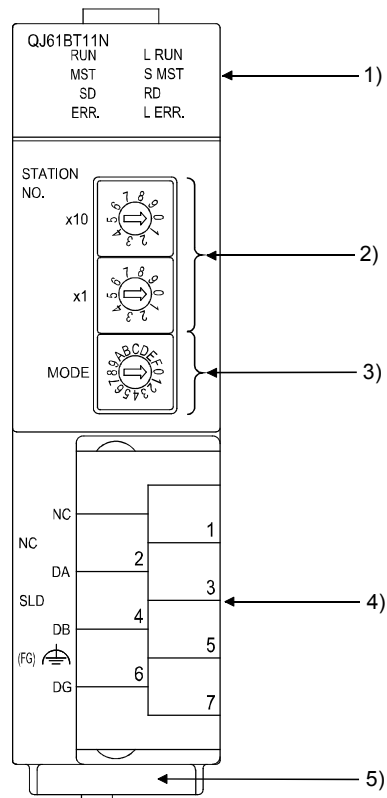
- (1) Be sure to turn off the power supply to the applicable station before installing or removing the terminal block.
If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed.
- (2) Always make sure to power off the system in advance when removing the terminating resistor to charge the system. If the terminating resistor is removed and mounted while the system is energized, normal data transmission will not be guaranteed

7.2.2 Installation environment

For further details, see the user's manual for the CPU module used.

7.3 Part Names and Settings

The following section describes the parts names of the master and local modules, and the contents of the LED display and switch settings.

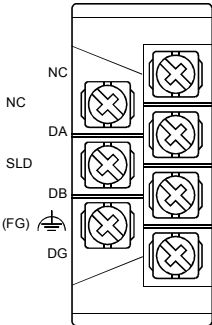


Number	Name	Description	
1)	LED indicators QJ61BT11N RUN MST SD ERR. L RUN S MST RD L ERR.	The data link status can be checked with each ON/OFF status.	
		LED name	Description
		RUN	On : Operating normally Off : Watchdog timer error
		ERR.	On: All stations have a communication error Also lights up when the following errors occur. • Switch type setting is incorrect • There are more than one master station on the same line • There is an error in the parameter contents • The data link monitoring timer was activated • The cable is disconnected Or, the transmission path is affected by noise. To check the source of the error, see Section 13.4. Or, see Section 8.4.2 for details regarding SW0058 (detailed LED display status) Flashing: A communication error station identified, or remote station No. duplicated.
		MST	On: Operating as a master station (in data link control)
		S MST	On: Operating as a standby master station (in standby status)
		L RUN	On: Data link is being executed
		L ERR.	On : Communication error (host) Flashing at fixed intervals: The settings of switches 2) and 3) were changed while the power is on. Flashing irregularly: The terminal resistor is not attached. The module and CC-Link dedicated cable are affected by noise.
		SD	On: Data being sent
		RD	On: Data being received
2)	Station number setting switches STATION NO. x10 0 1 2 3 4 5 6 7 8 9 x1 0 1 2 3 4 5 6 7 8 9	Set the module station number (Factory default: 0) <Setting range> Master station : 0 Local station : 1 to 64 Standby master station : 1 to 64 If a number other than 0 to 64 is set, the "ERR." LED lights up.	

"MST" and "S MST" LED indicator lamp status and station types

Type of station set	Operation status	
	Operating as a master station (controlling data link)	Operating as a standby master station (standing by)
Master station	MST ● ○ S MST	MST ○ ● S MST
Standby master station	MST ● ○ S MST	MST ○ ● S MST
Local station	—	—

● : On, ○ : Off

Number	Name	Description
3)	Transmission speed/mode setting switch MODE 	Set the transmission speed and operating conditions for the module (Factory default: 0)
		Setting value Transmission speed settings Mode
		0 Transmission speed 156 kbps Online
		1 Transmission speed 625 kbps (see Section 7.7.2)
		2 Transmission speed 2.5 Mbps
		3 Transmission speed 5 Mbps
		4 Transmission speed 10 Mbps
		5 Transmission speed 156 kbps Line test (see Section 7.8)
		6 Transmission speed 625 kbps When the station number setting switch is set to 0: Line test 1
		7 Transmission speed 2.5 Mbps When the station number setting switch is set to 1 to 64: Line test 2
		8 Transmission speed 5 Mbps
		9 Transmission speed 10 Mbps
		A Transmission speed 156 kbps Hardware test
		B Transmission speed 625 kbps (see Section 7.4)
		C Transmission speed 2.5 Mbps
		D Transmission speed 5 Mbps
		E Transmission speed 10 Mbps
	F	Setting not allowed
4)	Terminal block 	A CC-Link dedicated cable is connected for data linking. For the connection method, see Section 7.5.
		Terminals SLD and FG are connected inside the module. Since a 2-piece type terminal block is used, the module can be replaced without disconnecting the signal line to the terminal block. (Replace the module after turning its power OFF.)
5)	Serial No. label	The serial No. of the QJ61BT11N is indicated.

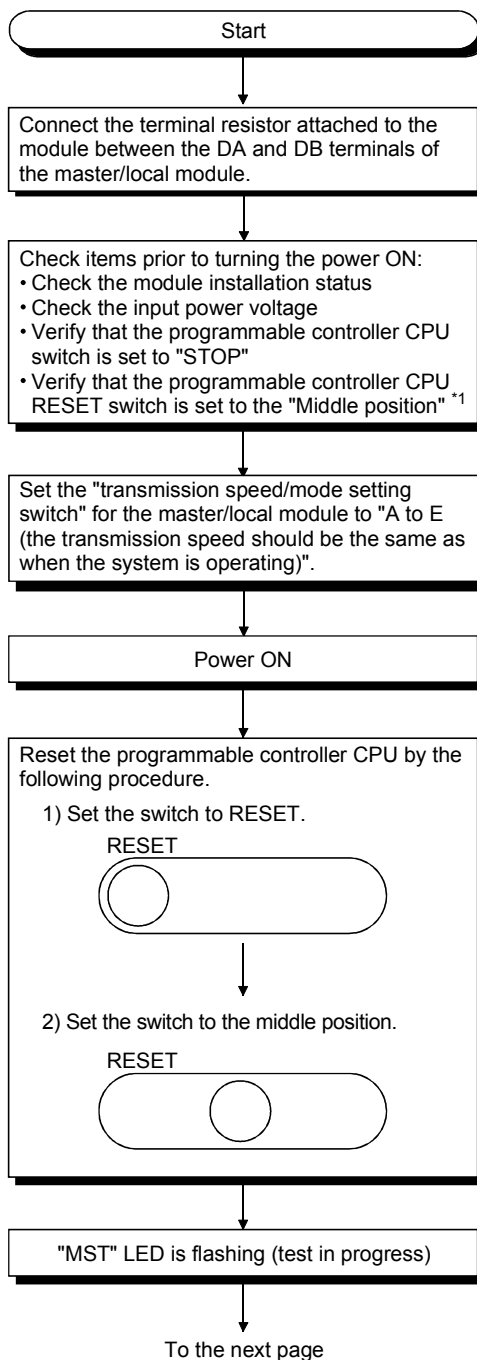
POINT

The settings of the station number setting switch and the transmission speed/mode setting switch become valid when the module power is turned from OFF to ON or the programmable controller CPU is reset. Thus, if the settings were changed while the module power was ON, turn the module power from OFF to ON or reset the programmable controller CPU again.

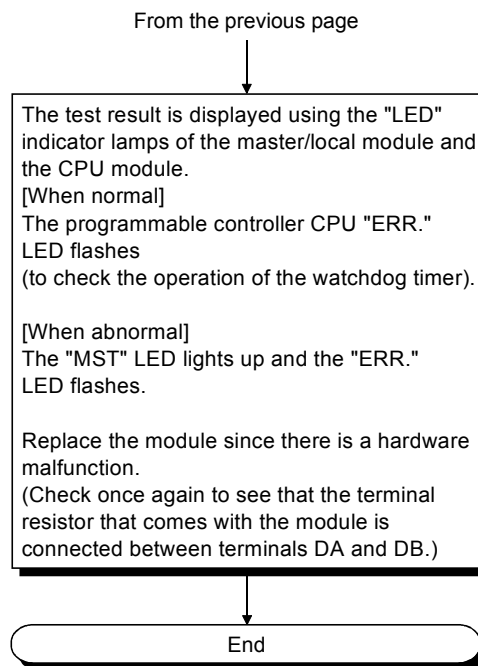
7.4 Checking the Module Status (Hardware Test)

The hardware test checks whether or not each module works properly by itself. Always perform this hardware test before configuring the system and for each module by itself without connecting the cable. Otherwise, the hardware test will not be executed properly.

Execute the hardware test using the following procedure.



*1 Only for the High Performance model QCPU, Process CPU, and C Controller module.

**POINT**

When the switch of the programmable controller CPU is set to "RUN" and a hardware test is performed, the system status become SP. UNIT DOWN and the programmable controller CPU stops to check the operation of the watch dog timer function. Make sure that the switch of the programmable controller CPU is set to "STOP" and then perform the hardware test.

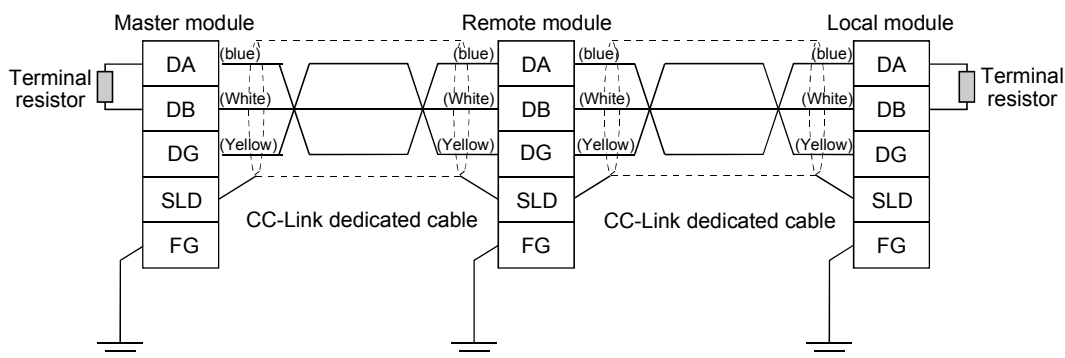
7.5 Connecting the Modules Using the CC-Link Dedicated Cables

This section explains how to connect the master module, local modules, standby master module, remote modules and intelligent device modules with the CC-Link dedicated cables.

- (1) Ver.1.10-compatible CC-Link dedicated cables, CC-Link dedicated cables (Ver.1.00) and CC-Link dedicated high-performance cables cannot be used together. If used together, correct data transmission will not be guaranteed.
- (2) CC-Link cables can be connected from any station number.
- (3) Connect the shielded wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the shielded wire using D type grounding via "FG".
The SLD and FG are connected within the module.
- (4) Connect the supplied "terminal resistors" to each module at both ends of the CC-Link system.
Connect the terminal resistors between "DA" and "DB".
There are restrictions on the case where the A(1S)J61BT11/A(1S)J61QBT11 is used as the master station in a T-branch system configuration. Refer to Section 7.6.1 for details.
- (5) The terminal resistors to be connected vary depending on the types of cables used in the CC-Link system.

Cable type	Terminal resistor
CC-Link dedicated cable	110 Ω 1/2 W (brown - brown - brown)
Version 1.10 compatible CC-Link dedicated cable	
CC-Link dedicated high-performance cable	130 Ω 1/2 W (brown - orange - brown)

- (6) The master module can be connected at points other than both ends.
- (7) Star connection is not allowed.
- (8) The connection method is shown below.

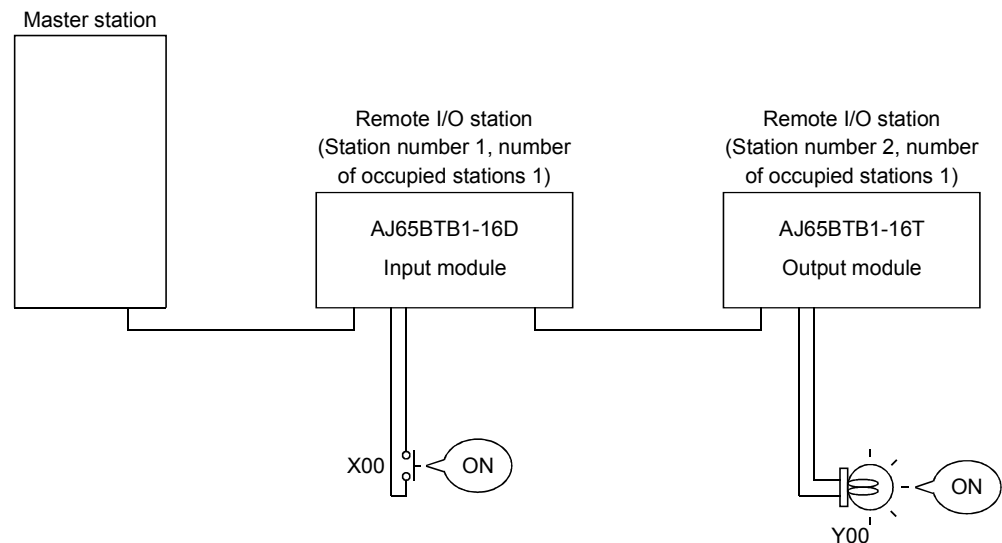


7.5.1 Wiring check

The following explains how to check the wiring status between the remote I/O and external devices.

[Example of wiring check]

Specify the "Remote input (RX)" for the master station to "X1000" and the "Remote output (RY)" to "Y1000" with the GX Developer.



(a) Checking the wiring between the input module and an external device

- 1) Turn ON the switch corresponding to the external device "X0," which is connected to the input module of station number 1.
- 2) Using the GX Developer, set "X1000" in the "Device:" field by choosing "Online" - "Monitor" - "Device batch" and then click on "Start monitor".
- 3) If X1000 is ON, the connection between the input module and external device has been properly performed.

(b) Checking the wiring between the output module and an external device

- 1) Using the GX Developer, set "Y1020" in the "Device:" field for the "Bit device" by choosing "Online" - "Debug" - "Device test" and then click on "FORCE ON".
- 2) If the connection between the output module and external device is properly performed, the indicator lamp corresponding to the external device "Y00" is lit.

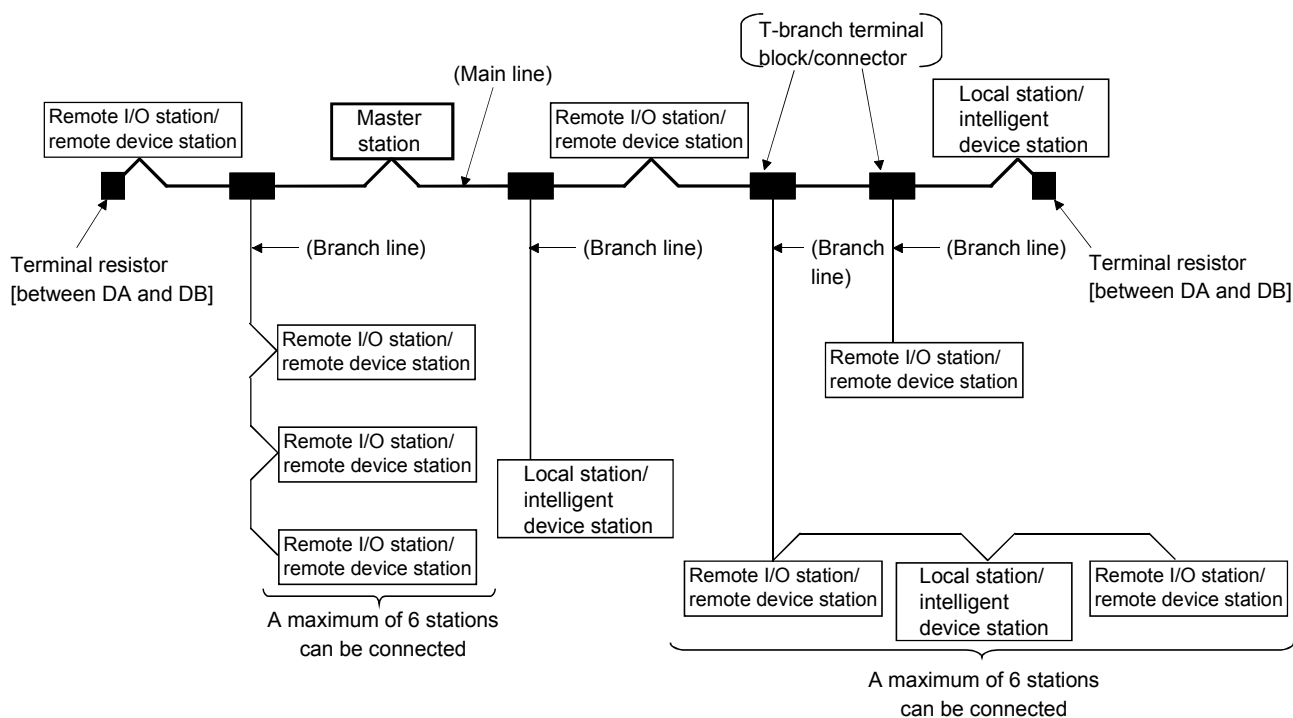
POINT

If X corresponding to the switch does not turn on or the lamp corresponding to Y does not turn on, confirm the slave station offset, size information (buffer memory address 3E0H, Un\G992) to check the RX/RX/RWw/RWw assignment status of the module.

7.6 T-Branch Connection

7.6.1 T-Branch system configuration

The following shows a system configuration using T-branch connection.

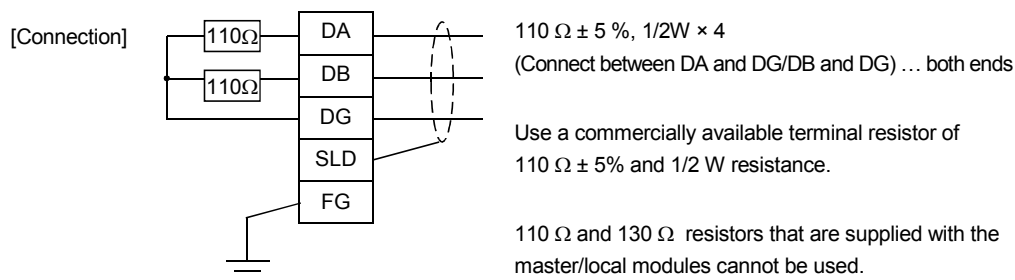


* The number of branch lines is determined by the branch line length per branch line and the overall branch line length.

When the model name and hardware version of the master module are as indicated below in a T-branch system configuration, change the terminating resistor connection method as described below.

When using the other master module, connect the terminating resistor packed with the product.

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



7.6.2 T-Branch communication specifications list

The following describes the communication specifications for T branch connection.
For communication specifications not listed below, see Section 3.1.

Item	Specification		Remarks														
Transmission speed	625 kbps	156 kbps	10 M/5 M/2.5 Mbps are not allowed.														
Maximum length of the main line	100 m (328.1 ft.)	500 m (1640.5 ft.)	Indicates the length of the cable between terminal resistors. The length of the T branch cable (branch line length) is not included.														
Maximum length of the branch line	8 m (26.25 ft.)		Indicates the overall cable length per branch.														
Overall branch line length	50 m (164.05 ft.)	200 m (656.2 ft.)	Indicates the overall length of the entire branch cable.														
Maximum number of connected stations on the branch line	6 stations per branch		The total number of connected stations depends on the CC-Link specifications.														
Connection cable	CC-Link dedicated cable Ver. 1.10 compatible CC-Link dedicated cable		• The CC-Link dedicated high-performance cable cannot be used. • Mixing of different brands of CC-Link dedicated cables is not allowed. • Mixing of different brands of Ver. 1.10 compatible CC-Link dedicated cables is allowed.														
T branch terminal block/connector	• Terminal block: Off-the-shelf terminal block • Connector: Connector for the FA sensor (ICE947-5-2) comparable product is recommended		• When wiring cables for the main line side, try not to remove the covering as much as possible.														
Maximum length of main line, distance between T branches, and length of cable between stations	CC-Link dedicated cable, Ver.1.10 compatible CC-Link dedicated cable (uses 110 Ω terminal resistor) <table><tr><th>Transmission speed</th><th>Maximum length of main line</th><th>Distance between T branches</th><th>Length of cable between the remote I/O stations or remote device stations * 1</th><th>Length of cable between the master/local station or intelligent device station and the adjacent station(s) * 2</th></tr><tr><td>625 kbps</td><td>100 m (328.1 ft.)</td><td rowspan="2">No limit</td><td rowspan="2">30 cm (11.8 in.) or longer</td><td>1 m (3.28 ft.) or longer (* 3) /</td></tr><tr><td>156 kbps</td><td>500 m (1640.5 ft.)</td><td>2 m (6.56 ft.) or longer (* 4)</td></tr></table>				Transmission speed	Maximum length of main line	Distance between T branches	Length of cable between the remote I/O stations or remote device stations * 1	Length of cable between the master/local station or intelligent device station and the adjacent station(s) * 2	625 kbps	100 m (328.1 ft.)	No limit	30 cm (11.8 in.) or longer	1 m (3.28 ft.) or longer (* 3) /	156 kbps	500 m (1640.5 ft.)	2 m (6.56 ft.) or longer (* 4)
Transmission speed	Maximum length of main line	Distance between T branches	Length of cable between the remote I/O stations or remote device stations * 1	Length of cable between the master/local station or intelligent device station and the adjacent station(s) * 2													
625 kbps	100 m (328.1 ft.)	No limit	30 cm (11.8 in.) or longer	1 m (3.28 ft.) or longer (* 3) /													
156 kbps	500 m (1640.5 ft.)			2 m (6.56 ft.) or longer (* 4)													

* 3: The cable length of 1m (3.28 ft.) or longer is for a system configured only with remote I/O stations and remote device stations.

* 4: The cable length of 2m (6.56 ft.) or longer is for a system configuration that contains local stations and intelligent device stations.

(Length of branch line: 8m (26.25 ft.) or shorter)

R Indicates a remote I/O station or a remote device station.

L/I Indicates a local station or an intelligent device station.

(Length of branch line: 8m (26.25 ft.) or shorter)

7.7 Switch Settings

This section explains how to set the module switches.

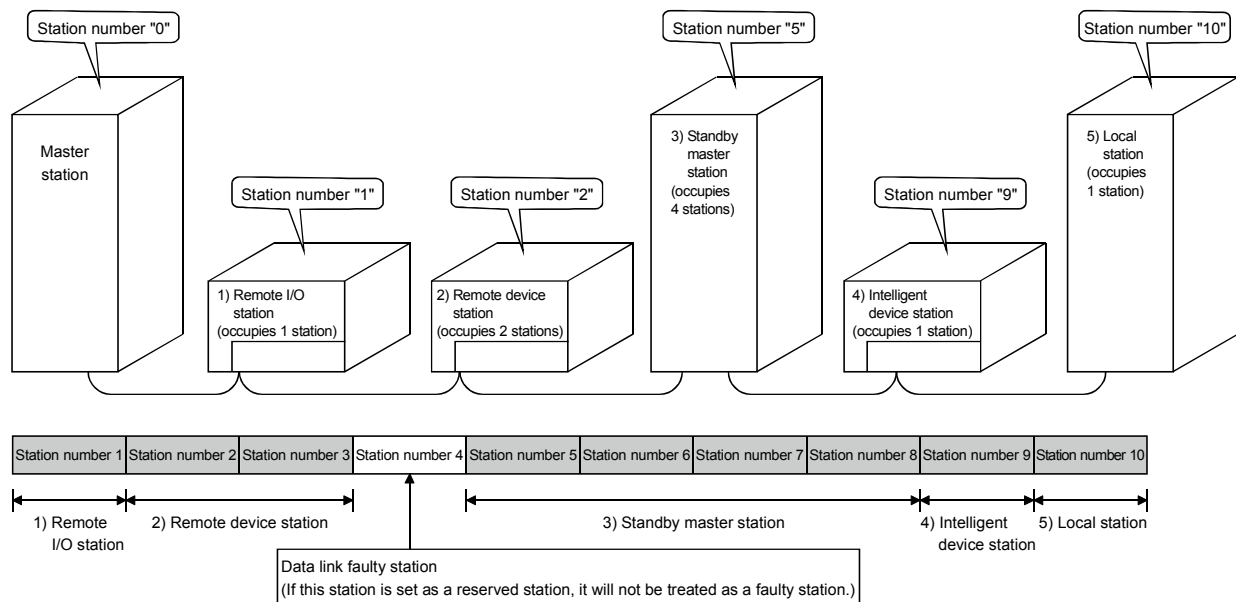
7.7.1 Station number setting

The following explains how to set the station numbers for the master station, local station, standby master station, remote station and intelligent device station. For details on the station number setting switches, see Section 7.3.

Specify the station numbers according to the following conditions.

- (1) Specify sequential station numbers
Station numbers can be specified regardless of the order in which the stations are connected.
For a module occupying two or more stations, specify the first station number.
- (2) Specify unique station numbers
If duplicate station numbers are specified, an installation error occurs. (Error codes are stored in SW0069)

[Setting example] When station numbers are specified by skipping one station number



POINT

Specify unoccupied station numbers as reserved stations. An unoccupied station number will be treated as a "data link faulty station" (can be verified with link special registers SW0080 to SW0083).

7.7.2 Transmission speed and mode settings

Transmission speed and mode settings are specified with the "transmission speed/mode setting switch".

For details on the transmission speed/mode setting switch, see Section 7.3.

The transmission speed that can be set varies depending on the total distance.
For more details, see Sections 3.1.1 and 3.1.2.

POINT
(1) Use the same transmission speed for the master station, remote stations, local stations, intelligent device stations and the standby master station. If the setting for even one of the stations is different, data link cannot be established properly.
(2) Transmission speed test can be used to check whether the same transmission speed is set for all of the master station, remote stations, local stations, intelligent device stations and standby master station. (See Section 7.9.)

7.8 Checking the Connection Status (Line Test)

After connecting all of the modules with CC-Link dedicated cables, verify that they are correctly connected and that data linking can be performed with remote stations, local stations, intelligent device stations and the standby master station.

Line test 1 checks the status of communication with all modules that have been connected.

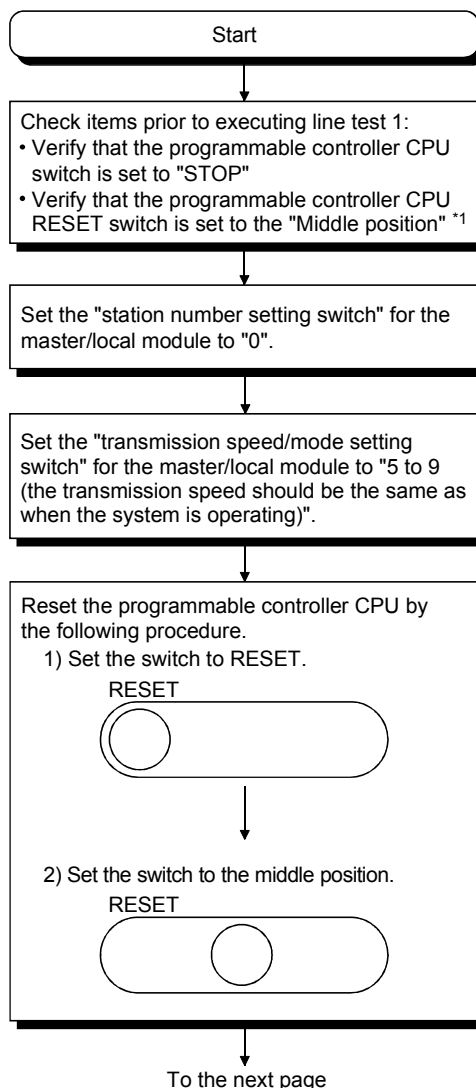
Line test 2 checks the status of communication with specific modules.

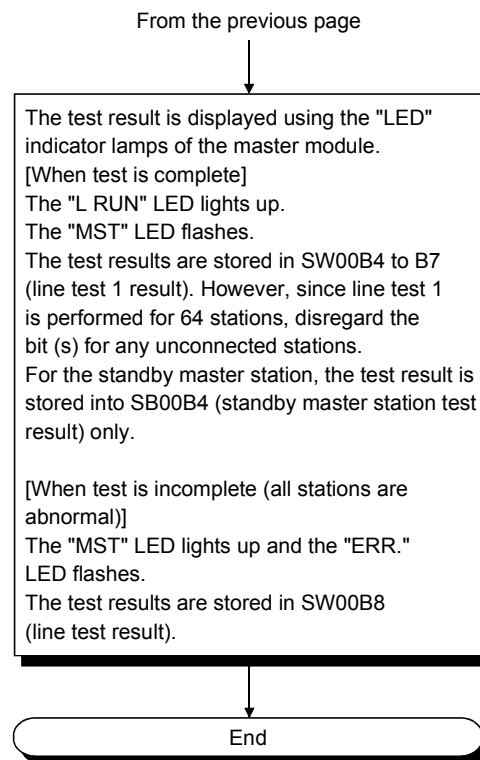
Neither line test 1 nor line test 2 requires parameter settings.

POINT

- (1) Line test 2 is performed when an error is generated by line test 1.
Thus, if the result of line test 1 is normal, there is no need to conduct line test 2.
- (2) Network parameter setting is required to execute Line test 2 for the standby master station.
- (3) When data link has started by the standby master station, Line test 1 and 2 are not executable. To perform these line tests, use GX Developer.

- (1) Checking the connection status and the status of communication with remote stations/local stations/intelligent device stations/standby master station (line test 1)
Perform the line test according to the following procedure.



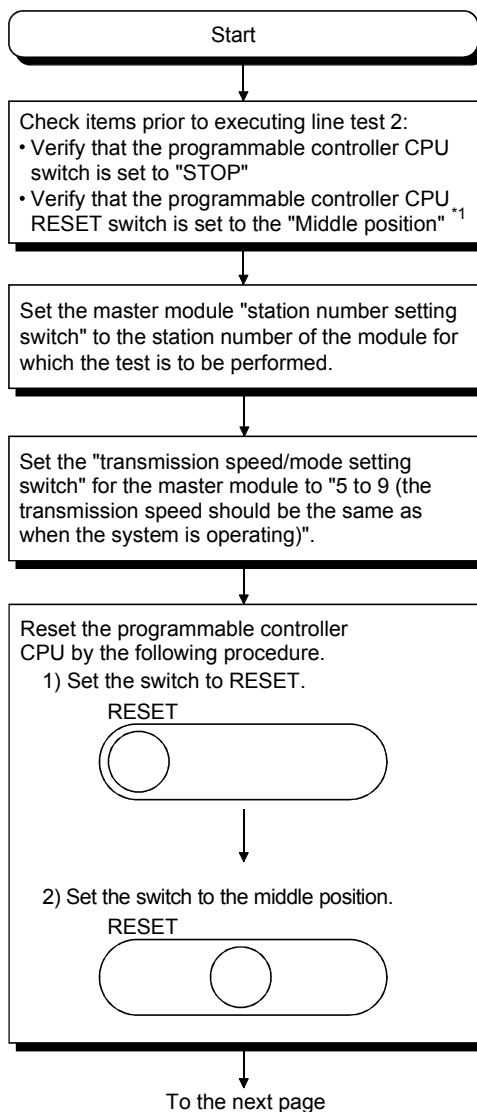


*1 Only for the High Performance model QCPU, Process CPU and C Controller module.

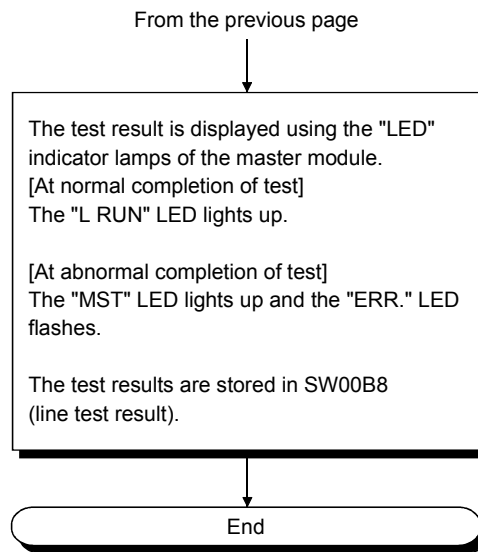
- (2) Checking the status of communication with a specific remote station/local station/intelligent device station/standby master station (line test 2)

Line test 2 checks whether data linking can be performed normally with a specific remote station, local station, intelligent device station or standby master station.

Execute line test 2 according to the following procedure.



*1 Only for the High Performance model QCPU, Process CPU and C Controller module.



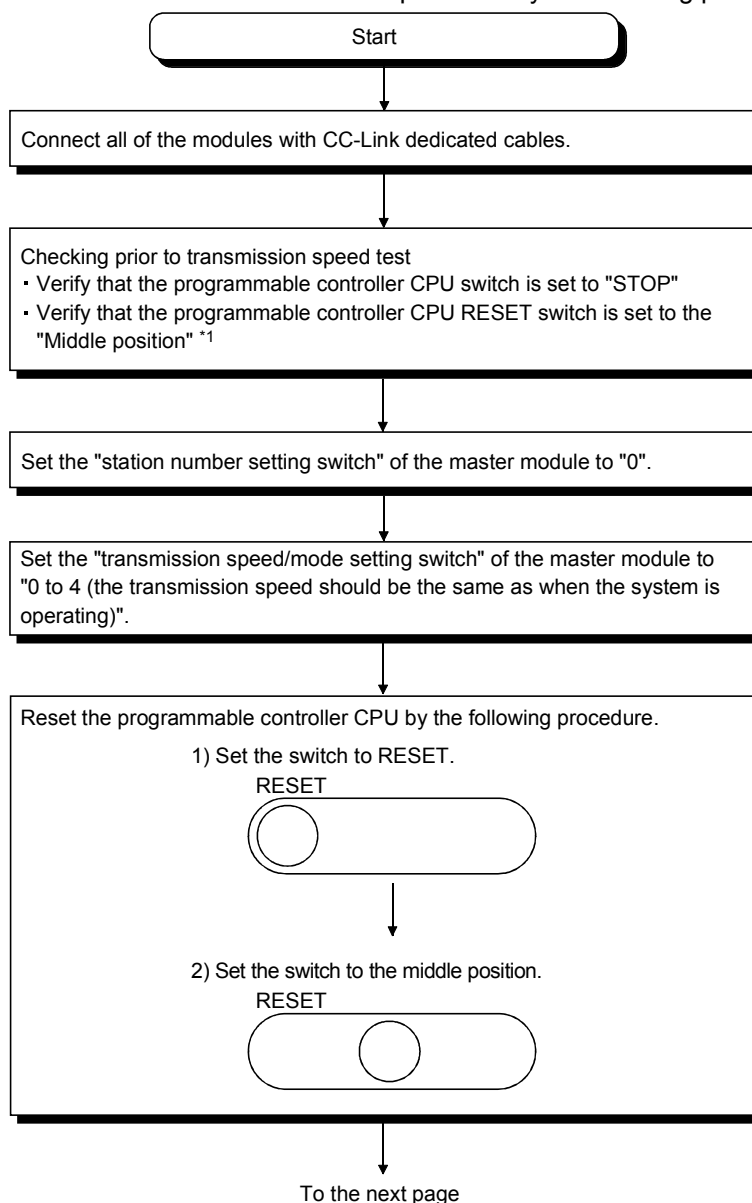
7.9 Checking the Transmission Speed (Transmission Speed Test)

Whether or not the same transmission speed is set for slave stations and the master station can be checked. (This test is available for the module whose first five digits of serial No. is 10032 or later.)

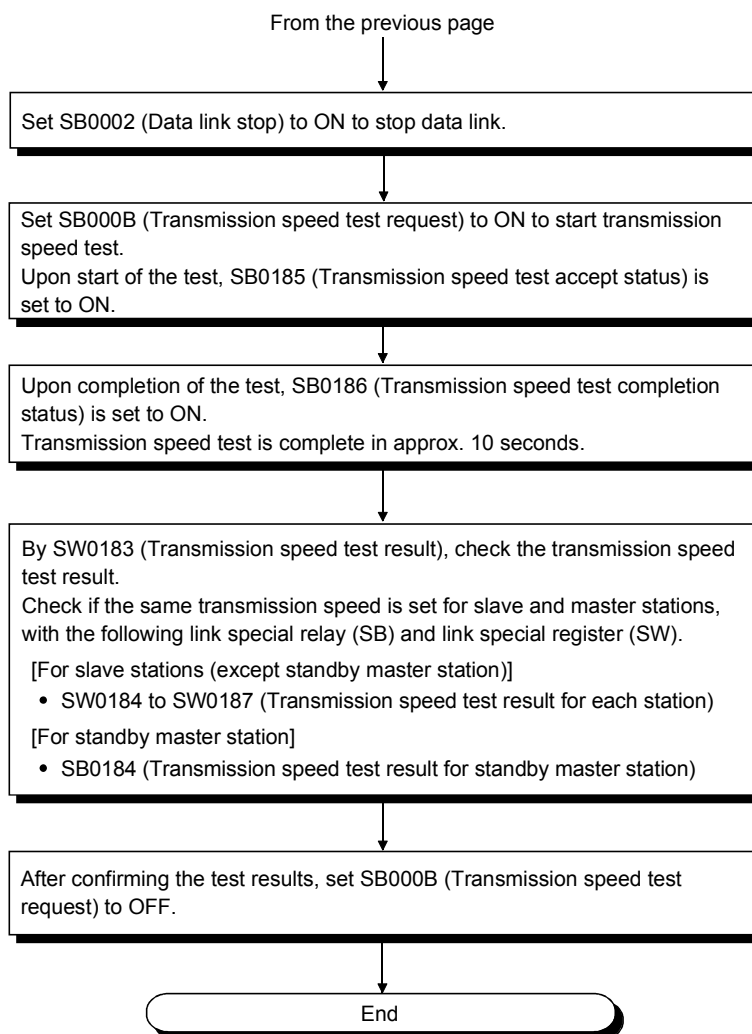
Since the station No. of the slave station with a different transmission speed setting can be identified, a communication error can be resolved easily.

(1) Transmission speed test procedure

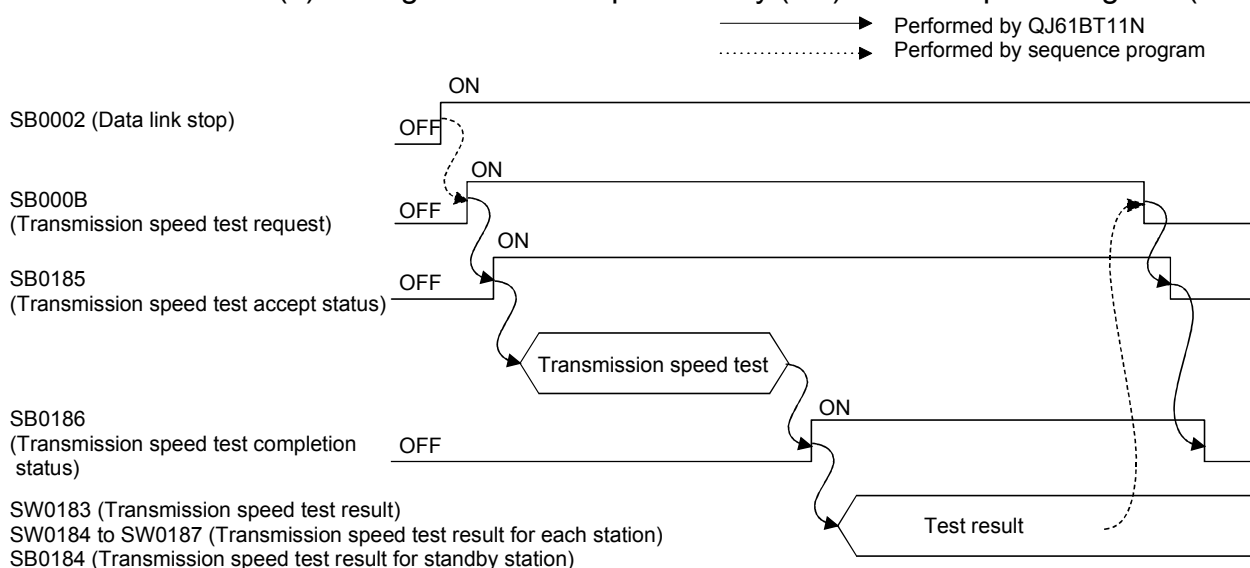
Perform the transmission speed test by the following procedure.



*1 Only for the High Performance model QCPU, Process CPU and C Controller module.



(2) Timing chart of link special relay (SB) and link special register (SW)



8 PROGRAMMING

This chapter explains common items relating to programming.

8.1 Precautions on Programming

The following explains precautions on the creation of a program:

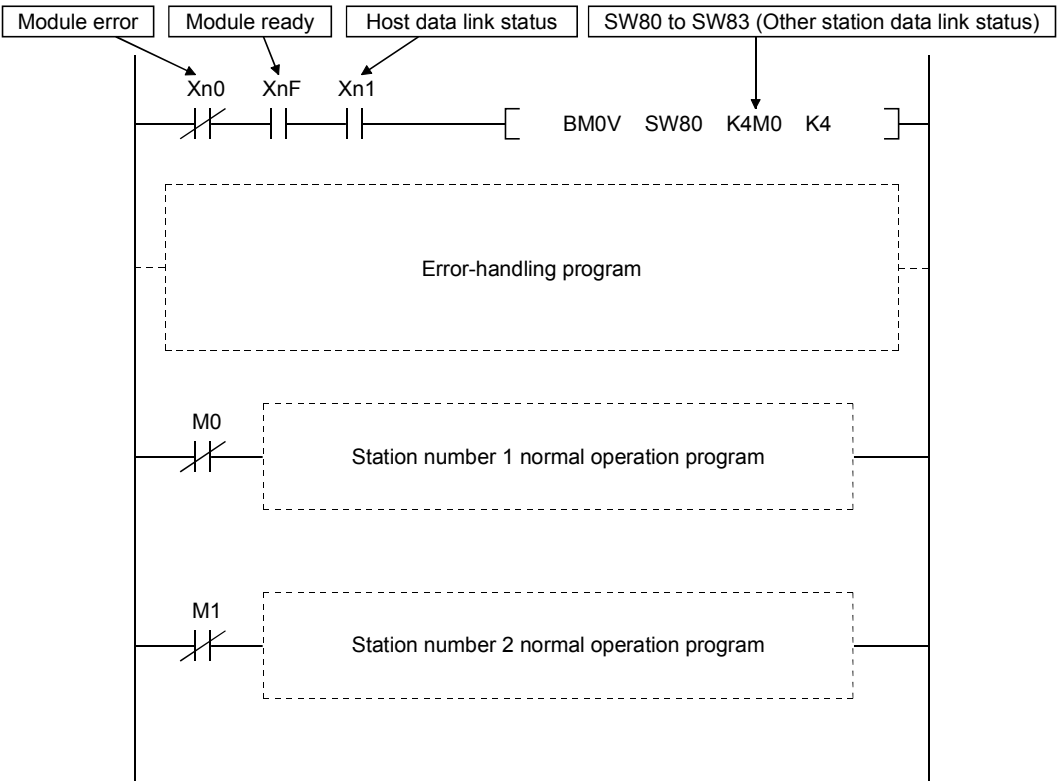
Create a program that allows the detection of data-link status and interlocking with the remote I/O stations, remote device stations, local stations, intelligent device stations, and standby master station.
In addition, create an error-handling program.

[Program example]

Set the "Special Relay (SB) Refresh Device" to "SB0" and the "Special Register (SW) Refresh Device" to "SW0" of the master station with GX Developer.

POINT

When setting the refresh devices for special relay (SB) and special register (SW) to SB and SW respectively, make sure that their device numbers do not duplicate with those used in the CC-Link IE controller network and MELSECNET/H network.



8.2 I/O Signals for the Programmable Controller CPU

This section explains the input/output signals for the programmable controller CPU of the master/local module.

8.2.1 I/O signal list

Table 8.1 shows a list of the I/O signals.

The "n" in the table indicates the master/local module's first I/O number, which is determined by both the installation position and the module installed before the master/local module.

<Example> When the master/local module's first I/O number is "X/Y30"

Xn0 to X (n + 1) F → X30 to X4F

Yn0 to Y (n + 1) F → Y30 to Y4F

Table 8.1 I/O signal list

Signal direction: Programmable controller CPU ← Master/local module				Signal direction: Programmable controller CPU → Master/local module			
Input number	Signal name	Availability		Output number	Signal name	Availability	
		Master station	Local station			Master station	Local station
Xn0	Module error	○	○	Yn0	Use prohibited	—	—
Xn1	Host data link status	○	○	Yn1			
Xn2	Use prohibited	—	—	Yn2			
Xn3	Other station data link status	○	○	Yn3			
Xn4	Use prohibited	—	—	Yn4			
Xn5				Yn5			
Xn6				Yn6			
Xn7				Yn7			
Xn8				Yn8			
Xn9				Yn9			
XnA				YnA			
XnB				YnB			
XnC				YnC			
XnD				YnD			
XnE				YnE			
XnF	Module ready	○	○	YnF			
X (n+1) 0	Use prohibited	—	—	Y (n+1) 0			
X (n+1) 1				Y (n+1) 1			
X (n+1) 2				Y (n+1) 2			
X (n+1) 3				Y (n+1) 3			
X (n+1) 4				Y (n+1) 4			
X (n+1) 5				Y (n+1) 5			
X (n+1) 6				Y (n+1) 6			
X (n+1) 7				Y (n+1) 7			
X (n+1) 8				Y (n+1) 8			
X (n+1) 9				Y (n+1) 9			
X (n+1) A				Y (n+1) A			
X (n+1) B				Y (n+1) B			
X (n+1) 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			

IMPORTANT

The use-prohibited output signals shown in Table 8.1 are accessed by the system and cannot be accessed by the user.

In the event these signals are used (turned on/off) by the user, normal operations cannot be guaranteed.

POINT

In the A/QnA series, data link startup was performed by setting the "Yn6 (Data Link Startup Request initiated by a buffer memory parameter)" and "Yn8 (Data link Startup Request initiated by an E²PROM parameter)".

Do not use "Yn6" and "Yn8" for the Q series because the data link startup is automatically performed.

8.2.2 Details of the I/O signals

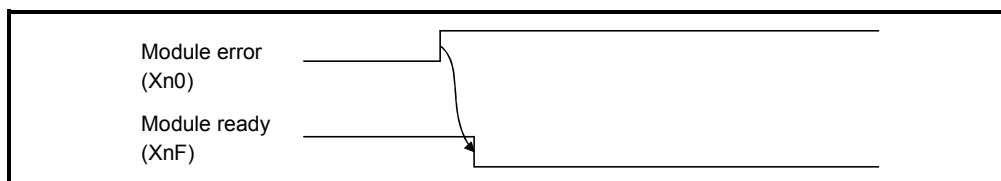
The following explains the on/off timings and conditions of the I/O signals shown in Table 8.1:

(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.

SB006E also represents the same meaning. For programming, use either Xn1 or SB006E only.

Note that the ON/OFF condition for Xn1 is opposite to that for SB006E.

When Xn1 is used, the condition is as follows:

OFF: Data link is stopped

ON : Data linking in progress

(3) Other station data link status: Xn3

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

The SB0080 signal has the same contents. For programming, use either Xn3 or SB0080 only.

OFF: All stations normal

ON : There is a faulty station (the faulty station status is stored in SW0080 to SW0083)

POINT

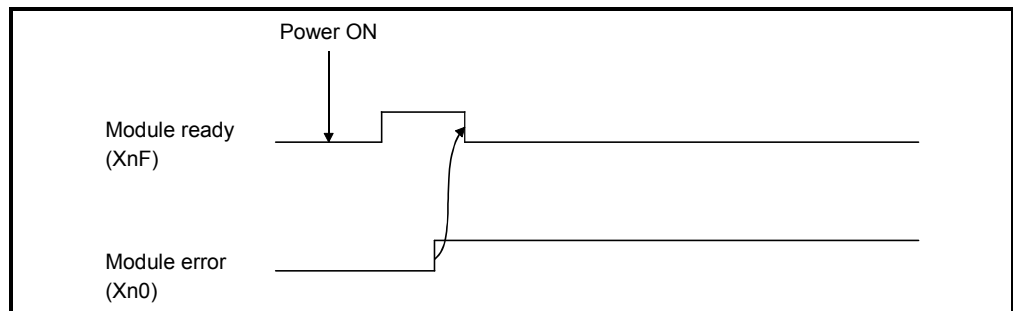
The other station data link status (Xn3) takes up to 6 seconds to turn on after a slave station connected to the master/local station becomes faulty.

The time to turn ON differs according to the system configuration, faulty status or other conditions.

(4) Module ready: XnF

This signal indicates whether the module is ready to operate.

- (a) When the module reaches ready-to-operate status, this signal turns ON automatically.
- (b) This signal turns OFF when either of the following conditions occurs:
 - 1) When an error is detected in the switch setting status for the module
 - 2) When the module error signal (Xn0) turns ON



8.3 Buffer Memory

The buffer memory transfers data between the master/local module and the programmable controller CPU.

The reading and writing of data are performed by parameter settings or with dedicated instructions using the GX Developer.

The contents of the buffer memory return to the default when the power is turned OFF or the programmable controller CPU is reset.

8.3.1 Buffer memory list

The buffer memory list is shown in Table 8.2.

Table 8.2 Buffer memory list (1/3)

Address		Item	Description	Read/write possibility	Availability		Reference section
Hexadecimal	Decimal				Master station	Local station	
0 _H to DF _H	0 to 223	Parameter information area	Stores the parameter settings.	Read only	○	—	Section 8.3.2 (1)
E0 _H to 15F _H	224 to 351	Remote input (RX) * 2	For the master station: Stores the input status from the remote/local /intelligent device/standby master stations.	Read only	○	—	Section 8.3.2 (2)
			For the local station : Stores the input status from the master station.		—	○	
160 _H to 1DF _H	352 to 479	Remote output (RY) * 2	For the master station: Stores the output status to the remote/local /intelligent device/standby master stations.	Write only	○	—	
			For the local station : Stores the output status to the master station. Also, stores the receive data from the remote/other local/intelligent device/standby master stations.	Read/write enabled	—	○	
1E0 _H to 2DF _H	480 to 735	Remote register (RWw) * 2 Master station: For sending Local station: For sending/receiving	For the master station: Stores the send data to the remote device/all local /intelligent device/standby master stations.	Write only	○	—	Section 8.3.2 (3)
			For the local station : Stores the send data to the master/other local/intelligent device/standby master stations. Also, stores the receive data from the remote device/other local/intelligent device/standby master stations.	Read/write enabled	—	○	

○: Available, — : Not available

Table 8.2 Buffer memory list (2/3)

Address		Item	Description	Read/write possibility	Availability		Reference section
Hexadecimal	Decimal				Master station	Local station	
2E0 _H to 3DF _H	736 to 991	Remote register (RW _r) * 2	For the master station: Stores the receive data from the remote device/local/intelligent device/standby master stations.	Read only	○	—	Section 8.3.2 (3)
		Master station: For receiving Local station: For receiving	For the local station : Stores the receive data from the master station.		—	○	
3E0 _H to 5DF _H	992 to 1503	Slave station offset, size information	Stores the offset and size of RX/R _Y /RW _w /RW _r per remote station/local station/intelligent device station/standby master station.	Read only	○	○	Section 8.3.2 (4)
5E0 _H to 5FF _H	1504 to 1535	Link special relay (SB)	Stores the data link status.	Read/write enabled (write may be disabled depending on the device)	○	○	Section 8.3.2 (5)
600 _H to 7FF _H	1536 to 2047	Link special register (SW)	Stores the data link status.		○	○	Section 8.3.2 (6)
800 _H to 9FF _H	2048 to 2559	Use prohibited * 1	—	—	—	—	—
A00 _H to FFF _H	2560 to 4095	Random access buffer	The specified data is stored and used by transient transmission.	Read/write enabled	○	○	Section 8.3.2 (7)
1000 _H to 1FFF _H	4096 to 8191	Communication buffers	Stores the send and receive data and control data when performing transient transmission (communication using the communication buffers) with the local station, standby master station, and intelligent device station.	Read/write enabled	○	○	Section 8.3.2 (8)
2000 _H to 2FFF _H	8192 to 12287	Automatic update buffer	Stores the automatic update data when performing transient transmission with the AJ65BT-R2(N) (communication using the automatic update buffer).	Read/write enabled	○	—	Section 8.3.2 (9)
3000 _H to 3FFF _H	12288 to 16383	Use prohibited * 1	—	—	—	—	—

○: Available, — : Not available

Table 8.2 Buffer memory list (3/3)

Address		Item	Description	Read/write possibility	Availability		Reference section
Hexadecimal	Decimal				Master station	Local station	
4000 _H to 41FF _H	16384 to 16895	Ver. 2 compatible remote input (RX) * 3	For the master station: Stores the input status from the remote/local /intelligent device/standby master stations.	Read only	○	—	Section 8.3.2 (10)
			For the local station : Stores the input status from the master station.		—	○	
4200 _H to 43FF _H	16896 to 17407	Ver. 2 compatible remote output (RY) * 3	For the master station: Stores the output status to the remote/local /intelligent device/standby master stations.	Write only	○	—	
			For the local station : Stores the output status to the master station. Also, stores the receive data from the remote/other local/intelligent device/standby master stations.	Read/write enabled	—	○	
4400 _H to 4BFF _H	17408 to 19455	Ver. 2 compatible remote register (RWw) * 3 Master station: For sending Local station: For sending/receiving	For the master station: Stores the send data to the remote device/all local /intelligent device/standby master stations.	Write only	○	—	Section 8.3.2 (11)
			For the local station : Stores the send data to the master/other local/intelligent device/standby master stations. Also, stores the receive data from the remote device/other local/intelligent device/standby master stations.	Read/write enabled	—	○	
4C00 _H to 53FF _H	19456 to 21503	Ver. 2 compatible remote register (RWr) * 3 Master station: For receiving Local station: For receiving	For the master station: Stores the receive data from the remote device/local/intelligent device/standby master stations.	Read only	○	—	
			For the local station : Stores the receive data from the master station.		—	○	
5400 _H to 7FFF _H	21504 to 32767	Use prohibited * 1	—	—	—	—	—

○: Available, —: Not available

*1 Do not write to any area where use is prohibited. This may cause errors.

*2 Used when the remote net ver. 1 mode or remote net additional mode is selected.

*3 Used when the remote net ver. 2 mode or remote net additional mode is selected.

8.3.2 Buffer memory details

The following explains the details of items shown in Table 8.2, "Buffer Memory List" in Section 8.3.1.

(1) Parameter information area

Stores the parameter settings.

Do not perform write to the parameter information area. Doing so may cause an error.

Table 8.3 Parameter Information Area List (1/3)

Address		Item	Description
Hex.	Dec.		
0 _H	0	(Use prohibited)	—
1 _H	1	Number of connected modules	Stores the total number of remote stations, local stations, intelligent device stations and standby master station that are connected to the master station (including reserved stations). Default value: 64 (modules) Storage area: 1 to 64 (modules)
2 _H	2	Number of retries	Stores the number of retries when a communication error occurs. Default value: 3 (times) Storage area: 1 to 7 (times)
3 _H	3	Number of automatic return modules	Stores the total number of remote stations, local stations, intelligent device stations and standby master station that can be returned to system operation by a single link scan. Default value: 1 (module) Storage area: 1 to 10 (modules)
4 _H	4	Standby master station specification	Stores the station number of the standby master station. Default value: 0 (no standby master station specified) Storage area: 0 to 64 (0: No standby master station specified)
5 _H	5	(Use prohibited)	—
6 _H	6	Operation specification when CPU is down	Stores the data link status when a master station programmable controller CPU error occurs. Default value: 0 (Stop) Storage area: 0 (Stop) : 1 (Continue)
7 _H	7	Scan mode specification	Stores either the synchronous or asynchronous mode for sequence scan. Default value: 0 (Asynchronous) Storage area: 0 (Asynchronous) : 1 (Synchronous)
8 _H	8	Delay time setting	Set 0 for the delay time.
10 _H to 13 _H	16 to 19	Reserved station specification	Stores the reserved station. Default value: 0 (Not specified) Storage area: Bit corresponding to the station number turns on.
14 _H to 17 _H	20 to 23	Error invalid station specification	Stores the error invalid station. Default value: 0 (Not specified) Storage area: Bit corresponding to the station number turns on.

Table 8.3 Parameter Information Area List (2/3)

Address		Item	Description						
Hex.	Dec.								
18 _H to 1F _H	24 to 31	(Use prohibited)	—						
20 _H (first module) to 5F _H (64th module)	32 (first module) to 95 (64th module)	Station information	Stores the setting status of the types of the connected remote, local, intelligent device and standby master stations. Default value: 0101_H (Ver.1compatible remote I/O station, Occupies 1 station, Station number 1) to 0140_H (Ver.1compatible remote I/O station, Occupies 1 station, Station number 64) Storage area: See below <table><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 number</td></tr></table> 1H: Occupies 1 station 2H: Occupies 2 stations 3H: Occupies 3 stations 4H: Occupies 4 stations 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 single remote device station 6H: Ver. 2 compatible single intelligent device station 8H: Ver. 2 compatible double remote device station 9H: Ver. 2 compatible double intelligent device station BH: Ver. 2 compatible quadruple remote device station CH: Ver. 2 compatible quadruple intelligent device station EH: Ver. 2 compatible octuple remote device station FH: Ver. 2 compatible octuple intelligent device station	b15 to b12	b11 to b8	b7 to b0	Station type	Number of occupied stations	Station number
b15 to b12	b11 to b8	b7 to b0							
Station type	Number of occupied stations	Station number							
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)	Allocation of communication buffer and automatic update buffer	Stores the buffer memory assignment status at transient transmission to the local, intelligent device and standby master stations. Default value Send buffer size: 40_H (64) (word) Receive buffer size: 40_H (64) (word) Automatic update buffer size: 80_H (128) (word) Storage area - Communication buffer : 0_H (0) (word) (no setting) or 40_H (64) (word) to 1000_H (4096) (word) Note that the total size of the communication buffer is within 1000_H (4096) (word). - Automatic update buffer: 0_H (0) (word) (no setting) or 80_H (128) (word) to 1000_H (4096) (word) Note that the total size of the automatic update buffers is 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	Stores the station numbers of the remote I/O stations set as 8 points in the remote I/O station points setting. * 1, * 2 Default value: 0 (no setting) Storage area: Bit corresponding to the station number turns on.						

*1 Used in the remote net ver. 2 mode or remote net additional mode.

*2 When the setting is "8 points + 8 points (reserved)", the station numbers are stored into both the 8-point remote I/O station setting and 16-point remote I/O station setting.

Table 8.3 Parameter Information Area List (3/3)

Address		Item	Description
Hex.	Dec.		
D4 _H to D7 _H	212 to 215	16-point remote I/O station setting	Stores the station numbers of the remote I/O stations set as 16 points in the remote I/O station points setting. * 1, * 2 Default value: 0 (no setting) Storage area: Bit corresponding to the station number turns on.
D8 _H to DB _H	216 to 219	0 points reserve station setting	Stores the station numbers of the reserved stations set to 0 points. * 1 Default value: 0 (no setting) Storage area: Bit corresponding to the station number turns on.
DC _H to DF _H	220 to 223	(Use prohibited)	—

*1 Used in the remote net ver. 2 mode or remote net additional mode.

*2 When the setting is "8 points + 8 points (reserved)", the station numbers are stored into both the 8-point remote I/O station setting and 16-point remote I/O station setting.

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

Used when the remote net ver. 1 mode or remote net additional mode is selected.

(a) Master station ← remote I/O station/remote device station/local station

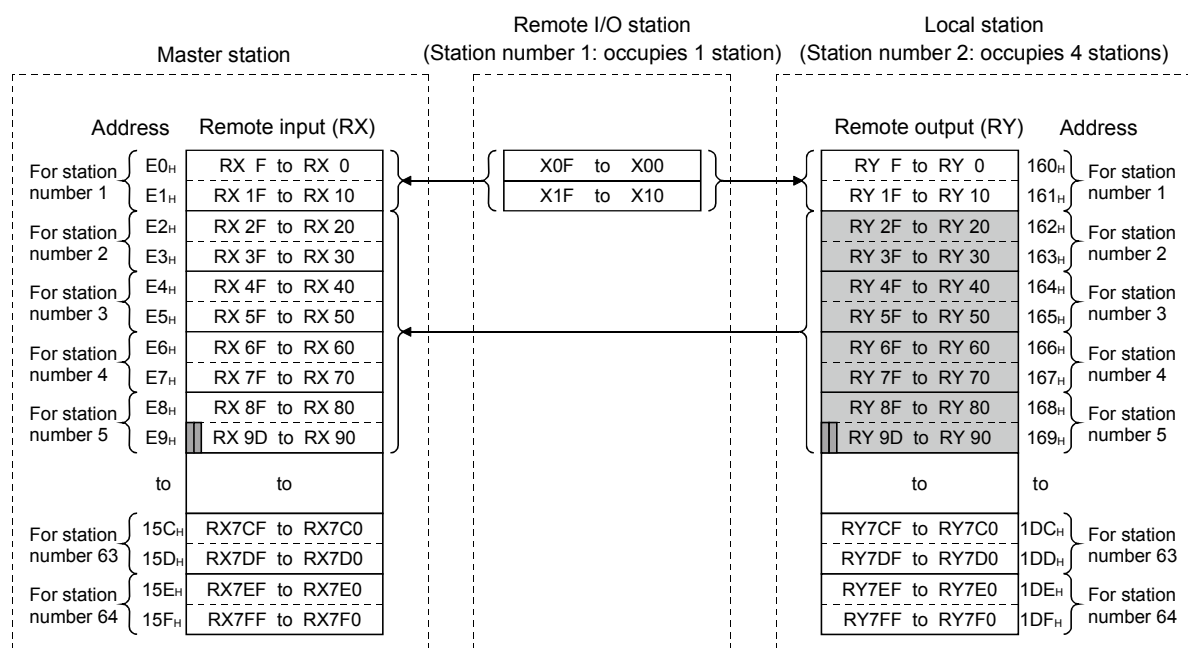
1) Master station

- The input status from the remote I/O station, remote device station (RX) and local station (RY) is stored.
- Two words are used per station.

2) Local station

- Data to be sent to the master station is stored in the remote output (RY) of the address corresponding to the host station number.
- The input status from the remote I/O station, remote device station (RX) and other local station is stored.
- Two words are used per station.

▮ ... The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RY9E and RY9F cannot be used.)



The following tables show the station numbers and corresponding buffer-memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

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 to E1 _H	14	FA _H to FB _H	27	114 _H to 115 _H	40	12E _H to 12F _H	53	148 _H to 149 _H
2	E2 _H to E3 _H	15	FC _H to FD _H	28	116 _H to 117 _H	41	130 _H to 131 _H	54	14A _H to 14B _H
3	E4 _H to E5 _H	16	FE _H to FF _H	29	118 _H to 119 _H	42	132 _H to 133 _H	55	14C _H to 14D _H
4	E6 _H to E7 _H	17	100 _H to 101 _H	30	11A _H to 11B _H	43	134 _H to 135 _H	56	14E _H to 14F _H
5	E8 _H to E9 _H	18	102 _H to 103 _H	31	11C _H to 11D _H	44	136 _H to 137 _H	57	150 _H to 151 _H
6	EA _H to EB _H	19	104 _H to 105 _H	32	11E _H to 11F _H	45	138 _H to 139 _H	58	152 _H to 153 _H
7	EC _H to ED _H	20	106 _H to 107 _H	33	120 _H to 121 _H	46	13A _H to 13B _H	59	154 _H to 155 _H
8	EE _H to EF _H	21	108 _H to 109 _H	34	122 _H to 123 _H	47	13C _H to 13D _H	60	156 _H to 157 _H
9	F0 _H to F1 _H	22	10A _H to 10B _H	35	124 _H to 125 _H	48	13E _H to 13F _H	61	158 _H to 159 _H
10	F2 _H to F3 _H	23	10C _H to 10D _H	36	126 _H to 127 _H	49	140 _H to 141 _H	62	15A _H to 15B _H
11	F4 _H to F5 _H	24	10E _H to 10F _H	37	128 _H to 129 _H	50	142 _H to 143 _H	63	15C _H to 15D _H
12	F6 _H to F7 _H	25	110 _H to 111 _H	38	12A _H to 12B _H	51	144 _H to 145 _H	64	15E _H to 15F _H
13	F8 _H to F9 _H	26	112 _H to 113 _H	39	12C _H to 12D _H	52	146 _H to 147 _H	—	—

[Local station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	160 _H to 161 _H	14	17A _H to 17B _H	27	194 _H to 195 _H	40	1AE _H to 1AF _H	53	1C8 _H to 1C9 _H
2	162 _H to 163 _H	15	17C _H to 17D _H	28	196 _H to 197 _H	41	1B0 _H to 1B1 _H	54	1CA _H to 1CB _H
3	164 _H to 165 _H	16	17E _H to 17F _H	29	198 _H to 199 _H	42	1B2 _H to 1B3 _H	55	1CC _H to 1CD _H
4	166 _H to 167 _H	17	180 _H to 181 _H	30	19A _H to 19B _H	43	1B4 _H to 1B5 _H	56	1CE _H to 1CF _H
5	168 _H to 169 _H	18	182 _H to 183 _H	31	19C _H to 19D _H	44	1B6 _H to 1B7 _H	57	1D0 _H to 1D1 _H
6	16A _H to 16B _H	19	184 _H to 185 _H	32	19E _H to 19F _H	45	1B8 _H to 1B9 _H	58	1D2 _H to 1D3 _H
7	16C _H to 16D _H	20	186 _H to 187 _H	33	1A0 _H to 1A1 _H	46	1BA _H to 1BB _H	59	1D4 _H to 1D5 _H
8	16E _H to 16F _H	21	188 _H to 189 _H	34	1A2 _H to 1A3 _H	47	1BC _H to 1BD _H	60	1D6 _H to 1D7 _H
9	170 _H to 171 _H	22	18A _H to 18B _H	35	1A4 _H to 1A5 _H	48	1BE _H to 1BF _H	61	1D8 _H to 1D9 _H
10	172 _H to 173 _H	23	18C _H to 18D _H	36	1A6 _H to 1A7 _H	49	1C0 _H to 1C1 _H	62	1DA _H to 1DB _H
11	174 _H to 175 _H	24	18E _H to 18F _H	37	1A8 _H to 1A9 _H	50	1C2 _H to 1C3 _H	63	1DC _H to 1DD _H
12	176 _H to 177 _H	25	190 _H to 191 _H	38	1AA _H to 1AB _H	51	1C4 _H to 1C5 _H	64	1DE _H to 1DF _H
13	178 _H to 179 _H	26	192 _H to 193 _H	39	1AC _H to 1AD _H	52	1C6 _H to 1C7 _H	—	—

(b) Master station → remote I/O station/remote device station/local station

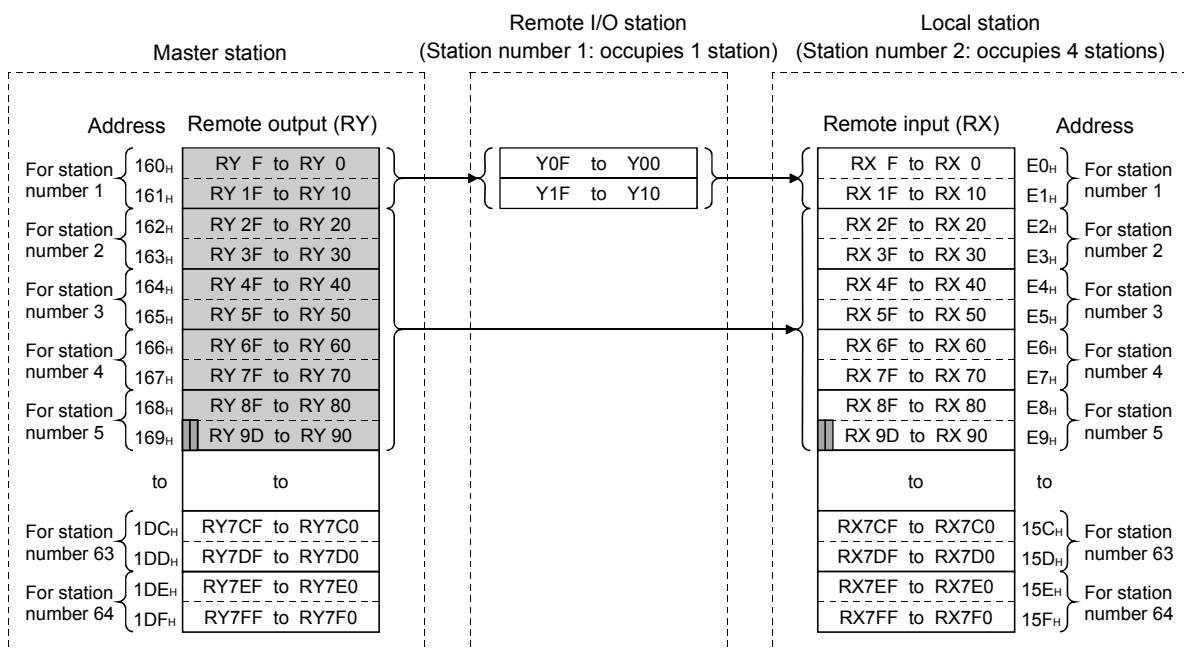
1) Master station

- The output status to the remote I/O station, remote device station (RY) and all local stations (RX) is stored.
- Two words are used per station.

2) Local station

- The data received from the remote I/O station, remote device station (RY) and master station (RY) is stored.
- Two words are used per station.

▮ ... The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RY9E and RY9F cannot be used.)



The following tables show the station numbers and corresponding buffer memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	160 _H to 161 _H	14	17A _H to 17B _H	27	194 _H to 195 _H	40	1AE _H to 1AF _H	53	1C8 _H to 1C9 _H
2	162 _H to 163 _H	15	17C _H to 17D _H	28	196 _H to 197 _H	41	1B0 _H to 1B1 _H	54	1CA _H to 1CB _H
3	164 _H to 165 _H	16	17E _H to 17F _H	29	198 _H to 199 _H	42	1B2 _H to 1B3 _H	55	1CC _H to 1CD _H
4	166 _H to 167 _H	17	180 _H to 181 _H	30	19A _H to 19B _H	43	1B4 _H to 1B5 _H	56	1CE _H to 1CF _H
5	168 _H to 169 _H	18	182 _H to 183 _H	31	19C _H to 19D _H	44	1B6 _H to 1B7 _H	57	1D0 _H to 1D1 _H
6	16A _H to 16B _H	19	184 _H to 185 _H	32	19E _H to 19F _H	45	1B8 _H to 1B9 _H	58	1D2 _H to 1D3 _H
7	16C _H to 16D _H	20	186 _H to 187 _H	33	1A0 _H to 1A1 _H	46	1BA _H to 1BB _H	59	1D4 _H to 1D5 _H
8	16E _H to 16F _H	21	188 _H to 189 _H	34	1A2 _H to 1A3 _H	47	1BC _H to 1BD _H	60	1D6 _H to 1D7 _H
9	170 _H to 171 _H	22	18A _H to 18B _H	35	1A4 _H to 1A5 _H	48	1BE _H to 1BF _H	61	1D8 _H to 1D9 _H
10	172 _H to 173 _H	23	18C _H to 18D _H	36	1A6 _H to 1A7 _H	49	1C0 _H to 1C1 _H	62	1DA _H to 1DB _H
11	174 _H to 175 _H	24	18E _H to 18F _H	37	1A8 _H to 1A9 _H	50	1C2 _H to 1C3 _H	63	1DC _H to 1DD _H
12	176 _H to 177 _H	25	190 _H to 191 _H	38	1AA _H to 1AB _H	51	1C4 _H to 1C5 _H	64	1DE _H to 1DF _H
13	178 _H to 179 _H	26	192 _H to 193 _H	39	1AC _H to 1AD _H	52	1C6 _H to 1C7 _H	—	—

[Local station]

Table of station numbers and corresponding buffer memory addresses

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 to E1 _H	14	FA _H to FB _H	27	114 _H to 115 _H	40	12E _H to 12F _H	53	148 _H to 149 _H
2	E2 _H to E3 _H	15	FC _H to FD _H	28	116 _H to 117 _H	41	130 _H to 131 _H	54	14A _H to 14B _H
3	E4 _H to E5 _H	16	FE _H to FF _H	29	118 _H to 119 _H	42	132 _H to 133 _H	55	14C _H to 14D _H
4	E6 _H to E7 _H	17	100 _H to 101 _H	30	11A _H to 11B _H	43	134 _H to 135 _H	56	14E _H to 14F _H
5	E8 _H to E9 _H	18	102 _H to 103 _H	31	11C _H to 11D _H	44	136 _H to 137 _H	57	150 _H to 151 _H
6	EA _H to EB _H	19	104 _H to 105 _H	32	11E _H to 11F _H	45	138 _H to 139 _H	58	152 _H to 153 _H
7	EC _H to ED _H	20	106 _H to 107 _H	33	120 _H to 121 _H	46	13A _H to 13B _H	59	154 _H to 155 _H
8	EE _H to EF _H	21	108 _H to 109 _H	34	122 _H to 123 _H	47	13C _H to 13D _H	60	156 _H to 157 _H
9	F0 _H to F1 _H	22	10A _H to 10B _H	35	124 _H to 125 _H	48	13E _H to 13F _H	61	158 _H to 159 _H
10	F2 _H to F3 _H	23	10C _H to 10D _H	36	126 _H to 127 _H	49	140 _H to 141 _H	62	15A _H to 15B _H
11	F4 _H to F5 _H	24	10E _H to 10F _H	37	128 _H to 129 _H	50	142 _H to 143 _H	63	15C _H to 15D _H
12	F6 _H to F7 _H	25	110 _H to 111 _H	38	12A _H to 12B _H	51	144 _H to 145 _H	64	15E _H to 15F _H
13	F8 _H to F9 _H	26	112 _H to 113 _H	39	12C _H to 12D _H	52	146 _H to 147 _H	—	—

(3) Remote registers (RWw) and (RWr)

Used when the remote net ver. 1 mode or remote net additional mode is selected.

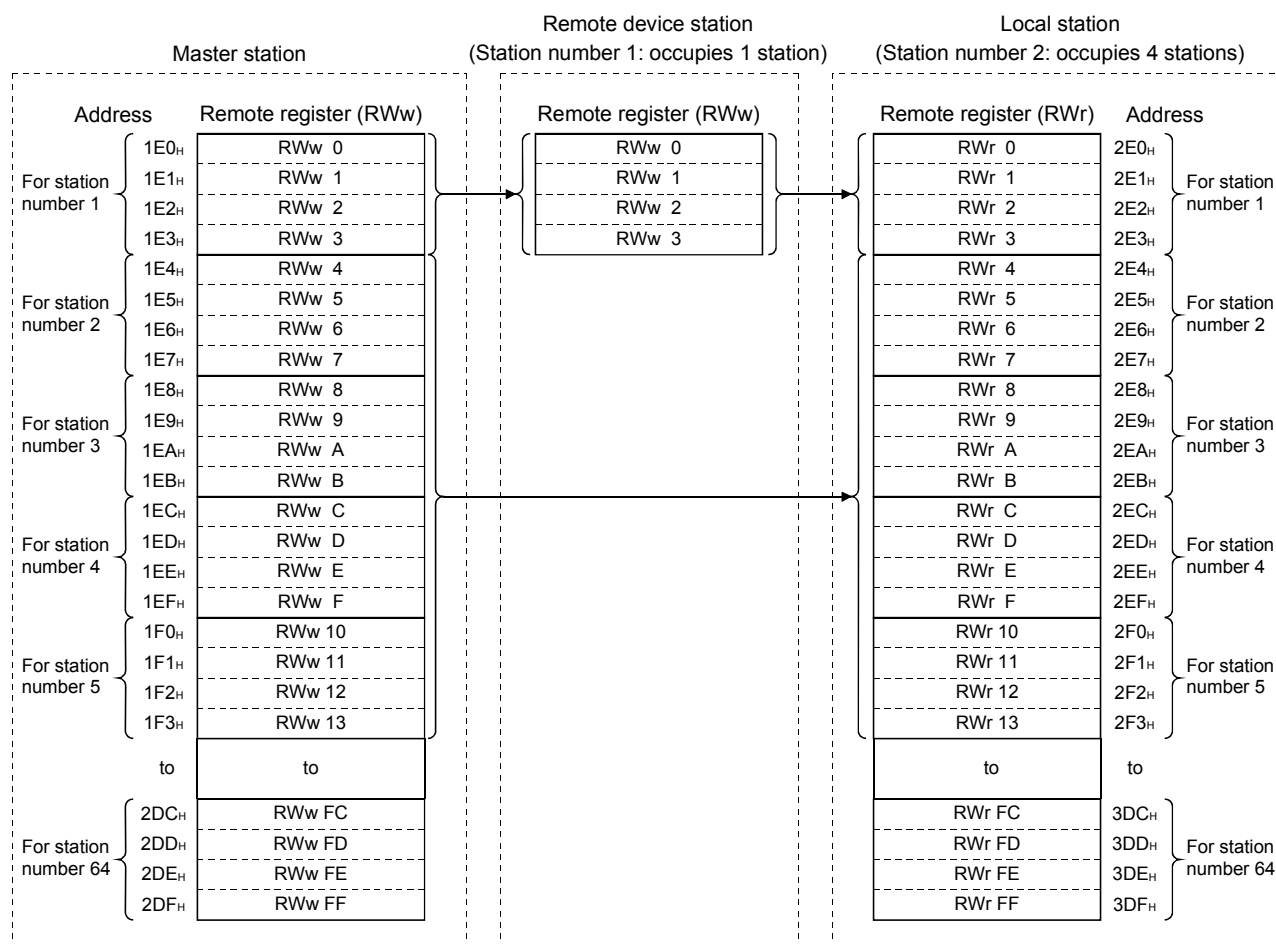
(a) Master station (RWw) → remote device station (RWw)/local station (RWr)

1) Master station

- The data to be sent to the remote register (RWw) of the remote device station and the remote registers (RWr) of all local stations are stored.
- Four words are used per station.

2) Local station

- The data sent to the remote register (RWw) of the remote device station can also be received.
- Four words are used per station.



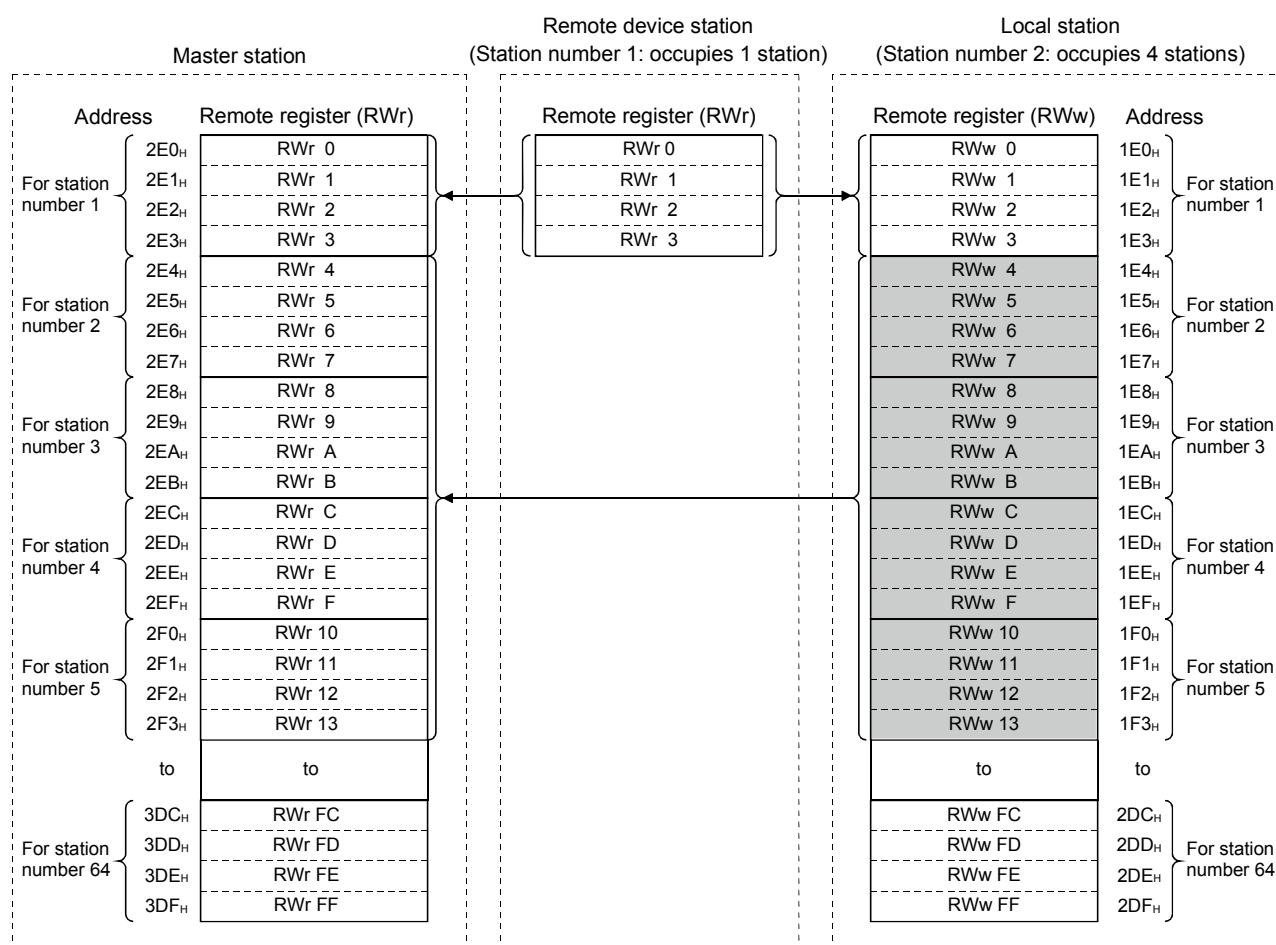
(b) Master station (RW_r) ← remote device station (RW_r)/local station (RW_w)

1) Master station

- The send data from the remote register (RW_r) of the remote device station and the remote register (RW_w) of the local station is stored.
- Four words are used per station.

2) Local station

- Data is sent to the master station and other local stations by storing it in the address corresponding to the host station number.
- Data in the remote register (RW_r) of the remote device station can also be received.
- Four words are used per station.



The following tables show the station numbers and corresponding buffer memory addresses.

[Master station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	2E0 _H to 2E3 _H	14	314 _H to 317 _H	27	348 _H to 34B _H	40	37C _H to 37F _H	53	3B0 _H to 3B3 _H
2	2E4 _H to 2E7 _H	15	318 _H to 31B _H	28	34C _H to 34F _H	41	380 _H to 383 _H	54	3B4 _H to 3B7 _H
3	2E8 _H to 2EB _H	16	31C _H to 31F _H	29	350 _H to 353 _H	42	384 _H to 387 _H	55	3B8 _H to 3BB _H
4	2EC _H to 2EF _H	17	320 _H to 323 _H	30	354 _H to 357 _H	43	388 _H to 38B _H	56	3BC _H to 3BF _H
5	2F0 _H to 2F3 _H	18	324 _H to 327 _H	31	358 _H to 35B _H	44	38C _H to 38F _H	57	3C0 _H to 3C3 _H
6	2F4 _H to 2F7 _H	19	328 _H to 32B _H	32	35C _H to 35F _H	45	390 _H to 393 _H	58	3C4 _H to 3C7 _H
7	2F8 _H to 2FB _H	20	32C _H to 32F _H	33	360 _H to 363 _H	46	394 _H to 397 _H	59	3C8 _H to 3CB _H
8	2FC _H to 2FF _H	21	330 _H to 333 _H	34	364 _H to 367 _H	47	398 _H to 39B _H	60	3CC _H to 3CF _H
9	300 _H to 303 _H	22	334 _H to 337 _H	35	368 _H to 36B _H	48	39C _H to 39F _H	61	3D0 _H to 3D3 _H
10	304 _H to 307 _H	23	338 _H to 33B _H	36	36C _H to 36F _H	49	3A0 _H to 3A3 _H	62	3D4 _H to 3D7 _H
11	308 _H to 30B _H	24	33C _H to 33F _H	37	370 _H to 373 _H	50	3A4 _H to 3A7 _H	63	3D8 _H to 3DB _H
12	30C _H to 30F _H	25	340 _H to 343 _H	38	374 _H to 377 _H	51	3A8 _H to 3AB _H	64	3DC _H to 3DF _H
13	310 _H to 313 _H	26	344 _H to 347 _H	39	378 _H to 37B _H	52	3AC _H to 3AF _H	—	—

[Local station]

Table of station numbers and corresponding buffer memory addresses

Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address	Station number	Buffer memory address
1	1E0 _H to 1E3 _H	14	214 _H to 217 _H	27	248 _H to 24B _H	40	27C _H to 27F _H	53	2B0 _H to 2B3 _H
2	1E4 _H to 1E7 _H	15	218 _H to 21B _H	28	24C _H to 24F _H	41	280 _H to 283 _H	54	2B4 _H to 2B7 _H
3	1E8 _H to 1EB _H	16	21C _H to 21F _H	29	250 _H to 253 _H	42	284 _H to 287 _H	55	2B8 _H to 2BB _H
4	1EC _H to 1EF _H	17	220 _H to 223 _H	30	254 _H to 257 _H	43	288 _H to 28B _H	56	2BC _H to 2BF _H
5	1F0 _H to 1F3 _H	18	224 _H to 227 _H	31	258 _H to 25B _H	44	28C _H to 28F _H	57	2C0 _H to 2C3 _H
6	1F4 _H to 1F7 _H	19	228 _H to 22B _H	32	25C _H to 25F _H	45	290 _H to 293 _H	58	2C4 _H to 2C7 _H
7	1F8 _H to 1FB _H	20	22C _H to 22F _H	33	260 _H to 263 _H	46	294 _H to 297 _H	59	2C8 _H to 2CB _H
8	1FC _H to 1FF _H	21	230 _H to 233 _H	34	264 _H to 267 _H	47	298 _H to 29B _H	60	2CC _H to 2CF _H
9	200 _H to 203 _H	22	234 _H to 237 _H	35	268 _H to 26B _H	48	29C _H to 29F _H	61	2D0 _H to 2D3 _H
10	204 _H to 207 _H	23	238 _H to 23B _H	36	26C _H to 26F _H	49	2A0 _H to 2A3 _H	62	2D4 _H to 2D7 _H
11	208 _H to 20B _H	24	23C _H to 23F _H	37	270 _H to 273 _H	50	2A4 _H to 2A7 _H	63	2D8 _H to 2DB _H
12	20C _H to 20F _H	25	240 _H to 243 _H	38	274 _H to 277 _H	51	2A8 _H to 2AB _H	64	2DC _H to 2DF _H
13	210 _H to 213 _H	26	244 _H to 247 _H	39	278 _H to 27B _H	52	2AC _H to 2AF _H	—	—

(4) Slave station offset, size information

In the remote net ver. 2 mode or remote net additional mode, the assignment of RX/RX/RWw/RWr for the station numbers varies according to the expanded cyclic setting and remote I/O station points setting.

(a) Offset

Stores the head buffer memory address of RX/RX/RWw/RWr assigned to each station.

When 2 or more stations are occupied, values are stored into only the head buffer memory address of the station number. (When station No. 1 occupies 2 stations, values are stored into the RX/RX/RWw/RWr offset and size of station No. 1, and the RX/RX/RWw/RWr offset and size of station No. 2 remains default.)

(b) Size

Stores the size of RX/RX/RWw/RWr assigned to each station in word unit. When the size is less than 1 word, it is rounded up and 1 is stored. (When the remote I/O station points setting is 8 points, 1 is stored.)

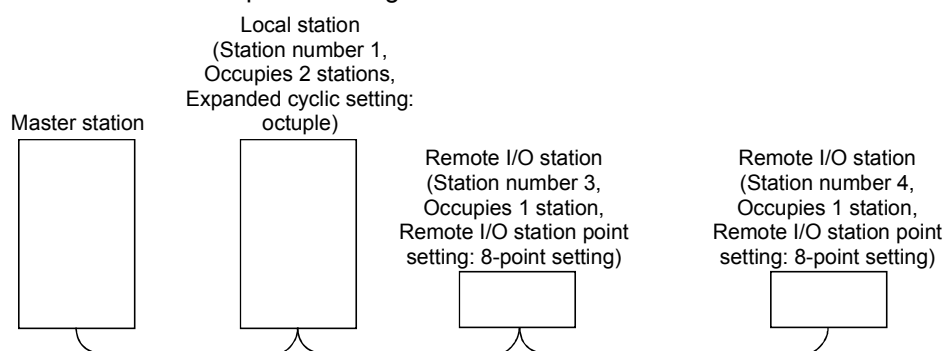
Refer to Section 4.4.13 for the remote I/O station points setting method.

For the reserved station, 0000H is stored.

Table 8.4 Correspondence between Station Numbers and RX/RX/RWw/RWr Offset, Size Buffer Memory Addresses

Buffer memory address		Item	Default (Hex.)
Hex.	Dec.		
3E0H	992	Station No. 1 RX offset	0000H
3E1H	993	Station No. 1 RX size	0000H
to	to	to	—
45EH	1118	Station No. 64 RX offset	0000H
45FH	1119	Station No. 64 RX size	0000H
460H	1120	Station No. 1 RY offset	0000H
461H	1121	Station No. 1 RY size	0000H
to	to	to	—
4DEH	1246	Station No. 64 RY offset	0000H
4DFH	1247	Station No. 64 RY size	0000H
4E0H	1248	Station No. 1 RWw offset	0000H
4E1H	1249	Station No. 1 RWw size	0000H
to	to	to	—
55EH	1374	Station No. 64 RWw offset	0000H
55FH	1375	Station No. 64 RWw size	0000H
560H	1376	Station No. 1 RWr offset	0000H
561H	1377	Station No. 1 RWr size	0000H
to	to	to	—
5DEH	1502	Station No. 64 RWr offset	0000H
5DFH	1503	Station No. 64 RWr size	0000H

Example) When the local station where expanded cyclic setting has been made and the remote I/O stations where remote I/O station points setting has been made are connected



Buffer memory name	Value	Description
Station No. 1 RX offset	4000 _H	Head buffer memory address of RX of station No. 1
Station No. 1 RX size	24 (18 _H)	384 (number of RX points) / 16 = 24 words
Station No. 2 RX offset	4000 _H	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 2 RX size	0 (default)	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 3 RX offset	4018 _H	Head buffer memory address of RX of station No. 3
Station No. 3 RX size	1 (1 _H)	Though the lower 8 bits of the buffer memory address 4018 _H are the corresponding size of RX of station No. 3, 1 is stored since less than 1 word is rounded up.
Station No. 4 RX offset	4018 _H	Head buffer memory address of RX of station No. 4
Station No. 4 RX size	1 (1 _H)	Though the upper 8 bits of the buffer memory address 4018 _H are the corresponding size of RX of station No. 4, 1 is stored since less than 1 word is rounded up.
Station No. 1 RY offset	4200 _H	Head buffer memory address of RY of station No. 1
Station No. 1 RY size	24 (18 _H)	384 (number of RY points) / 16 = 24 words
Station No. 2 RY offset	4000 _H	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 2 RY size	0 (default)	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 3 RY offset	4218 _H	Head buffer memory address of RY of station No. 3
Station No. 3 RY size	1 (1 _H)	Though the lower 8 bits of the buffer memory address 4218 _H are the corresponding size of RY of station No. 3, 1 is stored since less than 1 word is rounded up.
Station No. 4 RY offset	4218 _H	Head buffer memory address of RY of station No. 4
Station No. 4 RY size	1 (18 _H)	Though the upper 8 bits of the buffer memory address 4218 _H are the corresponding size of RY of station No. 4, 1 is stored since less than 1 word is rounded up.
Station No. 1 RWw offset	4400 _H	Head buffer memory address of RWw of station No. 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	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 2 RWw size	0 (default)	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 3 RWw offset	4440 _H	Head buffer memory address of RWw of station No. 3
Station No. 3 RWw size	0 (default)	Buffer memory size of RWw of station No. 3
Station No. 4 RWw offset	4440 _H	Head buffer memory address of RWw of station No. 4
Station No. 4 RWw size	0 (default)	Buffer memory size of RWw of station No. 4
Station No. 1 RWr offset	4C00 _H	Head buffer memory address of RWr of station No. 1
Station No. 1 RWr size	64 (40 _H)	2 (number of occupied stations) × 32 (expanded cyclic setting) = 64
Station No. 2 RWr offset	4C00 _H	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 2 RWr size	0 (default)	As 2 stations are occupied, the area of station No. 1 is checked.
Station No. 3 RWr offset	4C40 _H	Head buffer memory address of RWr of station No. 3
Station No. 3 RWr size	0 (default)	Buffer memory size of RWr of station No. 3
Station No. 4 RWr offset	4C40 _H	Head buffer memory address of RWr of station No. 4
Station No. 4 RWr size	0 (default)	Buffer memory size of RWr of station No. 4

(5) Link special relays (SB)

The link special relays store the data link status using bit ON/OFF data.

Buffer memory addresses 5E0_H to 5FF_H correspond to link special relays SB0000 to SB01FF.

For details on the link special relays (SB0000 to SB01FF), see Section 8.4.1.

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

(6) Link special registers (SW)

The link special registers store the data link status using word data.

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

For more details on the link special registers (SW0000 to SW01FF), see Section 8.4.2.

(7) Random access buffer

The random access buffer stores any data to be sent to other stations.

The reading and writing of data are performed using transient transmission.

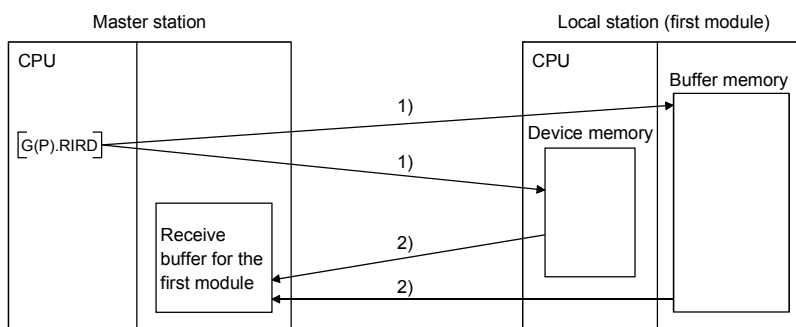
(8) Communication buffer

The communication buffers stores the send and receive data when performing transient transmission (communication using the communication buffers) between the local stations, standby master station, and intelligent device stations.

The communication buffer sizes for the local station, standby master station, and intelligent device station are set with network parameters.

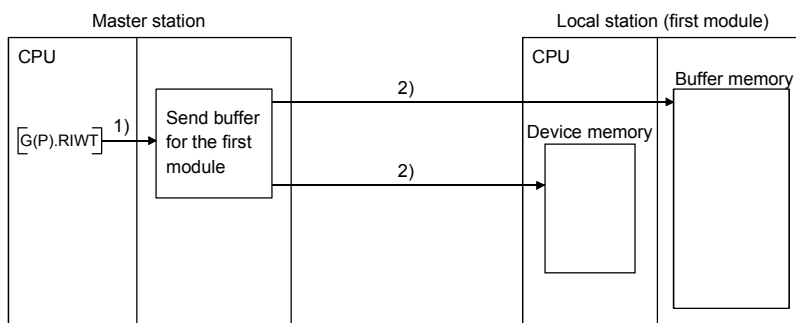
For more details on the communication buffer size settings, see Section 6.2.

[Example of communication using the communication buffers]



1) Accesses the buffer memory of the local station or the device memory of the CPU.

2) Stores the data specified by the control data in the receive buffer for the first module.



1) Stores the data to be written in the buffer memory of the local station or to the device memory of the CPU in the send buffer for the first module.

2) Accesses the buffer memory of the local station or the device memory of the CPU.

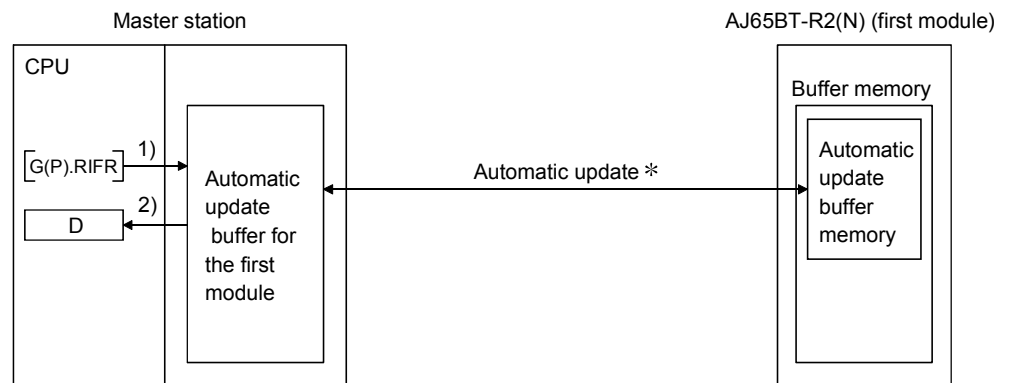
(9) Automatic update buffer

The automatic update buffer stores automatic update data when performing transient transmission (communication using the automatic update buffer) with the AJ65BT-R2(N).

The automatic update buffer size of the AJ65BT-R2 is specified by a network parameter.

For more details on the automatic update buffer size settings, see Section 6.2.

[Communication example using the automatic update buffer]



1) Accesses the automatic update buffer for the first module.

2) Stores the data specified by the control data in the CPU device.

* For details on the automatic update timing, see CC-Link System RS-232 Interface Module User's Manual (Nonprocedural Protocol Mode) AJ65BT-R2N.

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

Used when the remote net ver. 2 mode or remote net additional mode is selected.

(a) Master station ← Remote I/O station/remote device station/local station

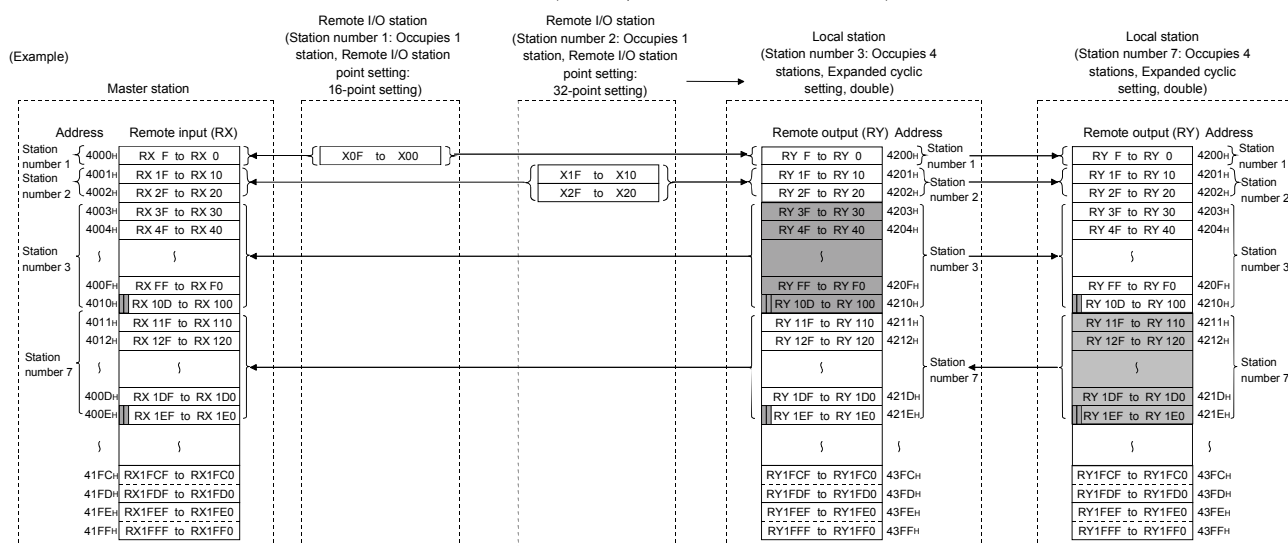
1) Master station

- The input status from the remote I/O station, remote device station (RX) and local station (RY) is stored.
- When 1 station is occupied, 2, 4 or 8 words are used. The number of used points changes depending on the extended cyclic setting and the number of occupied stations. (see Section 3.1)

2) Local station

- Data to be sent to the master station is stored in the remote output (RY) of the address corresponding to the host station number.
- The input status from the remote I/O station, remote device station (RX) and other local station is stored.
- When 1 station is occupied, any of 2 to 8 words are used. The number of used points changes depending on the extended cyclic setting and the number of occupied stations. (see Section 3.1)

⏏ ... The last two bits cannot be used for communication between the master station and the local station.
(In the example below, RYEE and RYEF cannot be used.)



POINT

The assignment range of each station in the preset station information can be confirmed by the slave station offset and size information (buffer memory addresses 3E0H to 5DFH). (Refer to Section 8.3.2 (4).)

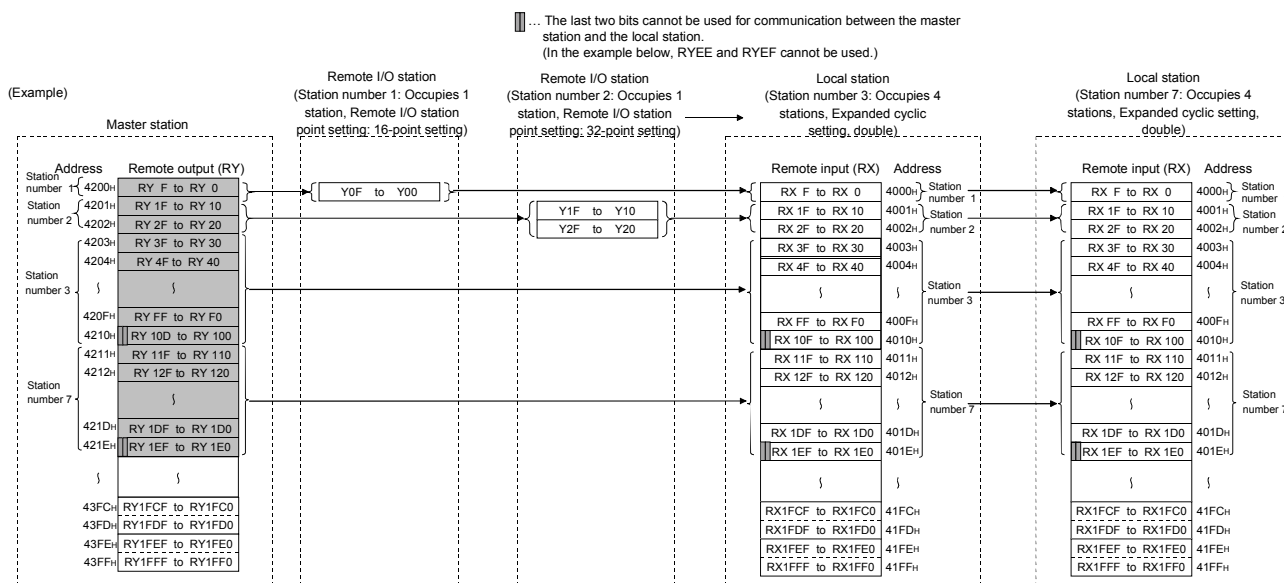
(b) Master station → Remote I/O station/remote device station/local station

1) Master station

- The output status to the remote I/O station, remote device station (RY) and all local stations (RX) is stored.
- When 1 station is occupied, 2, 4 or 8 words are used. The number of used points changes depending on the extended cyclic setting and the number of occupied stations. (see Section 3.1)

2) Local station

- The data received from remote I/O stations, remote device stations (RY) and master station (RY) are stored.
- When 1 station is occupied, any of 2 to 8 words are used. The number of used points changes depending on the extended cyclic setting and the number of occupied stations. (see Section 3.1)



POINT

The assignment range of each station in the preset station information can be confirmed by the slave station offset and size information (buffer memory addresses 3E0H to 5DFH). (Refer to Section 8.3.2 (4).)

(11) Ver.2 compatible remote registers (RWw) and (RWr)

Used when the remote net ver. 2 mode or remote net additional mode is selected.

(a) Master station (RWw) → remote device station (RWw)/local station (RWr)

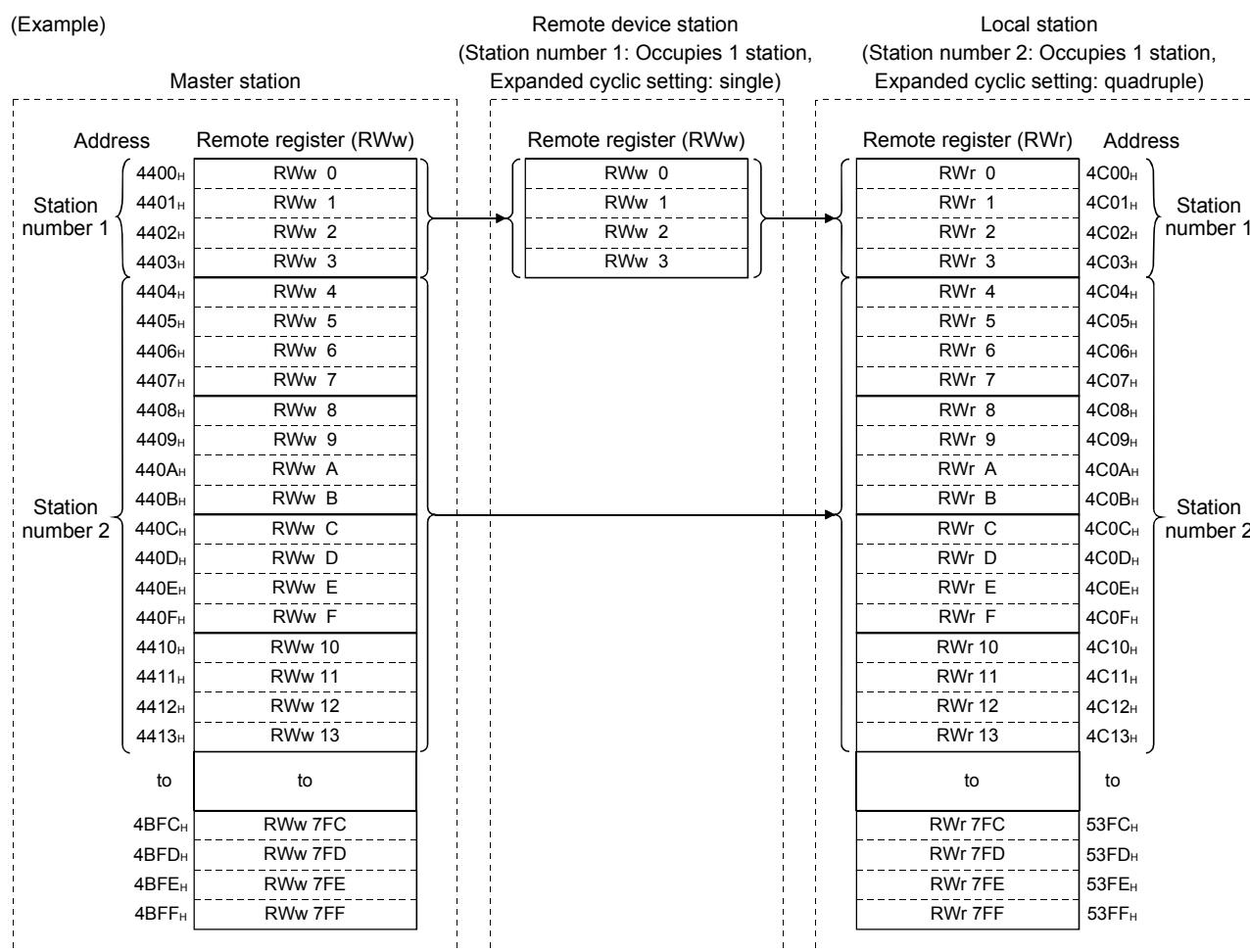
1) Master station

- The data to be sent to the remote register (RWw) of the remote device station and the remote registers (RWr) of all local stations are stored.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

2) Local station

- The data sent to the remote register (RWw) of the remote device station can also be received.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

(Example)



(b) Master station (RWr) ← remote device station (RWr)/local station (RWw)

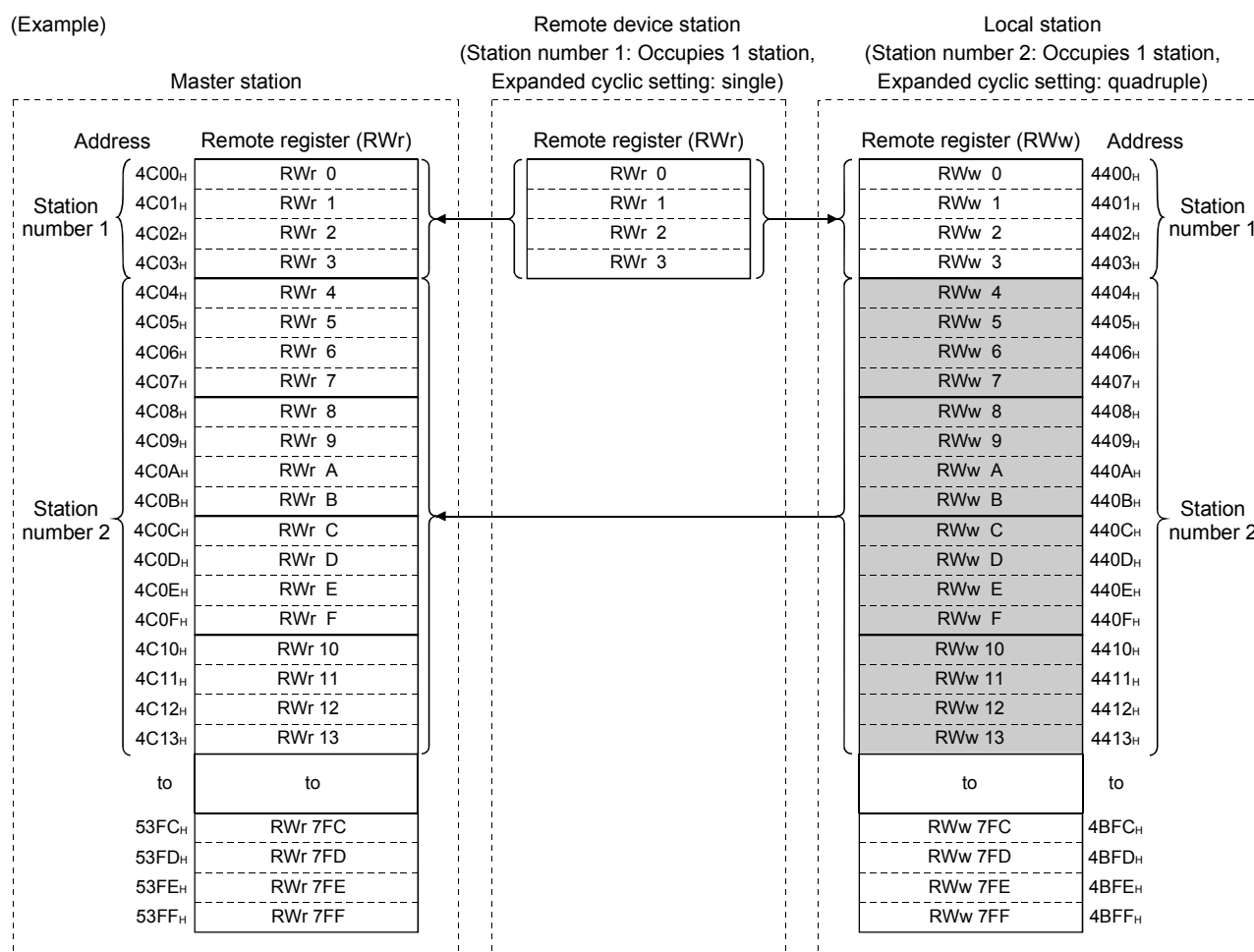
1) Master station

- The send data from the remote register (RWr) of the remote device station and the remote register (RWw) of the local station is stored.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

2) Local station

- Data is sent to the master station and other local stations by storing it in the address corresponding to the host station number.
- Data in the remote register (RWr) of the remote device station can also be received.
- When 1 station is occupied, any of 4 to 32 words are used. The number of used points changes depending on the expanded cyclic setting and the number of occupied stations. (see Section 3.1)

(Example)



8.4 Link Special Relays and Registers (SB/SW)

The data link status can be checked with bit data (link special relays: SB) and word data (link special registers: SW).

The SB and SW represent the information in the buffer memory of the master/local module, which is used by reading to the device specified in an automatic refresh parameter.

- Link special relays (SB) : Buffer memory addresses 5E0H to 5FFH
- Link special registers (SW): Buffer memory addresses 600H to 7FFH

8.4.1 Link special relays (SB)

Link special relays SB0000 to SB001F are turned ON/OFF by the sequence program, and SB0020 to SB01FF are automatically turned ON/OFF.

The values in parentheses in the number column indicate the buffer memory address.

When the standby master station is controlling the data link, the availability of the link's special relays is basically identical to that of the master station.

When the standby master station is operating as a local station, the availability of the link's special relays is identical to that of a local station.

For the correspondence with the buffer memory, see Section 8.3.2 (5).

Table 8.5 Link special relay list (1/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0000 (5E0H, b0)	Data link restart	Restarts the data link that had been stopped by SB0002. OFF: Restart not instructed ON : Restart instructed	○	○	×
SB0001 (5E0H, b1)	Refresh instruction at standby master switching	Instructs to perform cyclic data refresh after the data link control is transferred to the standby master station. OFF: Not instructed ON : Instructed	○	×	×
SB0002 (5E0H, b2)	Data link stop	Stops the host data link. However, when the master station executes this, the entire system will stop. OFF: No stop instruction ON : Stop instructed	○	○	×
SB0003 (5E0H, b3)	Refresh instruction when changing parameters by the dedicated instruction	Instructs to refresh cyclic data after changing parameters by the G(P).RLPASET instruction. OFF: Not instructed (stop refreshing) ON : Instructed (start/continue refreshing)	○	○	×
SB0004 (5E0H, b4)	Temporary error invalid request	Establishes the stations specified by SW0003 to SW0007 as temporary error invalid stations. OFF: Not requested ON : Requested	○	×	×
SB0005 (5E0H, b5)	Temporary error invalid canceling request	Cancels the temporary error invalid status of stations specified by SW0003 to SW0007. OFF: Not requested ON : Requested	○	×	×
SB0007 (5E0H, b7)	Master station duplication error canceling request	Instructs to cancel master station duplication error. OFF: Not instructed ON : Instructed	○	×	×
SB0008 (5E0H, b8)	Line test request	Executes line tests for the stations specified by SW0008. OFF: Not requested ON : Requested	○	×	×
SB0009 (5E0H, b9)	Parameter information read request	Reads the parameter setting information for the actual system configuration. (enabled only on Ver.1 remote stations) OFF: Not requested ON : Requested	○	×	×

Table 8.5 Link special relay list (2/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB000B (5E0 _H , b11)	Transmission speed test request	Use this to perform the transmission speed test. OFF: Not requested ON : Requested	○	×	×
SB000C (5E0 _H , b12)	Forced master switching	Forcefully transfers the data link control from the standby master station that is controlling the data link to the standby master station in case the standby master station becomes faulty. OFF: Not requested ON : Requested	○ * 1	×	×
SB000D (5E0 _H , b13)	Remote device station initialization procedure registration instruction	Starts the initial processing using the information registered during the initialization procedure registration. While SB000D is on, the refresh of the remote input/output and remote registers stops. OFF: Not instructed ON : Instructed	○	×	×
SB0020 (5E2 _H , b0)	Module status	Indicates the module access (module operation) status. OFF: Normal (Module is operating normally) ON : Abnormal (Module error has occurred)	○	○	○
SB0040 (5E4 _H , b0)	Data link restart acceptance	Indicates the data link restart instruction acknowledgement status. OFF: Not acknowledged ON : Startup instruction acknowledged	○	○	×
SB0041 (5E4 _H , b1)	Data link restart complete	Indicates the data link restart instruction acknowledgement completion status. OFF: Not complete ON : Startup complete	○	○	×
SB0042 (5E4 _H , b2)	Refresh instruction acknowledgement status at standby master switching	Indicates whether or not the refresh instruction at standby master switching have been acknowledged. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB0043 (5E4 _H , b3)	Refresh instruction complete status at standby master switching	Indicates whether or not the refresh instruction at standby master switching is complete. OFF: Not executed ON : Switching complete	○	×	×
SB0044 (5E4 _H , b4)	Data link stop acceptance	Indicates the data link stop instruction acknowledgement status. OFF: Not acknowledged ON : Stop instruction acknowledged	○	○	×
SB0045 (5E4 _H , b5)	Data link stop complete	Indicates the data link stop instruction acknowledgement completion status. OFF: Not complete ON : Stop complete	○	○	×
SB0046 (5E4 _H , b6)	Forced master switching executable status	Indicates whether the forced master switching (SB000C) signal can be executed or not. OFF: Cannot be executed. ON: Can be executed.	○ * 1	×	×
SB0048 (5E4 _H , b8)	Temporary error invalid acceptance status	Indicates the acknowledgement status of remote station temporary error invalid instruction. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB0049 (5E4 _H , b9)	Temporary error invalid complete status	Indicates the acknowledgement completion status of remote station temporary error invalid instruction. OFF: Not executed ON : Temporary error invalid station established/Specified station number is invalid	○	×	×
SB004A (5E4 _H , b10)	Temporary error invalid canceling acknowledgement status	Indicates the acknowledgement status of remote station temporary error invalid cancel instruction. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB004B (5E4 _H , b11)	Temporary error invalid canceling complete status	Indicates the acknowledgement completion status of remote station temporary error invalid cancel instruction. OFF: Not executed ON : Temporary error invalid station cancellation complete	○	×	×
SB004C (5E4 _H , b12)	Line test acceptance status	Indicates the line test request acknowledgement status. OFF: Not executed ON : Instruction acknowledged	○	×	×

*1: Can be used for the standby master station only.

Table 8.5 Link special relay list (3/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB004D (5E4 _H , b13)	Line test complete status	Indicates the line test completion status. OFF: Not executed ON : Test complete	○	×	×
SB004E (5E4 _H , b14)	Parameter information read acknowledgement status	Indicates the parameter information read request acknowledgement status. OFF: Not executed ON : Instruction acknowledged	○	×	×
SB004F (5E4 _H , b15)	Parameter information read completion status	Indicates the completion status of the parameter information read request. OFF: Not executed ON : Test complete	○	×	×
SB0050 (5E5 _H , b0)	Offline test status	Indicates the offline test execution status. OFF: Not executed ON : In progress	×	×	○
SB0057 (5E5 _H , b7)	Master station duplication error canceling acknowledgement	Indicates the acknowledgement status of master station duplication error canceling request. OFF: Not acknowledged ON : Acknowledged	○	×	×
SB0058 (5E5 _H , b8)	Master station duplication error canceling complete	Indicates the completion status of master station duplication error canceling request. OFF: Not complete ON : Complete	○	×	×
SB005A (5E5 _H , b10)	Master switching request acknowledgement	Indicates the acknowledgement status of the standby master station when it has received a master switching request from the line. OFF: Not acknowledged ON : Request acknowledged	○	×	×
SB005B (5E5 _H , b11)	Master switching request complete	Indicates whether or not the switching from the standby master station to master station is complete. OFF: Not complete ON : Complete	○	×	×
SB005C (5E5 _H , b12)	Forced master switching request acknowledgement	Indicates whether or not a forced master switching request has been acknowledged. OFF: Not acknowledged ON : Instruction acknowledged	○ * 1	×	×
SB005D (5E5 _H , b13)	Forced master switching request complete	Indicates whether or not a forced master switching request is complete. OFF: Not complete ON : Complete	○ * 1	×	×
SB005E (5E5 _H , b14)	Execution status of remote device station initialization procedure	Indicates the execution status of the initialization procedure. OFF: Not executed ON : Being executed	○	×	×
SB005F (5E5 _H , b15)	Completion status of remote device station initialization procedure	Indicates the completion status of the initialization procedure execution. OFF: Not complete ON : Complete	○	×	×
SB0060 (5E6 _H , b0)	Host mode	Indicates the mode setting status of the transmission speed/mode setting switch for the host. OFF: Online ON : Other than online	○	○	○
SB0061 (5E6 _H , b1)	Host type	Indicates the station type of the host. OFF: Master station (station number 0) ON : Local station (station numbers 1 to 64)	○	○	×
SB0062 (5E6 _H , b2)	Host standby master station setting status	Indicates whether or not the standby master station setting exists for the host. OFF: No setting ON : Setting exists	○	○	○
SB0065 (5E6 _H , b5)	Input data status of host data link faulty station	Indicates the input status setting from a data link faulty station of the host. OFF: Clear ON : Retain	○	○	×

* 1: Can be used for the standby master station only.

Table 8.5 Link special relay list (4/5)

Number	Name	Description	Availability (○: Available, ×: Not available)																	
			Online		Offline															
			Master station	Local station																
SB0066 (5E6 _H , b6)	Number of host occupied stations	Indicates the setting status of host occupied stations. <table border="1"><thead><tr><th>Number of occupied station</th><th>SB0066</th><th>SB0067</th></tr></thead><tbody><tr><td>1 station</td><td>OFF</td><td>OFF</td></tr><tr><td>2 stations</td><td>OFF</td><td>ON</td></tr><tr><td>3 stations</td><td>ON</td><td>ON</td></tr><tr><td>4 stations</td><td>ON</td><td>OFF</td></tr></tbody></table>	Number of occupied station	SB0066	SB0067	1 station	OFF	OFF	2 stations	OFF	ON	3 stations	ON	ON	4 stations	ON	OFF	×	○	×
Number of occupied station		SB0066	SB0067																	
1 station		OFF	OFF																	
2 stations		OFF	ON																	
3 stations		ON	ON																	
4 stations	ON	OFF																		
SB0067 (5E6 _H , b7)																				
SB006A (5E6 _H , b10)	Switch setting status	Indicates the switch setting status. OFF: Normal ON : Setting error exists (the error code is stored in SW006A)	○	○	○															
SB006D (5E6 _H , b13)	Parameter setting status	Indicates the parameter setting status. OFF: Normal ON : Setting error exists (the error code is stored in SW0068)	○	○	×															
SB006E (5E6 _H , b14)	Host station operation status	Indicates the data link communication status with other stations. OFF: Being executed ON : Not executed	○	○	×															
SB006F (5E6 _H , b15)	Setting status of block guarantee of cyclic data per station	Indicates the "block guarantee of cyclic data per station" setting status. OFF: Not set ON : Set	○	○	×															
SB0070 (5E7 _H , b0)	Master station information	Indicates the data link status. 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	Indicates whether or not a standby master station is present. OFF: Not present ON : Present	○	○	×															
SB0072 (5E7 _H , b2)	Scan mode setting information	Indicates the scan mode setting information. OFF: Asynchronous mode ON : Synchronous mode	○	×	×															
SB0073 (5E7 _H , b3)	Operation specification when CPU is down status	Indicates the operation specification status using a parameter when the CPU is down. OFF: Stop ON : Continue	○	×	×															
SB0074 (5E7 _H , b4)	Reserved station specified status	Indicates the reserved station specification status using a parameter. OFF: No specification ON : Specification exists (information is stored in SW0074 to SW0077)	○	○	×															
SB0075 (5E7 _H , b5)	Error invalid station specified status	Indicates the error invalid station specification status using a parameter. OFF: No specification ON : Specification exists (information is stored in SW0078 to SW007B)	○	○	×															
SB0076 (5E7 _H , b6)	Temporary error invalid station setting information	Indicates whether there is a temporary error invalid station setting. OFF: No setting ON : Setting exists (information is stored in SW007C to SW007F)	○	○	×															
SB0077 (5E7 _H , b7)	Parameter receive status	Indicates the parameter receive status from the master station. OFF: Reception complete ON : Reception not complete	×	○	×															
SB0078 (5E7 _H , b8)	Host station switch change detection	Detects changes to the host setting switch during data linking. OFF: No changes detected ON : Changes detected	○	○	×															
SB0079 (5E7 _H , b9)	Master station return specification information	Indicates whether the "Type" setting of the network parameters is set to "Master station" or "Master station (Duplex function)." OFF: Master station ON : Master station (Duplex function)	○	×	×															

Table 8.5 Link special relay list (5/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB007B (5E7 _H , b11)	Host master/standby master operation status	Indicates whether the host operates as the master or standby master station. OFF: Operates as the master station (controlling data link) ON : Operates as the standby master station (standby)	○	○	×
SB007C (5E7 _H , b12)	Slave station refresh/compulsory clear setting status in case of programmable controller CPU STOP	Indicates the parameter-set slave station refresh/compulsory clear setting status in case of programmable controller CPU STOP. OFF: Refresh ON : Clears compulsorily	○	×	×
SB0080 (5E8 _H , b0)	Other station data link status * 2	Indicates the communication status between remote/local/intelligent device/standby master stations. OFF: All stations normal ON : Faulty station exists (information is stored in SW0080 to SW0083)	○	○	×
SB0081 (5E8 _H , b1)	Other station watchdog timer error status	Indicates the occurrence of a watchdog timer error in other stations. OFF: No error ON : Error occurrence.	○	○	×
SB0082 (5E8 _H , b2)	Other station fuse blown status	Indicates the fuse blown occurrence status at other stations. (SW0088 to SW008B) OFF: No error ON : Error occurrence.	○	○	×
SB0083 (5E8 _H , b3)	Other station switch change status	Detects changes in setting switches of other stations during data linking. OFF: No change ON : Change detected.	○	○	×
SB0090 (5E9 _H , b0)	Host line status	Indicates the line status of the host. OFF: Normal ON : Abnormal (line disconnection)	×	○	×
SB0094 (5E9 _H , b4)	Other stations transient transmission status	Indicates whether a transient transmission error has occurred in other stations. OFF: No error ON : Error occurrence. (SW0094 to SW0097) Even when a dedicated instruction was retried, an error is detected.	○	○	×
SB0095 (5E9 _H , b5)	Master station transient transmission status	Indicates the transient transmission status of the master station. OFF: Normal ON : Abnormal	×	○	×
SB00B4 (5EB _H , b4)	Standby master station test result	Stores the test result of Line test 1/Line test 2. OFF: Normal ON : Abnormal	○	×	○
SB0184 (5F8 _H , b4)	Transmission speed test result for standby master station	Stores a result of the transmission speed test for the standby master station. OFF: Normal (Same transmission speed as that of master station), or no response from the module ON : Abnormal (Different transmission speed from that of master station)	○	×	×
SB0185 (5F8 _H , b5)	Transmission speed test accept status	Indicates the accept status of Transmission speed test request (SB000B). OFF: Not accepted ON : Accepted	○	×	×
SB0186 (5F8 _H , b6)	Transmission speed test completion status	Indicates the completion status of the transmission speed test. OFF: Not complete ON : Test complete	○	×	×

*2: The other station data link status (SB0080) takes up to 6 seconds to turn on after a slave station connected to the master/local station becomes faulty.

The time to turn ON differs according to the system configuration, faulty status or other conditions.

8.4.2 Link special registers (SW)

Data is stored in the link special registers SW000 to SW001F by the sequence program, and data is automatically stored in SW0020 to SW01FF. The values in parentheses in the number column indicate the buffer memory addresses. When the standby master station is controlling the data link, availability is basically identical to that of the master station. When the standby master station is operating as a local station, availability is identical to that of a local station.

Table 8.6 Link special register list (1/10)

Number	Name	Description	Availability (○: Available, ×: Not available)																																																				
			Online		Offline																																																		
			Master station	Local station																																																			
SW0003 (603 _H)	Multiple temporary error invalid station specification	Select whether multiple temporary error invalid stations are specified. 00 : Specifies multiple stations indicated by SW0004 to SW0007. 01 to 64: Specifies a single station from 1 to 64. (The specified number indicates the station number of a temporary error invalid station.)	○	×	×																																																		
SW0004 (604 _H) SW0005 (605 _H) SW0006 (606 _H) SW0007 (607 _H)	Temporary error invalid station specification * 2	Specifies a temporary error invalid station. 0: Not specified as a temporary error invalid station 1: Specified as a temporary error invalid station	○	×	×																																																		
		<table><tr><td></td><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>SW0004</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>SW0005</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>SW0006</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>SW0007</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>					b15	b14	b13	b12	to	b3	b2	b1	b0	SW0004	16	15	14	13	to	4	3	2	1	SW0005	32	31	30	29	to	20	19	18	17	SW0006	48	47	46	45	to	36	35	34	33	SW0007	64	63	62	61	to	52	51	50	49
		b15				b14	b13	b12	to	b3	b2	b1	b0																																										
SW0004		16				15	14	13	to	4	3	2	1																																										
SW0005		32				31	30	29	to	20	19	18	17																																										
SW0006	48	47	46	45	to	36	35	34	33																																														
SW0007	64	63	62	61	to	52	51	50	49																																														
		Numbers 1 to 64 in the above table indicate the station numbers. Error invalid stations, reserved stations and any station of the number higher than the max. are not specified.																																																					
SW0008 (608 _H)	Line test station setting	0 : Entire system (executed for all stations) 01 to 64 : Specified station only Default value: 0	○	×	×																																																		
SW0009 (609 _H)	Monitoring time setting	Sets the monitoring time when a dedicated instruction is used. Default value: 10 (seconds) Setting range: 0 to 360 (seconds) The monitoring time of 360 seconds will be used if a value outside of the above setting range is specified. If a value is set in SW000B, time elapsed until error completion of a dedicated instruction is as follows: (Number of retries + 1) x Monitoring time	○	○	×																																																		
SW000A (60A _H)	CPU monitoring time setting	Sets the CPU response monitoring time when the CPU is accessed with a dedicated instruction. Default value: 90 (seconds) Setting range: 0 to 3600 (seconds) The monitoring time of 3600 seconds will be used if a value outside of the above setting range is specified.	○	○	×																																																		
SW000B (60B _H)	Dedicated instruction retry count setting	Set the number of retries for use of dedicated instructions. Default value: 0 (No retry) Setting range: 0 to 7 (times) When the set value is out of the range, 7 is applied.	○	○	×																																																		

*2: Only the bit for the first station number is turned on.

Table 8.6 Link special register list (2/10)

Number	Name	Description	Availability (○: Available, ×: Not available)																																	
			Online		Offline																															
			Master station	Local station																																
SW0014 (614 _H)	Specification of remote device station to be initialized.	Specifies the station to be initialized using the information saved in initialization procedure registration. 0: Initial processing not performed 1: Initial processing performed	○ * 1	×	×																															
SW0015 (615 _H)		<table><tr><td>b15</td><td>b14</td><td>b13</td><td>b12</td><td>b11</td><td>b10</td><td>b9</td><td>b8</td><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td></tr><tr><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table>				b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
b15		b14				b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1																		
16		15				14	13	12	11	10	9	8	7	6	5	4	3	2	1																	
SW0016 (616 _H)		<table><tr><td>32</td><td>31</td><td>30</td><td>29</td><td>28</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>48</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td><td>39</td><td>38</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td></tr></table>				32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17																					
48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33																					
SW0017 (617 _H)	<table><tr><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td><td>59</td><td>58</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49																			
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. Not necessary to set for the number of occupied stations. Error invalid stations, reserved stations and any station of the number higher than the max. are not specified.																																			
SW0020 (620 _H)	Module status	Indicates the status of communication with a programmable controller CPU. 0 : Normal Other than 0: Stores an error code (Error code of programmable controller CPU).	○	○	○																															
SW0041 (641 _H)	Data link restart result	Stores the execution result of the data link restart instruction with SB0000. 0 : Normal Other than 0: Stores an error code (see Section 13.3).	○	○	×																															
SW0043 (643 _H)	Refresh instruction at standby master switching result	Indicates the execution result of refresh instruction at standby master switching. 0 : Normal Other than 0: Stores an error code (see Section 13.3).	○	×	×																															
SW0045 (645 _H)	Data link stop result	Stores the execution result of the data-link stop instruction with SB0002. 0 : Normal Other than 0: Stores an error code (see Section 13.3).	○	○	×																															
SW0049 (649 _H)	Temporary error invalid station specification result	Indicates the execution result of temporary error invalid station specification. 0 : Normal Other than 0: Stores an error code (see Section 13.3).	○	×	×																															
SW004B (64B _H)	Temporary error invalid station specification cancel result	Indicates the execution result of the temporary error invalid station specification cancellation. 0 : Normal Other than 0: Stores an error code (see Section 13.3).	○	×	×																															
SW004D (64D _H)	Line test result	Indicates the execution result of the line test. 0 : Normal Other than 0: Stores an error code (see Section 13.3).	○	×	×																															
SW004F (64F _H)	Parameter setting test result	Indicates the execution result of the parameter setting test. 0 : Normal Other than 0: Stores an error code (see Section 13.3).	○	×	×																															
SW0052 (652 _H)	Automatic CC-Link startup execution result	Stores the system configuration check result when a new station is added to a system using an automatic CC-Link startup. 0 : Normal Other than 0: Stores an error code (see Section 13.3.)	○	×	×																															
SW0057 (657 _H)	Master station duplication error canceling result	Stores the execution result of the master station duplication error canceling request. 0 : Normal Other than 0: Stores an error code (see Section 13.3.) B31A _H : Data linking BBC5 _H : Master station duplication error	○	×	×																															

* 1: Can be used for the standby master station only.

Table 8.6 Link special register list (3/10)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0058 (658 _H)	Detailed LED display status	Stores the details of the LED display status. 0: OFF 1: ON → LINE(ERROR) : Cable is disconnected or the transmission path is 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) : Duplicate master station on the same line → SW(ERROR) : Error in switch settings → LOCAL : Operating as a local station → S MST : Operating as the standby master station → MST : Operating as the master station → ERR. : Error occurrence → RUN : The module is operating normally.	○	○	○
SW0059 (659 _H)	Transmission speed setting	Stores the contents of the transmission speed setting. 0: Cancel 1: Set → 10 Mbps → 5 Mbps → 2.5 Mbps → 625 kbps → 156 kbps	○	○	○
SW005D (65D _H)	Forced master switching instruction result	Stores the execution result of the forced master switching instruction with SB000C. 0 : Normal Other than 0: Stores the error code (see Section 13.3).	○ * 1	×	×
SW005F (65F _H)	Remote device station initialization procedure registration instruction result	Stores the execution result of the initialization procedure registration instruction with SB000D. 0 : Normal Other than 0: Stores the error code (see Section 13.3).	○	×	×
SW0060 (660 _H)	Mode setting status	Stores the mode setting status. 0: Online (Remote net mode) 1: Online (Remote I/O net mode) 2: Offline 3: Line test 1 4: Line test 2 6: Hardware test	○	○	○
SW0061 (661 _H)	Host station number	Stores the station number of the host that is currently in operation. 0 : Master station 1 to 64: Local station	○	○	○

*1: Can be used for the standby master station only.

Table 8.6 Link special register list (4/10)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0062 (662 _H)	Module operating status	Stores the operation setting status of the module. Station type 0: Master station/local station 1: Standby master station (Valid only when b1 is 0) Master station duplex function 0: Master station duplex function invalid 1: Master station duplex function valid Input status from the data link faulty station 0: Clear 1: Hold Number of occupied stations 00: Occupies 1 station 10: Occupies 2 stations 11: Occupies 3 stations 01: Occupies 4 stations Master station/local station start by dedicated instruction 0: Start by CPU parameter 1: Start by dedicated instruction Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP 0: Refresh 1: Clears compulsorily Expanded cyclic setting 00: Single 01: Double 10: Quadruple 11: Octuple Block guarantee of cyclic data per station 0: Not set 1: Set	○	○	○
SW0064 (664 _H)	No. of retries information	Indicates the retry count setting information when there is an error response. 1 to 7 (times)	○	×	×
SW0065 (665 _H)	No. of automatic return stations	Indicates the setting information for the number of automatic return stations during one link scan. 1 to 10 (stations)	○	×	×
SW0066 (666 _H)	Delay timer information	Indicates the delay time setting information.	○	×	×
SW0067 (667 _H)	Parameter information	Stores the parameter information area to be used. 0 _H : CPU built-in parameters 3 _H : Dedicated instruction (parameter setting with the G(P).RLPASET instruction and data link startup.) D _H : Default parameters (automatically starts CC-Link)	○	×	○
SW0068 (668 _H)	Host parameter status	Stores the parameter setting status. 0 : Normal Other than 0: Stores the error code (see Section 13.3).	○	○	×
SW0069 (669 _H)	Loading status * 3	Stores the duplicate station number status and parameter matching of each station. 0 : Normal Other than 0: Stores the error code (see Section 13.3). Details are stored in SW0098 to 9B and SW009C to 9F.	○	×	×
SW006A (66A _H)	Switch setting status	Stores the switch setting status. 0 : Normal Other than 0: Stores the error code (see Section 13.3).	○	○	○
SW006D (66D _H)	Max. link scan time	Stores the maximum value of the link scan time (in 1 ms units).	○	○	×
SW006E (66E _H)	Current link scan time	Stores the current value of the link scan time (in 1 ms units).	○	○	×
SW006F (66F _H)	Min. link scan time	Stores the minimum value of the link scan time (in 1 ms units).	○	○	×
SW0070 (670 _H)	Total number of stations	Stores the final station number set in the parameter. 1 to 64 (stations)	○	×	×
SW0071 (671 _H)	Max. communication station number	Stores the maximum station number (setting of the station number setting switch) that is performing data link. 1 to 64 (stations)	○	×	×
SW0072 (672 _H)	Number of connected modules	Stores the number of modules that are performing data link.	○	×	×

*3: This register checks and stores the status only at link startup.

Table 8.6 Link special register list (5/10)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW0073 (673 _H)	Standby master station number	Stores the station number of the standby master station. 1 to 64 (stations)	○	○	×
SW0074 (674 _H) SW0075 (675 _H) SW0076 (676 _H) SW0077 (677 _H)	Reserved station specified status * 2	Stores the reserved station setting status. 0: Not reserved station 1: Reserved station b15 b14 b13 b12 to b3 b2 b1 b0 SW0074 16 15 14 13 to 4 3 2 1 SW0075 32 31 30 29 to 20 19 18 17 SW0076 48 47 46 45 to 36 35 34 33 SW0077 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers. Any station of the number higher than the max. are excepted.	○	○	×
SW0078 (678 _H) SW0079 (679 _H) SW007A (67A _H) SW007B (67B _H)	Error invalid station specified status * 2	Stores the error invalid station setting status. 0: Other than error invalid station 1: Error invalid station b15 b14 b13 b12 to b3 b2 b1 b0 SW0078 16 15 14 13 to 4 3 2 1 SW0079 32 31 30 29 to 20 19 18 17 SW007A 48 47 46 45 to 36 35 34 33 SW007B 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excepted.	○	○	×
SW007C (67C _H) SW007D (67D _H) SW007E (67E _H) SW007F (67F _H)	Temporary error invalid status * 5	Indicates the temporary error invalid status. 0: Normal status 1: Temporary error invalid status b15 b14 b13 b12 to b3 b2 b1 b0 SW007C 16 15 14 13 to 4 3 2 1 SW007D 32 31 30 29 to 20 19 18 17 SW007E 48 47 46 45 to 36 35 34 33 SW007F 64 63 62 61 to 52 51 50 49 Numbers 1 to 64 in the above table indicate the station numbers. Error invalid stations, reserved stations and any station of the number higher than the max. are excepted.	○	○	×
SW0080 (680 _H) SW0081 (681 _H) SW0082 (682 _H) SW0083 (683 _H)	Other station data link status * 5 * 7	Stores the data link status of each station. 0: Normal 1: Data link error occurred 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 Numbers 1 to 64 in the above table indicate the station numbers. Temporary error invalid stations, error invalid stations, reserved stations and any station of the number higher than the max. are excepted.	○	○	×

*2: Only the bit for the first station number is turned on.

*5: Bits for the number of occupied stations are turned on.

*7: The other station data link status (SW0080 to SW0083) takes up to 6 seconds to turn on after a slave station connected to the master/local station becomes faulty.

The time to turn ON differs according to the system configuration, faulty status or other conditions.

Table 8.6 Link special register list (6/10)

Number	Name	Description	Availability (○: Available, ×: Not available)																																																				
			Online		Offline																																																		
			Master station	Local station																																																			
SW0084 (684 _H) SW0085 (685 _H) SW0086 (686 _H) SW0087 (687 _H)	Other station watchdog timer error occurrence status * 2	Indicates the watchdog timer error occurrence status. 0: No watchdog timer error 1: Watchdog timer error occurred <table><tr><td></td><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>SW0084</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0085</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0086</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0087</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excepted.		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																																														
SW0088 (688 _H) SW0089 (689 _H) SW008A (68A _H) SW008B (68B _H)	Other station fuse blown status * 5	Stores the fuse blown occurrence status of each station. 0: Normal 1: Abnormal <table><tr><td></td><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>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excepted.		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																																														
SW008C (68C _H) SW008D (68D _H) SW008E (68E _H) SW008F (68F _H)	Other station switch change status * 2	Indicates the switch change status of other stations performing data link. 0: No change 1: Change occurred <table><tr><td></td><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>SW008C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW008D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excepted.		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																																														
SW0090 (690 _H)	Line status	Stores the line status. 0: Normal 1: Data link cannot be performed (disconnected)	×	○	×																																																		

*2: Only the bit for the first station number is turned on.

*5: Bits for the number of occupied stations are turned on.

Table 8.6 Link special register list (7/10)

Number	Name	Description	Availability (○: Available, ×: Not available)																																																						
			Online		Offline																																																				
			Master station	Local station																																																					
SW0094 (694 _H) SW0095 (695 _H) SW0096 (696 _H) SW0097 (697 _H)	Other stations transient transmission status * 2	Indicates the transient transmission error status of each station. 0: No transient transmission error 1: Transient transmission error occurrence <table><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>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> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excluded. Even when a dedicated instruction was retried, an error is detected.	b15	b14	b13	b12	to	b3	b2	b1	b0	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	○	○	×							
b15	b14	b13	b12	to	b3	b2	b1	b0																																																	
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																																																	
SW0098 (698 _H) SW0099 (699 _H) SW009A (69A _H) SW009B (69B _H)	Station number overlap status * 6	Stores the overlap status when the first station number of each module is not overlapped. 0: Normal 1: Overlap station number (first station number only) <table><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>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> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excluded. Unable to detect station number overlapping of standby master stations.	b15	b14	b13	b12	to	b3	b2	b1	b0	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	○	×	×							
b15	b14	b13	b12	to	b3	b2	b1	b0																																																	
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																																																	
SW009C (69C _H) SW009D (69D _H) SW009E (69E _H) SW009F (69F _H)	Loading/parameter consistency status * 6	Stores the consistency status between the loaded station and the parameter settings. A matching error occurs in any of the following cases. 1) Station type mismatch * 2) Number of occupied stations mismatch 3) Expanded cyclic setting mismatch * 4) CC-Link compatible version mismatch * A matching error will not occur when installation ≤ parameter. (For example, a matching error will not occur when a remote device station is installed and the parameter setting is an intelligent device station.) 0: Normal 1: Matching error Example of matching error <table><tr><td>Installation</td><td>Parameter</td></tr><tr><td>Remote device station</td><td>Remote I/O station</td></tr><tr><td rowspan="2">Intelligent device station</td><td>Remote I/O station</td></tr><tr><td>Remote device station</td></tr></table> <table><tr><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>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> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excluded.	Installation	Parameter	Remote device station	Remote I/O station	Intelligent device station	Remote I/O station	Remote device station	b15	b14	b13	b12	to	b3	b2	b1	b0	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	○	×	×
Installation	Parameter																																																								
Remote device station	Remote I/O station																																																								
Intelligent device station	Remote I/O station																																																								
	Remote device station																																																								
b15	b14	b13	b12	to	b3	b2	b1	b0																																																	
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																																																	

*2: Only the bit for the first station number is turned on.

*6: Only the bit for the first station number is turned on.

The status is checked and stored only at link startup and at parameter update.

Table 8.6 Link special register list (8/10)

Number	Name	Description	Availability (○: Available, ×: Not available)																				
			Online		Offline																		
			Master station	Local station																			
SW00B4 (6B4 _H)	Line test 1 result * 6	Stores the line test 1 result. 0: Normal 1: Abnormal	○	×	○																		
SW00B5 (6B5 _H)		<table><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>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></table>				b15	b14	b13	b12	to	b3	b2	b1	b0	16	15	14	13	to	4	3	2	1
b15		b14				b13	b12	to	b3	b2	b1	b0											
16		15				14	13	to	4	3	2	1											
SW00B6 (6B6 _H)		<table><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></table>				32	31	30	29	to	20	19	18	17									
32	31	30	29	to	20	19	18	17															
SW00B7 (6B7 _H)	<table><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></table>	48	47	46	45	to	36	35	34	33													
48	47	46	45	to	36	35	34	33															
	<table><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>	64	63	62	61	to	52	51	50	49													
64	63	62	61	to	52	51	50	49															
Numbers 1 to 64 in the above table indicate the station numbers.																							
SW00B8 (6B8 _H)	Line test result	Stores the line test 1/line test 2 result. 0 : Normal Other than 0: Stores the error code (see Section 13.3).	×	×	○																		
SW0110 (710 _H)	Remote device station initialization procedure registration execution individual information (target 1)	The execution phase of initialization procedure registration is stored. Upper bit: Next execution procedure number (FFH at completion) Lower bit: Targeted station number	○	×	×																		
SW0111 (711 _H)	Remote device station initialization procedure registration execution individual information (target 2)																						
SW0112 (712 _H)	Remote device station initialization procedure registration execution individual information (target 3)																						
SW0113 (713 _H)	Remote device station initialization procedure registration execution individual information (target 4)																						
SW0114 (714 _H)	Remote device station initialization procedure registration execution individual information (target 5)																						
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 (718 _H)	Remote device station initialization procedure registration execution individual information (target 8)																						

*6: Only the bit for the first station number is turned on.

In addition, these registers check and store the status at link startup and at parameter update.

Table 8.6 List of link special registers (9/10)

Number	Name	Description	Availability (o: Available, x: Not available)		
			Online		Offline
			Master station	Local station	
SW0118 (718 _H)	Remote device station initialization procedure registration execution individual information (target 9)	Stores the execution information of initialization procedure registration. High: Next execution procedure number (FF _H at completion) Low: Targeted station number	○	×	×
SW0119 (719 _H)	Remote device station initialization procedure registration execution individual information (target 10)				
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)				
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)				

Table 8.6 List of link special registers (10/10)

Number	Name	Description	Availability (○: Available, x: Not available)																																																																
			Online		Offline																																																														
			Master station	Local station																																																															
SW011F (71FH)	Remote device station initialization procedure registration execution individual information (target 16)	Stores the execution information of initialization procedure registration. High: Next execution procedure number (FFH at completion) Low: Targeted station number	○	×	×																																																														
SW0140 (740H) SW0141 (741H) SW0142 (742H) SW0143 (743H)	Compatible CC-Link ver. information * 5	Indicates the slave stations compatible with CC-Link ver. 2. 0: Ver.1compatible slave station 1: Ver.2compatible slave station <table><tr><td></td><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>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> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and any station of the number higher than the max. are excepted.		b15	b14	b13	b12	to	b3	b2	b1	b0	SW0140	16	15	14	13	to	4	3	2	1	SW0141	32	31	30	29	to	20	19	18	17	SW0142	48	47	46	45	to	36	35	34	33	SW0143	64	63	62	61	to	52	51	50	49	○	×	×												
		b15	b14	b13	b12	to	b3	b2	b1	b0																																																									
SW0140		16	15	14	13	to	4	3	2	1																																																									
SW0141		32	31	30	29	to	20	19	18	17																																																									
SW0142		48	47	46	45	to	36	35	34	33																																																									
SW0143	64	63	62	61	to	52	51	50	49																																																										
SW0144 (744H) SW0145 (745H) SW0146 (746H) SW0147 (747H)	CC-Link ver. installation/parameter matching status * 5	Stores the CC-Link version matching status of the parameters and slave stations. 0: Normal 1: Matching error Example of matching error <table><tr><td colspan="2">Installation</td><td colspan="2">Parameter</td></tr><tr><td colspan="2">Ver.2compatible remote device station</td><td colspan="2">Ver.1compatible remote device station</td></tr><tr><td colspan="2">Ver.1compatible remote device station</td><td colspan="2">Ver.2compatible remote device station</td></tr></table> <table><tr><td></td><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>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> Numbers 1 to 64 in the above table indicate the station numbers. Reserved stations and final station number onwards are not targeted.	Installation		Parameter		Ver.2compatible remote device station		Ver.1compatible remote device station		Ver.1compatible remote device station		Ver.2compatible remote device station			b15	b14	b13	b12	to	b3	b2	b1	b0	SW0144	16	15	14	13	to	4	3	2	1	SW0145	32	31	30	29	to	20	19	18	17	SW0146	48	47	46	45	to	36	35	34	33	SW0147	64	63	62	61	to	52	51	50	49	○	×	×
Installation		Parameter																																																																	
Ver.2compatible remote device station		Ver.1compatible remote device station																																																																	
Ver.1compatible remote device station		Ver.2compatible remote device station																																																																	
		b15	b14	b13	b12	to	b3	b2	b1	b0																																																									
SW0144	16	15	14	13	to	4	3	2	1																																																										
SW0145	32	31	30	29	to	20	19	18	17																																																										
SW0146	48	47	46	45	to	36	35	34	33																																																										
SW0147	64	63	62	61	to	52	51	50	49																																																										
SW0148 (748H)	Parameter mode	Indicates in which mode the system is operating. 0: Remote net ver.1 mode 1: Remote net additional mode 2: Remote net ver.2 mode	○	○	×																																																														
SW0149 (749H)	Host parameter mode	Indicates in which mode the host is operating. 0: Remote net ver.1 mode 1: Remote net additional mode 2: Remote net ver.2 mode	○	○	○																																																														
SW0183 (783H)	Transmission speed test result	Indicates the execution result of the transmission speed test. 0: Normal Other than 0: Stores an error code (see Section 13.3)	○	○	×																																																														
SW0184 (784H) SW0185 (785H) SW0186 (786H) SW0187 (787H)	Transmission speed test result for each station ²	Indicates transmission speed test results by station numbers. 0: Normal (Same transmission speed as that of master station), or no response from the module 1: Abnormal (Different transmission speed from that of master station) <table><tr><td></td><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>SW0184</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0185</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0186</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0187</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table> Numbers 1 to 64 in the above table indicate the station numbers.		b15	b14	b13	b12	to	b3	b2	b1	b0	SW0184	16	15	14	13	to	4	3	2	1	SW0185	32	31	30	29	to	20	19	18	17	SW0186	48	47	46	45	to	36	35	34	33	SW0187	64	63	62	61	to	52	51	50	49	○	×	×												
		b15	b14	b13	b12	to	b3	b2	b1	b0																																																									
SW0184		16	15	14	13	to	4	3	2	1																																																									
SW0185		32	31	30	29	to	20	19	18	17																																																									
SW0186		48	47	46	45	to	36	35	34	33																																																									
SW0187	64	63	62	61	to	52	51	50	49																																																										

*2: Only the bit for the first station number is turned on.

*5: The bits for the number of occupied stations turn ON.

The timing when the data in a link special register (SW) is updated differs depending on the link register number.

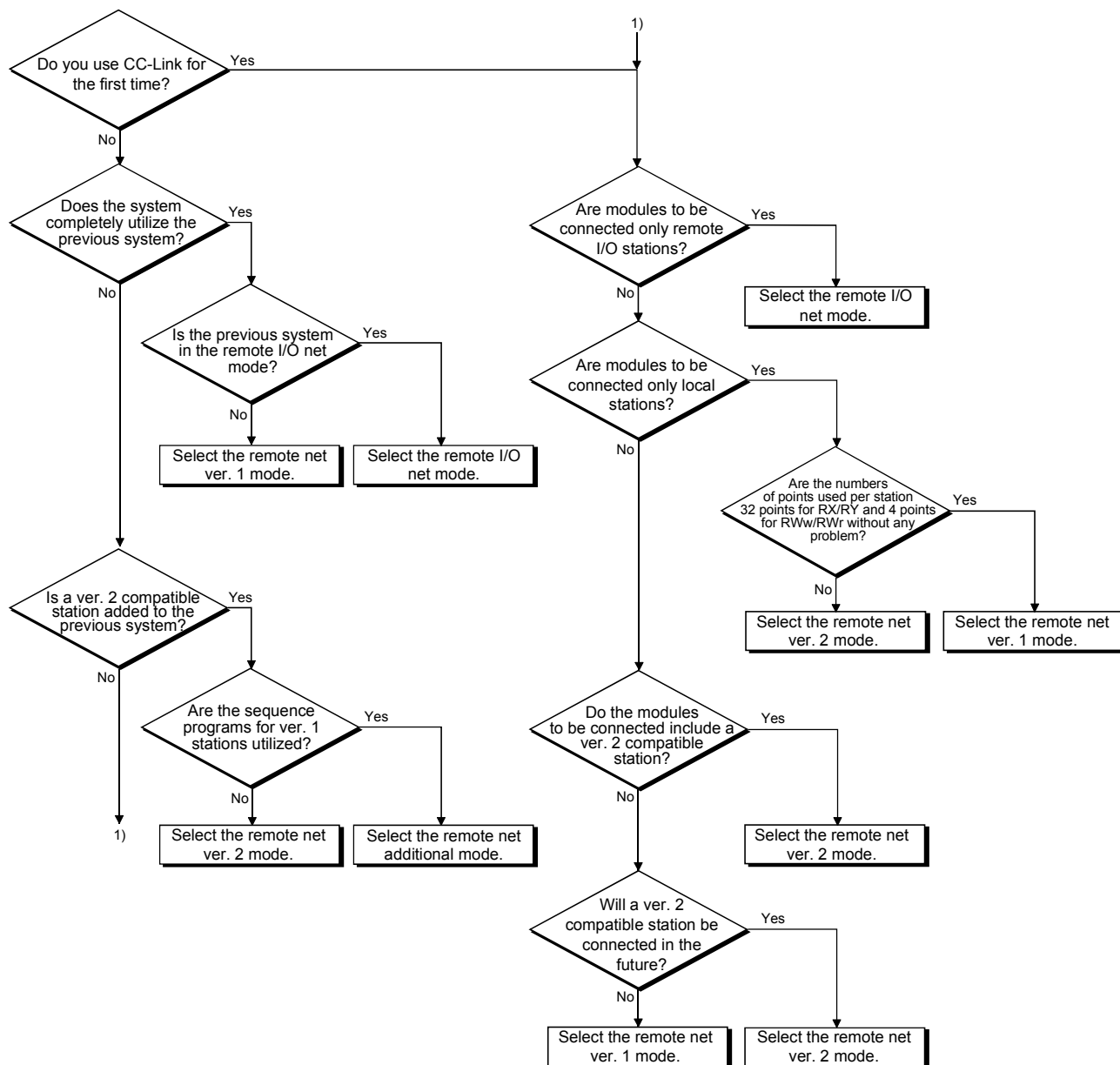
Table 8.7 lists the update timings of link special registers.

Table 8.7 Update timing of the link special registers

Link special register	Data update timing	Link special register	Data update timing
SW0041	Updated independently regardless of SB	SW0071	Updated independently regardless of SB
SW0045		SW0072	(Update after each station is stabilized.)
SW0060	When SB0060 changes	SW0074 to SW0077	When SB0074 changes
SW0061	When SB0061 changes	SW0078 to SW007B	When SB0075 changes
SW0062	Updated independently regardless of SB	SW0080 to SW0083	When SB0080 changes
SW0067		SW0088 to SW008B	Updated independently regardless of SB
SW0068		SW0090	When SB0090 changes
SW0069		SW0098 to SW009B	Updated independently regardless of SB
SW006A		SW009C to SW009F	
SW006D		SW00B4 to SW00B7	
SW006E		SW00B8	
SW006F		—	—
SW0070			

8.5 Mode Selection Method

Four different modes are available for CC-Link to be applicable to various systems.
The following flowchart explains the points of mode selection.



9 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE I/O STATIONS

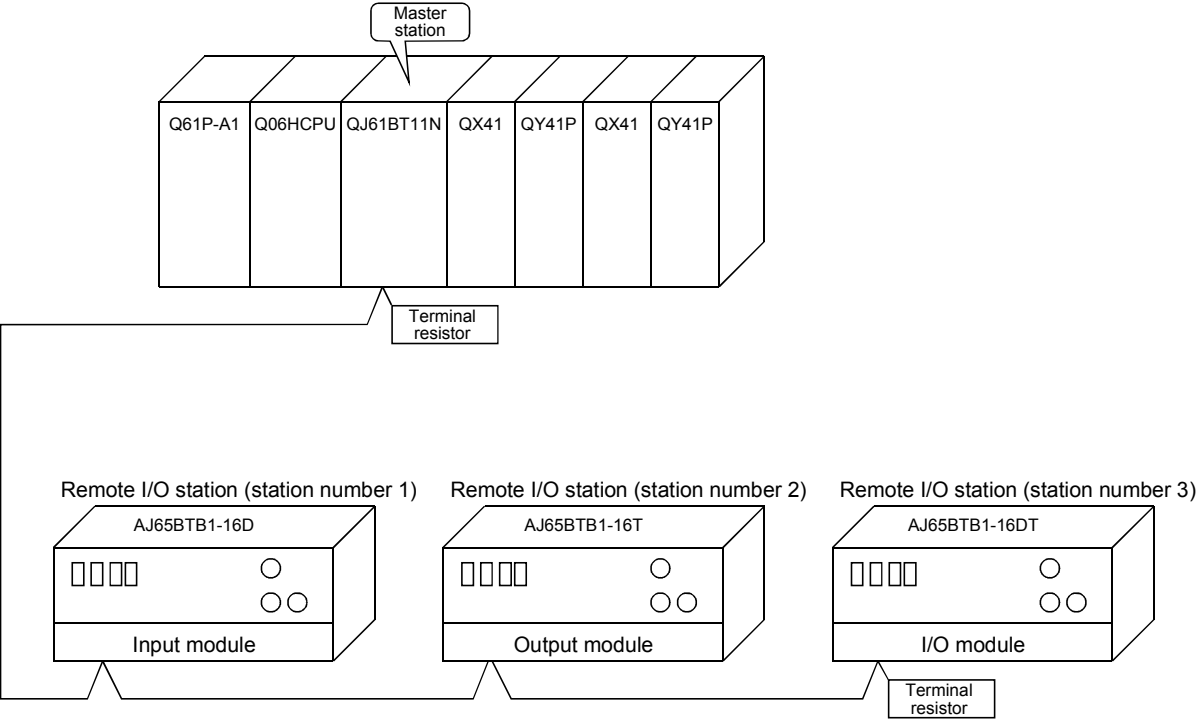
This chapter explains the procedures from module settings to parameter settings, programming, and finally operation check using a system configuration example.

9.1 When Remote I/O Net Mode is Used

The remote I/O net mode is used.

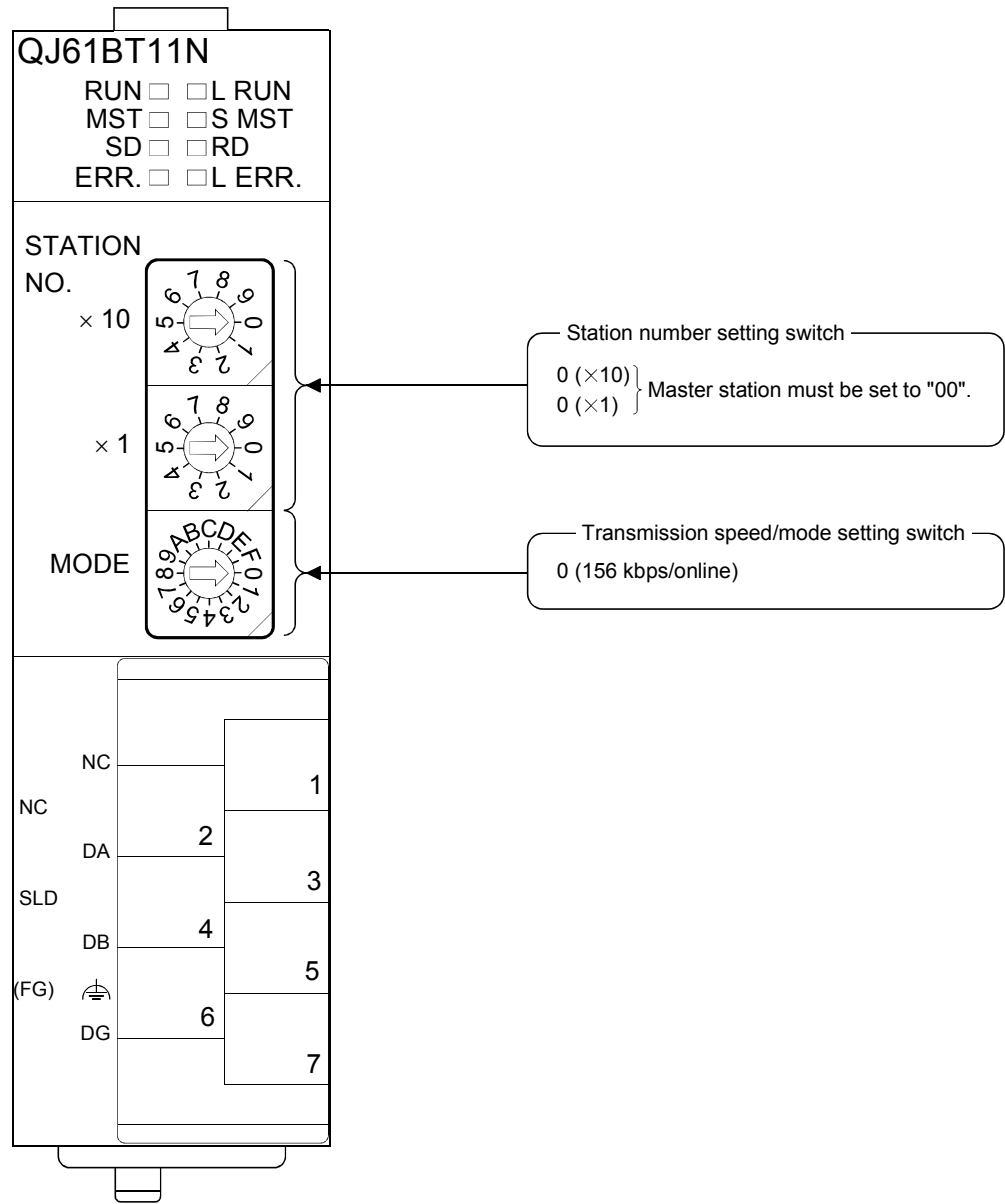
9.1.1 Configuring a system

As shown below, a system with three connected remote I/O stations is used as an example.



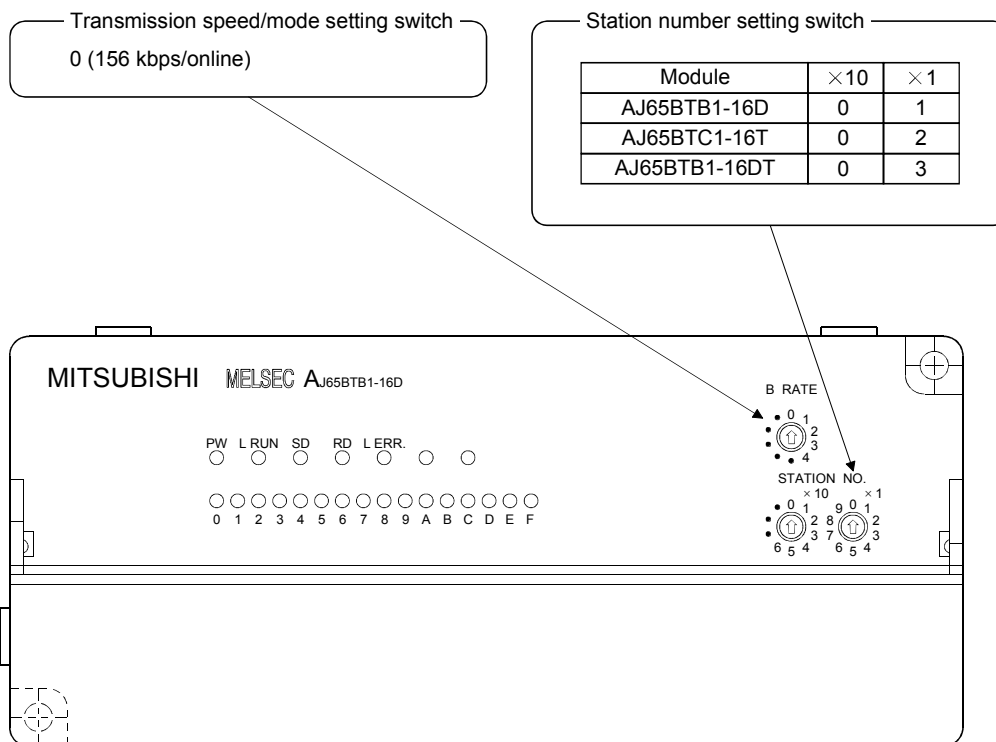
(1) Setting the master station

Settings of the master station switches are shown below:



(2) Setting the remote I/O stations

Settings of the remote I/O station switches are shown below:



9.1.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

(1) Setting the network parameters of the master station

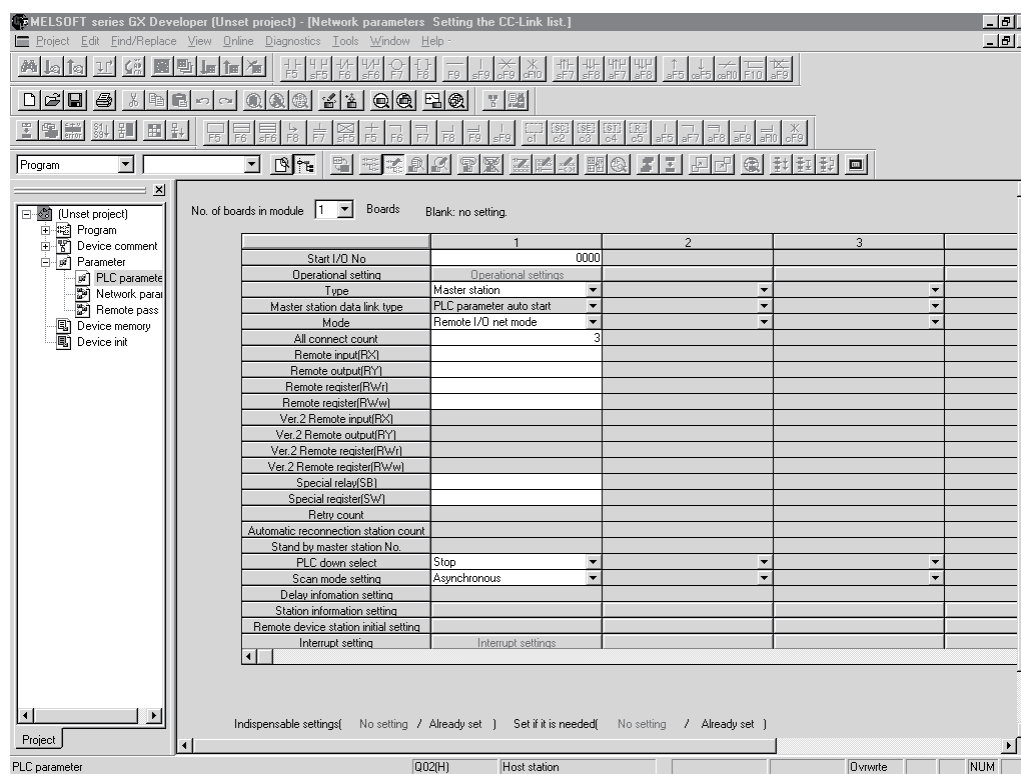
Set the network parameters as follows using the attached parameter setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	<u>Master station</u> Master station (Duplex function) 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 Off line Default: Remote net (Ver.1 mode)	Remote net (Ver.1 mode) Remote net (Ver.2 mode) Remote net (Additional mode) <u>Remote I/O net mode</u> Off line
All connect count		1 to 64 Default: 64	3 modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	

Item	Setting range	Setting value
Retry count	1 to 7 Default: 3	times
Automatic reconnection station count	1 to 10 Default: 1	modules
Standby master station No.	Blank, 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 information setting	Set 0.	

(a) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

Set the automatic refresh parameters according to the procedure below.

- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for special relay (SB) to SB0.
- 4) Set the refresh device for special register (SW) to SW0.

POINT

When setting the refresh devices for special relay (SB) and special register (SW) to SB and SW respectively, make sure that their device numbers do not duplicate with those used in the CC-Link IE controller network and MELSECNET/H network.

(a) Example of automatic refresh parameter settings

An example of automatic refresh parameter settings is shown below:

MELSOFT series GX Developer (Unset project) - [Network parameters: Setting the CC-Link list]

Project Edit Find/Replace View Online Diagnostics Tools Window Help

Program

No. of boards in module: 1 Boards Blank: no setting.

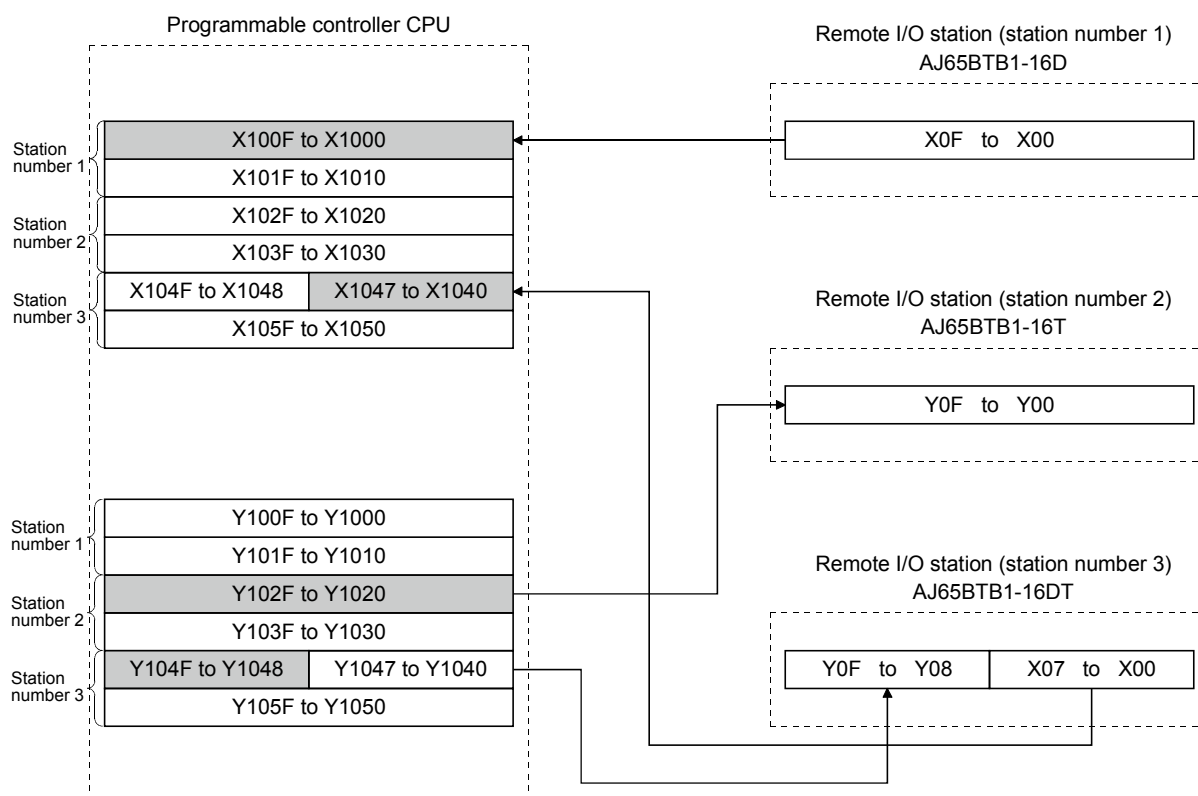
	1	2	3
Start I/O No.	0000		
Operational setting	Operational settings		
Type	Master station		
Master station data link type	PLC parameter auto start		
Mode	Remote I/O net mode		
All connect count	3		
Remote input(RX)	X1000		
Remote output(RY)	Y1000		
Remote register(RW)			
Ver.2 Remote input(RX)			
Ver.2 Remote output(RY)			
Ver.2 Remote register(RW)			
Ver.2 Remote register(RW)			
Special relay(SB)	SB0		
Special register(SW)	SW0		
Retry count			
Automatic reconnection station count			
Stand by master station No.			
PLC down select	Stop		
Scan mode setting	Asynchronous		
Delay information setting			
Station information setting			
Remote device station initial setting			
Interrupt setting	Interrupt settings		

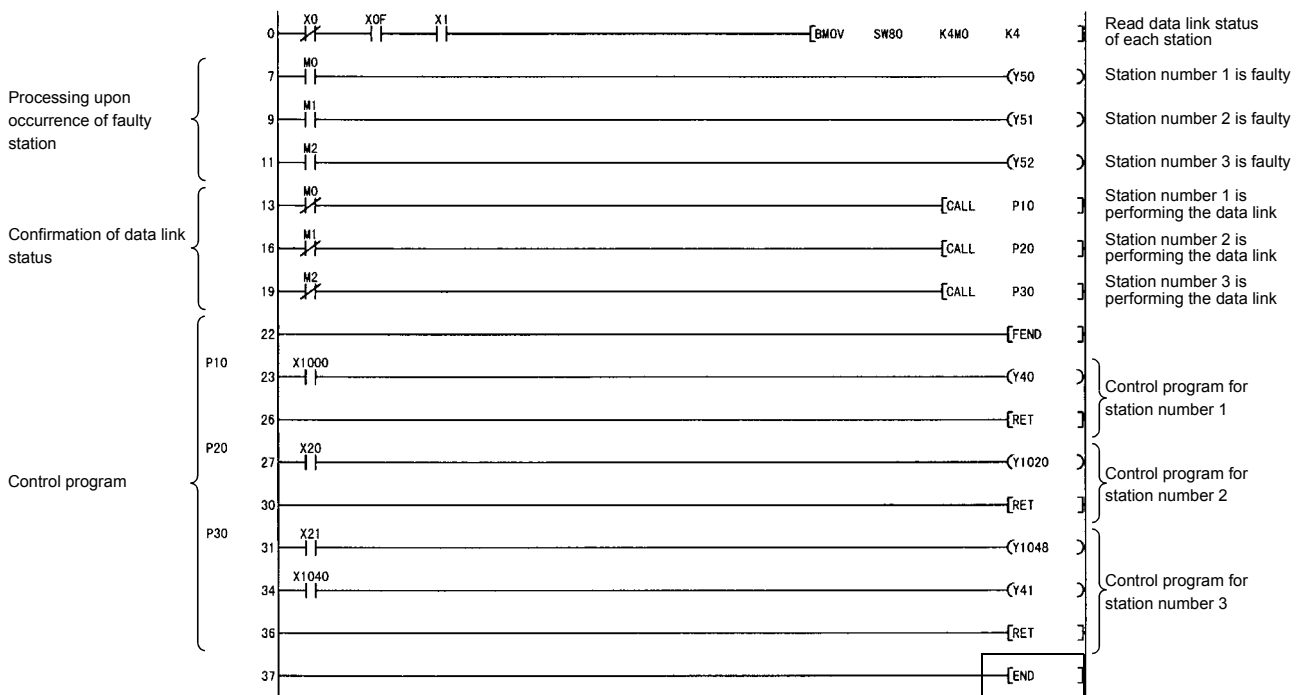
Indispensable settings[No setting / Already set] Set if it is needed[No setting / Already set]

Ready Q02(H) Host station Overwrite NUM

9.1.3 Creating a program

This section shows the program used to control the remote I/O stations. The following diagram shows the relationship between the devices of the programmable controller CPU and the inputs/outputs of remote I/O stations. The shaded areas indicate the devices that are actually used.





9.1.4 Performing the data link

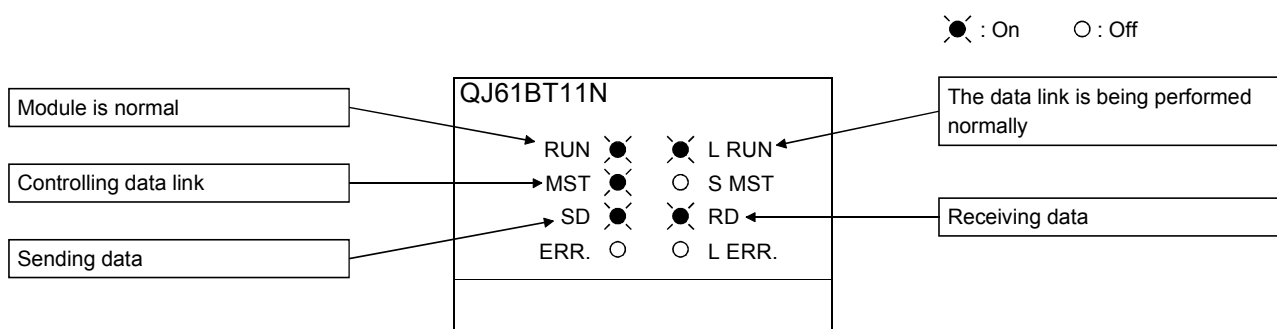
Turn on the power to the remote I/O stations first, and then turn on the power to the master station to start the data link.

(1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote I/O station when the data link is being performed normally.

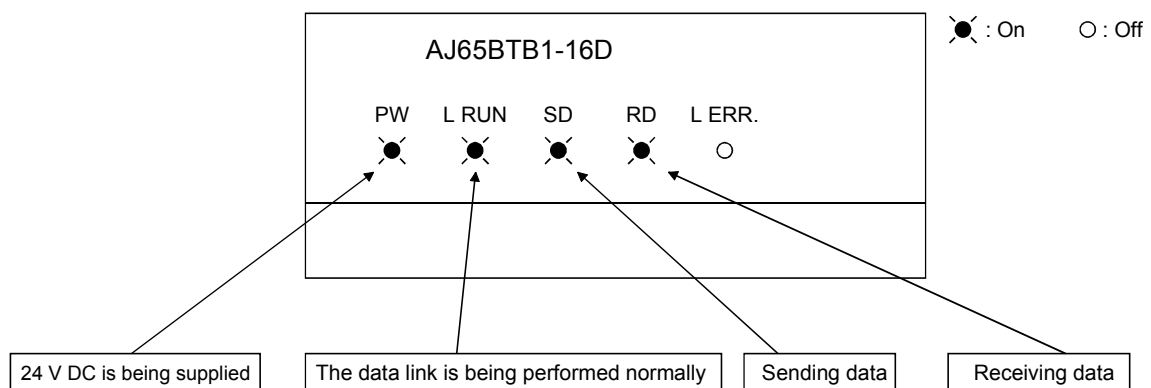
(a) LED display of the master station

Make sure that the LED display shows the following status:



(b) LED display of the remote I/O station

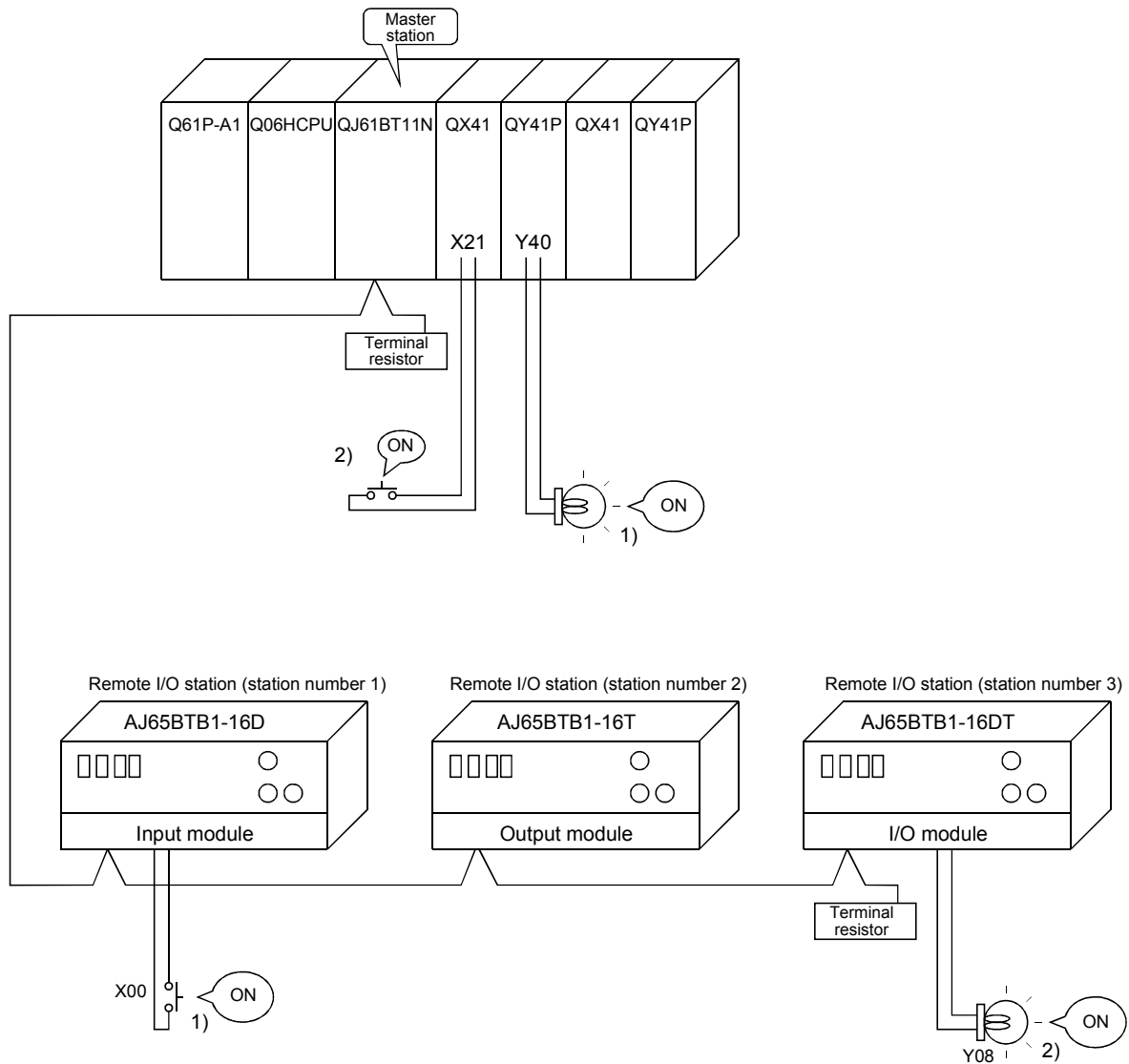
Make sure that the LED display shows the following status:



(2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

- 1) For example, when X00 of the remote I/O station AJ65BTB1-16D (station number 1) is turned on, Y40 (QY41P) of the master station turns on.
- 2) When X21 (QX41) of the master station is turned on, Y08 of the remote I/O station AJ65BTB1-16DT (station Number 3) turns on.



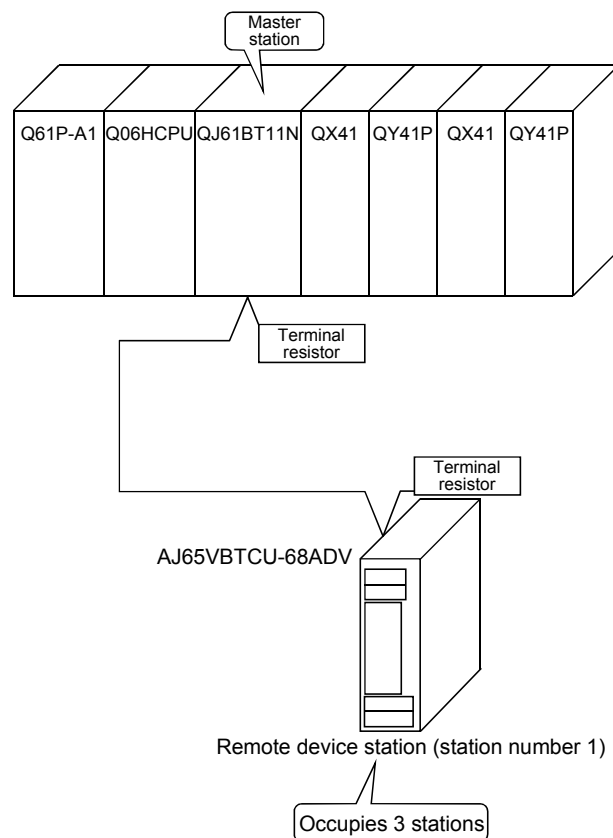
10 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE DEVICE STATIONS

This chapter explains the procedures from module settings to parameter settings, programming, and finally operation check using a system configuration example. For more detailed information on remote device stations, see the Remote Device Station User's Manual.

10.1 When Remote Net Ver. 1 Mode is Used

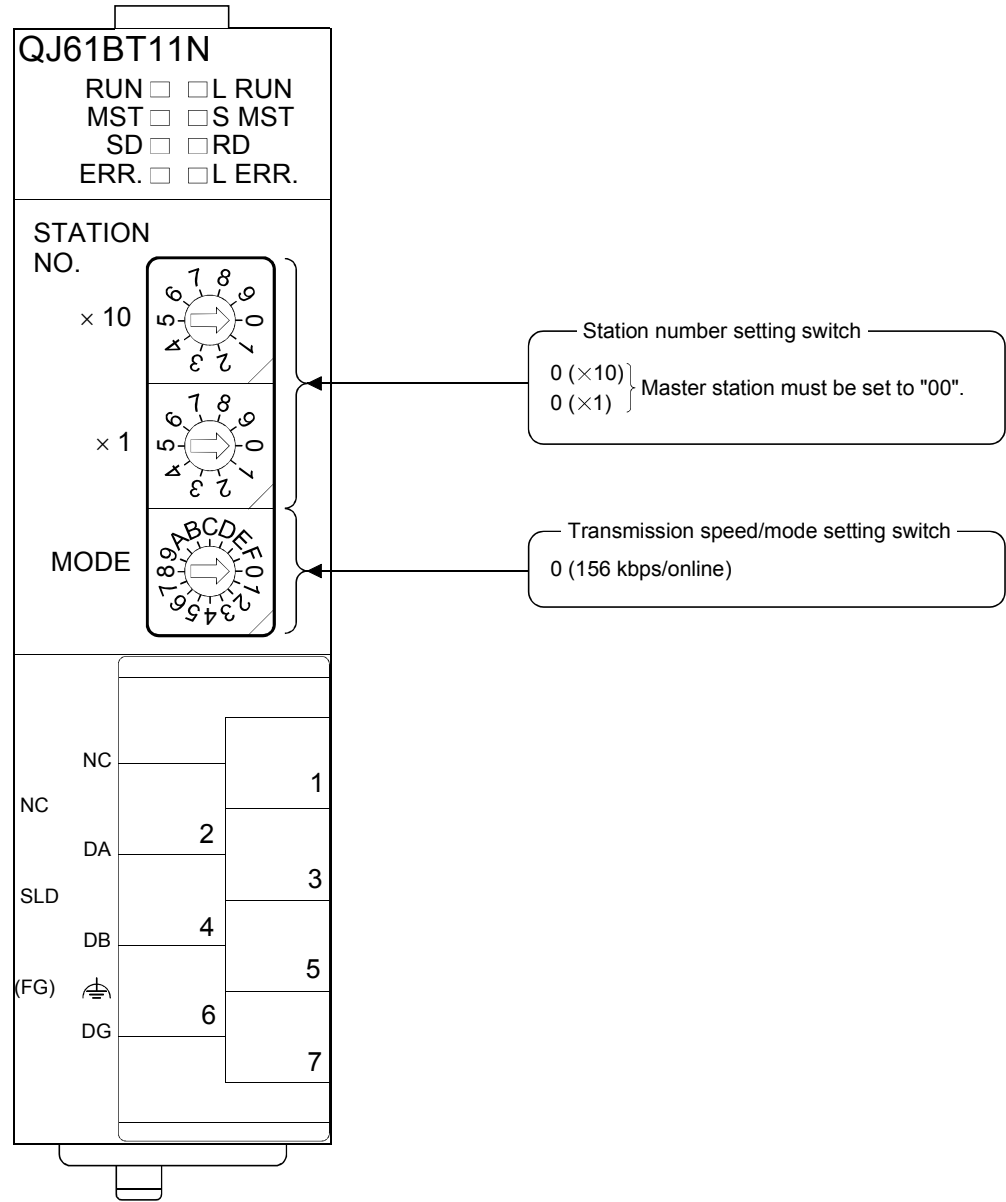
10.1.1 Configuring a system

As shown below, a system with one connected remote I/O station is used as an example.



(1) Setting the master station

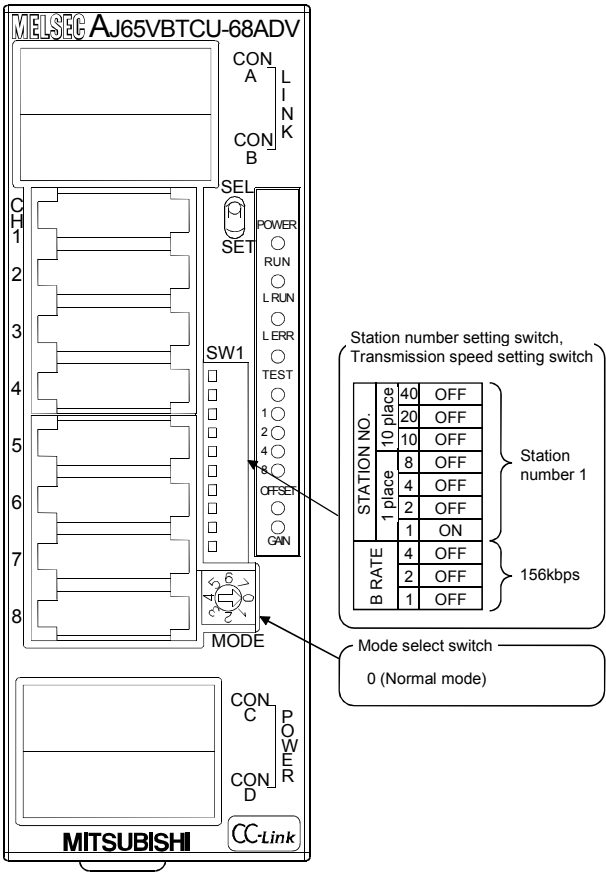
Settings of the master station switches are shown below:



(2) Setting the remote device station

Settings of the remote device station switches are shown below:

For more detailed information about the contents of the settings, see the Remote
Device Station User's Manual.



10.1.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

(1) Setting the network parameters of the master station

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	<u>Master station</u> Master station (Duplex function) 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 Off line Default: Remote net (Ver.1 mode)	<u>Remote net (Ver.1 mode)</u> Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	1 modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	

10 COMMUNICATION BETWEEN THE MASTER STATION AND REMOTE DEVICE STATIONS

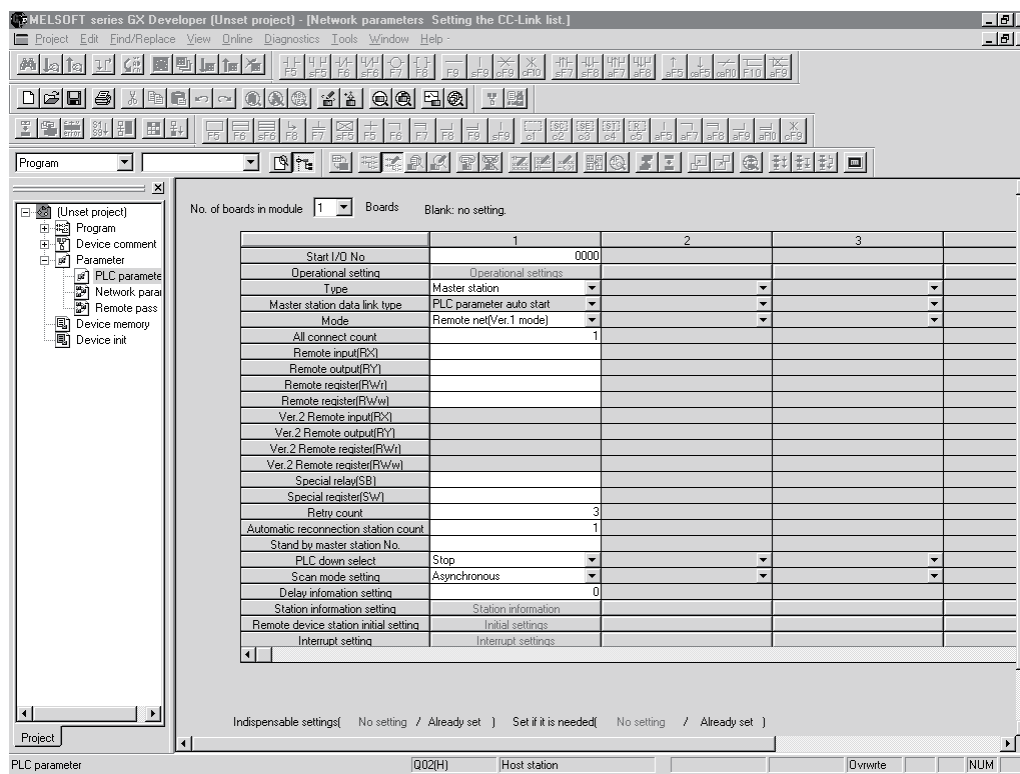
MELSEC-Q

Item	Setting range	Setting value
Retry count	1 to 7 Default: 3	3 times
Automatic reconnection station count	1 to 10 Default: 1	1 modules
Standby master station No.	Blank, 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 information setting	Set 0.	

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	Remote device station	single	Occupies 3 stations	96 points	No setting			

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

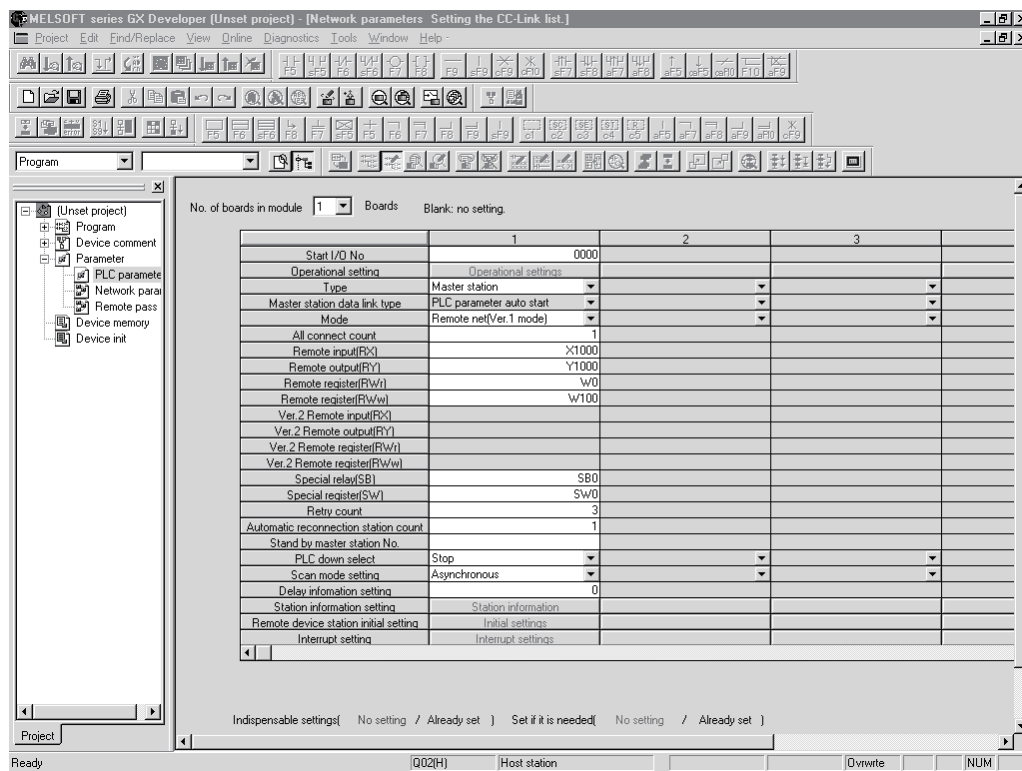
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W100.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



10.1.3 Initial setting of the remote device station

This section explains the initial setting of the remote device station.

(1) Setting the target station number

Set the target station for which the initial setting is performed.

(a) Setting the target station number

Set the target to "1".

	Target	No. of			Target	No. of		
1	1	0	Regist procedure		9		Regist procedure	
2			Regist procedure		10		Regist procedure	
3			Regist procedure		11		Regist procedure	
4			Regist procedure		12		Regist procedure	
5			Regist procedure		13		Regist procedure	
6			Regist procedure		14		Regist procedure	
7			Regist procedure		15		Regist procedure	
8			Regist procedure		16		Regist procedure	

Clear Check End setup Cancel

(b) Selecting the Regist procedure

Click the "Regist procedure" of the target station number "1".

(2) Setting the regist procedure registration

Set the conditions and details of the remote device station settings.

In this section, AJ65VBTCU-68ADV is used as an example for the Regist procedure registration.

The details to be set are as follows:

- Set channels 1, 2 to A-D conversion enable (the first condition).
- Set the Input range of channel 1 to 0 - 5V, and channel 2 to User range setting 1 (the second condition).
- Set channel 1 to Sampling processing, and specify channel 2 as Average processing and set it to Number of times (the third condition).
- Set channel 2 Average number of times to 16 times (the forth condition).
- Turn the Initial data processing completed flag to ON (the fifth condition).
- Turn the Initial data setting request flag to ON (the sixth condition).
- Turn the Initial data processing completed flag to OFF (the seventh condition).
- Turn the Initial data setting request flag to OFF (the eighth condition).

For more detailed information about the settings, see the Remote Device Station User's Manual.

Set the input format to "HEX".

(a) Setting the first condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

- 3) Executorial condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "ON".
 - 4) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "00", and the "Write Data" to "0003".
- (b) Setting the second condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "01", and the "Write Data" to "0031".
- (c) Setting the third condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "03", and the "Write Data" to "0200".
- (d) Setting the fourth condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "05", and the "Write Data" to "0010".
- (e) Setting the fifth condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "ON".

(f) Setting the sixth condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting

Set "Write Device" to "RY", the "Device Number" to "19", and the
"Write Data" to "ON".

(g) Setting the seventh condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings

Set the "Condition Device" to "RX", the "Device Number" to "18", and
the "Execute Condition" to "OFF".

4) Details of execution setting

Set the "Write Device" to "RY", the "Device Number" to "18", and the
"Write Data" to "OFF".

(h) Setting the eighth condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings

Set the "Condition Device" to "RX", the "Device Number" to "19", and
the "Execute Condition" to "ON".

4) Details of execution setting

Set the "Write Device" to "RY", the "Device Number" to "19", and the
"Write Data" to "OFF".

(i) Setting results

The results of settings (a) to (h) are shown below.

Remote device station initial setting: Procedure registration module 1: Target station 1									
Input format		HEX.							
Execute Flag	Operational condition	Executorial condition			Details of execution			Write Device	Write Data
		Condition Device	Device Number	Execute Condition	Write Device	Device Number	Write Data		
Execute	Set new	RX	18	ON	RWw	00	0003		
Execute	Same as prev.set	RX	18	ON	RWw	01	0031		
Execute	Same as prev.set	RX	18	ON	RWw	03	0200		
Execute	Same as prev.set	RX	18	ON	RWw	05	0010		
Execute	Same as prev.set	RX	18	ON	RY	18	ON		
Execute	Same as prev.set	RX	18	ON	RY	19	ON		
Execute	Set new	RX	18	OFF	RY	18	OFF		
Execute	Set new	RX	19	ON	RY	19	OFF		

(3) Validating the remote device station initial settings

This section explains the link special relays (SB) relating to the initial settings of remote device stations.

Numeric values in parentheses in the Number column indicate addresses and bit positions of the buffer memory.

Example: For buffer memory address 5E0H and bit 13: (5E0H, b13)

Table 10.1 List of link special relays related to remote device station initial settings

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB000D (5E0H, b13)	Remote device station initialization procedure registration instruction	Starts initial processing using the information registered during the initialization procedure registration. While SB000D is on, the refresh of the remote input/output and remote registers stops. OFF: No instruction ON: Instructed	○ *	×	×
SB005E (5E5H, b14)	Execution status of remote device station initialization procedure	Indicates the execution status of the initialization procedure. OFF: Not executed ON: Being executed	○ *	×	×
SB005F (5E0H, b15)	Complete status of remote device station initialization procedure	Indicates completion status of the execution of the initialization procedure execution. OFF: Not complete ON: Complete	○ *	×	×
SW005F (65FH)	Remote device station initialization procedure instruction result	Stores the execution result of initialization procedure registration instruction with SB000D. 0: Normal Other than 0: Store an the error code (see Section 13.3).	○ *	×	×

* Parameter setting is required in the case of a standby master station. (First 5 digits of serial No. must be 07112 or later.)

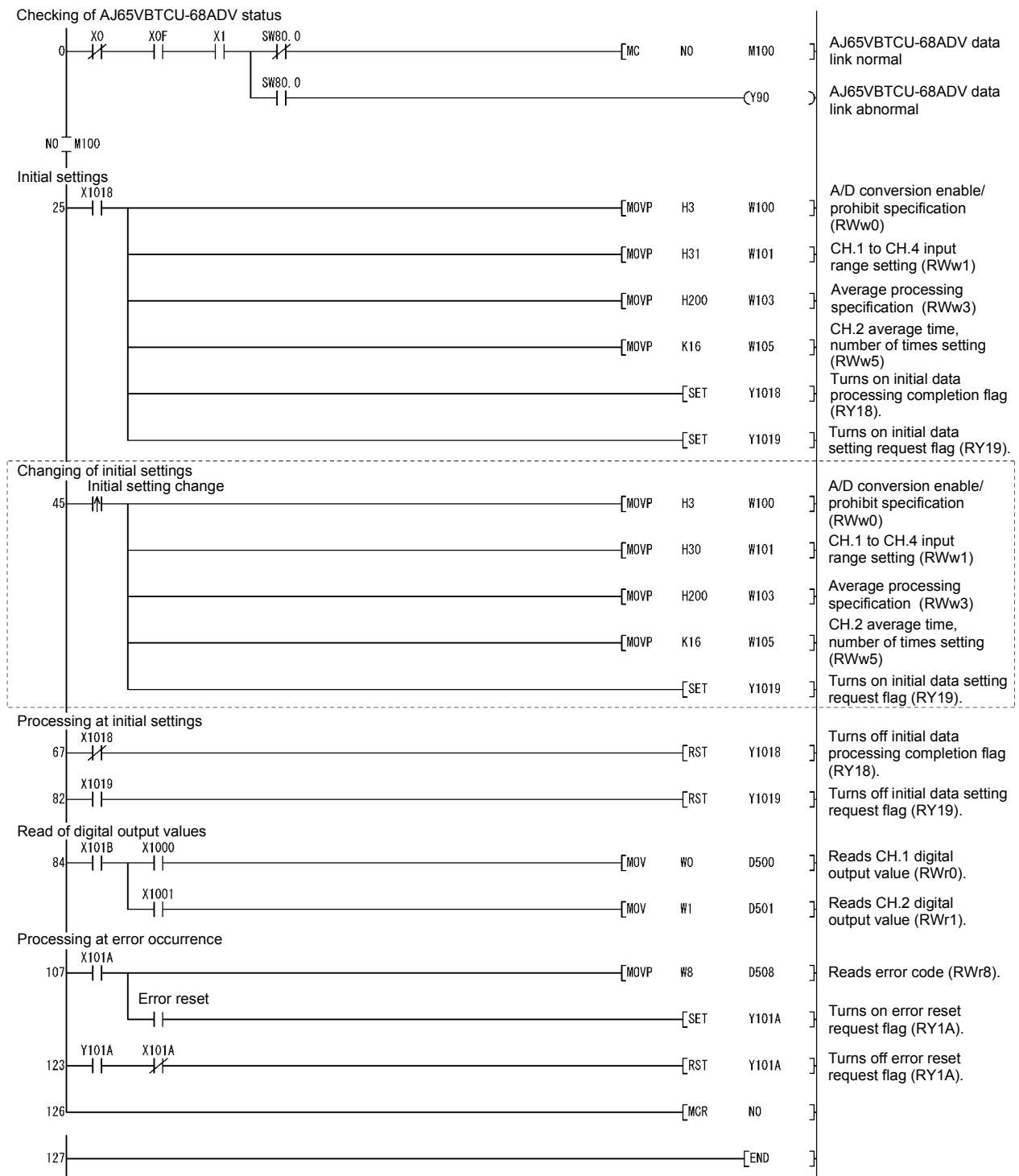
For details on how to create a program, see Section 10.1.4.

POINT
(1) When remote device station initialization procedure registration instruction (SB0000) is turned off after the initial processing completion, all of the RY signals that has been turned on in the initial procedure registration is turned off. Therefore, about signals that are required to turn always on, such as conversion valid signal, they should be turned on in the sequence program. (2) If the procedure registration is not completed for all stations registered to the remote device station initialization procedure registration, the completion status of remote device station initialization procedure (SB005F) does not turn on. If there is a faulty station, turn off the remote device station initialization procedure registration instruction (SB000D) according to the completion status of the other stations.

REMARK

Setting with the sequence program (Reference)

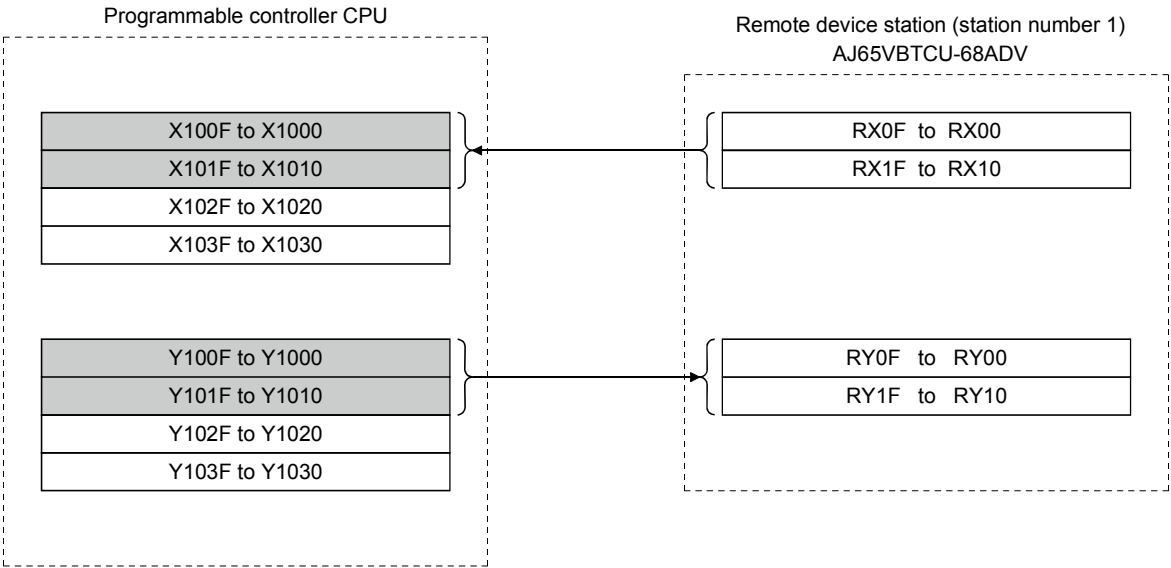
For reference, an example setting performed with the sequence program is shown below.



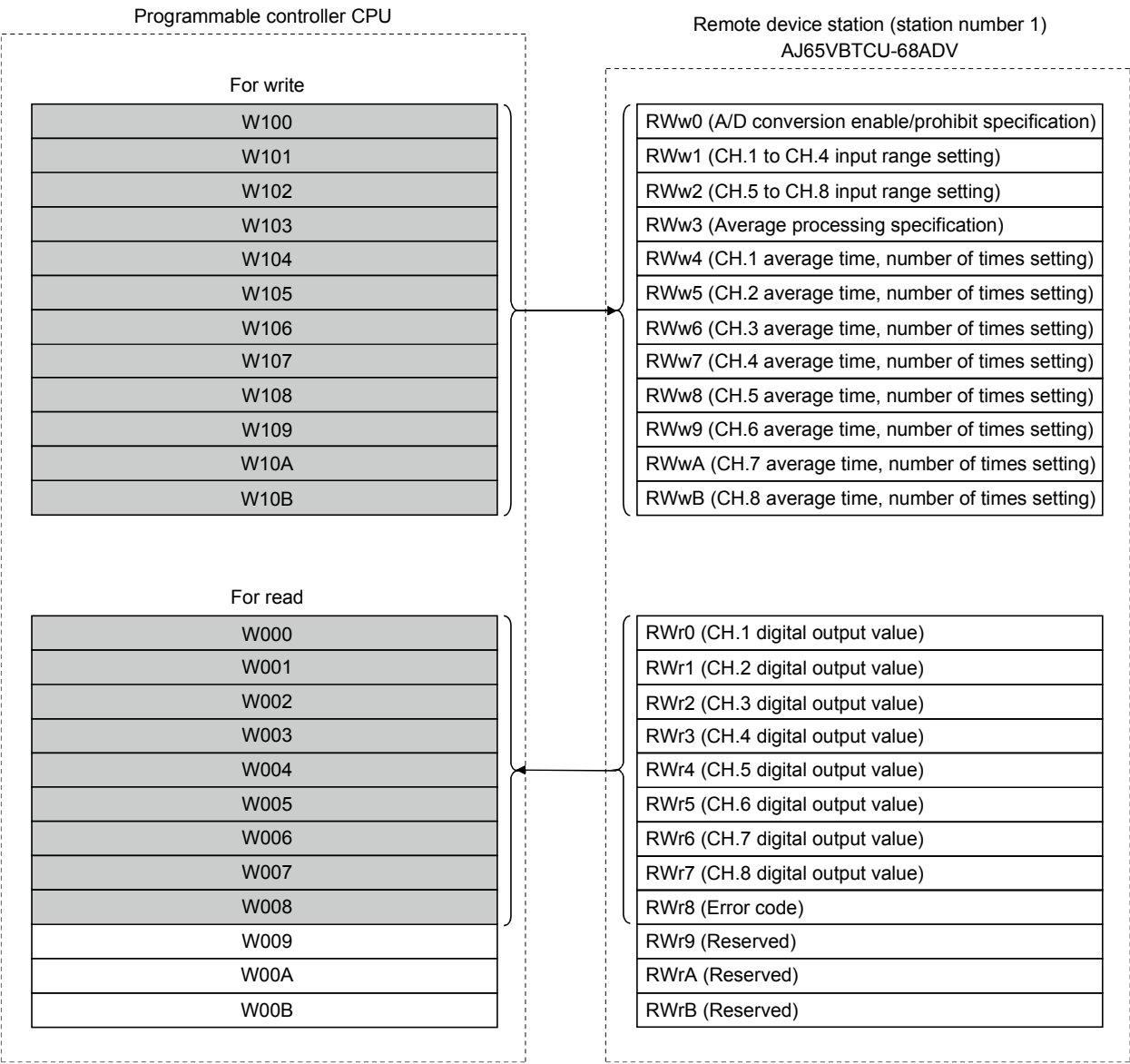
10.1.4 Creating a program

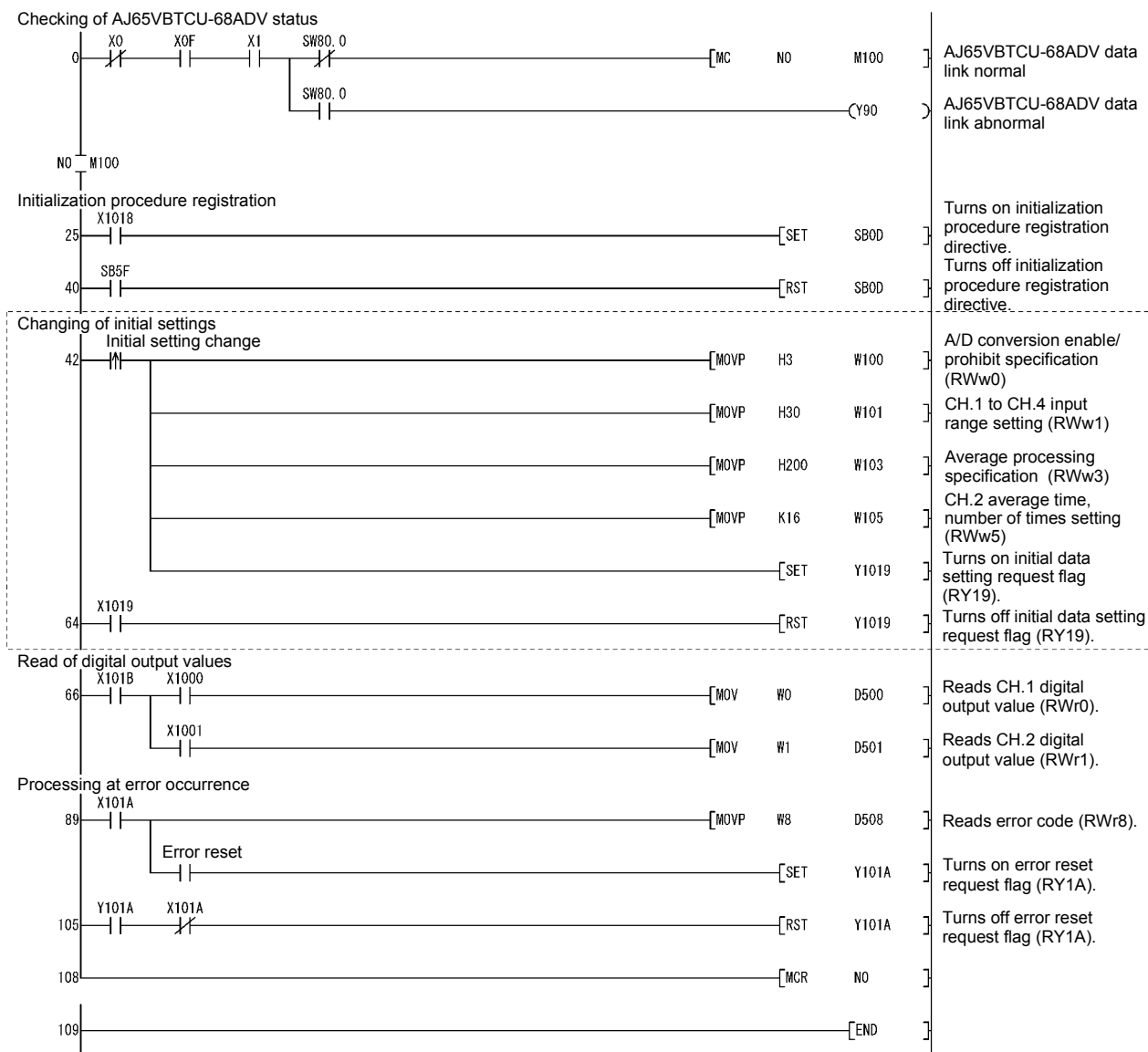
This section shows a program used to control remote device stations.
The following diagrams show the relationships of the remote input/output and remote registers between the programmable controller CPU devices and the remote device station.
The shaded areas indicate the devices that are actually used.
For detailed information about each remote device station, see the User's Manual for each module.

[Remote input (RX) and remote output (RY)]



[Remote registers (RWw and RWr)]





The program enclosed by the dotted line is necessary only when the initial settings are changed.

10.1.5 Performing the data link

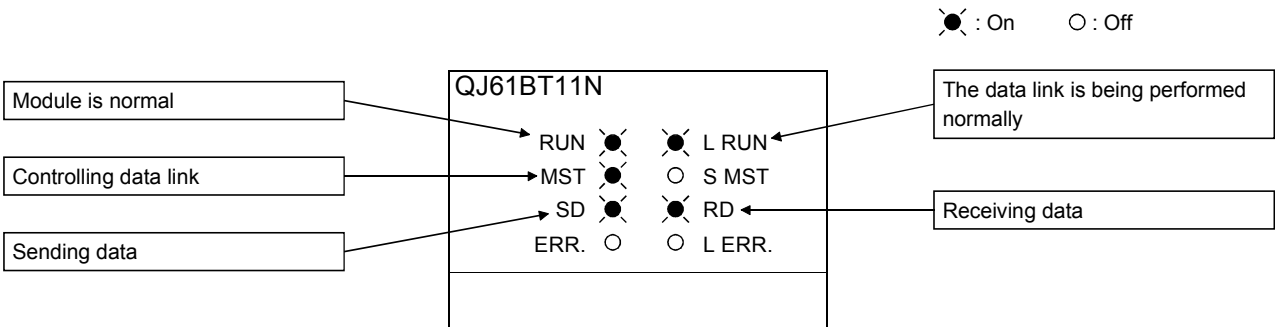
Turn on the power to the remote device station first, and then turn on the power to the master station to start the data link.

(1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote device station when the data link is being performed normally.

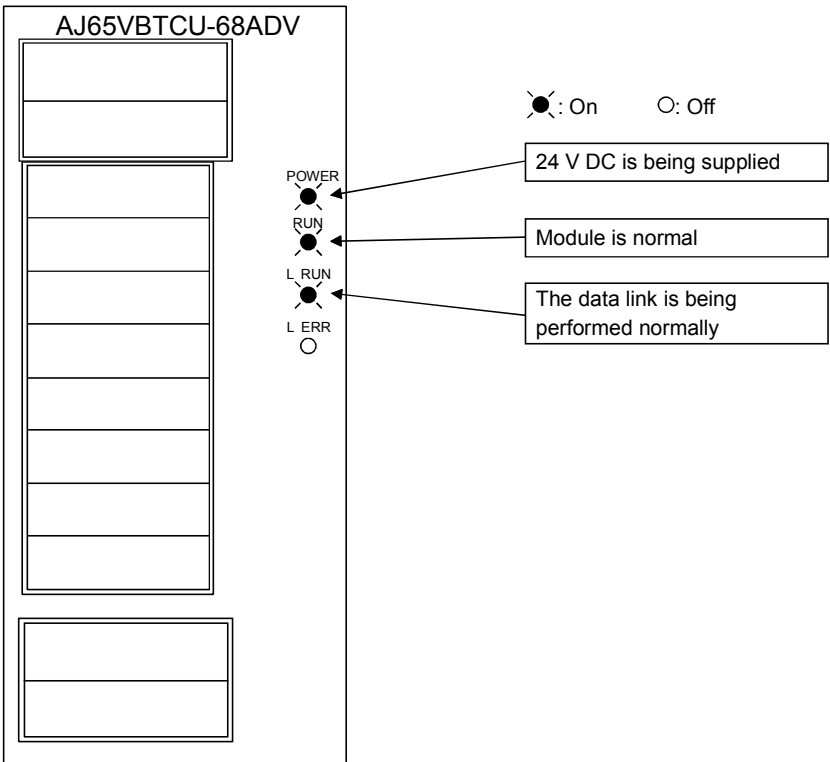
(a) LED display of the master station

Make sure that the LED display shows the following status:



(b) LED display of the remote device station

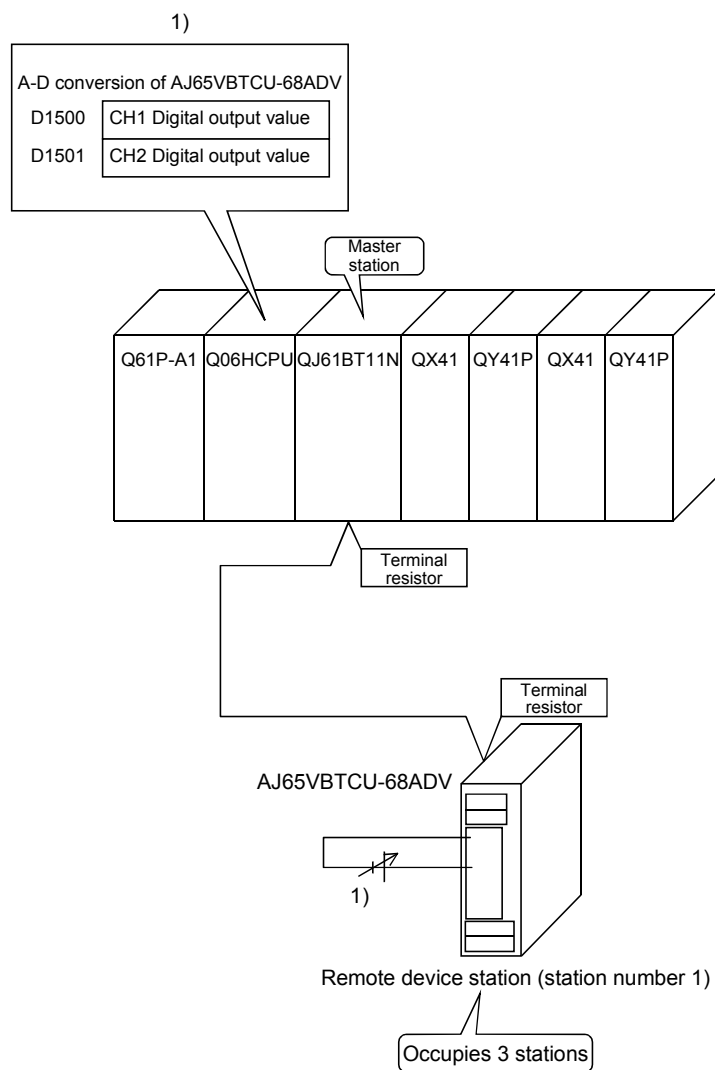
Make sure that the LED display shows the following status:



(2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

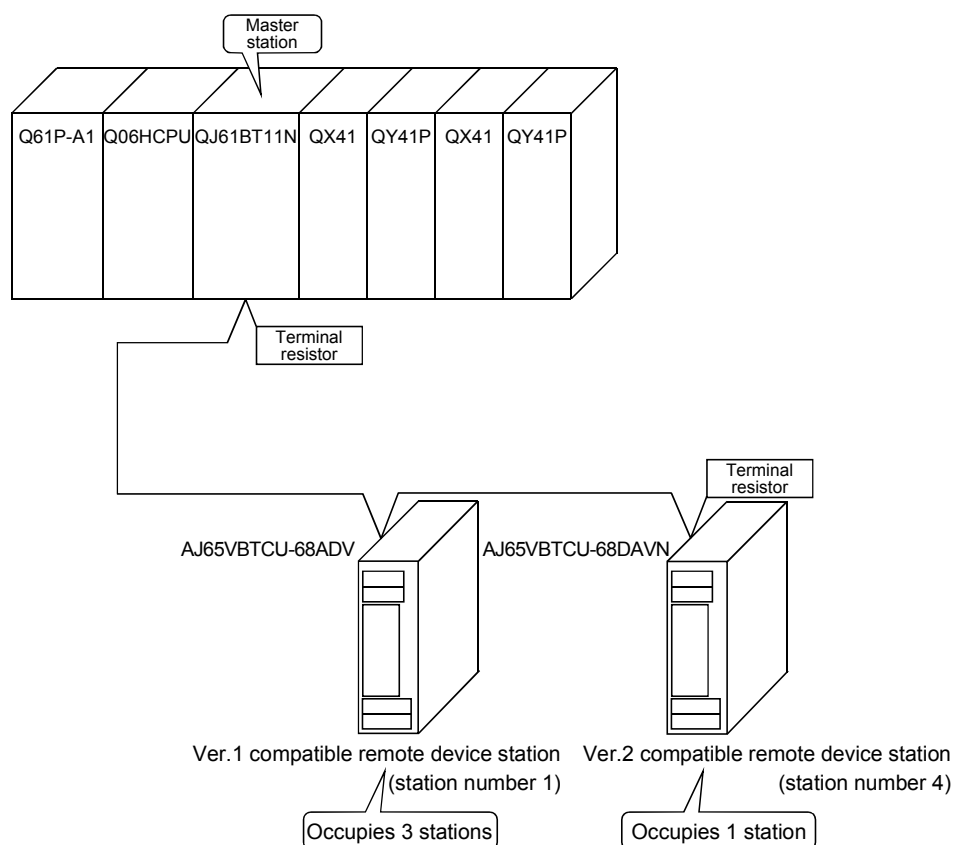
- 1) Change the voltage input to the AJ65VBTCU-68ADV and confirm that the A-D converted digital value also changes.



10.2 When Remote Net Ver.2 Mode is Used

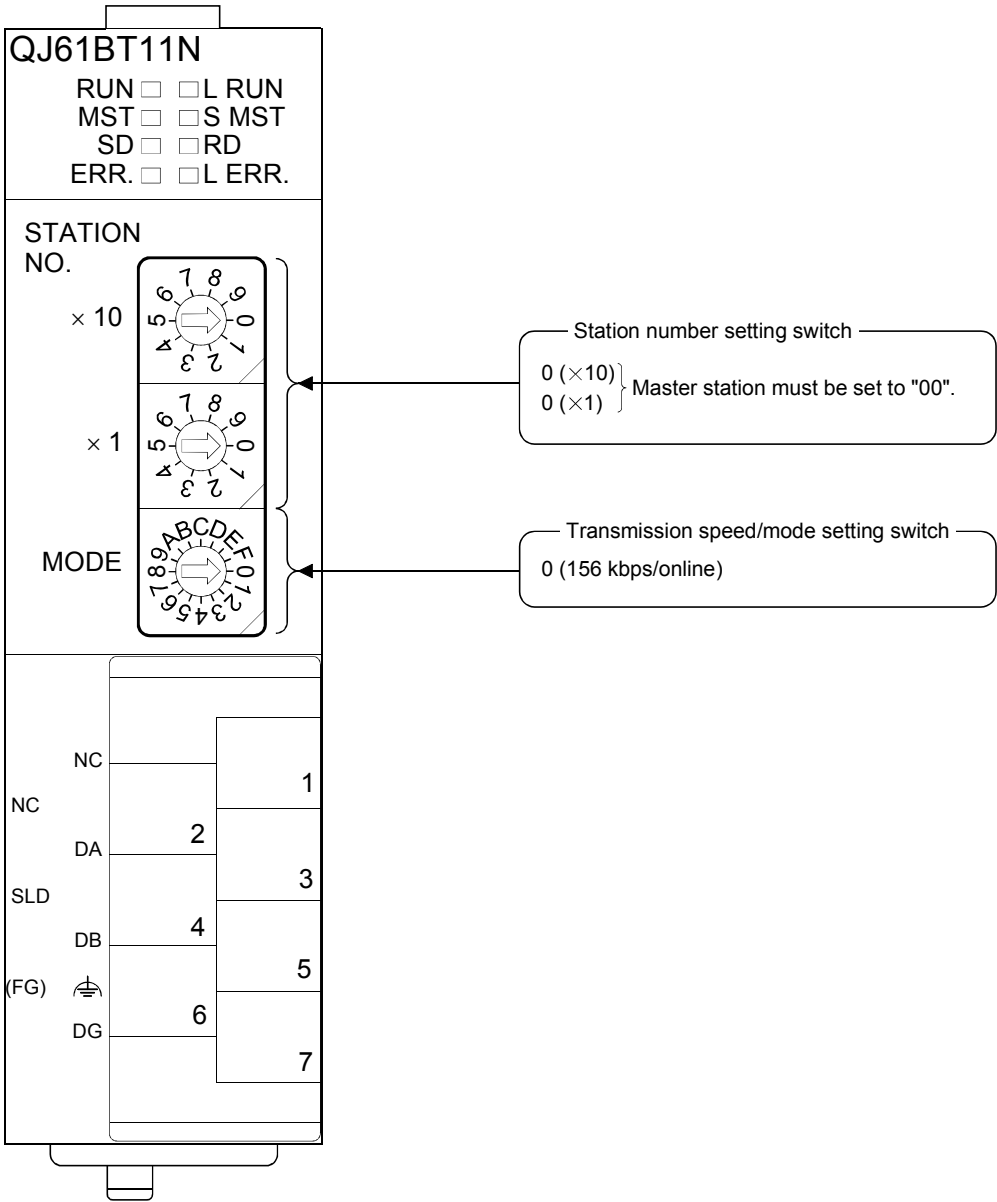
10.2.1 Configuring a system

As shown below, a system where one ver.1 compatible remote device station and one ver.2 compatible remote device station are connected is used as an example.



(1) Setting the master station

Settings of the master station switches are shown below:

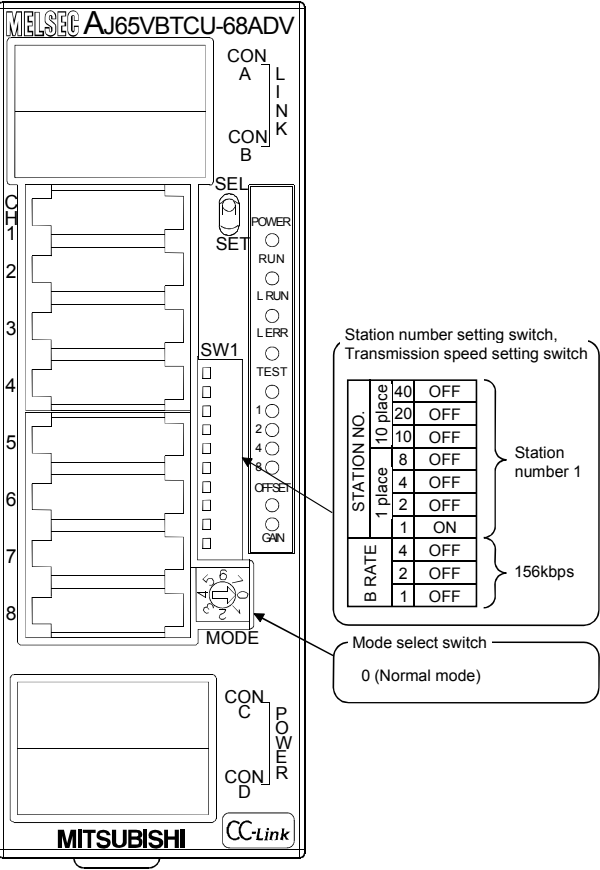


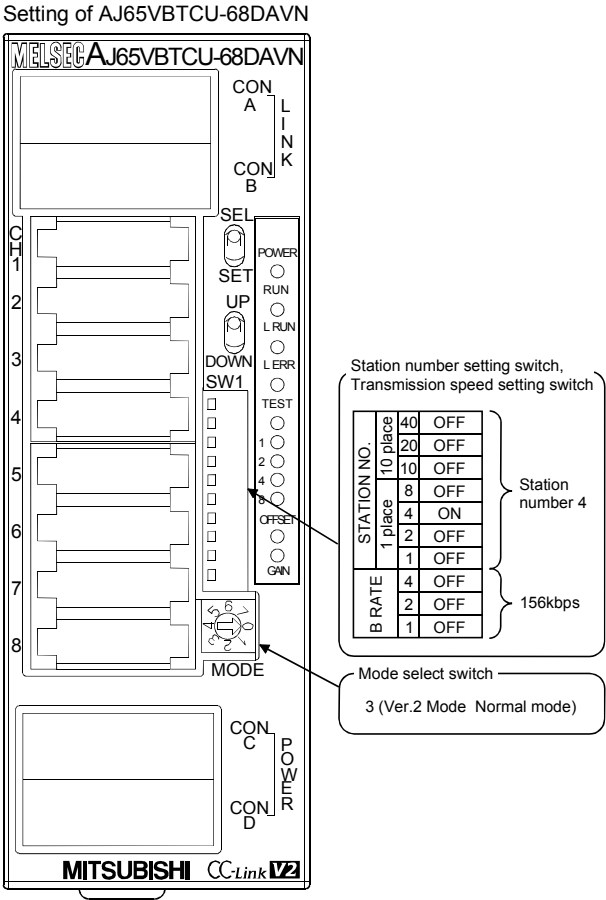
(2) Setting the remote device station

Settings of the remote device station switches are shown below:

For more detailed information about the contents of the settings, see the Remote Device Station User's Manual.

Setting of AJ65VBTCU-68ADV





10.2.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

(1) Setting the network parameters of the master station

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

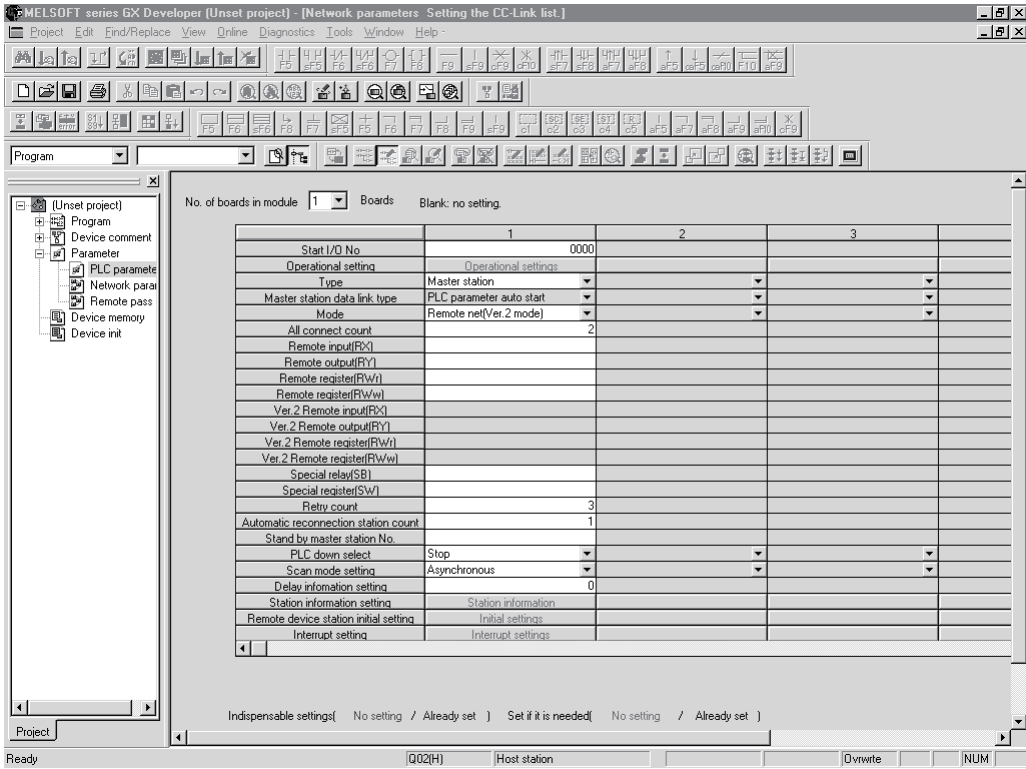
Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	<u>Master station</u> Master station (Duplex function) 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 Off line Default: Remote net (Ver.1 mode)	Remote net (Ver.1 mode) <u>Remote net (Ver.2 mode)</u> Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	2 modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	

Item	Setting range	Setting value
Retry count	1 to 7 Default: 3	3 times
Automatic reconnection station count	1 to 10 Default: 1	1 modules
Standby master station No.	Blank, 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 information setting	Set 0.	

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	Ver.1 Remote device station	single	Occupies 3 stations	96 points	No setting			
4	Ver.2 Remote device station	quadruple	Occupies 1 station	64 points	No setting			

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

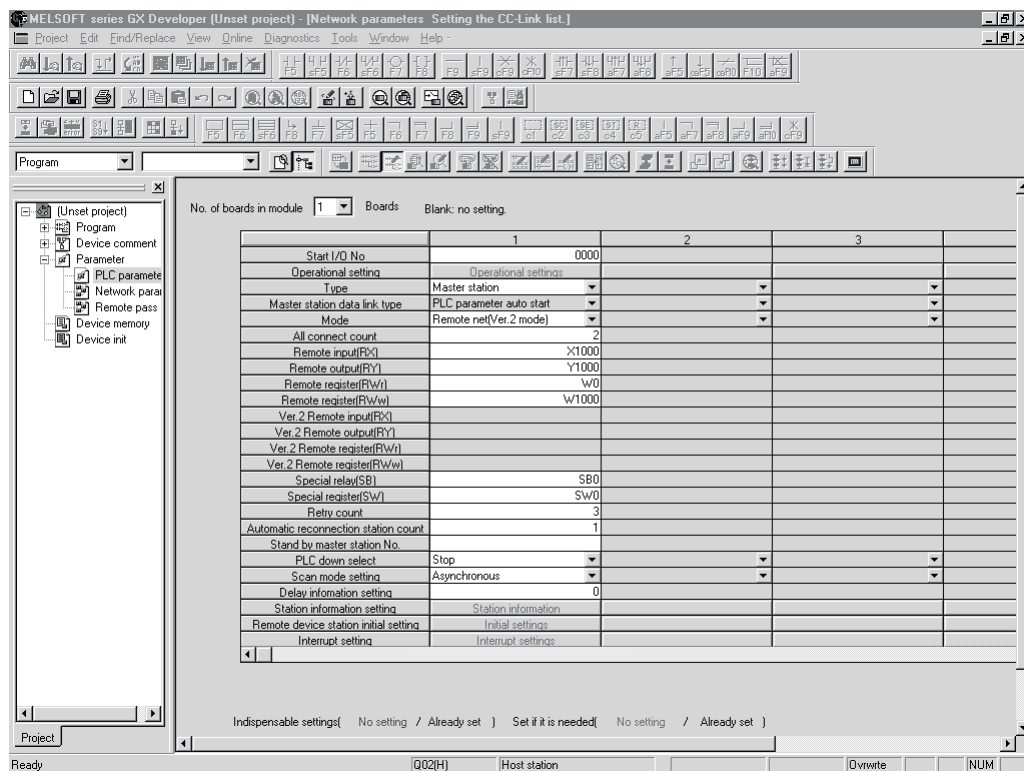
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W1000.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



10.2.3 Initial setting of the remote device station

This section explains the initial setting of the remote device station.

(1) Setting the target station number

Set the target station for which the initial setting is performed.

(a) Setting the target station number

Set the target station numbers to "1" and "4".

Target station No.	No. of registered procedures			Target station No.	No. of registered procedures		
1	1	0	Regist procedure	9			Regist procedure
2	4	0	Regist procedure	10			Regist procedure
3			Regist procedure	11			Regist procedure
4			Regist procedure	12			Regist procedure
5			Regist procedure	13			Regist procedure
6			Regist procedure	14			Regist procedure
7			Regist procedure	15			Regist procedure
8			Regist procedure	16			Regist procedure

Clear Check End Cancel

(b) Selecting the Regist procedure

Click the "Regist procedure" of the target station number "1".

(2) Setting the regist procedure registration

Set the conditions and details of the remote device station settings.

In this section, AJ65VBTCU-68ADV is used as an example for the Regist procedure registration.

The details to be set are as follows:

- Set channels 1, 2 to A-D conversion enable (the first condition).
- Set the Input range of channel 1 to 0 - 5V, and channel 2 to User range setting 1 (the second condition).
- Set channel 1 to Sampling processing, and specify channel 2 as Average processing and set it to Number of times (the third condition).
- Set channel 2 Average number of times to 16 times (the forth condition).
- Turn the Initial data processing completed flag to ON (the fifth condition).
- Turn the Initial data setting request flag to ON (the sixth condition).
- Turn the Initial data processing completed flag to OFF (the seventh condition).
- Turn the Initial data setting request flag to OFF (the eighth condition).

For more detailed information about the settings, see the Remote Device Station User's Manual.

Set the input format to "HEX.".

(a) Setting the first condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

- 3) Executorial condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "ON".
 - 4) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "00", and the "Write Data" to "0003".
- (b) Setting the second condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "01", and the "Write Data" to "0031".
- (c) Setting the third condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "03", and the "Write Data" to "0200".
- (d) Setting the fourth condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "05", and the "Write Data" to "0010".
- (e) Setting the fifth condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "ON".

(f) Setting the sixth condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting

Set "Write Device" to "RY", the "Device Number" to "19", and the
"Write Data" to "ON".

(g) Setting the seventh condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings

Set the "Condition Device" to "RX", the "Device Number" to "18", and
the "Execute Condition" to "OFF".

4) Details of execution setting

Set the "Write Device" to "RY", the "Device Number" to "18", and the
"Write Data" to "OFF".

(h) Setting the eighth condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings

Set the "Condition Device" to "RX", the "Device Number" to "19", and
the "Execute Condition" to "ON".

4) Details of execution setting

Set the "Write Device" to "RY", the "Device Number" to "19", and the
"Write Data" to "OFF".

(i) Setting results

The results of settings (a) to (h) are shown below.

Remote device station initial setting: Procedure registration module 1: Target station 1

Input format:

Execute Flag	Operational condition	Executional condition			Details of execution		
		Condition Device	Device Number	Execute Condition	Write Device	Device Number	Write Data
Execute	Set new	RX	18	ON	RWw	00	0003
Execute	Same as prev.set	RX	18	ON	RWw	01	0031
Execute	Same as prev.set	RX	18	ON	RWw	03	0200
Execute	Same as prev.set	RX	18	ON	RWw	05	0010
Execute	Same as prev.set	RX	18	ON	RY	18	ON
Execute	Same as prev.set	RX	18	ON	RY	19	ON
Execute	Set new	RX	18	OFF	RY	18	OFF
Execute	Set new	RX	19	ON	RY	19	OFF

Similarly, make the procedure registration of the AJ65VBTCU-68DAVN. Click the "Register procedure" of the target station number "4".

The details to be set are as follows:

- Set channels 1, 2 to Analog output enable. (the first condition)
- Set the output range of channel 1 to 0 - 5V, and channel 2 to User range setting 1. (the second condition)
- Set the HOLD/CLEAR setting of channels 1, 2 to CLEAR. (the third condition)
- Turn the Initial data processing completed flag to ON (the forth condition).
- Turn the Initial data setting request flag to ON (the fifth condition).
- Turn the Initial data processing completed flag to OFF (the sixth condition).
- Turn the Initial data setting request flag to OFF (the seventh condition).

Remote device station initial setting: Procedure registration module 1: Target station 4

Input format:

Execute Flag	Operational condition	Executional condition			Details of execution		
		Condition Device	Device Number	Execute Condition	Write Device	Device Number	Write Data
Execute	Set new	RX	18	ON	RWw	08	00FC
Execute	Same as prev.set	RX	18	ON	RWw	09	0031
Execute	Same as prev.set	RX	18	ON	RWw	0B	0000
Execute	Same as prev.set	RX	18	ON	RY	18	ON
Execute	Same as prev.set	RX	18	ON	RY	19	ON
Execute	Set new	RX	18	OFF	RY	18	OFF
Execute	Set new	RX	19	ON	RY	19	OFF

(3) Validating the remote device station initial settings

This section explains the link special relays (SB) relating to the initial settings of remote device stations.

Numeric values in parentheses in the Number column indicate addresses and bit positions of the buffer memory.

Example: For buffer memory address 5E0H and bit 13: (5E0H, b13)

Table 10.2 List of link special relays related to remote device station initial settings

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB000D (5E0H, b13)	Remote device station initialization procedure registration instruction	Starts initial processing using the information registered during the initialization procedure registration. While SB000D is on, the refresh of the remote input/output and remote registers stops. OFF: No instruction ON: Instructed	○ *	×	×
SB005E (5E5H, b14)	Execution status of remote device station initialization procedure	Indicates the execution status of the initialization procedure. OFF: Not executed ON: Being executed	○ *	×	×
SB005F (5E0H, b15)	Complete status of remote device station initialization procedure	Indicates completion status of the execution of the initialization procedure execution. OFF: Not complete ON: Complete	○ *	×	×
SW005F (65FH)	Remote device station initialization procedure instruction result	Stores the execution result of initialization procedure registration instruction with SB000D. 0: Normal Other than 0: Store an error code (see Section 13.3).	○ *	×	×

* Parameter setting is required in the case of a standby master station. (First 5 digits of serial No. must be 07112 or later.)

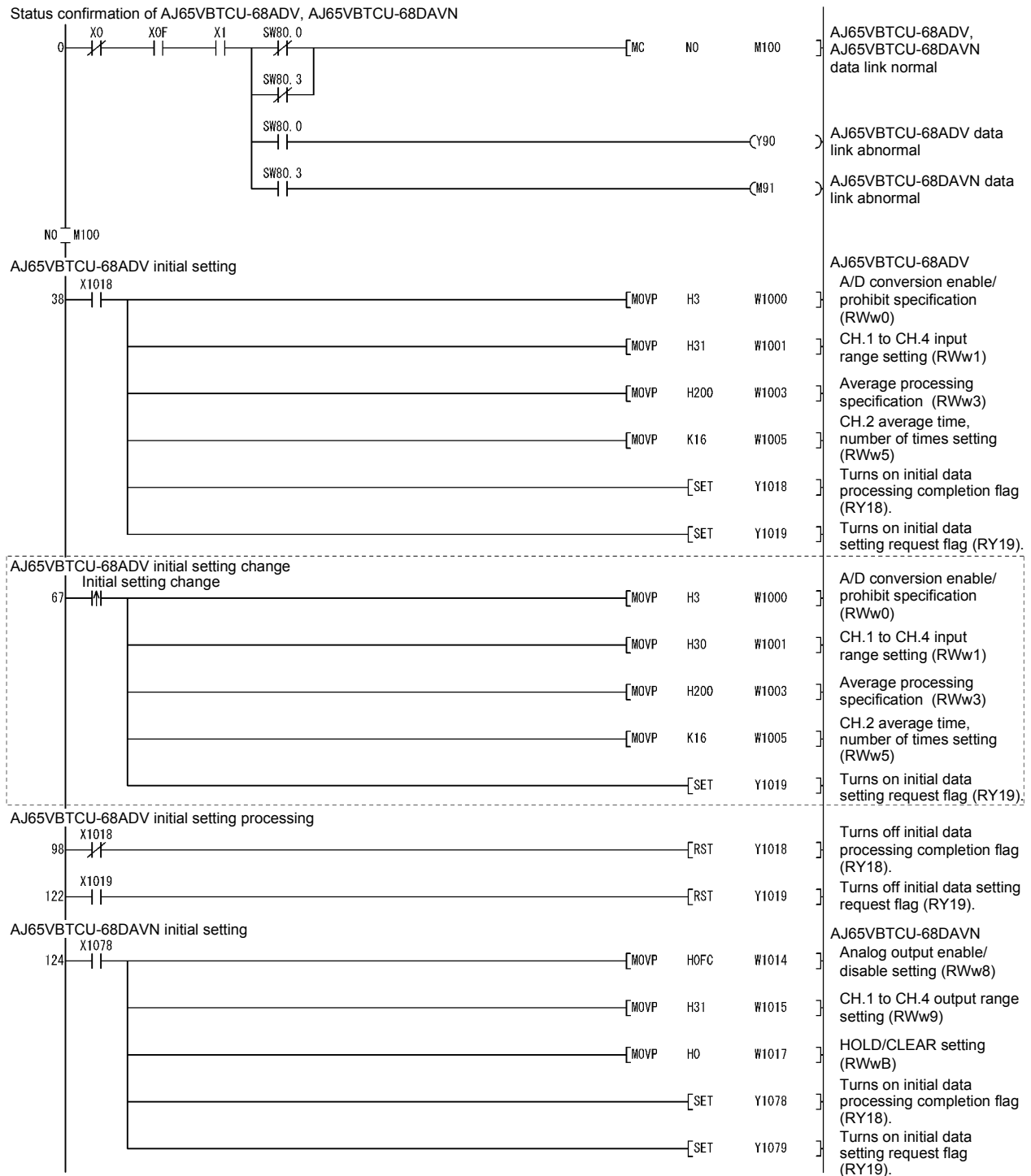
For details on how to create a program, see Section 10.2.4.

POINT
(1) When remote device station initialization procedure registration instruction (SB0000) is turned off after the initial processing completion, all of the RY signals that has been turned on in the initial procedure registration is turned off. Therefore, about signals that are required to turn always on, such as conversion valid signal, they should be turned on in the sequence program. (2) If the procedure registration is not completed for all stations registered to the remote device station initialization procedure registration, the completion status of remote device station initialization procedure (SB005F) does not turn on. If there is a faulty station, turn off the remote device station initialization procedure registration instruction (SB000D) according to the completion status of the other stations.

REMARK

Setting with the sequence program (Reference)

For reference, an example setting performed with the sequence program is shown below.

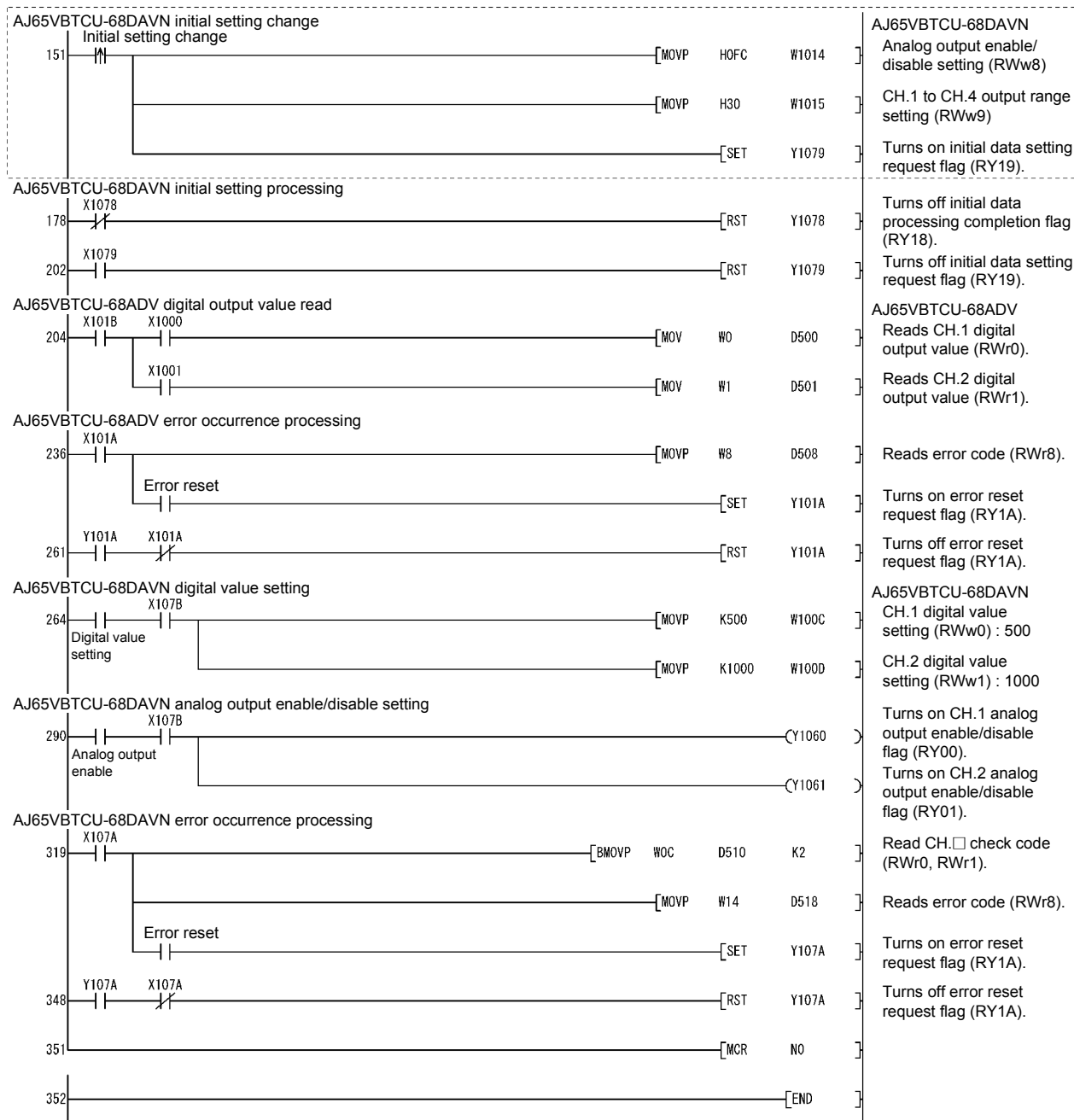


The program enclosed by the dotted line is necessary only when the initial settings are changed.

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REMARK

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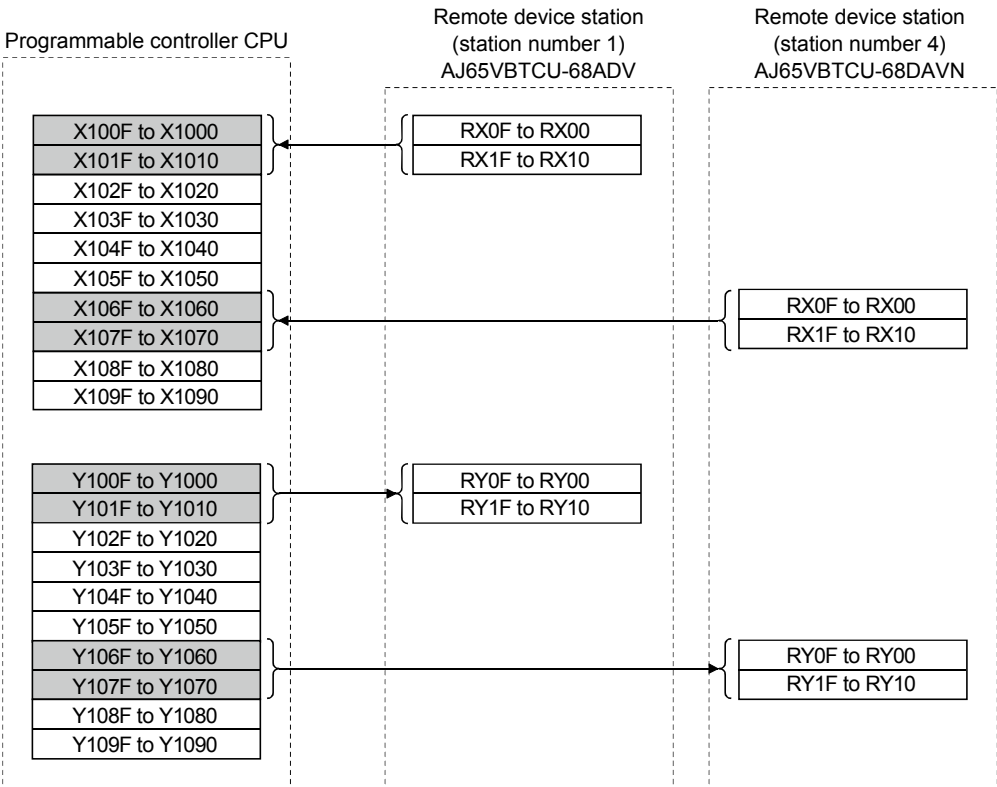


The program enclosed by the dotted line is necessary only when the initial settings are changed.

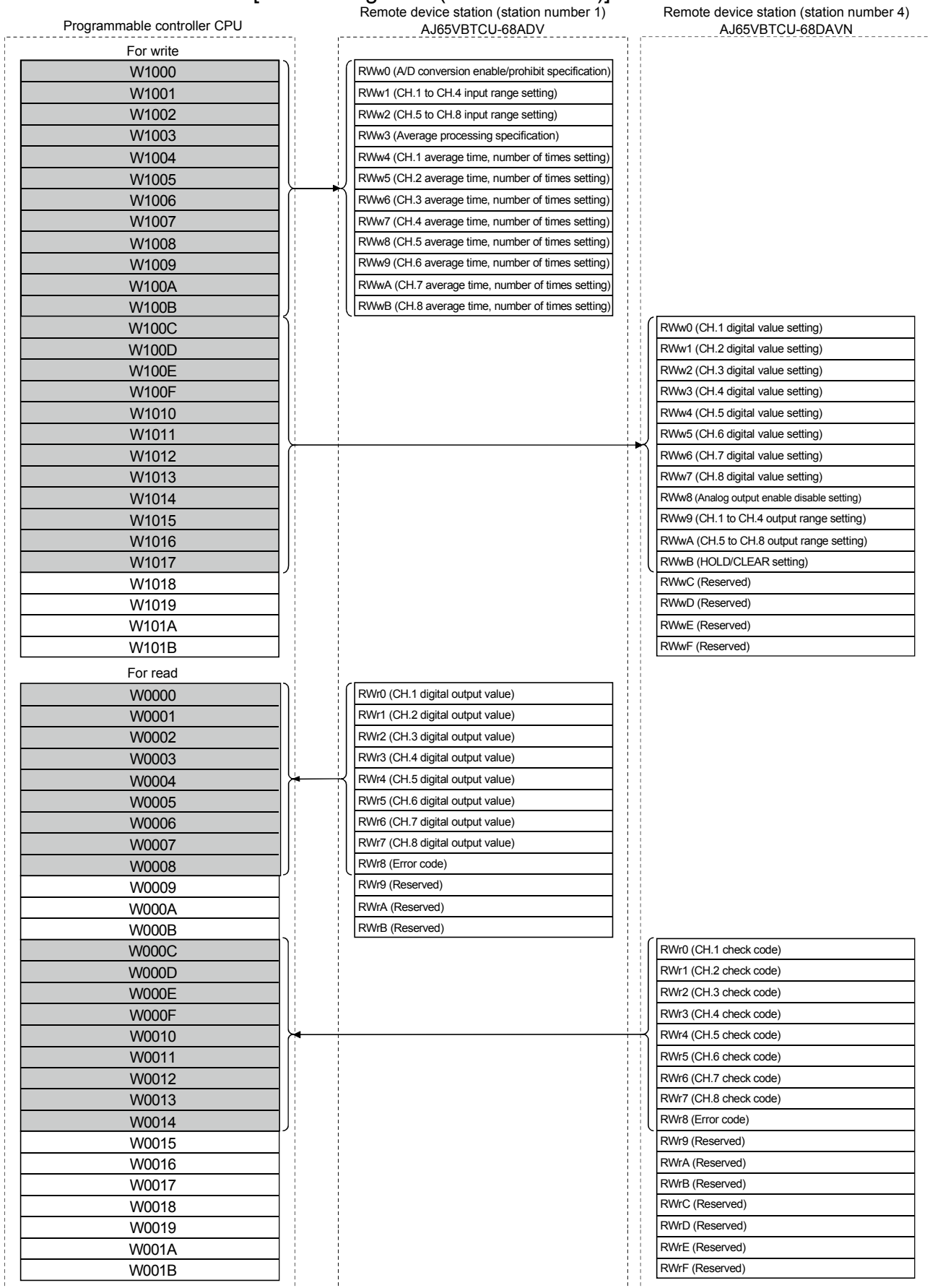
10.2.4 Creating a program

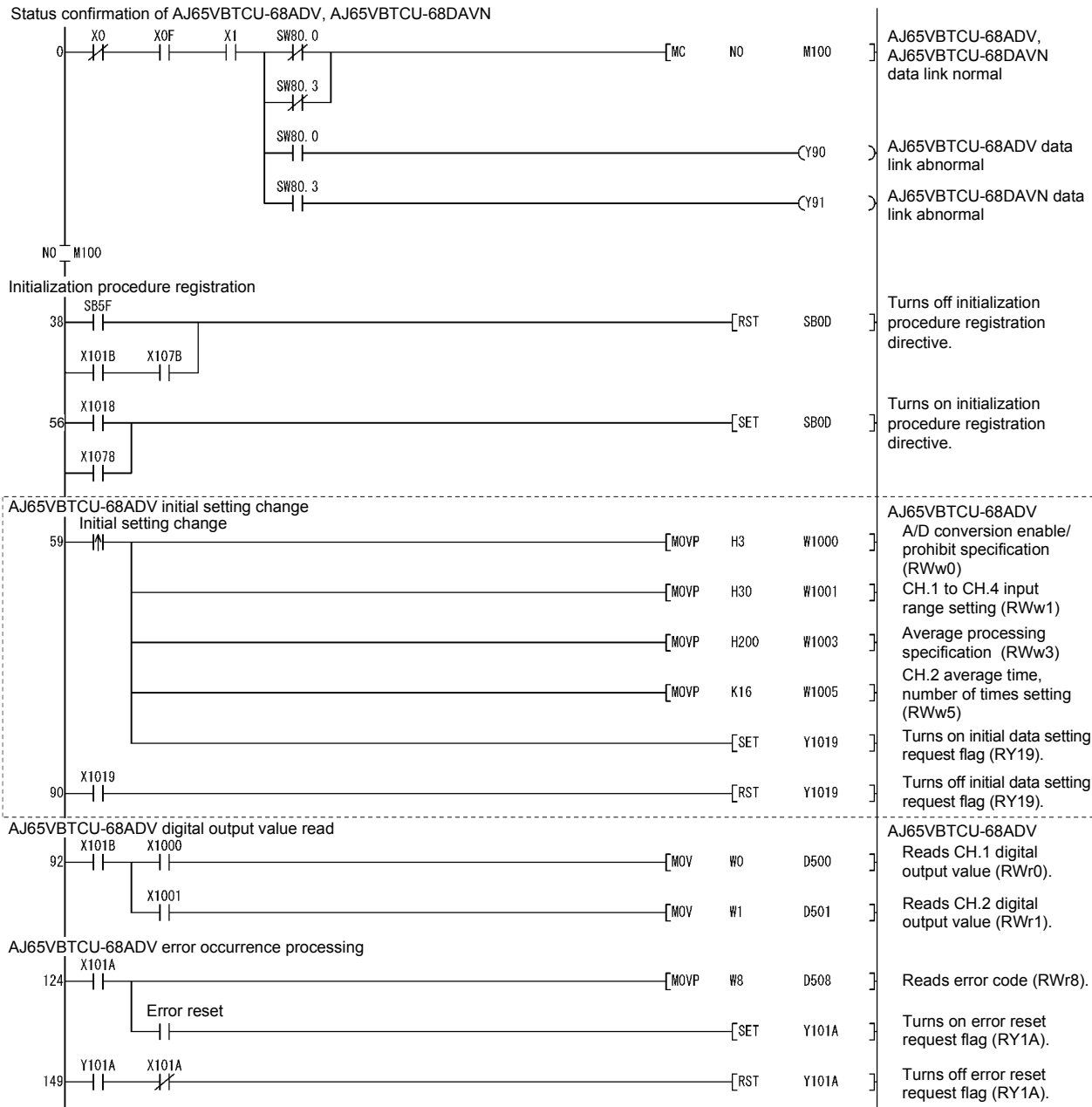
This section shows a program used to control remote device stations.
The following diagrams show the relationships of the remote input/output and remote registers between the programmable controller CPU devices and the remote device station.
The shaded areas indicate the devices that are actually used.
For detailed information about each remote device station, see the User's Manual for each module.

[Remote input (RX) and remote output (RY)]

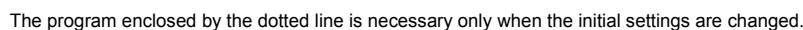


[Remote registers (RWw and RWr)]





MELSEC-Q



10.2.5 Performing the data link

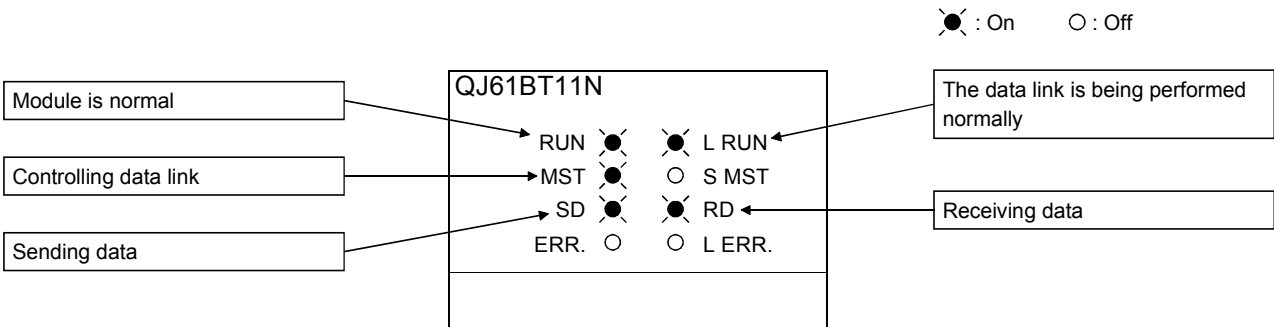
Turn on the power to the remote device station first, and then turn on the power to the master station to start the data link.

(1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote device station when the data link is being performed normally.

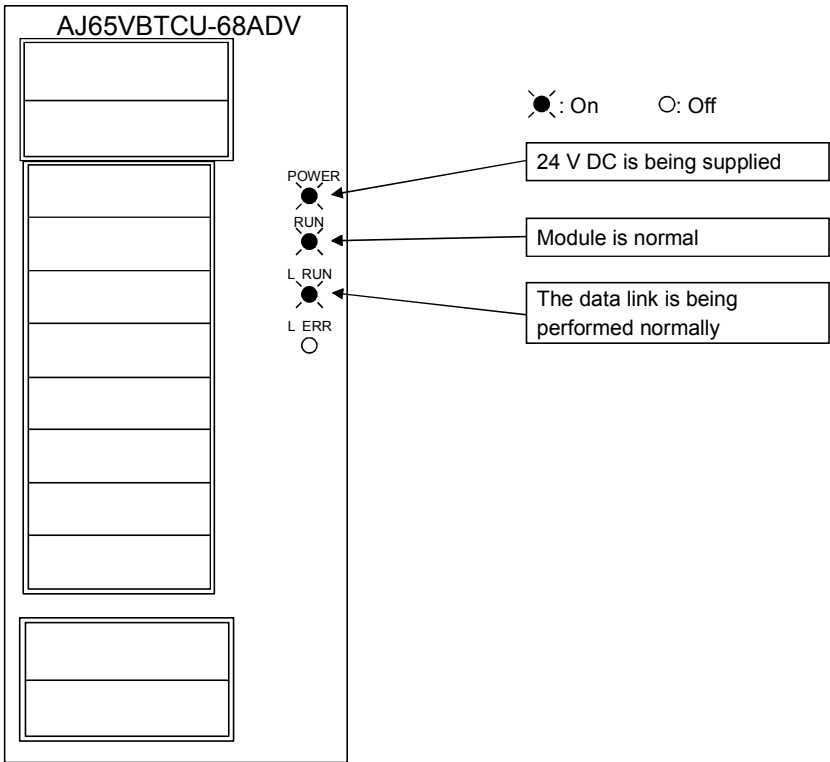
(a) LED display of the master station

Make sure that the LED display shows the following status:



(b) LED display of the remote device station

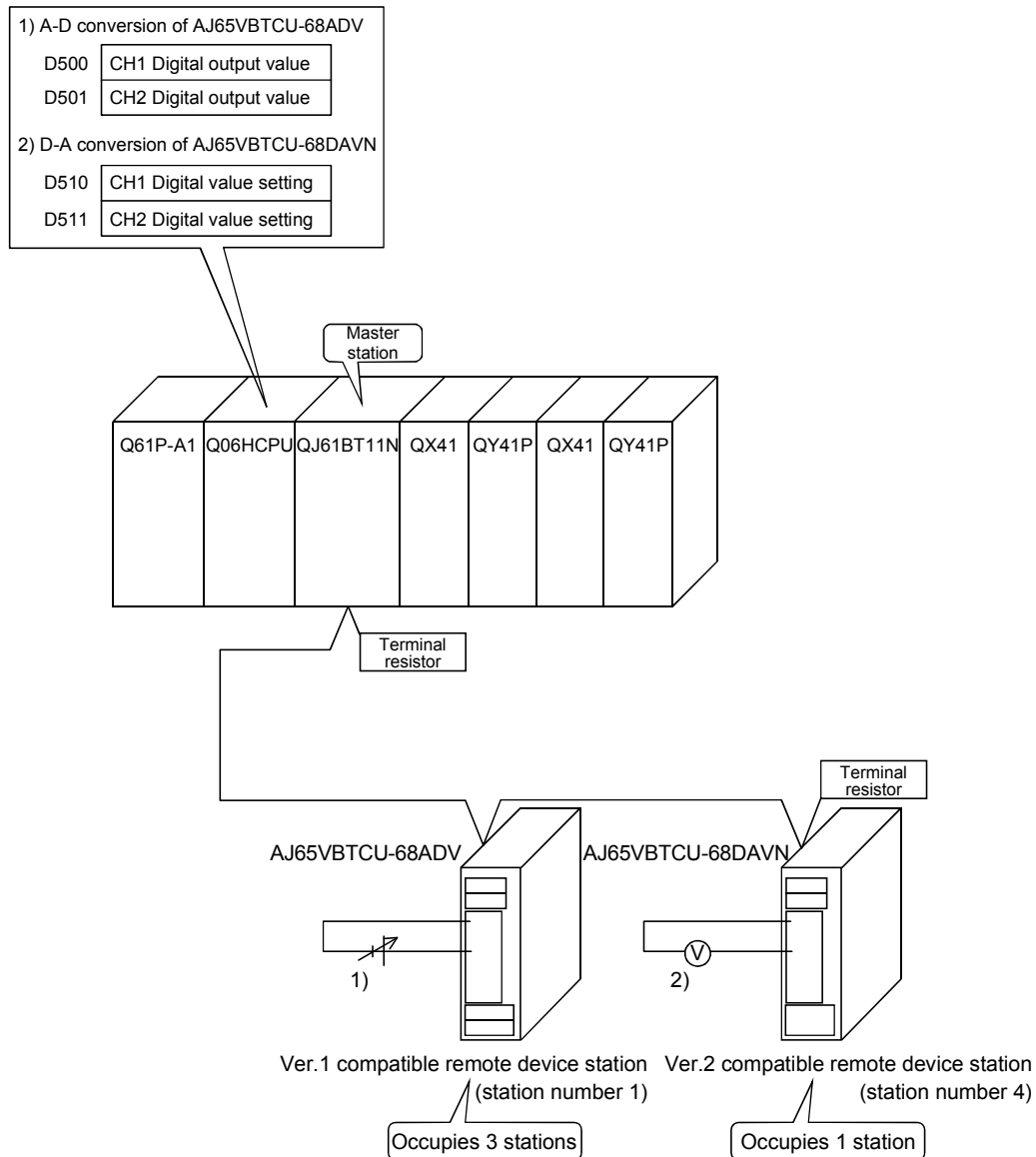
For both the AJ65VBTCU-68ADV and AJ65VBTCU-68DAVN, confirm that the LED display status is as shown below.



(2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

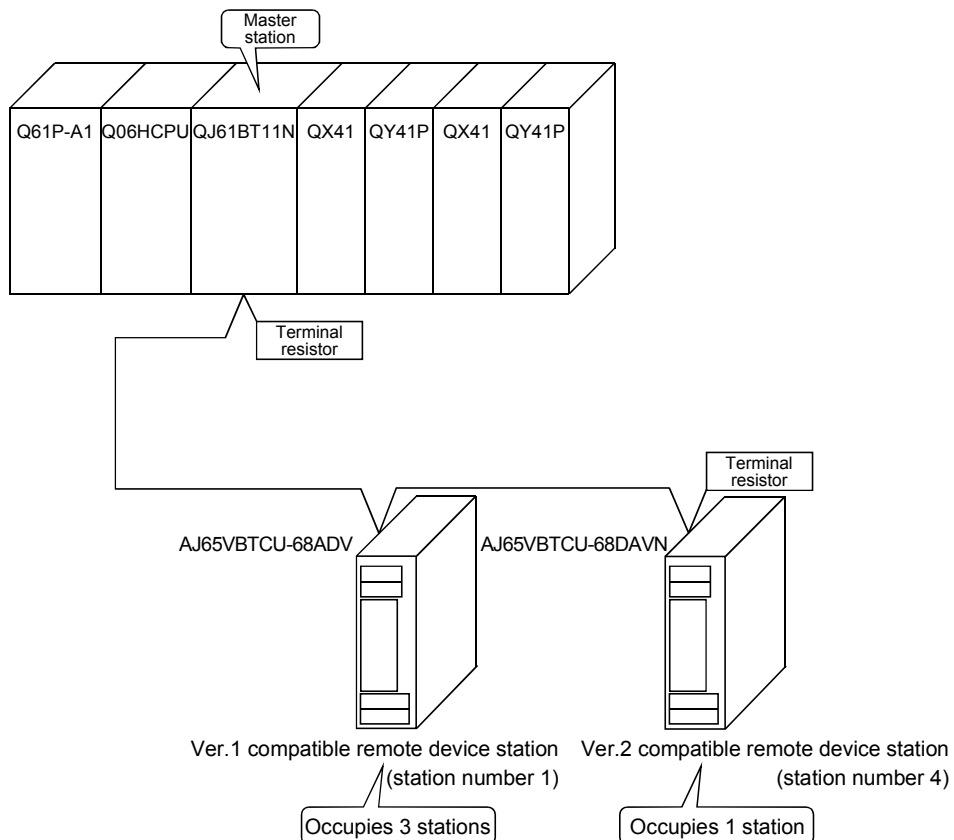
- 1) Change the voltage input to the AJ65VBTCU-68ADV and confirm that the A-D converted digital value also changes.
- 2) Set digital values to the AJ65VBTCU-68DAVN, and confirm that the voltages converted from digital to analog are output.



10.3 When Remote Net Additional Mode is Used

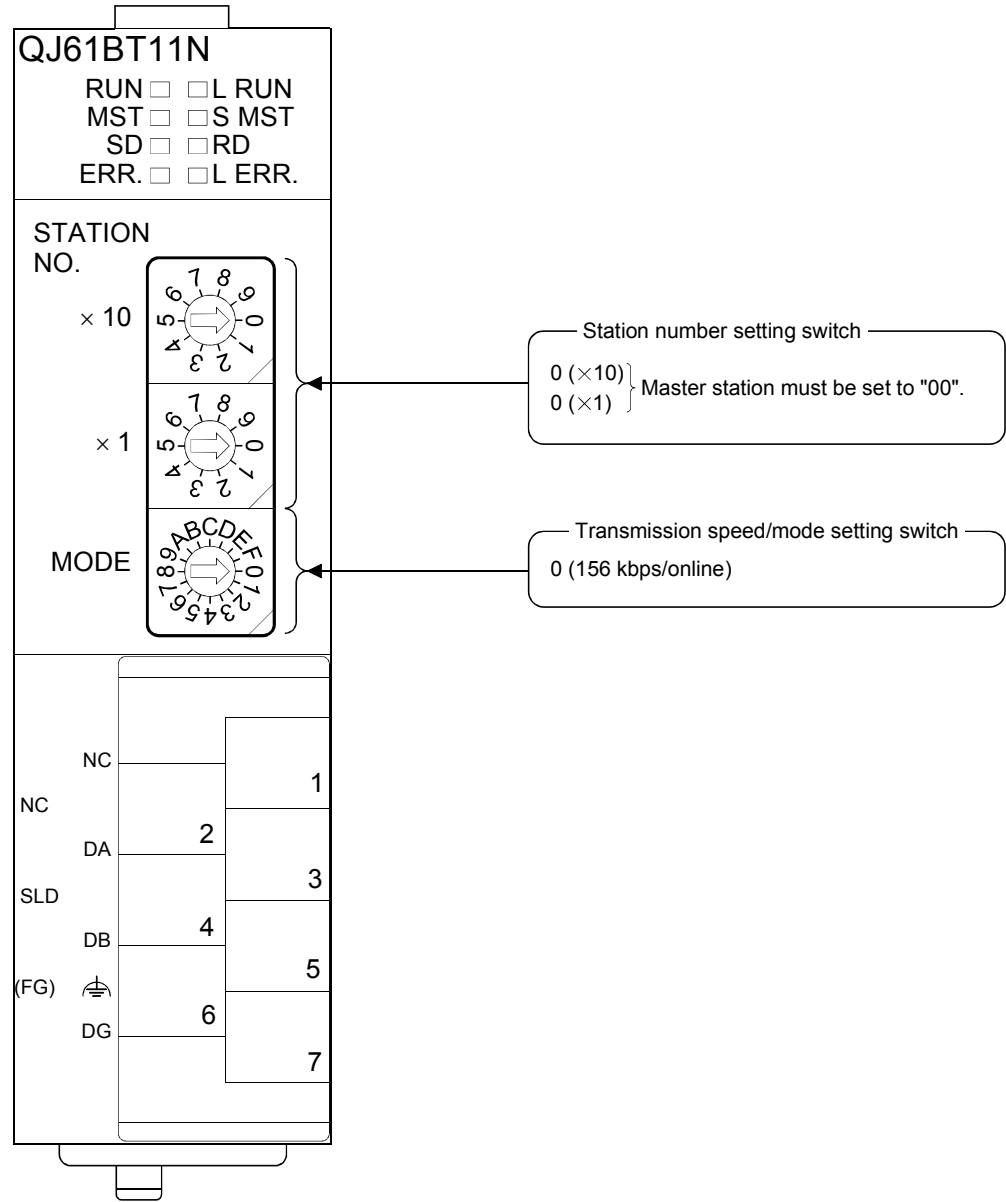
10.3.1 Configuring a system

As shown below, a system where one ver. 1 compatible remote device station and one ver. 2 compatible remote device station are connected is used as an example.



(1) Setting the master station

Settings of the master station switches are shown below:

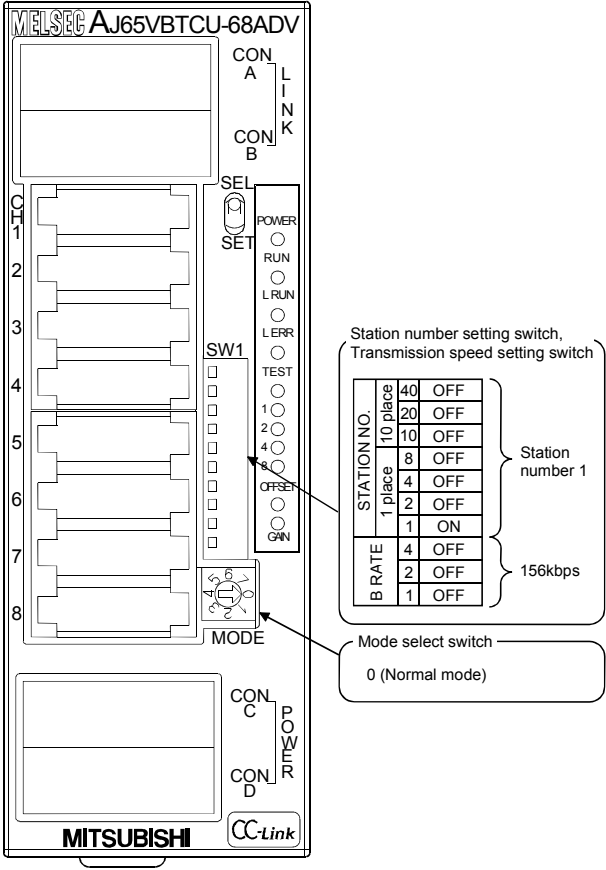


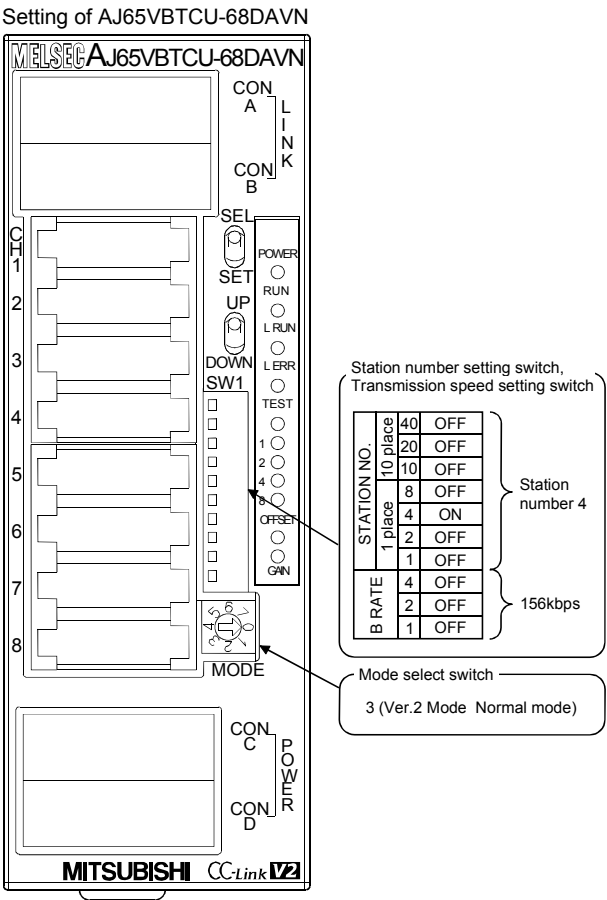
(2) Setting the remote device station

Settings of the remote device station switches are shown below:

For more detailed information about the contents of the settings, see the Remote Device Station User's Manual.

Setting of AJ65VBTCU-68ADV





10.3.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

(1) Setting the network parameters of the master station

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

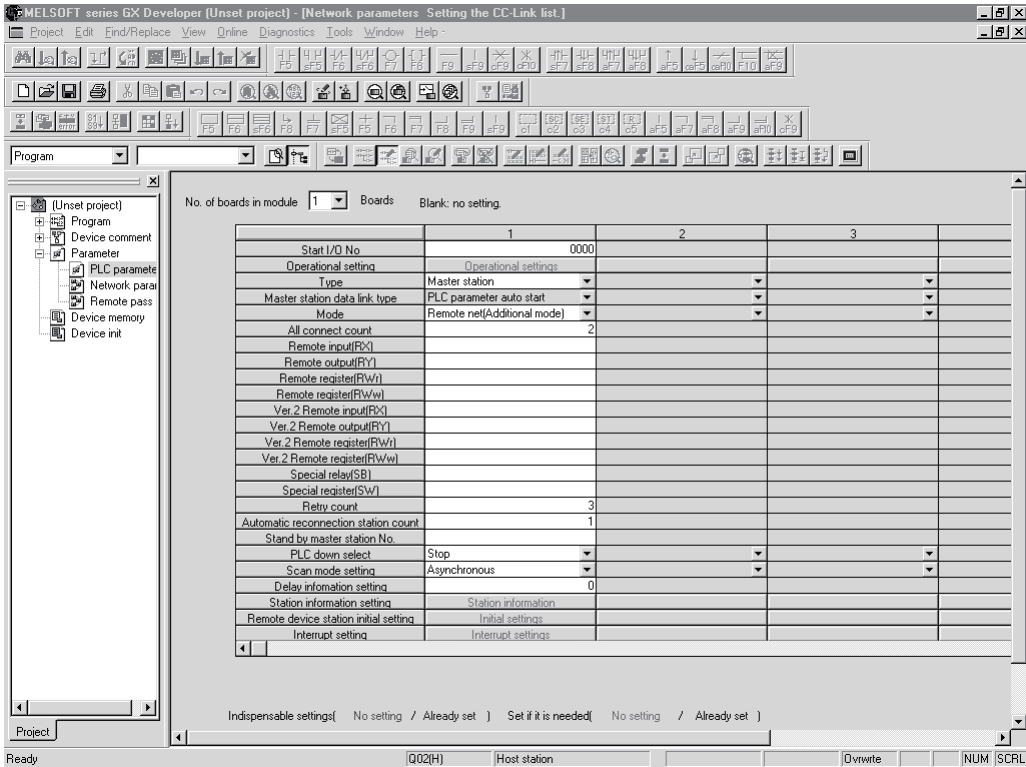
Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	<u>Master station</u> Master station (Duplex function) 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 Off line Default: Remote net (Ver.1 mode)	Remote net (Ver.1 mode) Remote net (Ver.2 mode) <u>Remote net (Additional mode)</u> Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	2 modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	

Item	Setting range	Setting value
Retry count	1 to 7 Default: 3	3 times
Automatic reconnection station count	1 to 10 Default: 1	1 modules
Standby master station No.	Blank, 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 information setting	Set 0.	

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	Ver.1 Remote device station	single	Occupies 3 stations	96 points	No setting			
4	Ver.2 Remote device station	quadruple	Occupies 1 station	64 points	No setting			

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

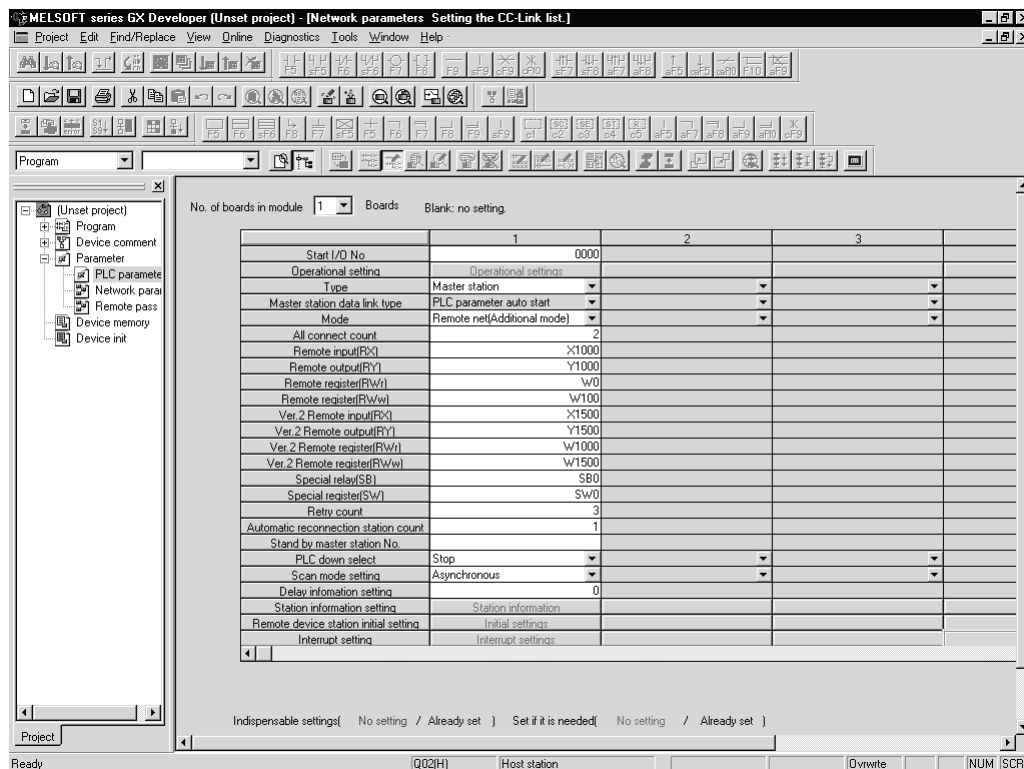
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W100.
- 5) Set the refresh device for ver.2 remote input (RX) to X1500.
- 6) Set the refresh device for ver.2 remote output (RY) to Y1500.
- 7) Set the refresh device for ver.2 remote register (RW_r) to W1000.
- 8) Set the refresh device for ver.2 remote register (RW_w) to W1500.
- 9) Set the refresh device for special relay (SB) to SB0.
- 10) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



10.3.3 Initial setting of the remote device station

This section explains the initial setting of the remote device station.

(1) Setting the target station number

Set the target station for which the initial setting is performed.

(a) Setting the target station number

Set the target station numbers to "1" and "4".

Target station No.	No. of registered procedures		
1	1	0	Regist procedure
2	4	0	Regist procedure
3			Regist procedure
4			Regist procedure
5			Regist procedure
6			Regist procedure
7			Regist procedure
8			Regist procedure
9			Regist procedure
10			Regist procedure
11			Regist procedure
12			Regist procedure
13			Regist procedure
14			Regist procedure
15			Regist procedure
16			Regist procedure

Clear Check End Cancel

(b) Selecting the Regist procedure

Click the "Regist procedure" of the target station number "1".

(2) Setting the regist procedure registration

Set the conditions and details of the remote device station settings.

In this section, AJ65VBTCU-68ADV is used as an example for the Regist procedure registration.

The details to be set are as follows:

- Set channels 1, 2 to A-D conversion enable (the first condition).
- Set the Input range of channel 1 to 0 - 5V, and channel 2 to User range setting 1 (the second condition).
- Set channel 1 to Sampling processing, and specify channel 2 as Average processing and set it to Number of times (the third condition).
- Set channel 2 Average number of times to 16 times (the forth condition).
- Turn the Initial data processing completed flag to ON (the fifth condition).
- Turn the Initial data setting request flag to ON (the sixth condition).
- Turn the Initial data processing completed flag to OFF (the seventh condition).
- Turn the Initial data setting request flag to OFF (the eighth condition).

For more detailed information about the settings, see the Remote Device Station User's Manual.

Set the input format to "HEX.".

(a) Setting the first condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

- 3) Executorial condition settings
Set the "Condition Device" to "RX", the "Device Number" to "18", and the "Execute Condition" to "ON".
 - 4) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "00", and the "Write Data" to "0003".
- (b) Setting the second condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "01", and the "Write Data" to "0031".
- (c) Setting the third condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "03", and the "Write Data" to "0200".
- (d) Setting the fourth condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RWw", the "Device Number" to "05", and the "Write Data" to "0010".
- (e) Setting the fifth condition
- 1) Execute Flag setting
Set the "Execute Flag" to "Execute".
 - 2) Operational condition setting
Set the "Operational condition" to "Same as prev. set".
 - 3) Details of execution setting
Set the "Write Device" to "RY", the "Device Number" to "18", and the "Write Data" to "ON".

(f) Setting the sixth condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Same as prev. set".

3) Details of execution setting

Set "Write Device" to "RY", the "Device Number" to "19", and the
"Write Data" to "ON".

(g) Setting the seventh condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings

Set the "Condition Device" to "RX", the "Device Number" to "18", and
the "Execute Condition" to "OFF".

4) Details of execution setting

Set the "Write Device" to "RY", the "Device Number" to "18", and the
"Write Data" to "OFF".

(h) Setting the eighth condition

1) Execute Flag setting

Set the "Execute Flag" to "Execute".

2) Operational condition setting

Set the "Operational condition" to "Set new".

3) Executional condition settings

Set the "Condition Device" to "RX", the "Device Number" to "19", and
the "Execute Condition" to "ON".

4) Details of execution setting

Set the "Write Device" to "RY", the "Device Number" to "19", and the
"Write Data" to "OFF".

(i) Setting results

The results of settings (a) to (h) are shown below.

Remote device station initial setting: Procedure registration module 1: Target station 1

Input format:

Execute Flag	Operational condition	Executional condition			Details of execution		
		Condition Device	Device Number	Execute Condition	Write Device	Device Number	Write Data
Execute	Set new	RX	18	ON	RWw	00	0003
Execute	Same as prev.set	RX	18	ON	RWw	01	0031
Execute	Same as prev.set	RX	18	ON	RWw	03	0200
Execute	Same as prev.set	RX	18	ON	RWw	05	0010
Execute	Same as prev.set	RX	18	ON	RY	18	ON
Execute	Same as prev.set	RX	18	ON	RY	19	ON
Execute	Set new	RX	18	OFF	RY	18	OFF
Execute	Set new	RX	19	ON	RY	19	OFF

Similarly, make the procedure registration of the AJ65VBTCU-68DAVN. Click the "Register procedure" of the target station number "4".

The details to be set are as follows:

- Set channels 1, 2 to Analog output enable. (the first condition)
- Set the Output range of channel 1 to 0 - 5V, and channel 2 to User range setting 1. (the second condition)
- Set the HOLD/CLEAR setting of channels 1, 2 to CLEAR. (the third condition)
- Turn the Initial data processing completed flag to ON (the forth condition).
- Turn the Initial data setting request flag to ON (the fifth condition).
- Turn the Initial data processing completed flag to OFF (the sixth condition).
- Turn the Initial data setting request flag to OFF (the seventh condition).

Remote device station initial setting: Procedure registration module 1: Target station 4

Input format:

Execute Flag	Operational condition	Executional condition			Details of execution		
		Condition Device	Device Number	Execute Condition	Write Device	Device Number	Write Data
Execute	Set new	RX	18	ON	RWw	08	00FC
Execute	Same as prev.set	RX	18	ON	RWw	09	0031
Execute	Same as prev.set	RX	18	ON	RWw	0B	0000
Execute	Same as prev.set	RX	18	ON	RY	18	ON
Execute	Same as prev.set	RX	18	ON	RY	19	ON
Execute	Set new	RX	18	OFF	RY	18	OFF
Execute	Set new	RX	19	ON	RY	19	OFF

(3) Validating the remote device station initial settings

This section explains the link special relays (SB) relating to the initial settings of remote device stations.

Numeric values in parentheses in the Number column indicate addresses and bit positions of the buffer memory.

Example: For buffer memory address 5E0H and bit 13: (5E0H, b13)

Table 10.3 List of link special relays related to remote device station initial settings

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB000D (5E0H, b13)	Remote device station initialization procedure registration instruction	Starts initial processing using the information registered during the initialization procedure registration. While SB000D is on, the refresh of the remote input/output and remote registers stops. OFF: No instruction ON: Instructed	○ *	×	×
SB005E (5E5H, b14)	Execution status of remote device station initialization procedure	Indicates the execution status of the initialization procedure. OFF: Not executed ON: Being executed	○ *	×	×
SB005F (5E0H, b15)	Complete status of remote device station initialization procedure	Indicates completion status of the execution of the initialization procedure execution. OFF: Not complete ON: Complete	○ *	×	×
SW005F (65FH)	Remote device station initialization procedure instruction result	Stores the execution result of initialization procedure registration instruction with SB000D. 0: Normal Other than 0: Store an the error code (see Section 13.3).	○ *	×	×

* Parameter setting is required in the case of a standby master station. (First 5 digits of serial No. must be 07112 or later.)

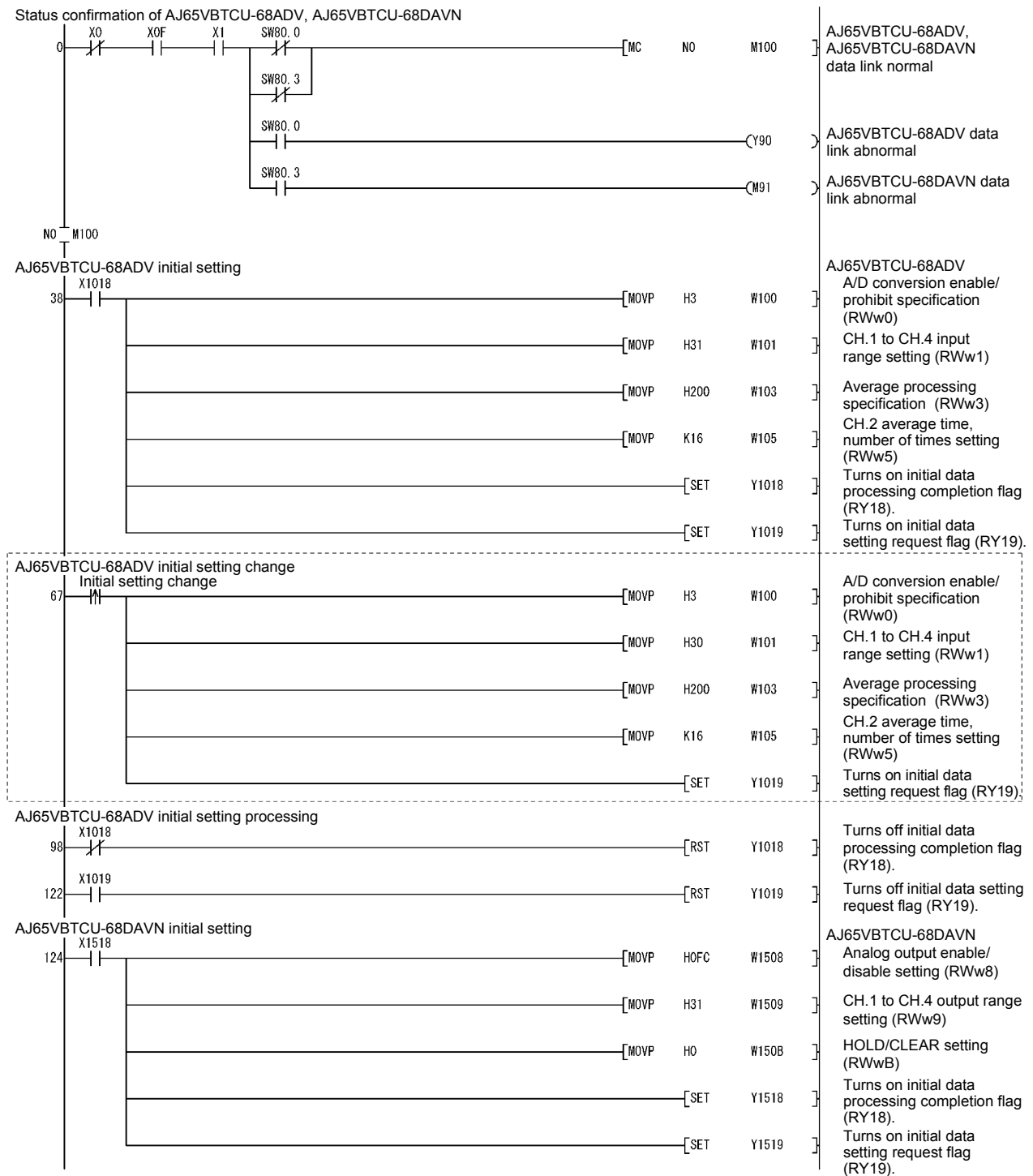
For details on how to create a program, see Section 10.3.4.

POINT
(1) When remote device station initialization procedure registration instruction (SB0000) is turned off after the initial processing completion, all of the RY signals that has been turned on in the initial procedure registration is turned off. Therefore, about signals that are required to turn always on, such as conversion valid signal, they should be turned on in the sequence program. (2) If the procedure registration is not completed for all stations registered to the remote device station initialization procedure registration, the completion status of remote device station initialization procedure (SB005F) does not turn on. If there is a faulty station, turn off the remote device station initialization procedure registration instruction (SB000D) according to the completion status of the other stations.

REMARK

Setting with the sequence program (Reference)

For reference, an example setting performed with the sequence program is shown below.

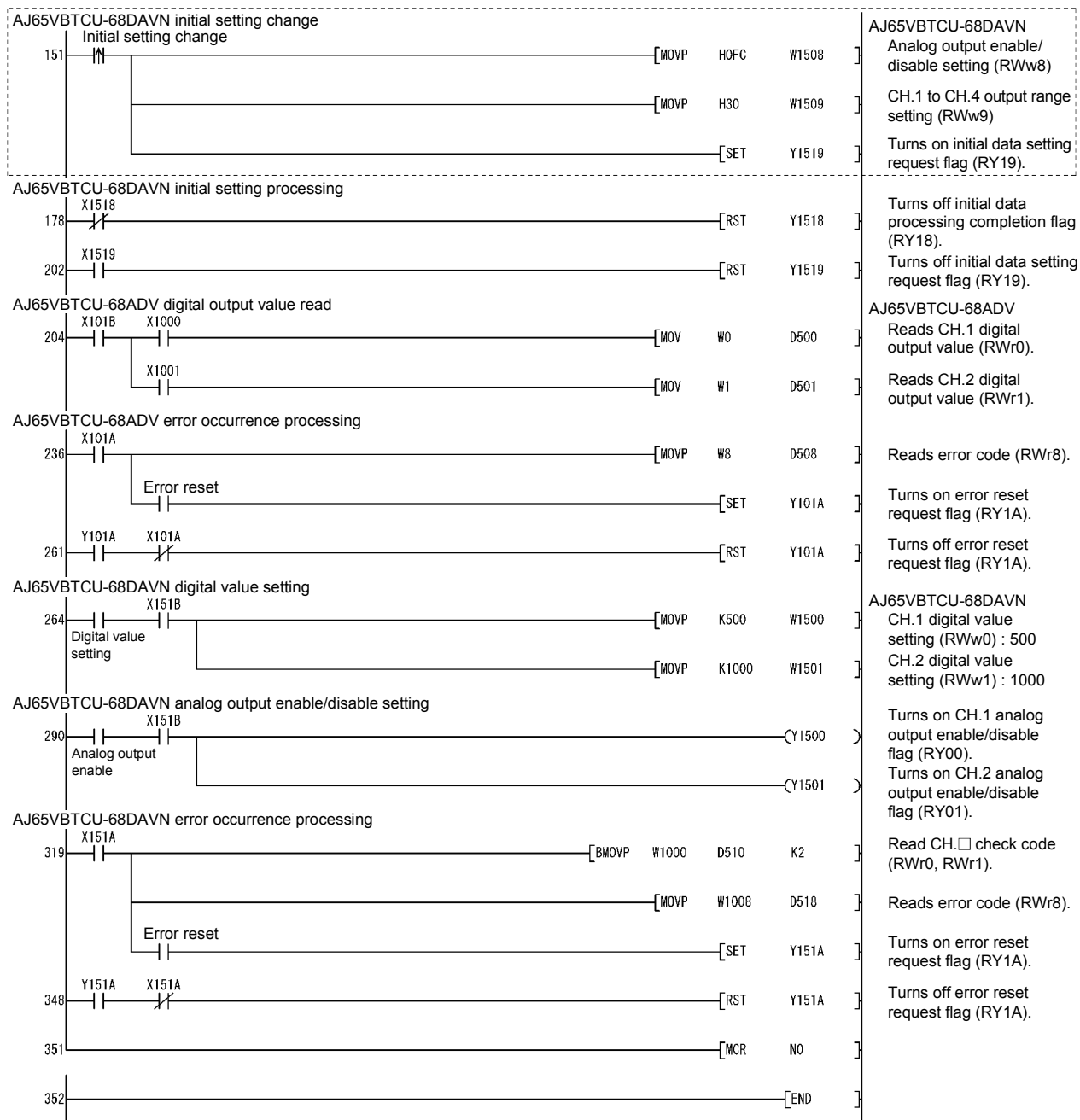


The program enclosed by the dotted line is necessary only when the initial settings are changed.

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REMARK

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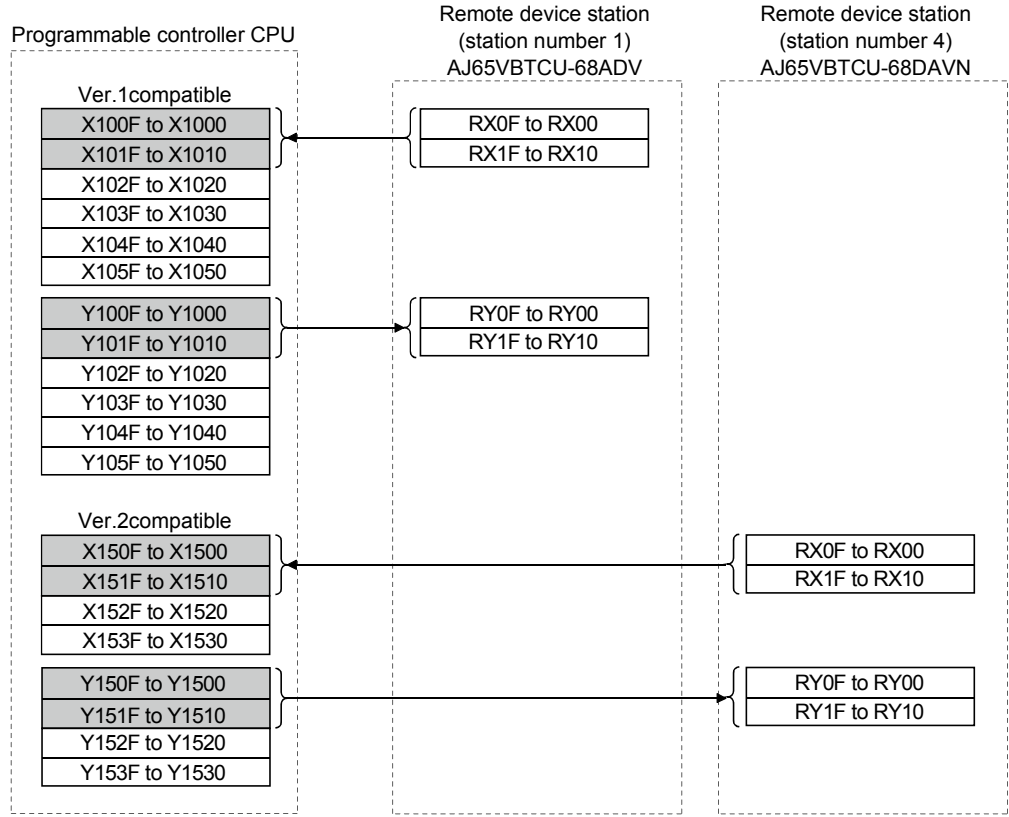


The program enclosed by the dotted line is necessary only when the initial settings are changed.

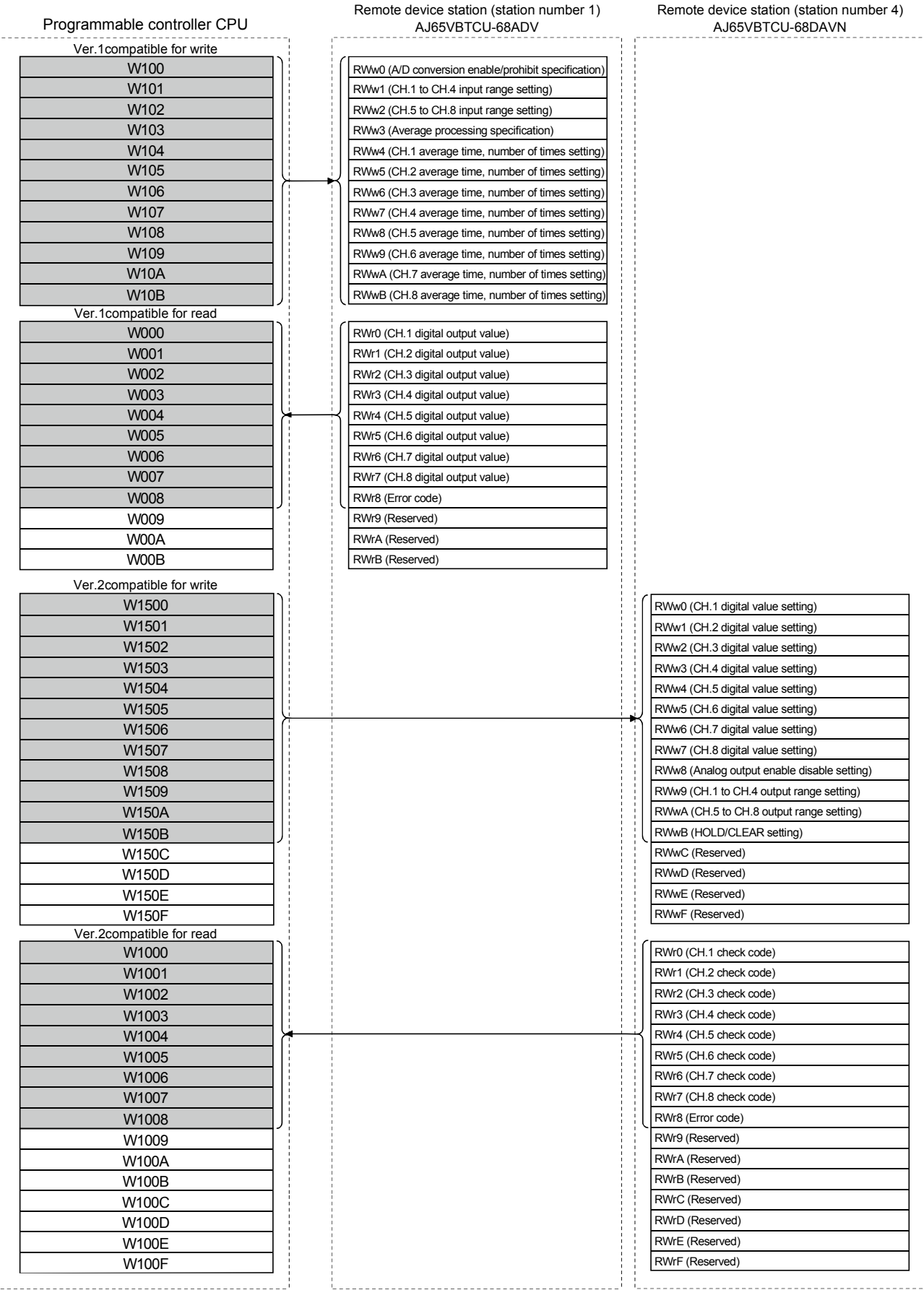
10.3.4 Creating a program

This section shows a program used to control remote device stations.
The following diagrams show the relationships of the remote input/output and remote registers between the programmable controller CPU devices and the remote device station.
The shaded areas indicate the devices that are actually used.
For detailed information about each remote device station, see the User's Manual for each module.

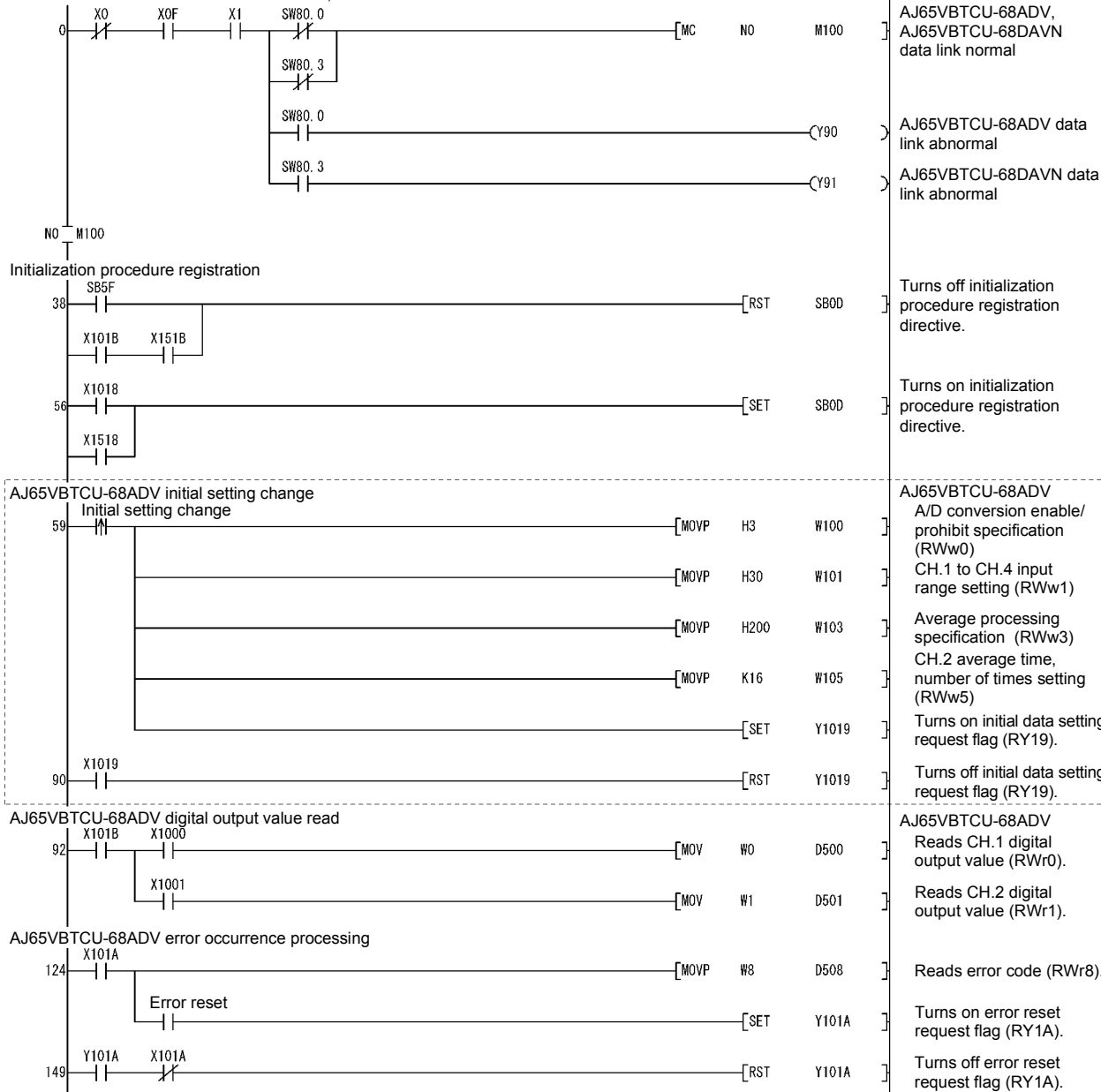
[Remote input (RX) and remote output (RY)]



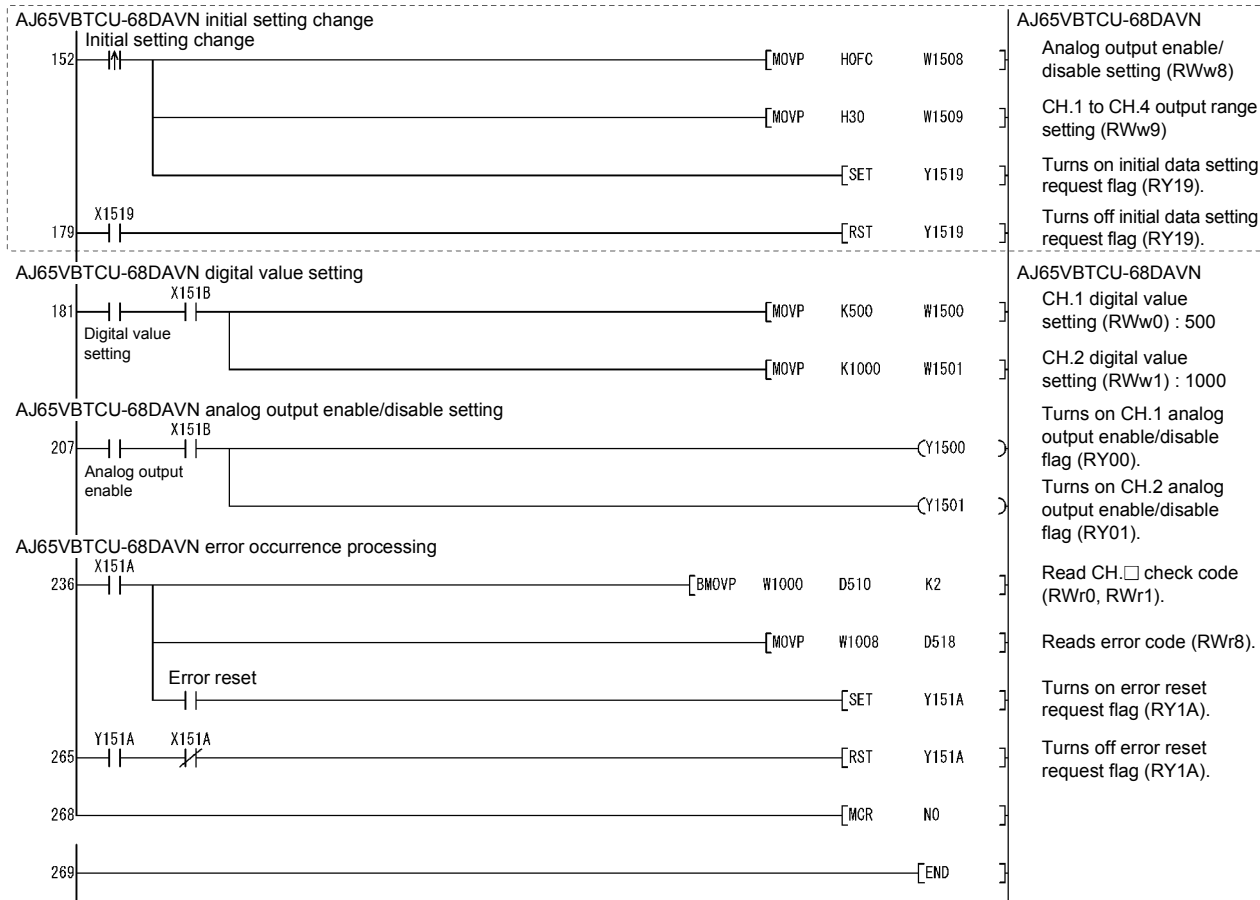
[Remote registers (RWw and RWr)]



Status confirmation of AJ65VBTCU-68ADV, AJ65VBTCU-68DAVN



The program enclosed by the dotted line is necessary only when the initial settings are changed.



The program enclosed by the dotted line is necessary only when the initial settings are changed.

10.3.5 Performing the data link

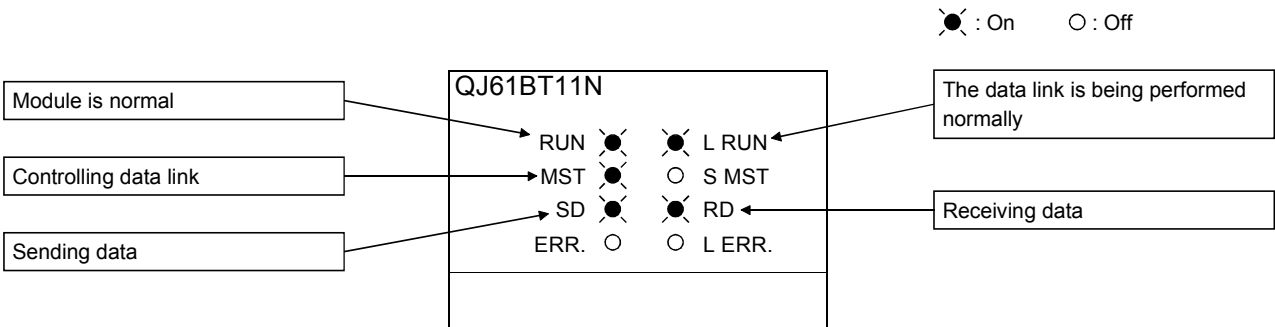
Turn on the power to the remote device station first, and then turn on the power to the master station to start the data link.

(1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the remote device station when the data link is being performed normally.

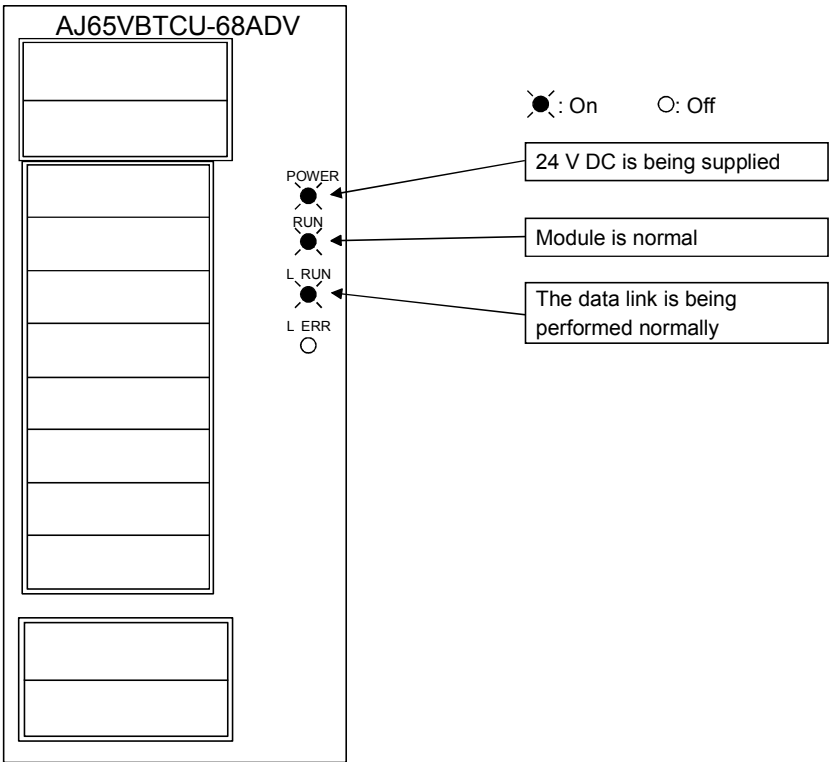
(a) LED display of the master station

Make sure that the LED display shows the following status:



(b) LED display of the remote device station

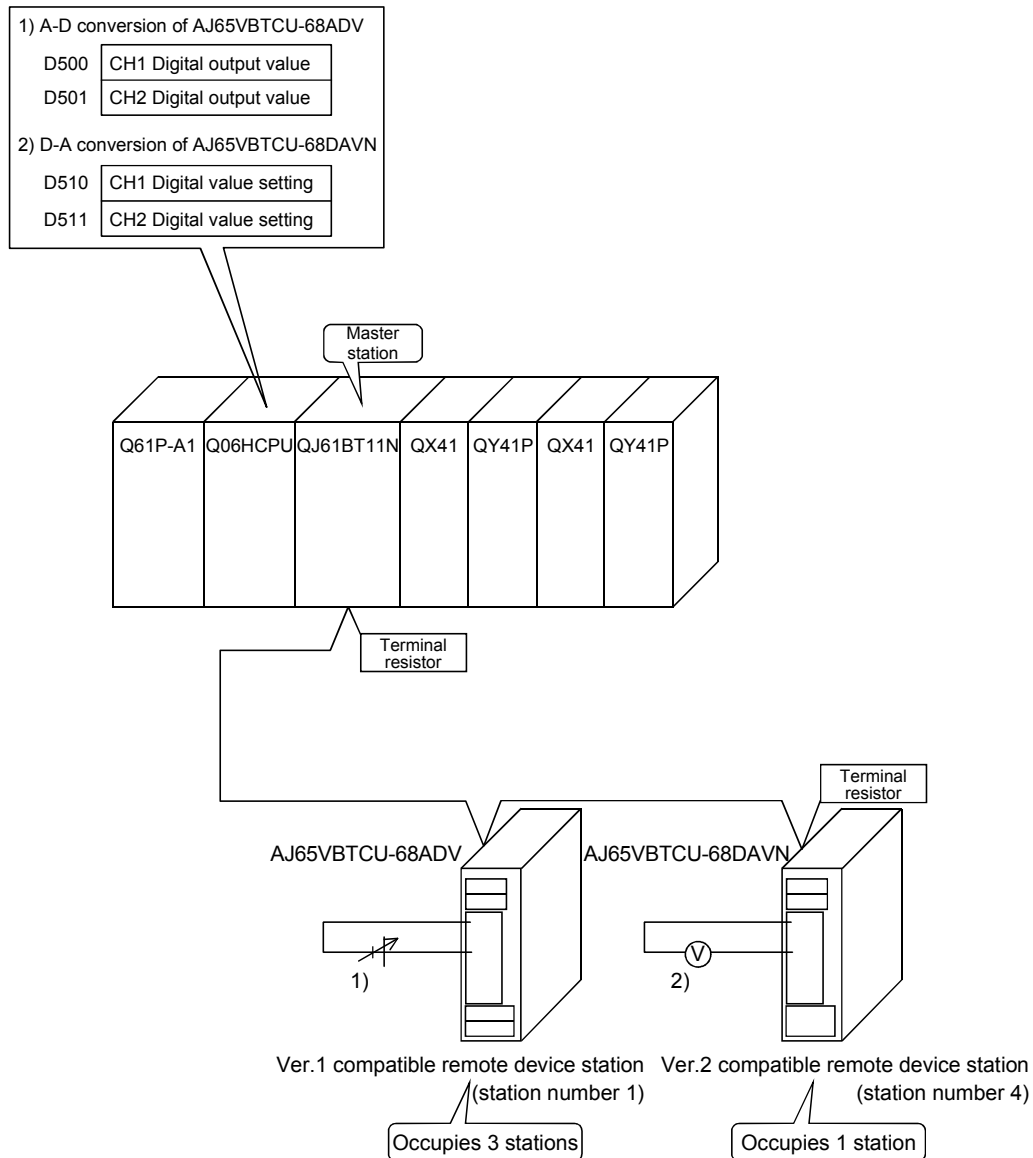
For both the AJ65VBTCU-68ADV and AJ65VBTCU-68DAVN, confirm that the LED display status is as shown below.



(2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

- 1) Change the voltage input to the AJ65VBTCU-68ADV and confirm that the A-D converted digital value also changes.
- 2) Set digital values to the AJ65VBTCU-68DAVN, and confirm that the voltages converted from digital to analog are output.



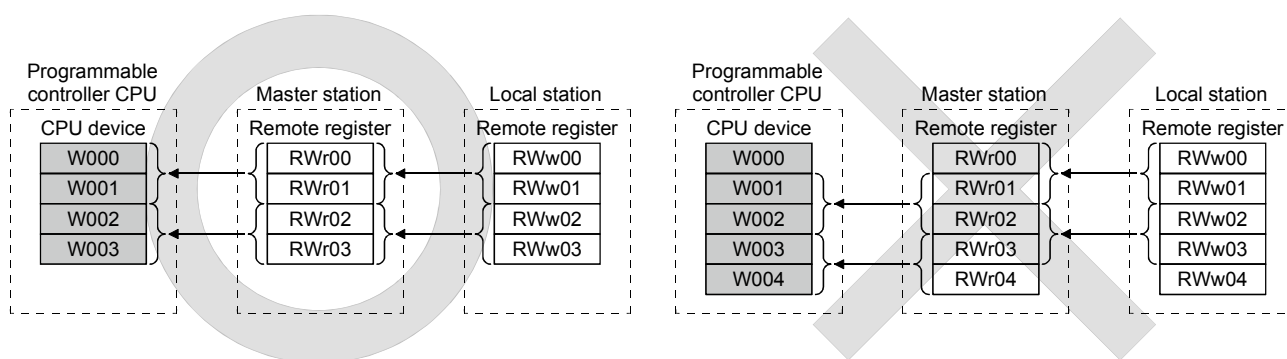
11 COMMUNICATION BETWEEN THE MASTER STATION AND LOCAL STATIONS

This chapter explains the procedures from module settings to parameter settings, programming, and finally operation check using a system configuration example.

11.1 Secured 32-bit Data

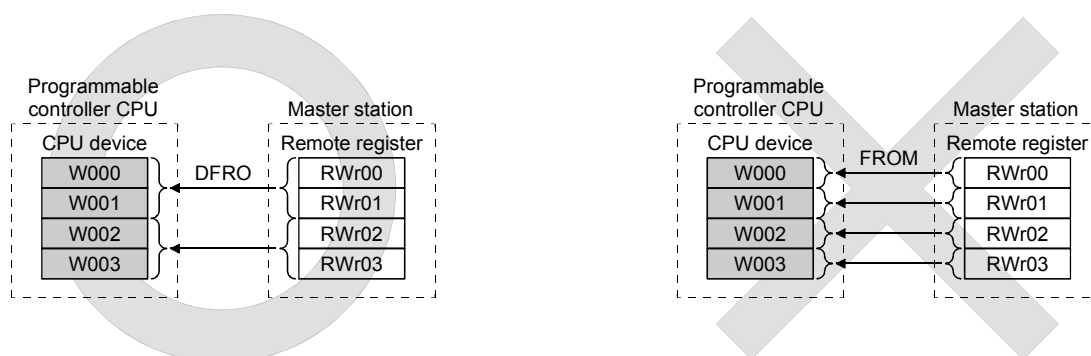
When the following conditions, 1) and 2) are satisfied in the CC-Link network, 32-bit data in remote registers (RWr/RWw) between a programmable controller CPU and a master/local station can be secured.

1) Access starts from a remote register (RWr/RWw) address of an "even number".



* Because the start address on the remote register side is an "odd address", new and old data may be mixed in 16-bit (1-word) units.

2) Access by the sequence program must be made in units of even points.



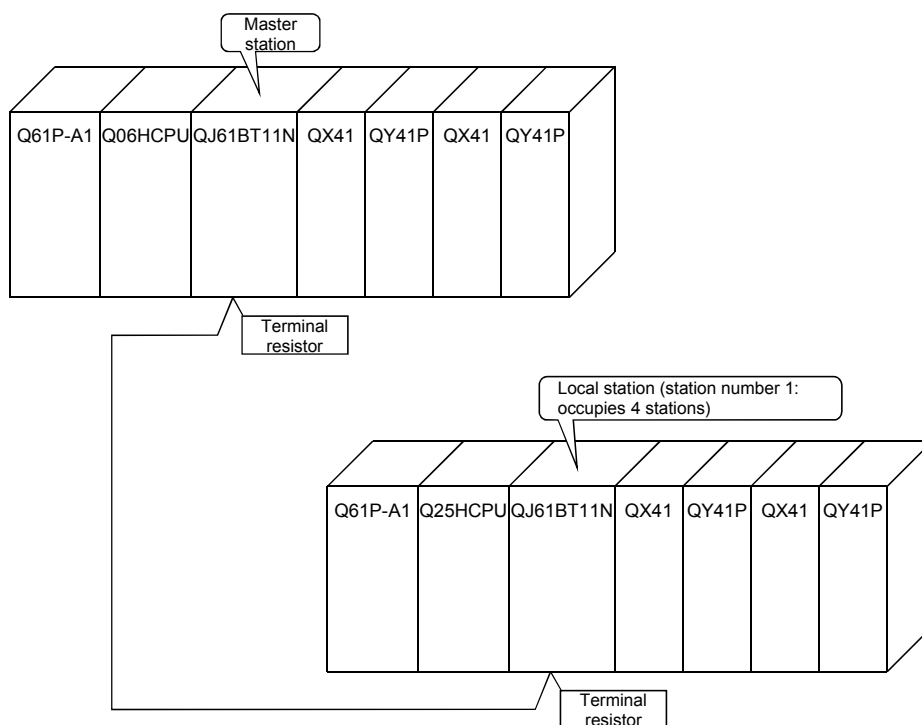
* Because the access is made for each single point (1-word), new and old data may be mixed in 16-bit (1-word) units.

11.2 When Remote Net Ver.1 Mode is Used

11

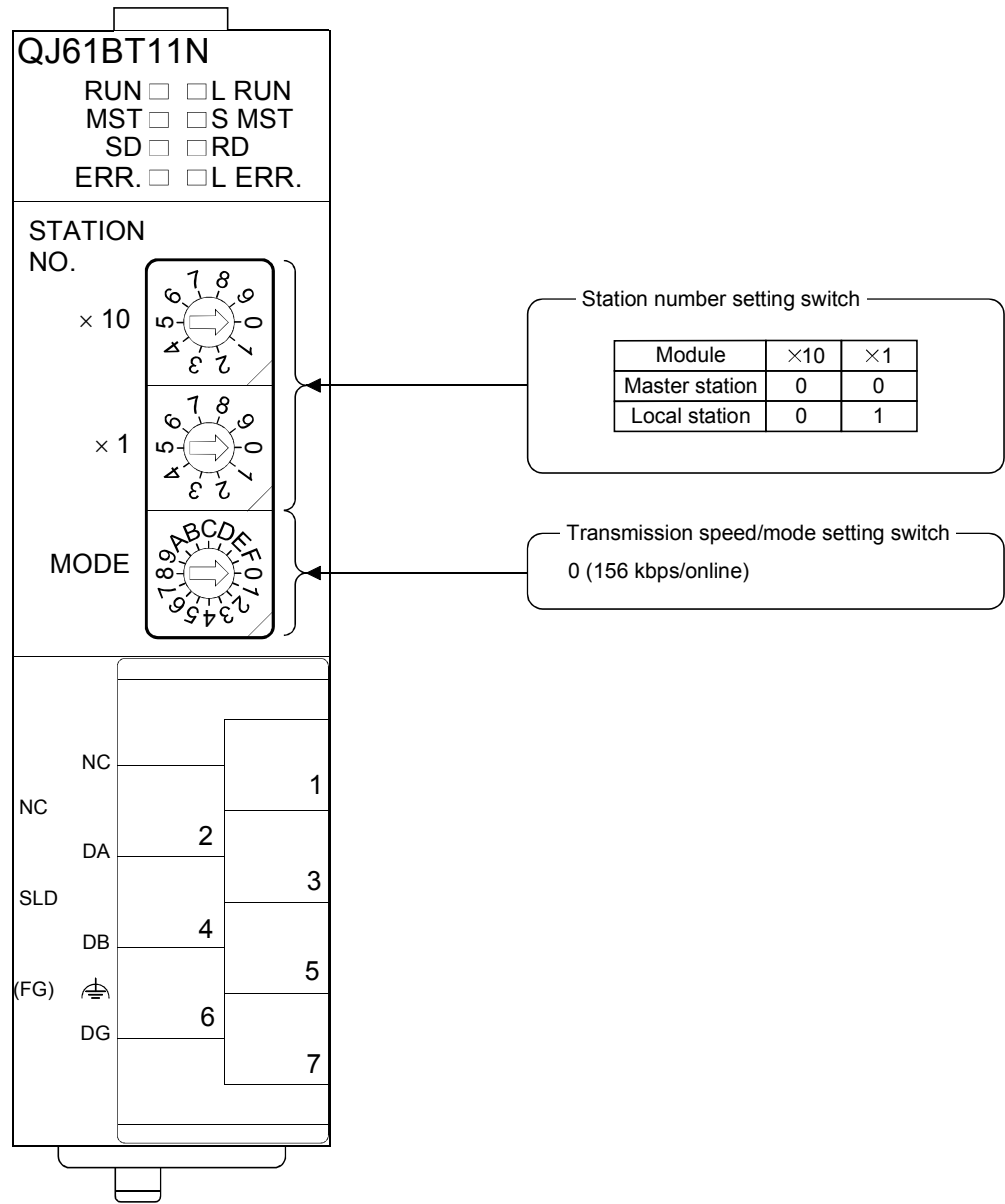
11.2.1 Configuring a system

As shown below, a system with one connected local station is used as an example.



(1) Setting the master and local stations

Settings of the master station switches are shown below:



11.2.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

(1) Setting the network parameters of the master station

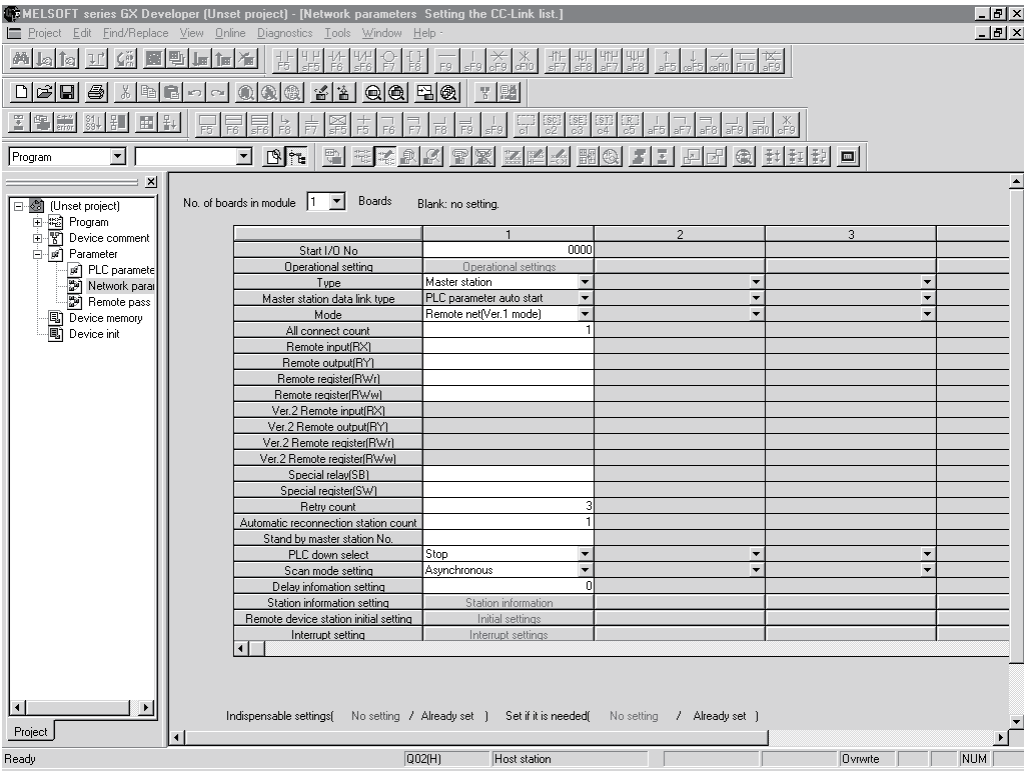
(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Block guarantee of cyclic data per station function setting	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	<u>Master station</u> Master station (Duplex function) 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 Off line Default: Remote net (Ver.1 mode)	<u>Remote net (Ver.1 mode)</u> Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	1 modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	3 times
Automatic reconnection station count		1 to 10 Default: 1	1 modules
Standby master station No.		Blank, 1 to 64 (Blank: No standby master station specified) Default: Blank	
PLC down select		Stop/continue Default: Stop	<u>Stop</u> /continue
Scan mode setting		Asynchronous/synchronous Default: Asynchronous	<u>Asynchronous</u> /synchronous
Delay information setting		Set 0.	

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	Intelligent device station	single	Occupies 4 stations	128 points	No setting	64	64	128

(b) Example of network parameter settings
An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

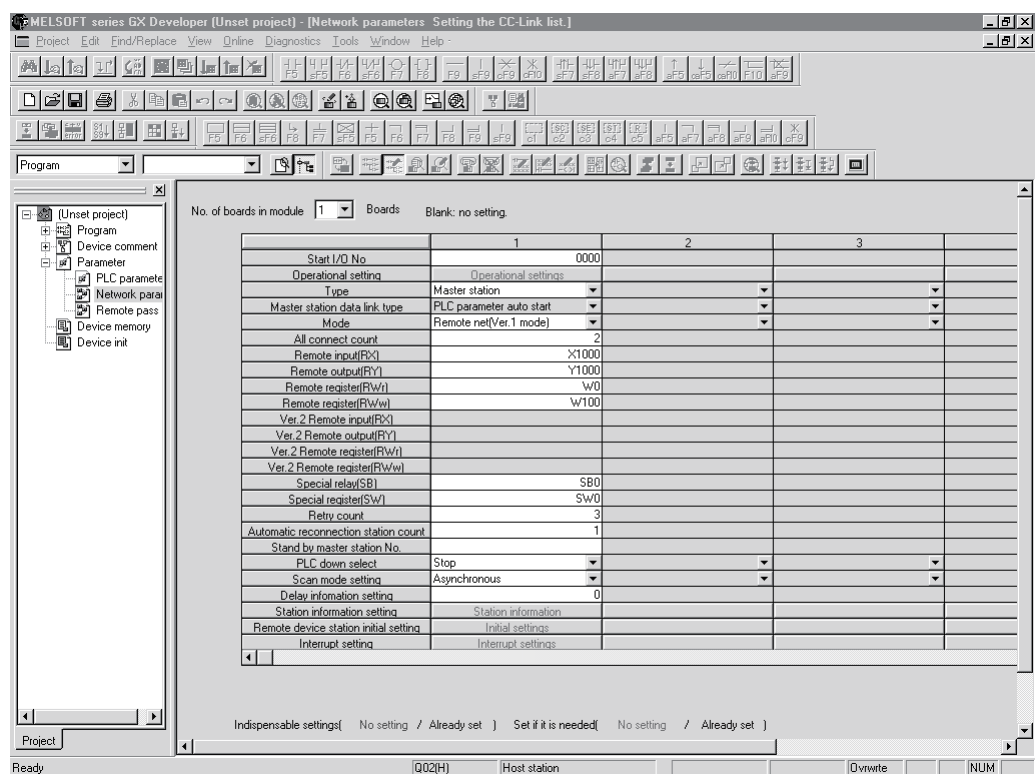
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RWr) to W0.
- 4) Set the refresh device for remote register (RWw) to W100.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



11.2.3 Setting the local station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the local station.

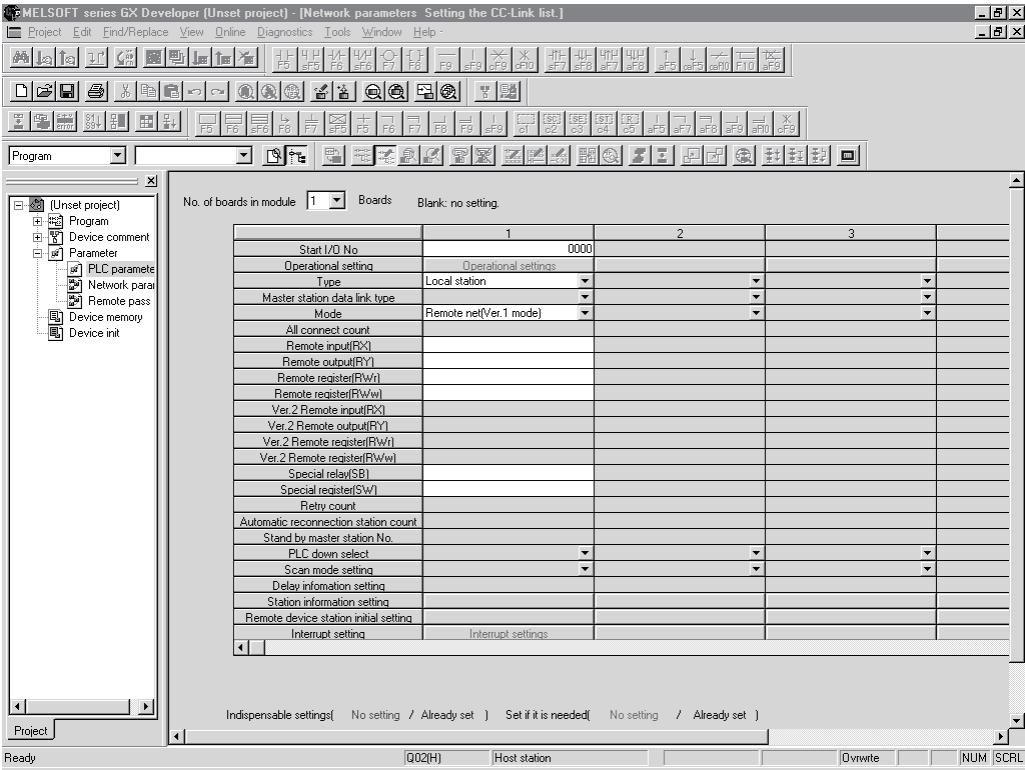
(1) Setting the network parameters of the local station

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Clear: Refresh	<u>Refresh</u> /Clears compulsorily
	Number of occupied stations	Occupies 1 to 4 stations Default: Occupies 1 station	Occupies 4 stations
	Expanded cyclic setting	single/double/quadruple/octuple Default: single	
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	Master station Master station (Duplex function) <u>Local station</u> Standby master station
Mode		Remote net (Ver.1 mode) Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line Default: Remote net (Ver.1 mode)	<u>Remote net (Ver.1 mode)</u> Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	times
Automatic reconnection station count		1 to 10 Default: 1	modules
Standby master station No.		Blank, 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 information setting		Set 0.	

(b) Example of network parameter settings
An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the local station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

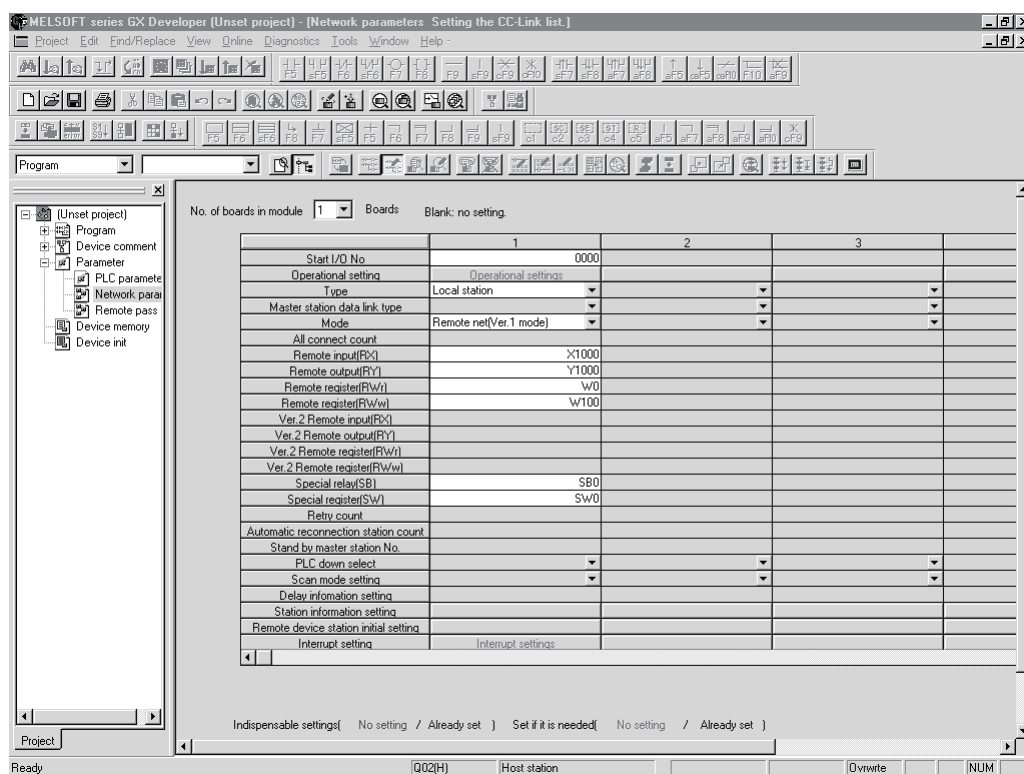
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W100.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

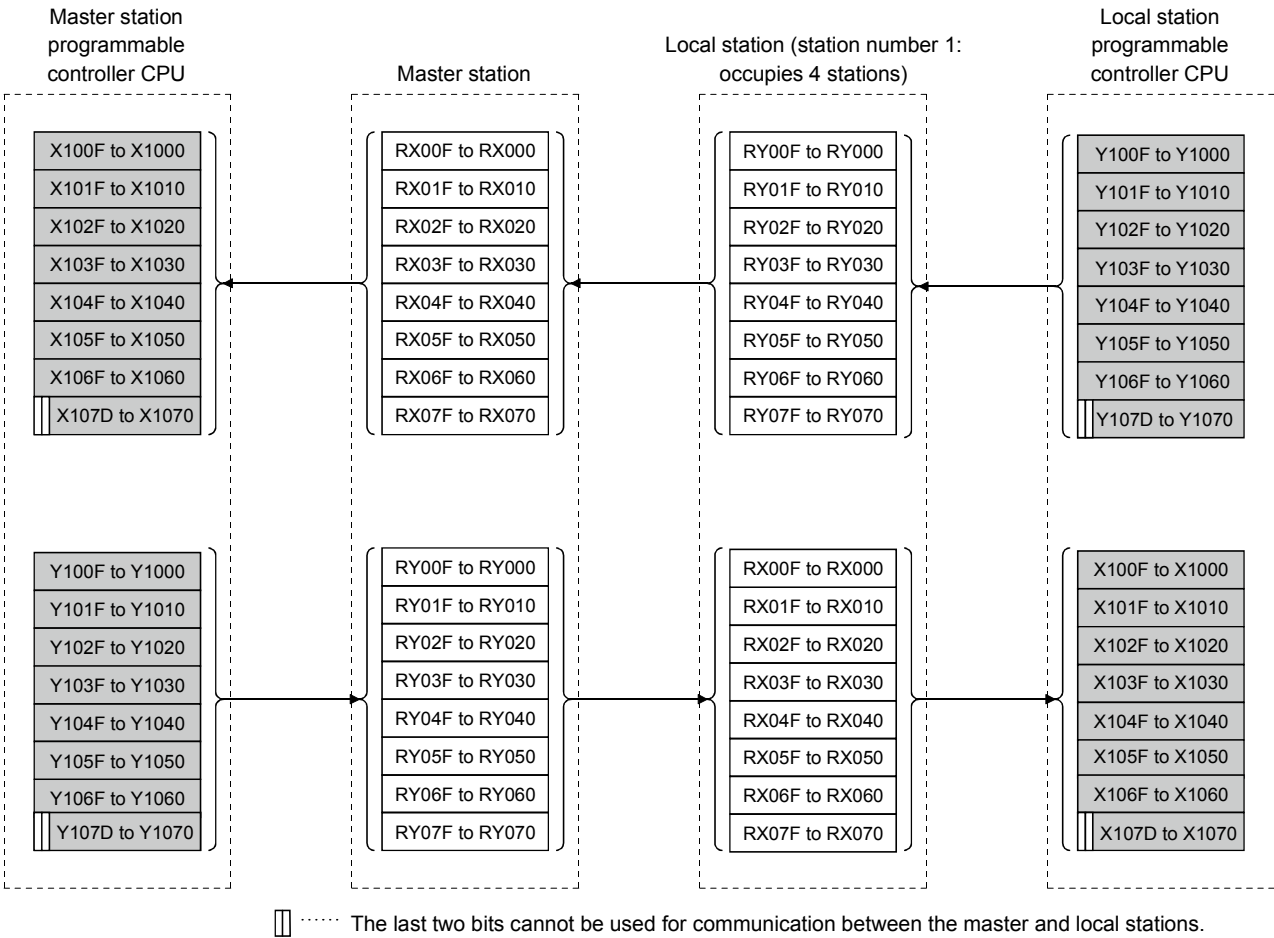
A setting example is shown below.



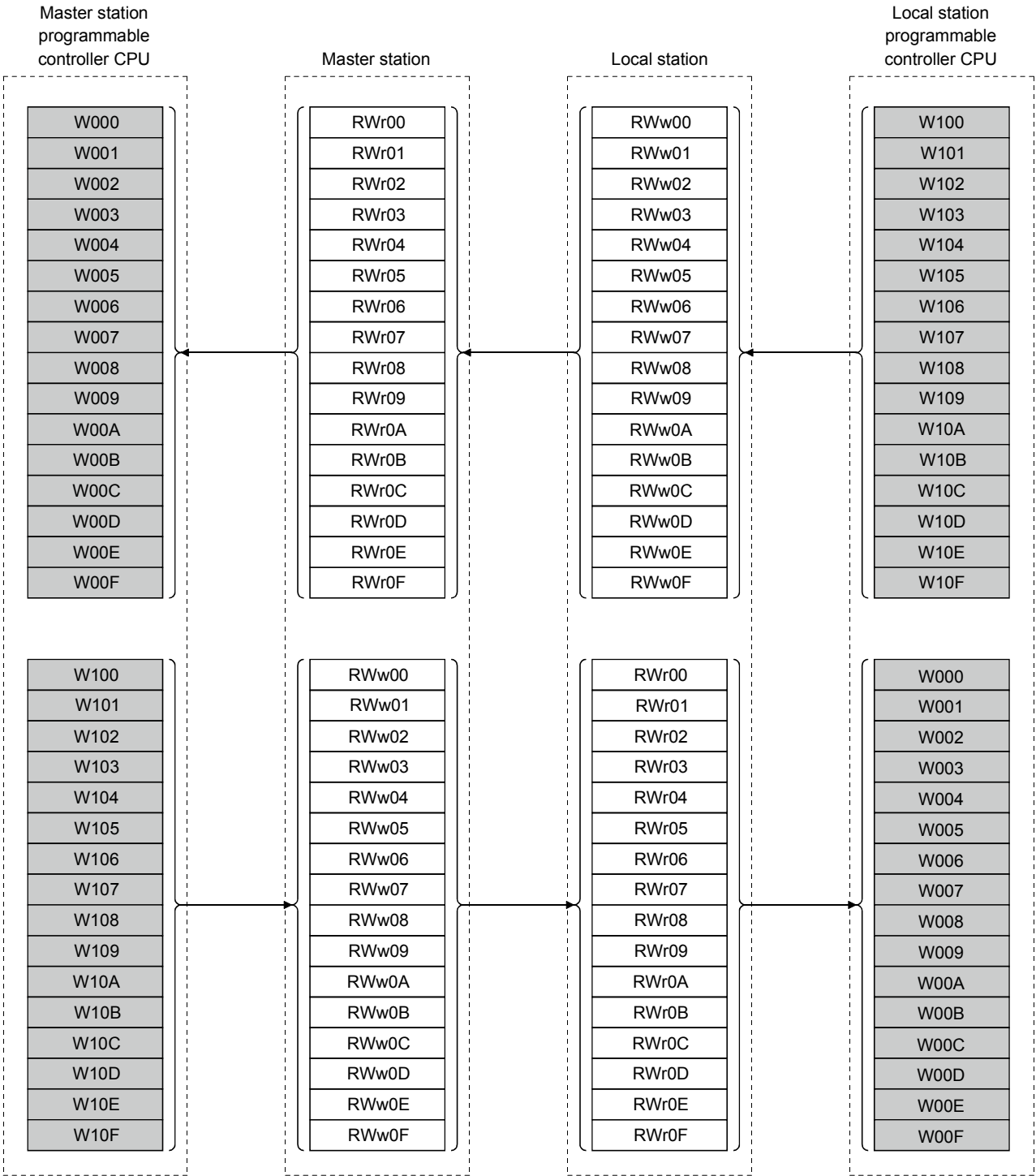
11.2.4 Creating a program

This section shows the program to be used for communication between the master and local stations. The following diagram shows the relationship between the devices of the master station programmable controller CPU and the devices of the local station programmable controller CPU.
The shaded areas indicate the devices that are actually used.

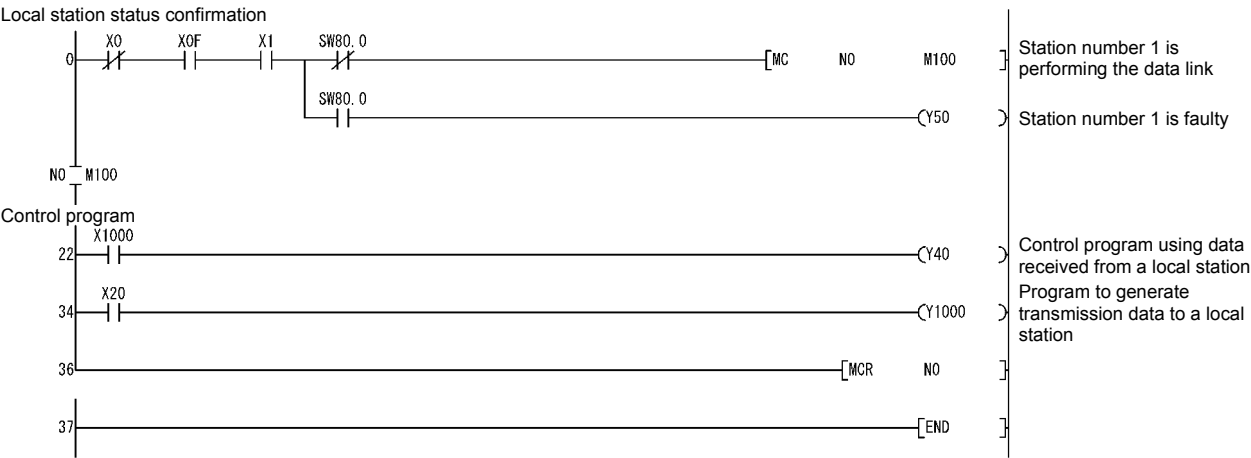
[Remote input (RX) and remote output (RY)]



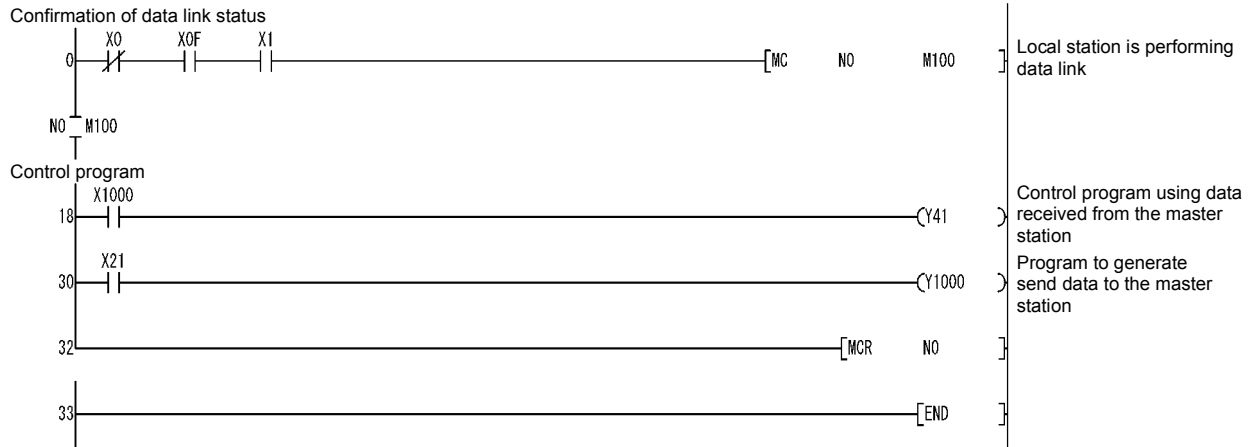
[Remote registers (RWw and RWr)]



(1) Master station program



(2) Local station program



REMARK

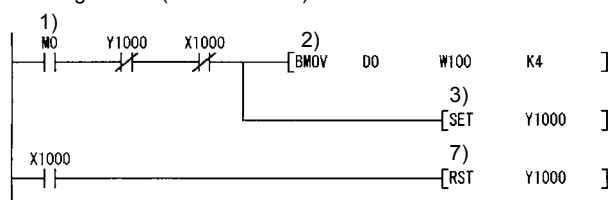
Securing cyclic data on a per-station basis

By configuring an interlock with remote I/O (RX/RX), cyclic data can be secured on a per-station (4-word) basis.*1

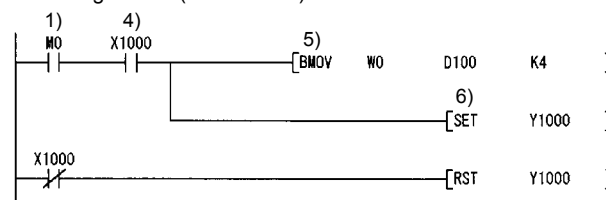
*1 Data of more than one station are not secured.

Configure an interlock with remote I/O (RX/RX) as shown in the following example.

Sending station (master station)



Receiving station (local station)



- 1) The send/receive command (M0) turns ON.
- 2) Data of D0 to D3 are stored in W100 to W103 (RWw0 to RWw3).
- 3) Upon completion of storage in W100 to W103, Y1000 (RY0) for handshake turns ON.
- 4) By cyclic transmission, remote output (RY) data are sent following the remote resister (RWw) data, and the receiving station's X1000 (RX0) turns ON.
- 5) Data of W0 to W3 (RWr0 to RWr3) are stored in D100 to D103.
- 6) Upon completion of storage in D100 to D103, Y1000 (RY0) for handshake turns ON.
- 7) When the data transmission to the receiving station is complete, Y1000 turns OFF.

11.2.5 Performing the data link

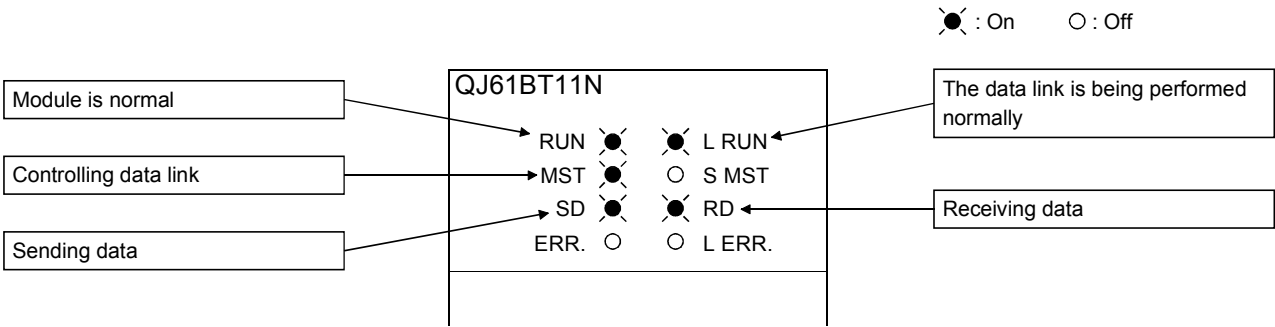
Turn on the power to the local station first, and then turn on the power to the master station to start the data link.

(1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the local station when the data link is being performed normally.

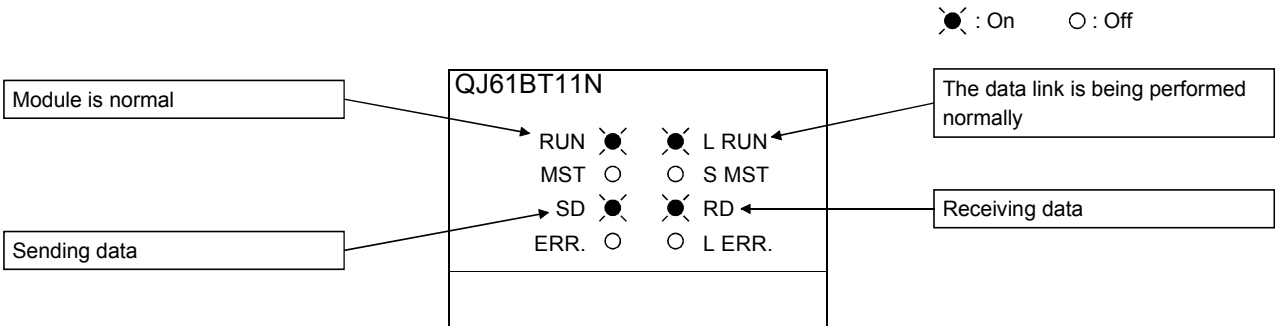
(a) LED display of the master station

Make sure that the LED display shows the following status:



(b) LED display of the local station

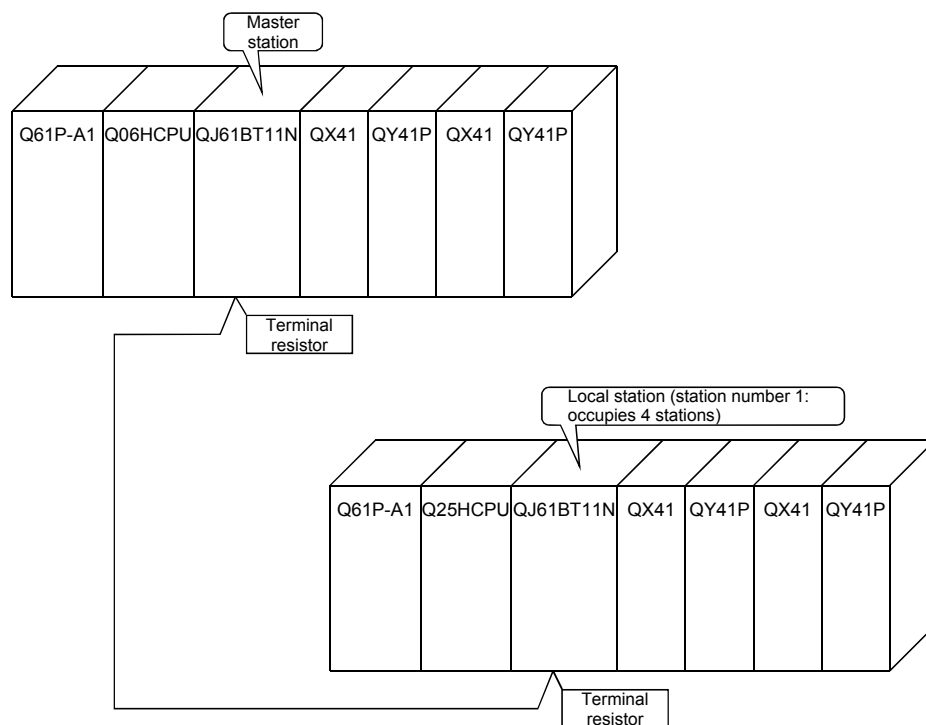
Make sure that the LED display shows the following status:



(2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

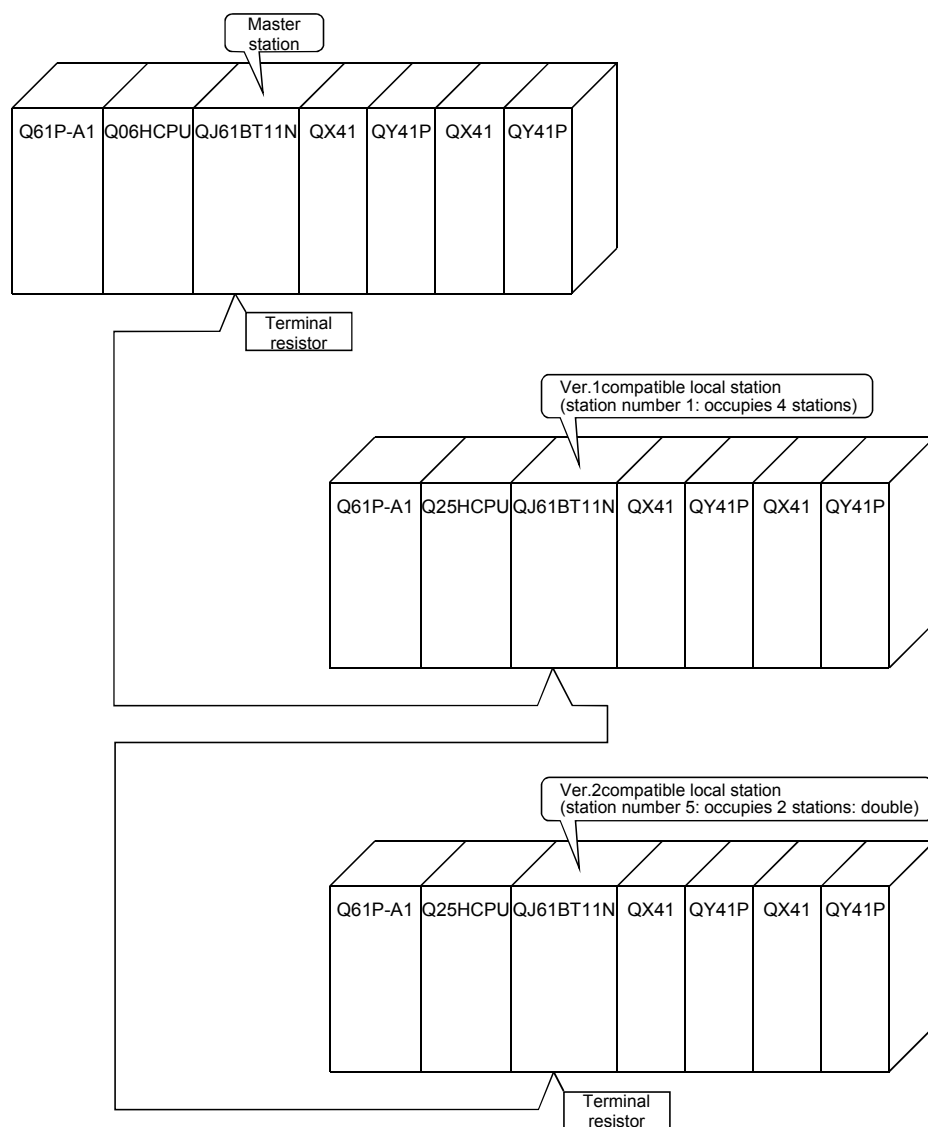
- 1) When X20 of the master station is turned on, Y41 of the local station turns on.
- 2) When X21 of the local station is turned on, Y40 of the master station turns on.



11.3 When Remote Net Ver.2 Mode is Used

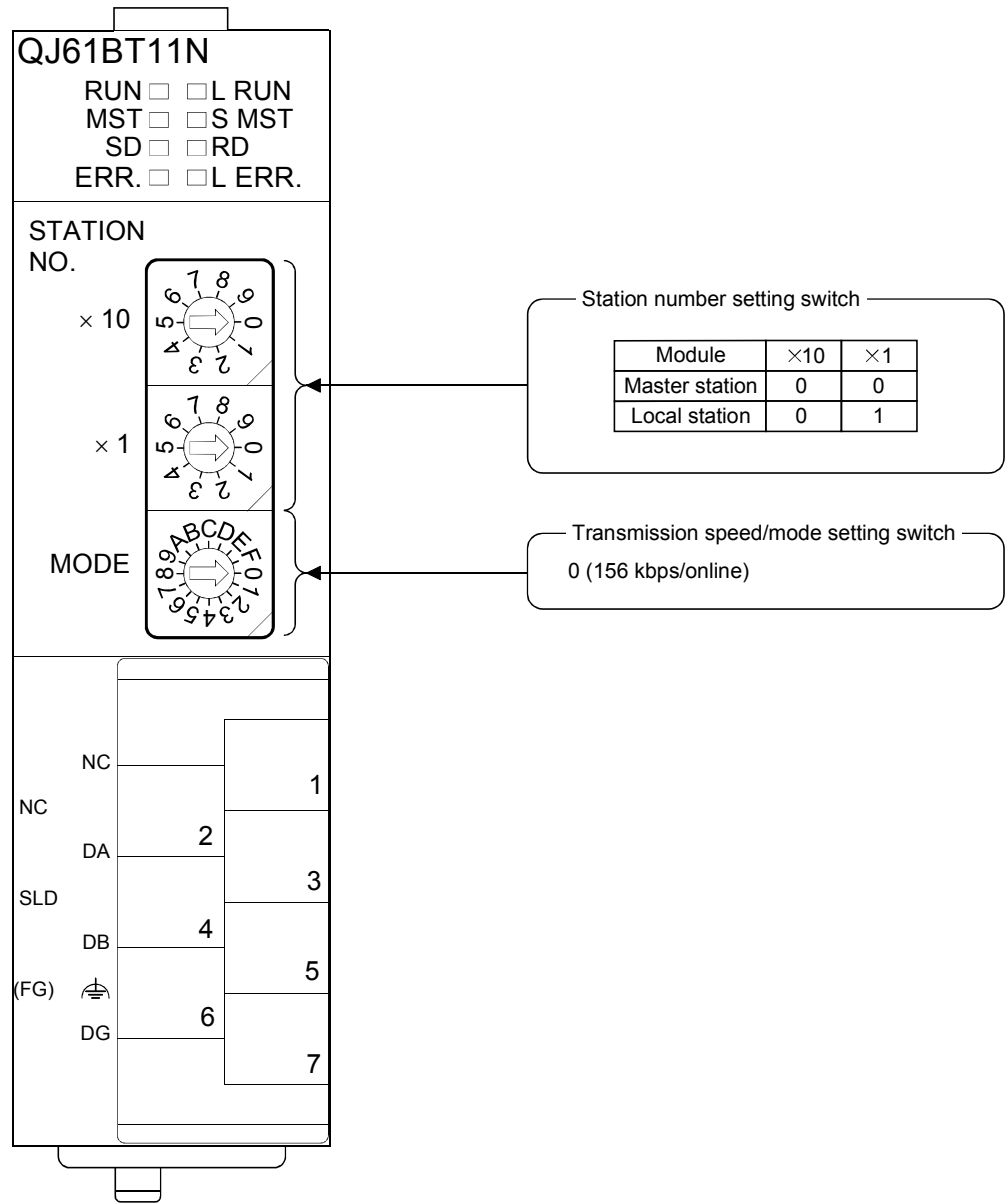
11.3.1 Configuring a system

As shown below, a system with two connected local station is used as an example.



(1) Setting the master and local stations

Settings of the master station switches are shown below:



11.3.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

(1) Setting the network parameters of the master station

(a) Setting the network parameters

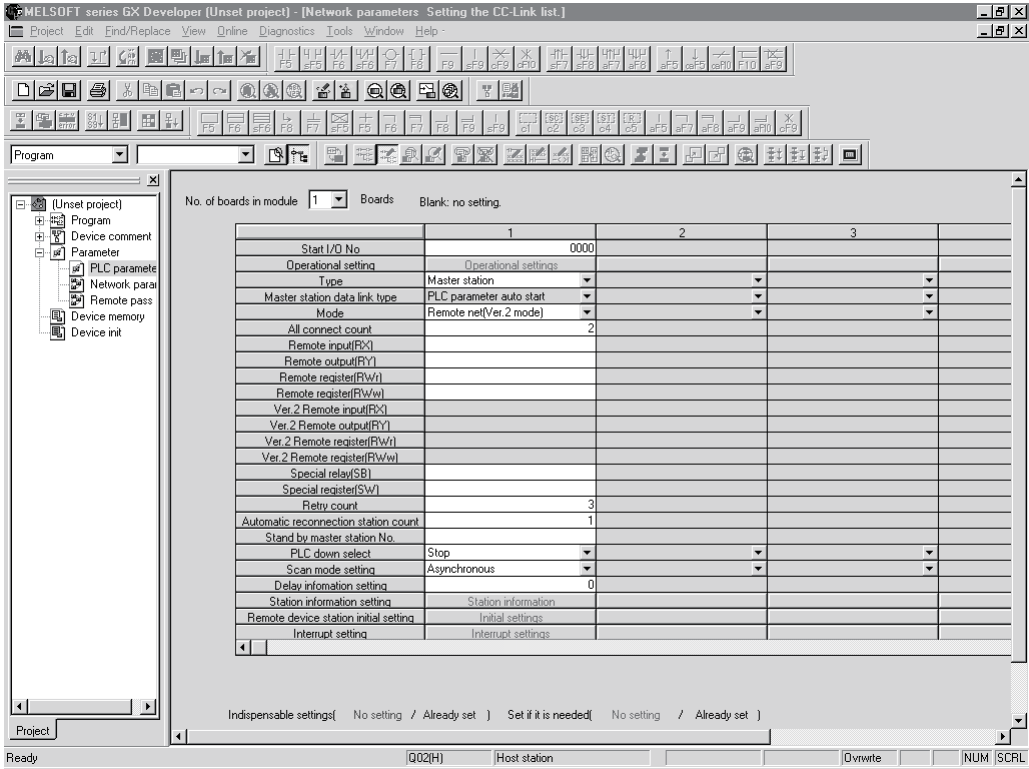
Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	<u>Master station</u> Master station (Duplex function) 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 Off line Default: Remote net (Ver.1 mode)	Remote net (Ver.1 mode) <u>Remote net (Ver.2 mode)</u> Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	2 modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	3 times
Automatic reconnection station count		1 to 10 Default: 1	1 modules
Standby master station No.		Blank, 1 to 64 (Blank: No standby master station specified) Default: Blank	
PLC down select		Stop/continue Default: Stop	<u>Stop</u> /continue
Scan mode setting		Asynchronous/synchronous Default: Asynchronous	<u>Asynchronous</u> /synchronous
Delay information setting		Set 0.	

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	Ver.1Intelligent device station	single	Occupies 4 stations	128 points	No setting	64	64	128
5	Ver.2Intelligent device station	double	Occupies 2 stations	96 points	No setting	64	64	128

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

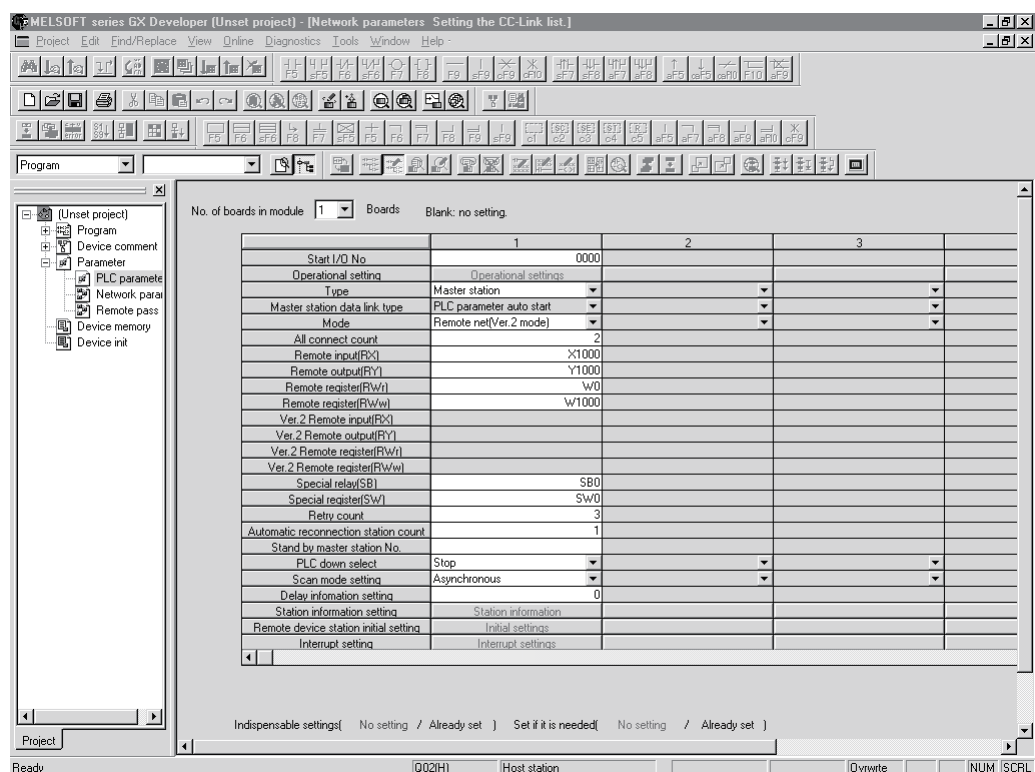
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W1000.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



11.3.3 Setting the local station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the local station.

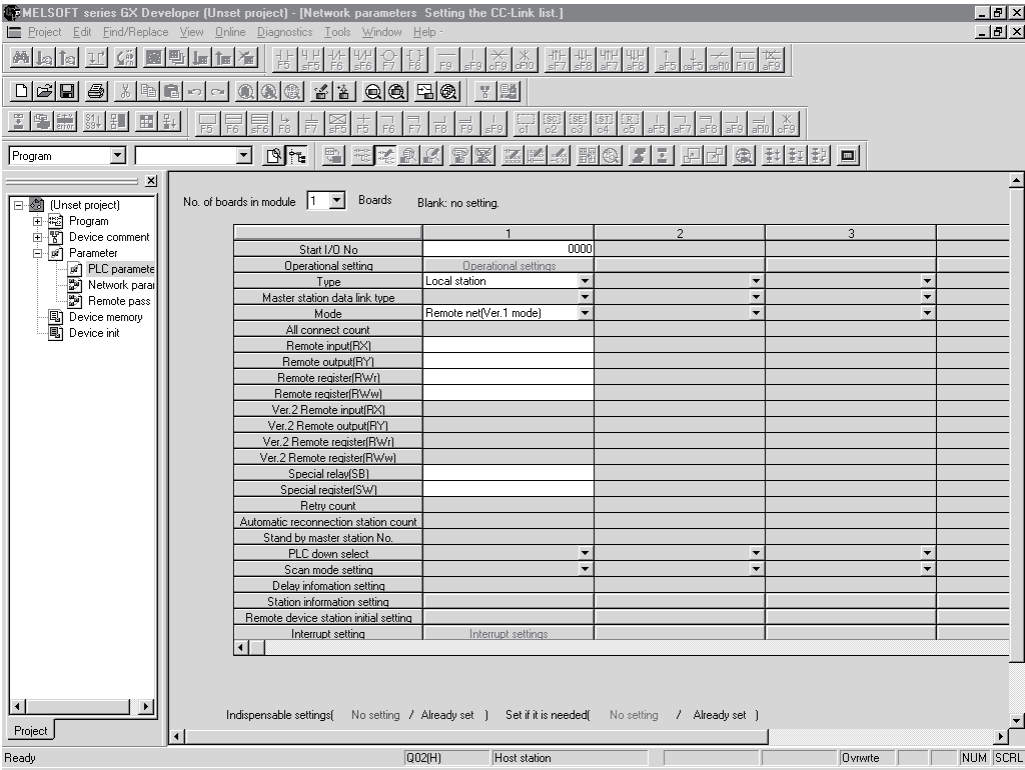
(1) Setting the network parameters of the ver.1 compatible local station (station number 1)

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Clear: Refresh	<u>Refresh</u> /Clears compulsorily
	Number of occupied stations	Occupies 1 to 4 stations Default: Occupies 1 station	Occupies 4 stations
	Expanded cyclic setting	single/double/quadruple/octuple Default: single	
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	Master station Master station (Duplex function) <u>Local station</u> Standby master station
Mode		Remote net (Ver.1 mode) Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line Default: Remote net (Ver.1 mode)	<u>Remote net (Ver.1 mode)</u> Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	times
Automatic reconnection station count		1 to 10 Default: 1	modules
Standby master station No.		Blank, 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 information setting		Set 0.	

(b) Example of network parameter settings
An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

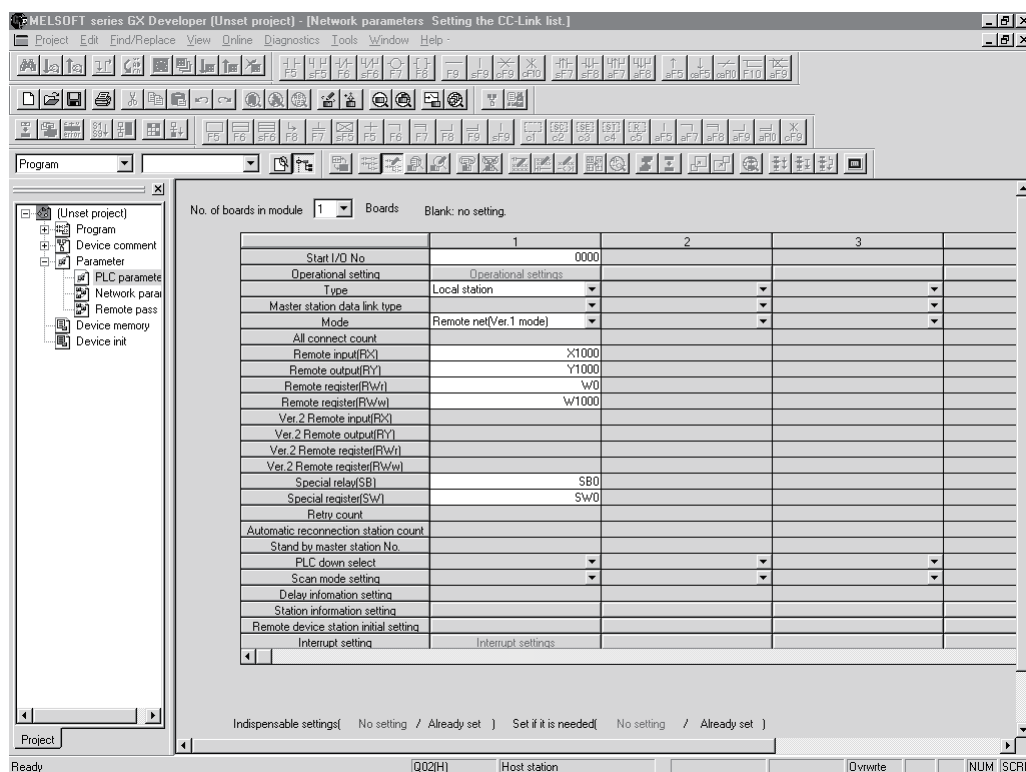
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W1000.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



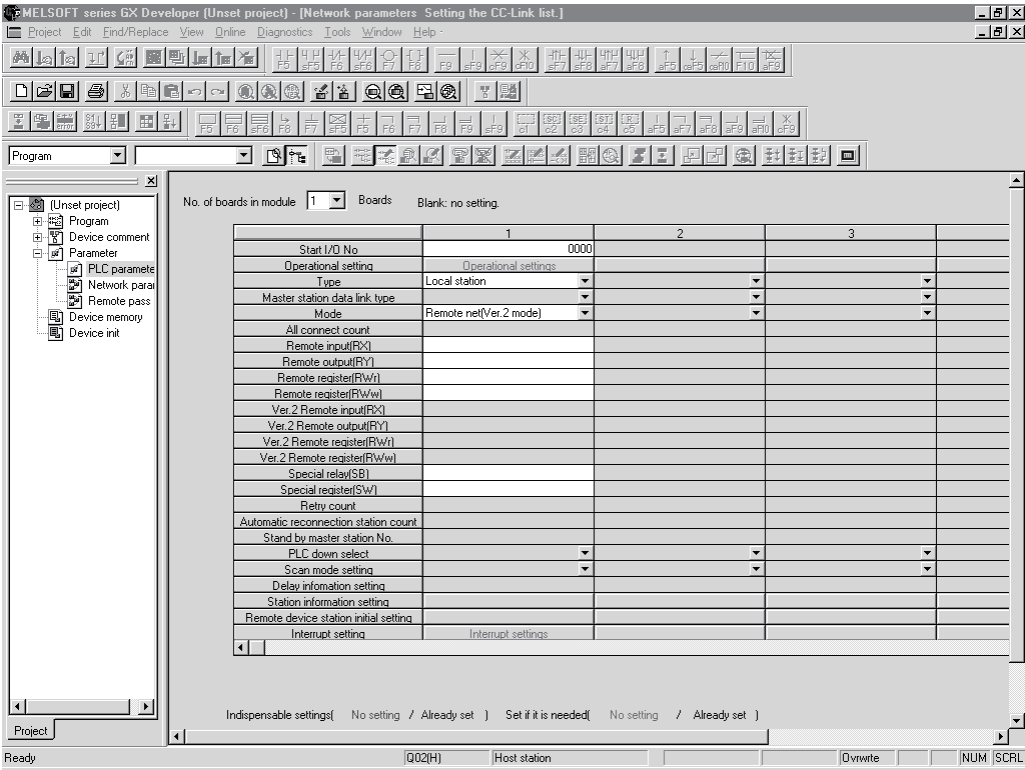
(3) Setting the network parameters of the ver.2 compatible local station (station number 5)

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Number of occupied stations	Occupies 1 to 4 stations Default: Occupies 1 station	Occupies 2 stations
	Expanded cyclic setting	single/double/quadruple/octuple Default: single	double
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	Master station Master station (Duplex function) <u>Local station</u> Standby master station
Mode		Remote net (Ver.1 mode) Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line Default: Remote net (Ver.1 mode)	Remote net (Ver.1 mode) <u>Remote net (Ver.2 mode)</u> Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	times
Automatic reconnection station count		1 to 10 Default: 1	modules
Standby master station No.		Blank, 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 information setting		Set 0.	

(b) Example of network parameter settings
An example of network parameter settings is shown below:



(4) Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

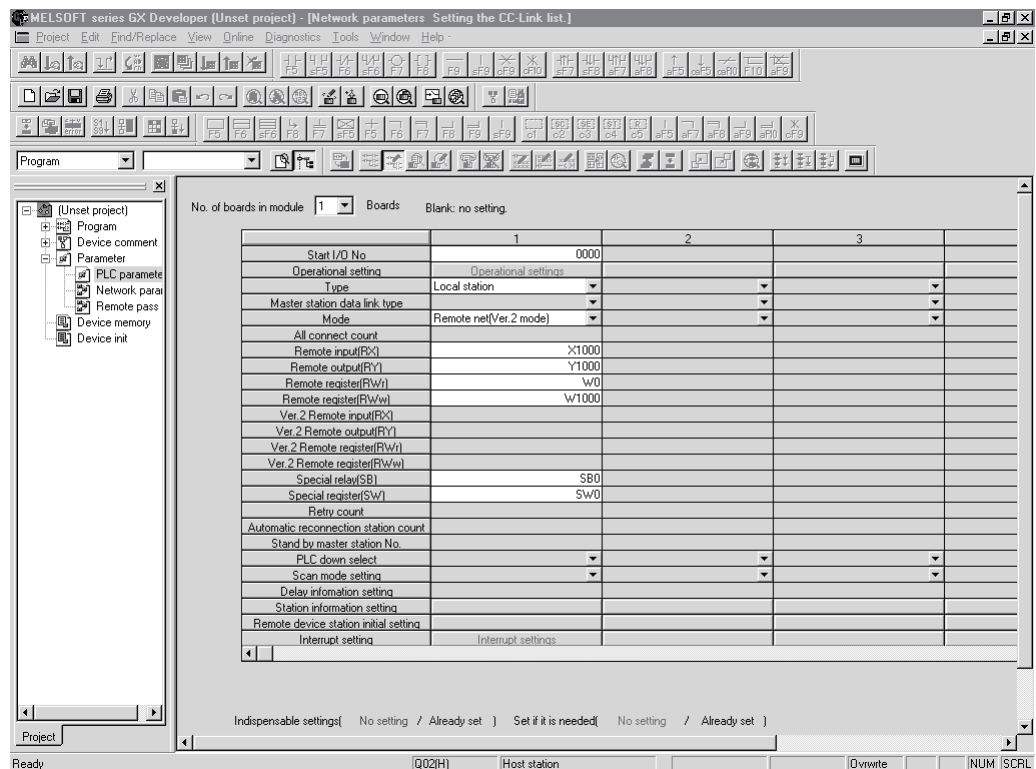
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W1000.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.

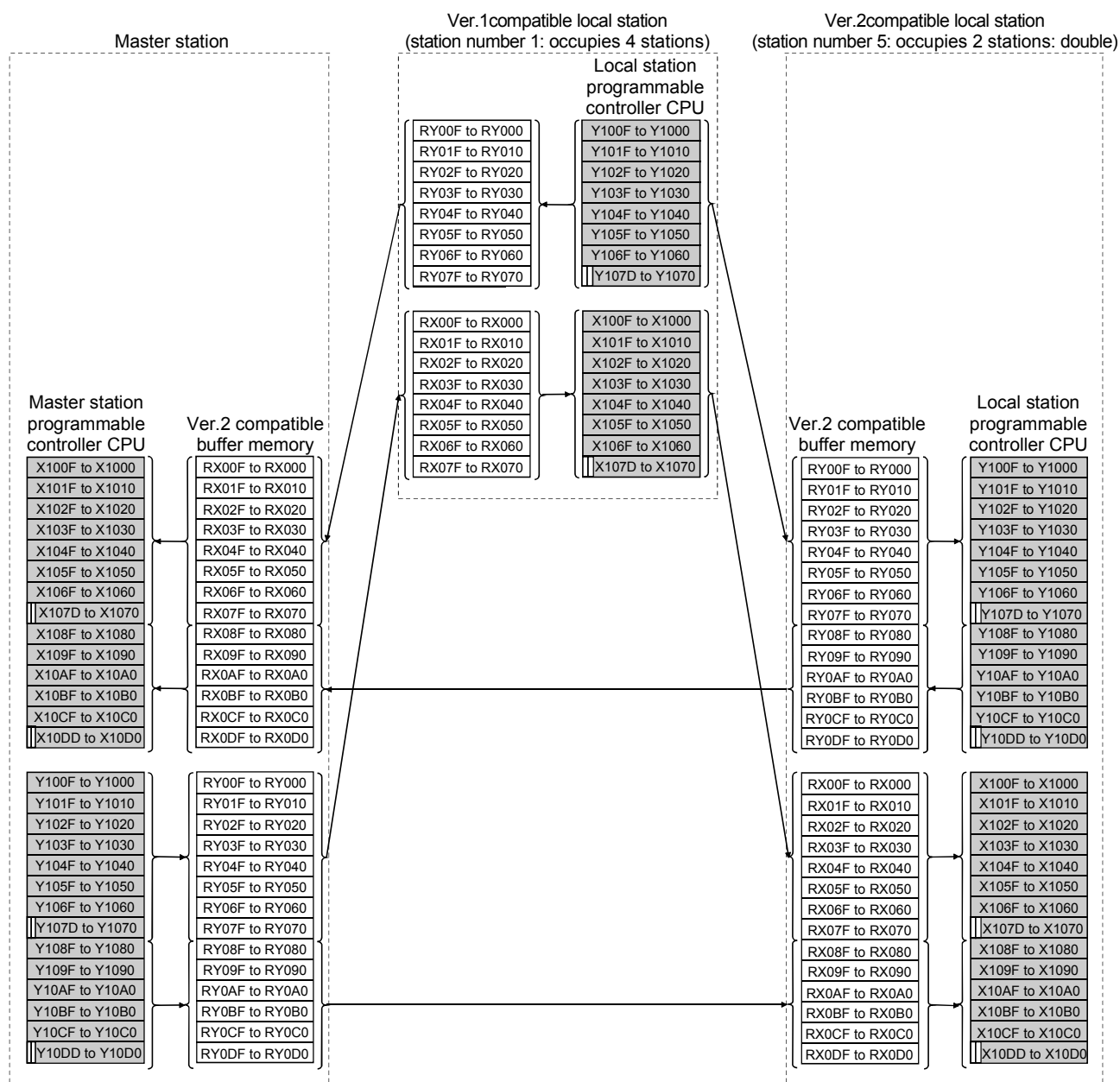


11.3.4 Creating a program

This section shows the program to be used for communication between the master and local stations. The following diagram shows the relationship between the devices of the master station programmable controller CPU and the devices of the local station programmable controller CPU.

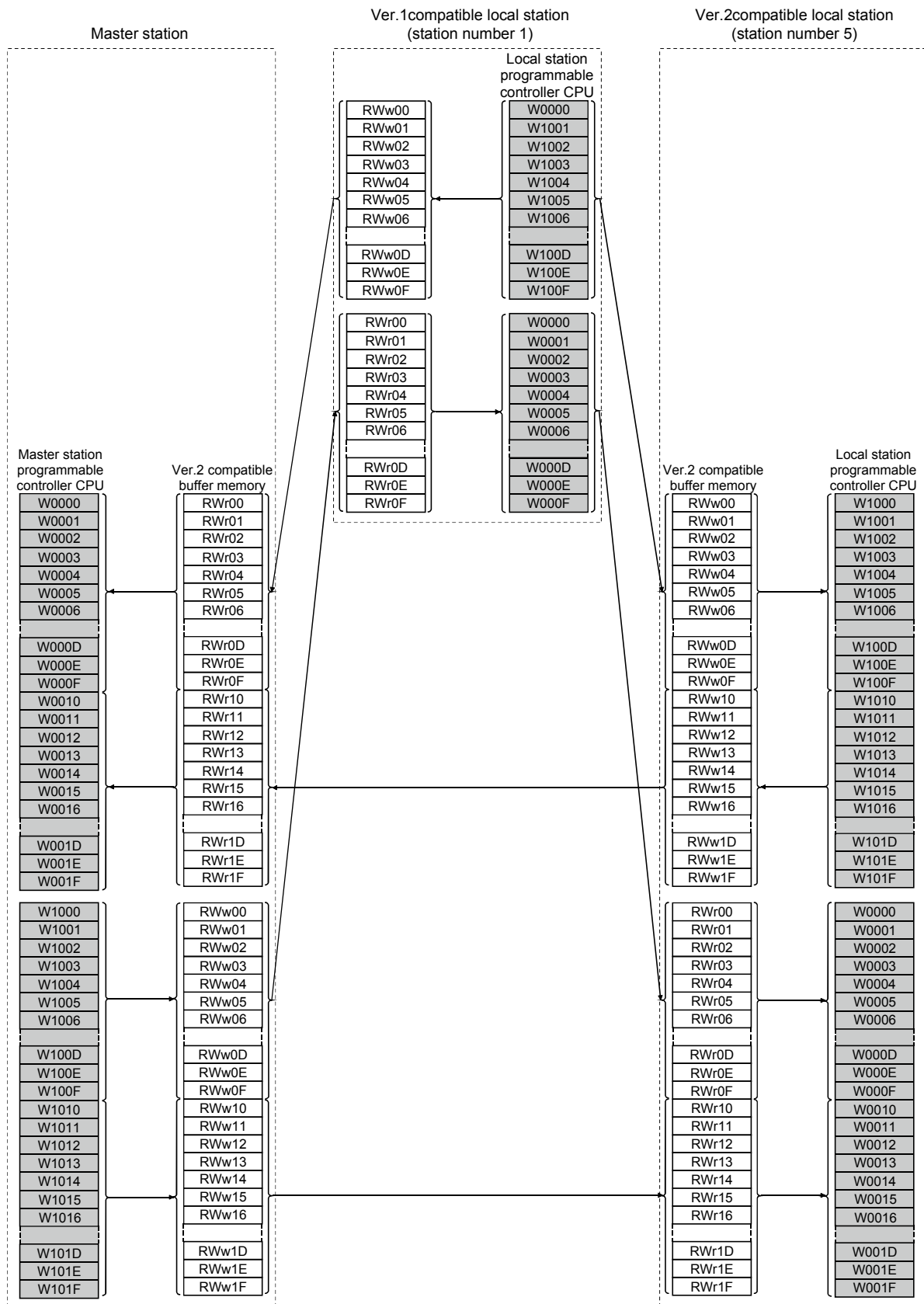
The shaded areas indicate the devices that are actually used.

[Remote input (RX) and remote output (RY)]

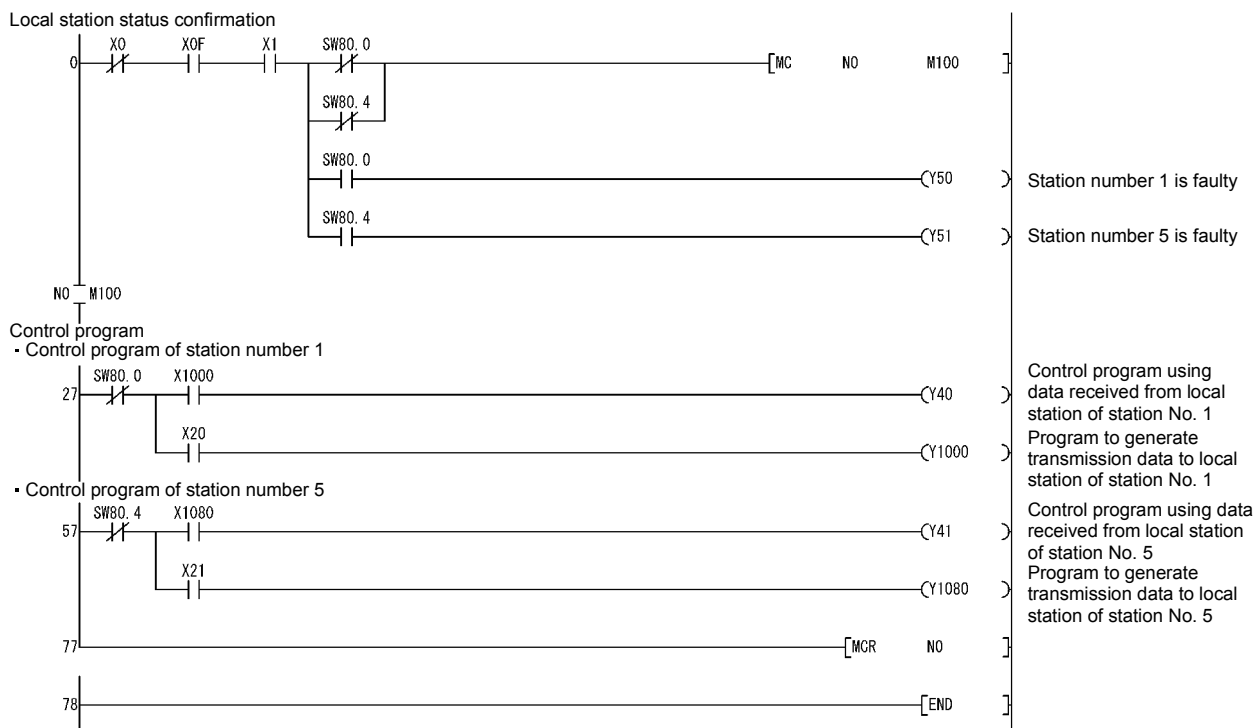


□..... The last two bits cannot be used for communication between the master and local stations.

[Remote registers (RWw and RWr)]

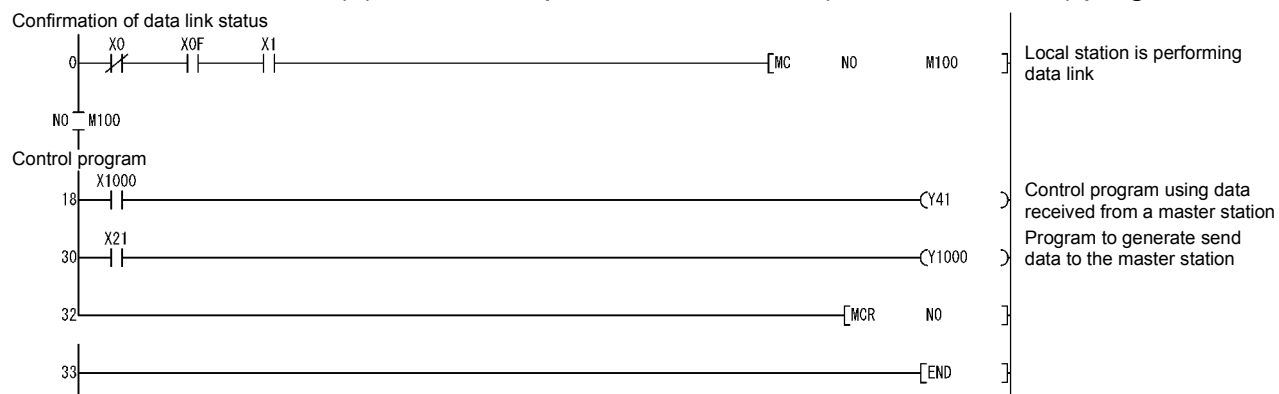


(1) Master station program

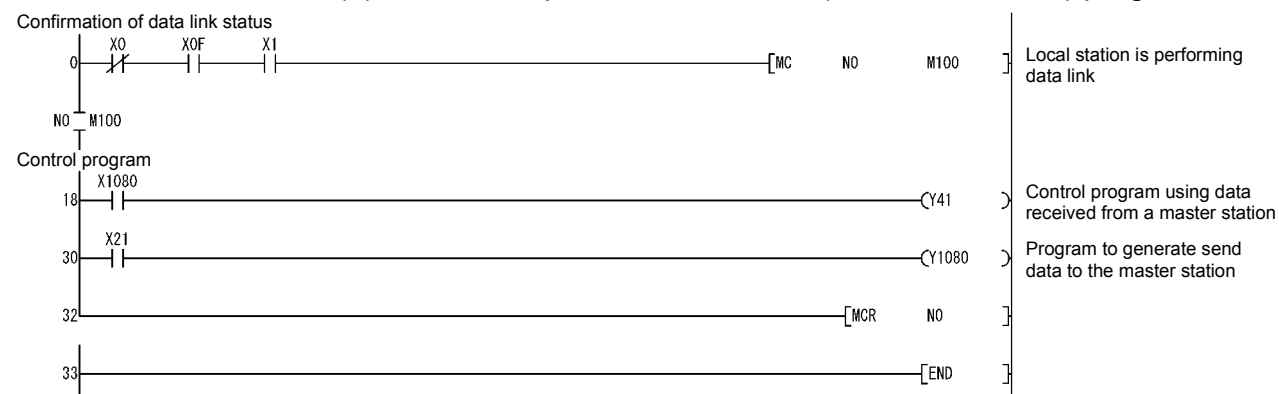


(2) Local station program

(a) Ver.1 compatible local station (station number 1) program



(b) Ver.2 compatible local station (station number 5) program



REMARK

By configuring an interlock with remote I/O (RX/R_Y), cyclic data can be secured on a per-station (4-word) basis.
For details, refer to Remark in Section 11.2.4.

11.3.5 Performing the data link

Turn on the power to the local station first, and then turn on the power to the master station to start the data link.

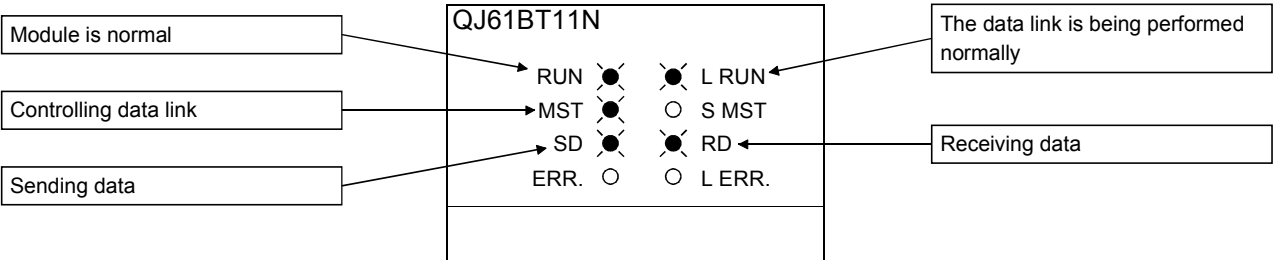
(1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the local station when the data link is being performed normally.

(a) LED display of the master station

Make sure that the LED display shows the following status:

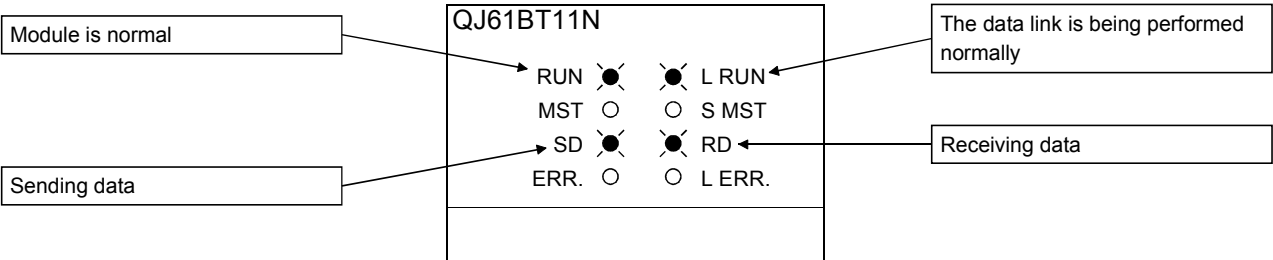
● : On ○ : Off



(b) LED display of the local station

Make sure that the LED display shows the following status:

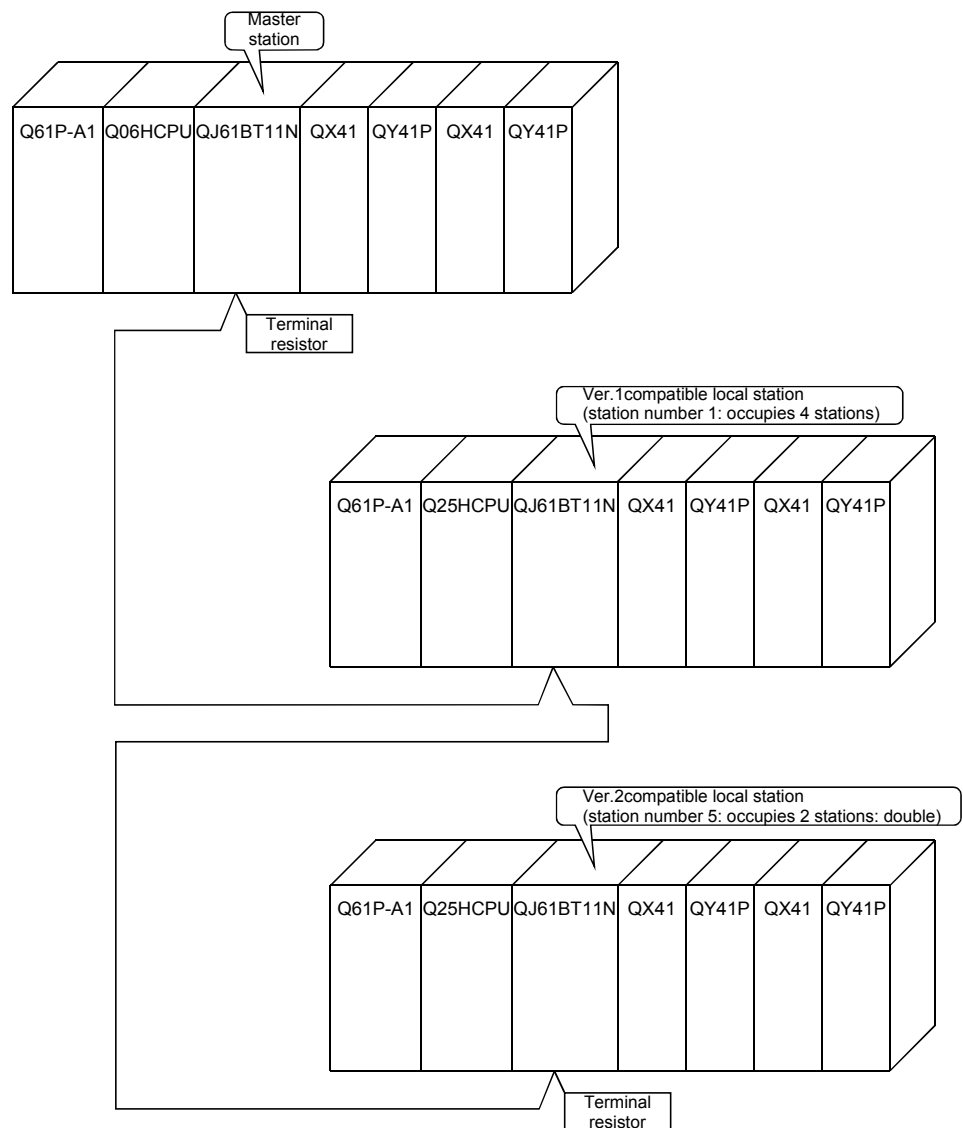
● : On ○ : Off



(2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

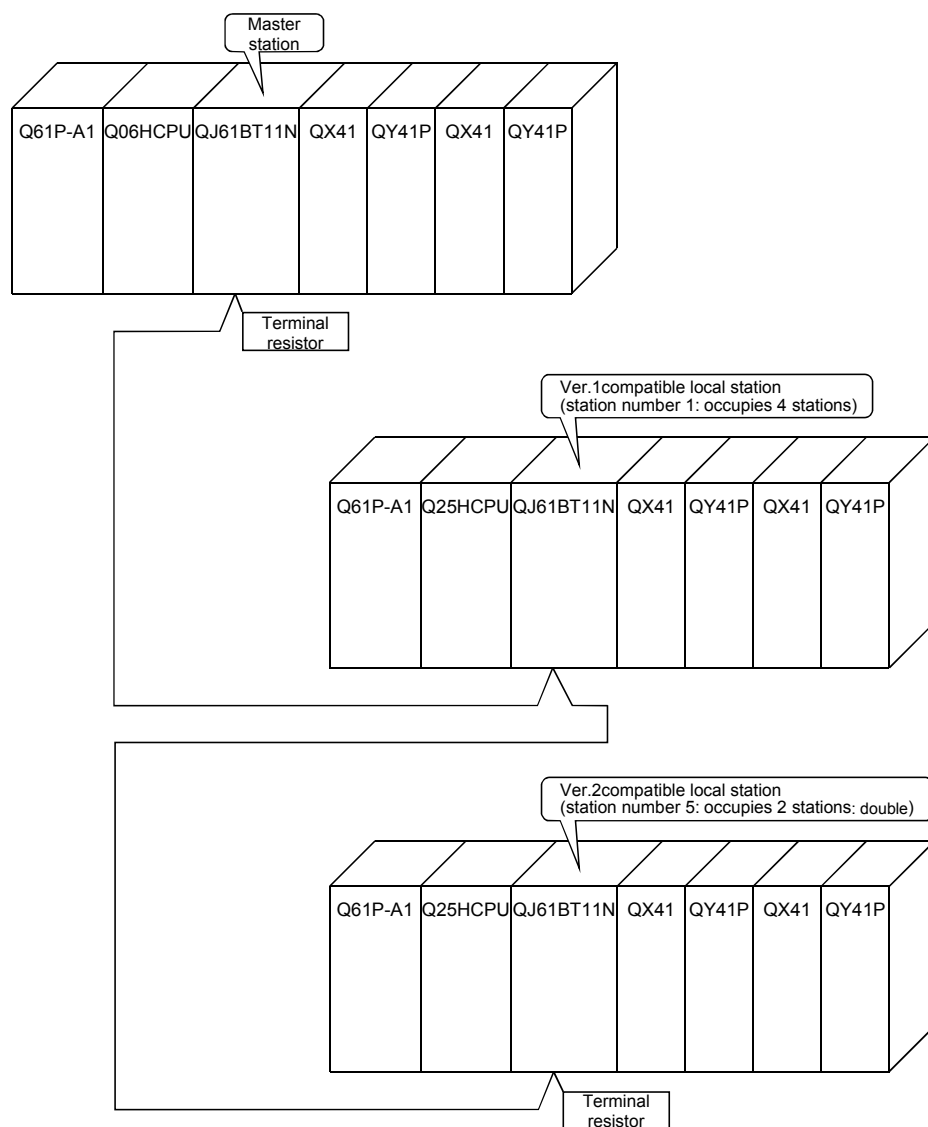
- 1) When X20 of the master station is turned on, Y41 of the local station of station No. 1 turns on.
- 2) When X21 of the local station of station No. 1 is turned on, Y40 of the master station turns on.
- 3) When X21 of the master station is turned on, Y41 of the local station of station No. 5 turns on.
- 4) When X21 of the local station of station No. 5 is turned on, Y41 of the master station turns on.



11.4 When Remote Net Additional Mode is Used

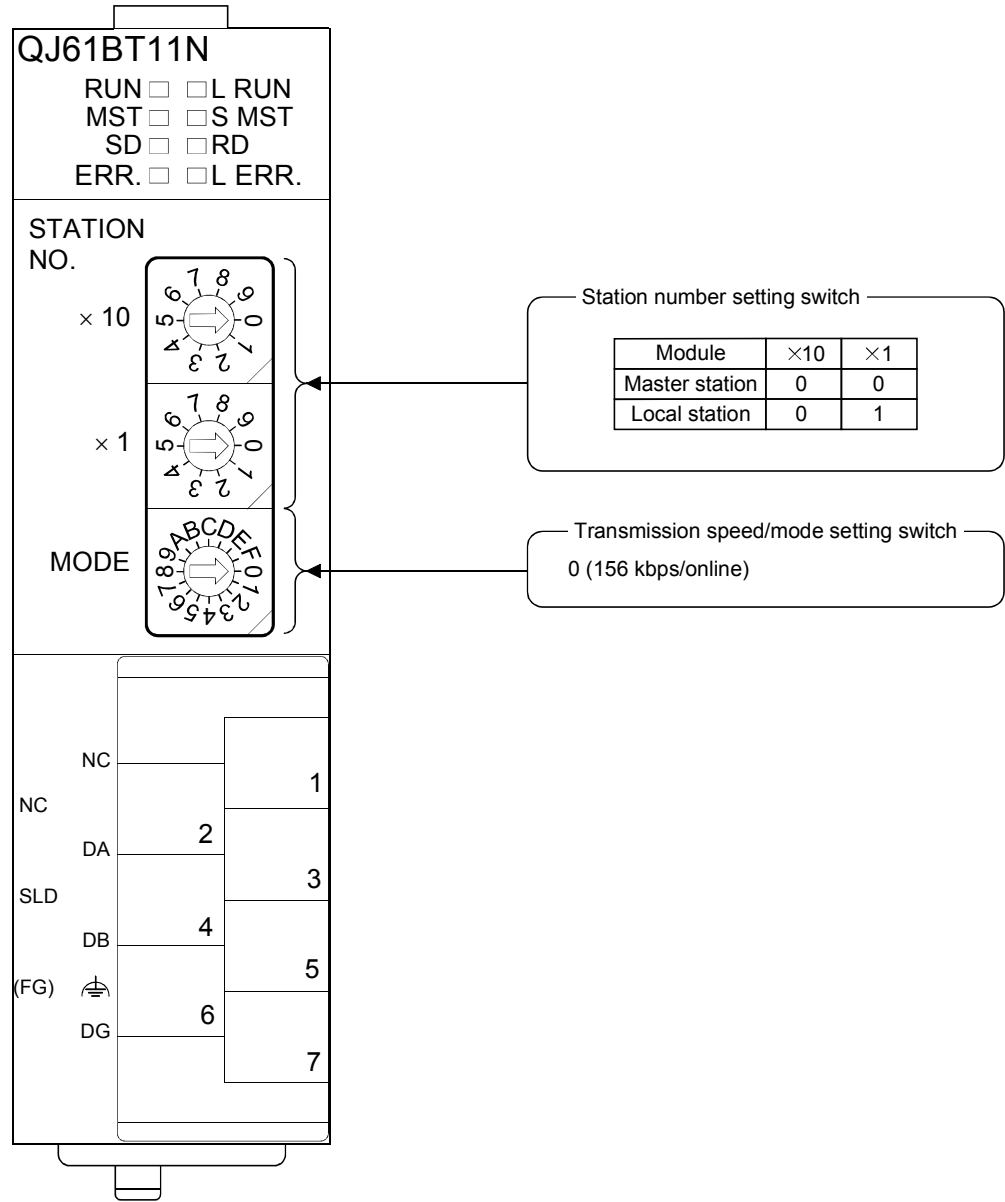
11.4.1 Configuring a system

As shown below, a system with two connected local station is used as an example.



(1) Setting the master and local stations

Settings of the master station switches are shown below:



11.4.2 Setting the master station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the master station.

(1) Setting the network parameters of the master station

(a) Setting the network parameters

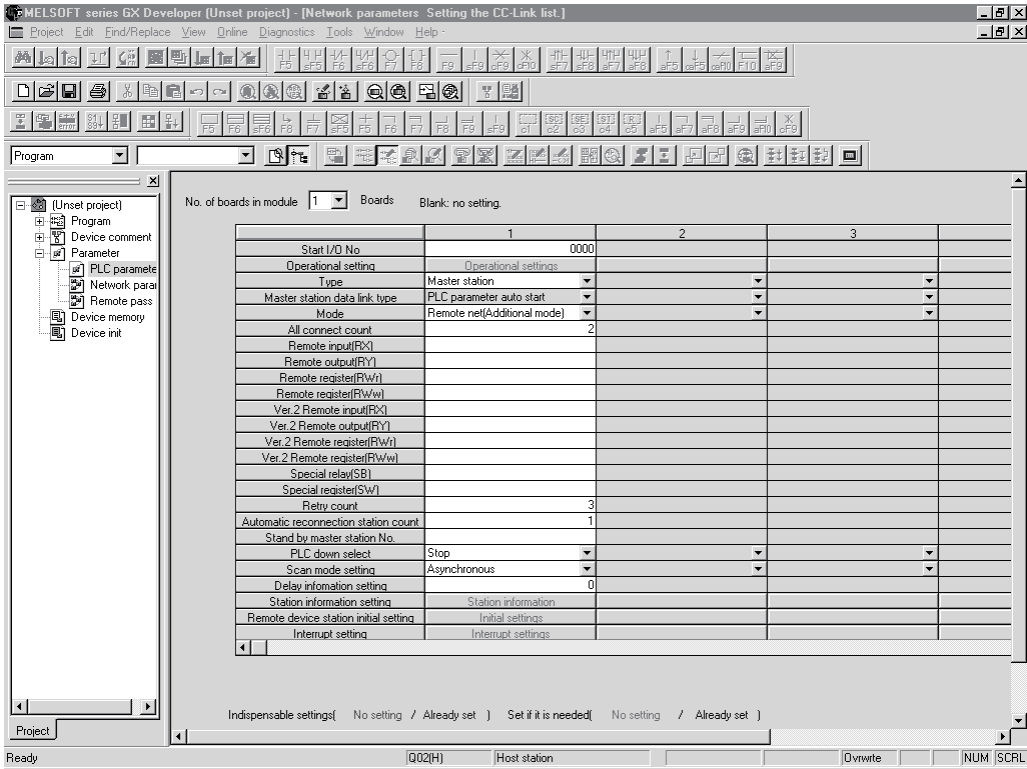
Set the network parameters as follows using the attached parameter setting checklist and station information setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	<u>Master station</u> Master station (Duplex function) 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 Off line Default: Remote net (Ver.1 mode)	Remote net (Ver.1 mode) Remote net (Ver.2 mode) <u>Remote net (Additional mode)</u> Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	2 modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	3 times
Automatic reconnection station count		1 to 10 Default: 1	1 modules
Standby master station No.		Blank, 1 to 64 (Blank: No standby master station specified) Default: Blank	
PLC down select		Stop/continue Default: Stop	<u>Stop</u> /continue
Scan mode setting		Asynchronous/synchronous Default: Asynchronous	<u>Asynchronous</u> /synchronous
Delay information setting		Set 0.	

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	Ver.1Intelligent device station	single	Occupies 4 stations	128 points	No setting	64	64	128
5	Ver.2Intelligent device station	double	Occupies 2 stations	96 points	No setting	64	64	128

(b) Example of network parameter settings

An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the master station

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

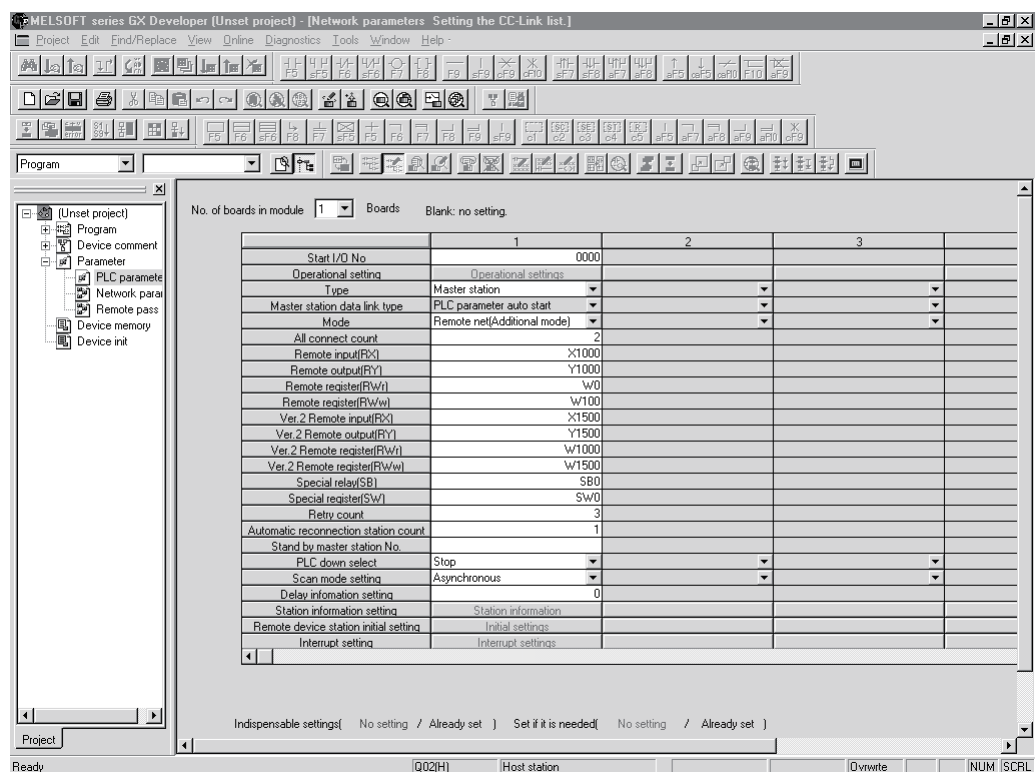
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RWr) to W0.
- 4) Set the refresh device for remote register (RWw) to W100.
- 5) Set the refresh device for ver.2 remote input (RX) to X1500.
- 6) Set the refresh device for ver.2 remote output (RY) to Y1500.
- 7) Set the refresh device for ver.2 remote register (RWr) to W1000.
- 8) Set the refresh device for ver.2 remote register (RWw) to W1500.
- 9) Set the refresh device for special relay (SB) to SB0.
- 10) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



11.4.3 Setting the local station parameters

This section explains the settings of the network parameters and the automatic refresh parameters of the local station.

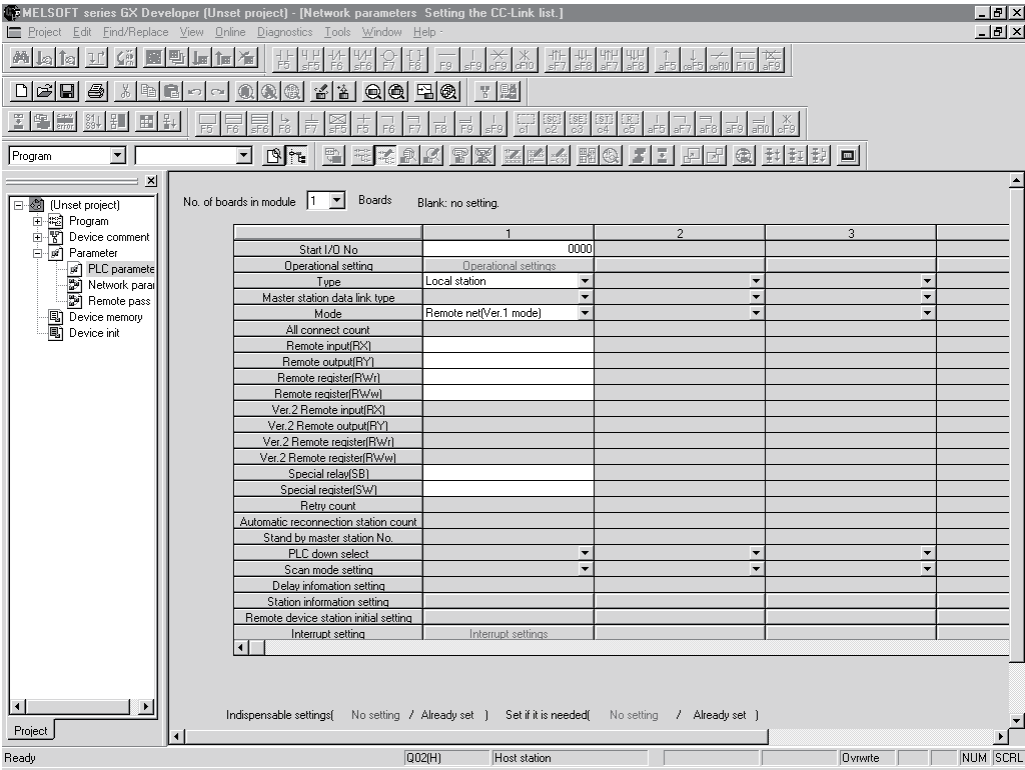
(1) Setting the network parameters of the ver.1 compatible local station (station number 1)

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Clear: Refresh	<u>Refresh</u> /Clears compulsorily
	Number of occupied stations	Occupies 1 to 4 stations Default: Occupies 1 station	Occupies 4 stations
	Expanded cyclic setting	single/double/quadruple/octuple Default: single	
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	Master station Master station (Duplex function) <u>Local station</u> Standby master station
Mode		Remote net (Ver.1 mode) Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line Default: Remote net (Ver.1 mode)	<u>Remote net (Ver.1 mode)</u> Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	times
Automatic reconnection station count		1 to 10 Default: 1	modules
Standby master station No.		Blank, 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 information setting		Set 0.	

(b) Example of network parameter settings
An example of network parameter settings is shown below:



(2) Setting the automatic refresh parameters of the ver.1 compatible local station (station number 1)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

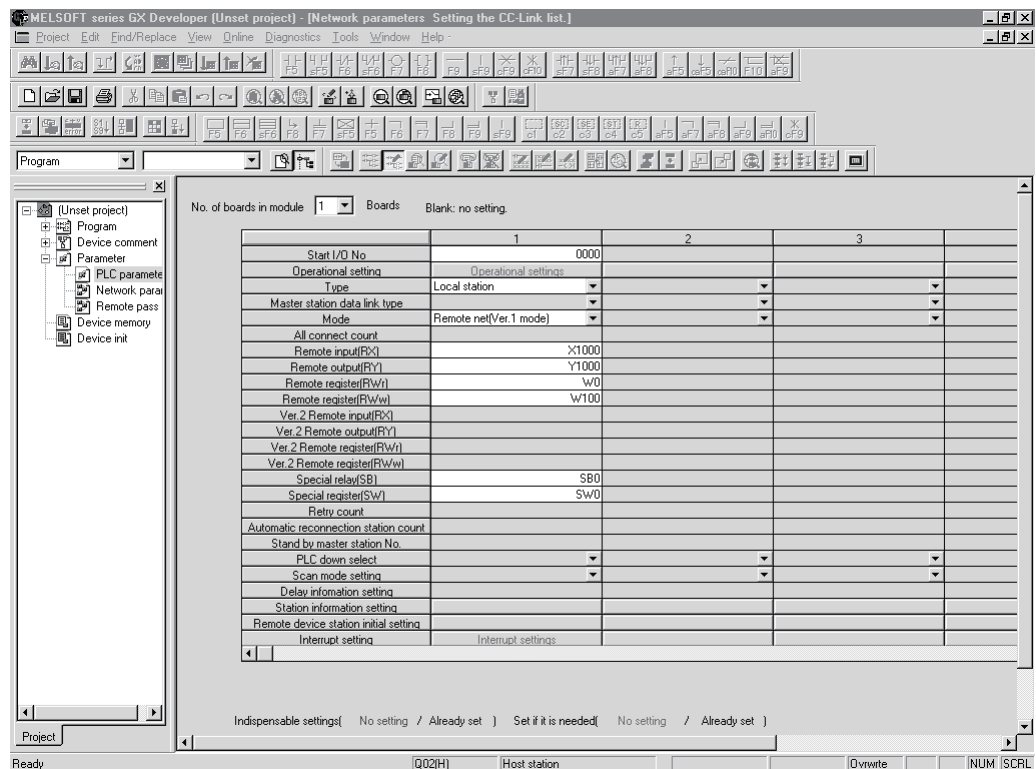
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W100.
- 5) Set the refresh device for special relay (SB) to SB0.
- 6) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.



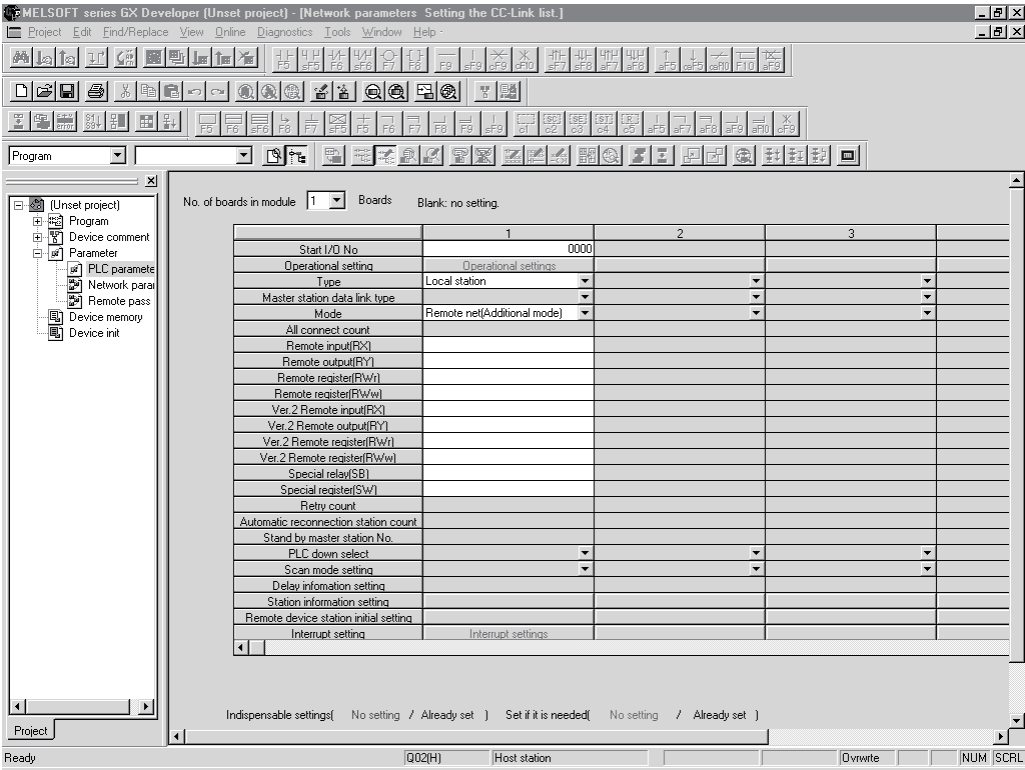
(3) Setting the network parameters of the ver.2 compatible local station (station number 5)

(a) Setting the network parameters

Set the network parameters as follows using the attached parameter setting checklist.

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/ <u>clear</u>
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	<u>Refresh</u> /Clears compulsorily
	Number of occupied stations	Occupies 1 to 4 stations Default: Occupies 1 station	Occupies 2 stations
	Expanded cyclic setting	single/double/quadruple/octuple Default: single	double
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	<u>Disable</u> /Enable
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	Master station Master station (Duplex function) <u>Local station</u> Standby master station
Mode		Remote net (Ver.1 mode) Remote net (Ver.2 mode) Remote net (Additional mode) Remote I/O net mode Off line Default: Remote net (Ver.1 mode)	Remote net (Ver.1 mode) Remote net (Ver.2 mode) <u>Remote net (Additional mode)</u> Remote I/O net mode Off line
All connect count		1 to 64 Default: 64	modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	times
Automatic reconnection station count		1 to 10 Default: 1	modules
Standby master station No.		Blank, 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 information setting		Set 0.	

(b) Example of network parameter settings
An example of network parameter settings is shown below:



(4) Setting the automatic refresh parameters of the ver.2 compatible local station (station number 5)

(a) Setting the automatic refresh parameters

Set the automatic refresh parameters according to the procedure below.

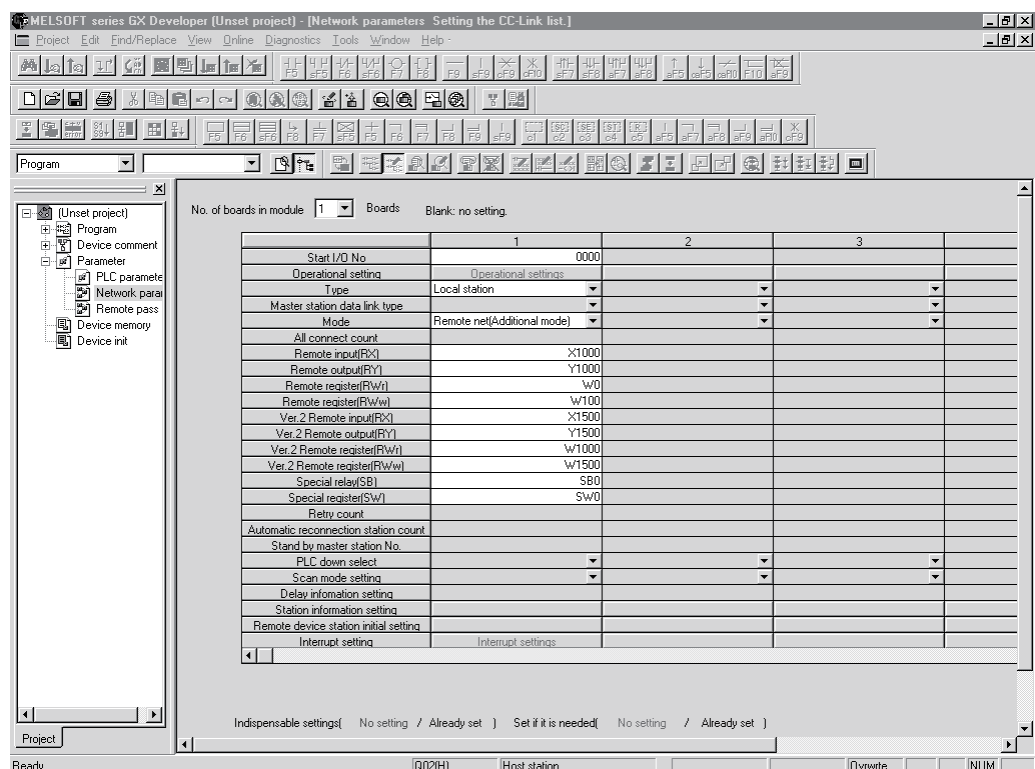
- 1) Set the refresh device for remote input (RX) to X1000.
- 2) Set the refresh device for remote output (RY) to Y1000.
- 3) Set the refresh device for remote register (RW_r) to W0.
- 4) Set the refresh device for remote register (RW_w) to W100.
- 5) Set the refresh device for ver.2 remote input (RX) to X1500.
- 6) Set the refresh device for ver.2 remote output (RY) to Y1500.
- 7) Set the refresh device for ver.2 remote register (RW_r) to W1000.
- 8) Set the refresh device for ver.2 remote register (RW_w) to W1500.
- 9) Set the refresh device for special relay (SB) to SB0.
- 10) Set the refresh device for special register (SW) to SW0.

POINT

When setting X, Y, B, W, SB and SW as refresh devices, make setting so that they do not overlap with the device numbers used on the other networks, etc.

(b) Setting example

A setting example is shown below.

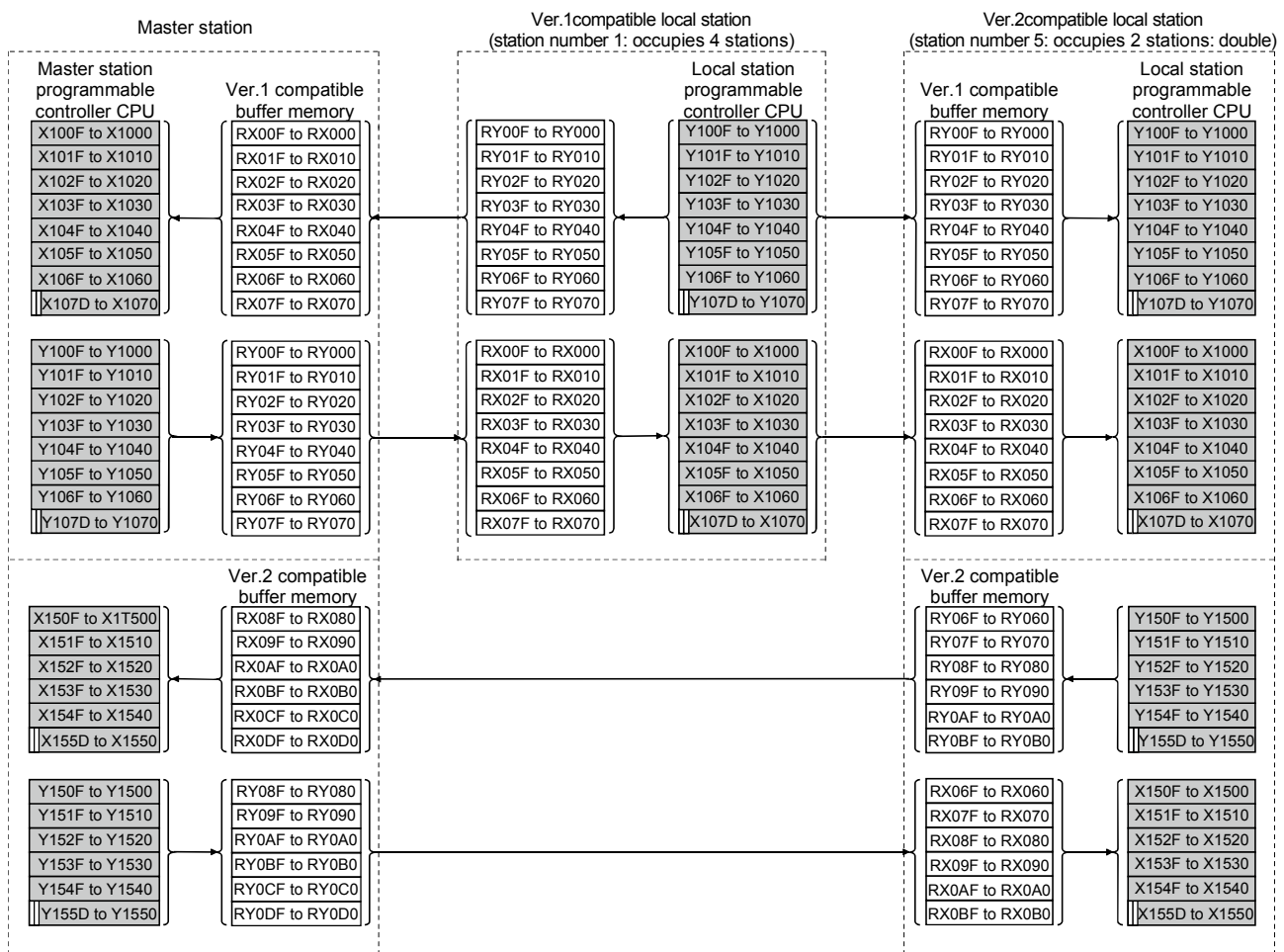


11.4.4 Creating a program

This section shows the program to be used for communication between the master and local stations. The following diagram shows the relationship between the devices of the master station programmable controller CPU and the devices of the local station programmable controller CPU.

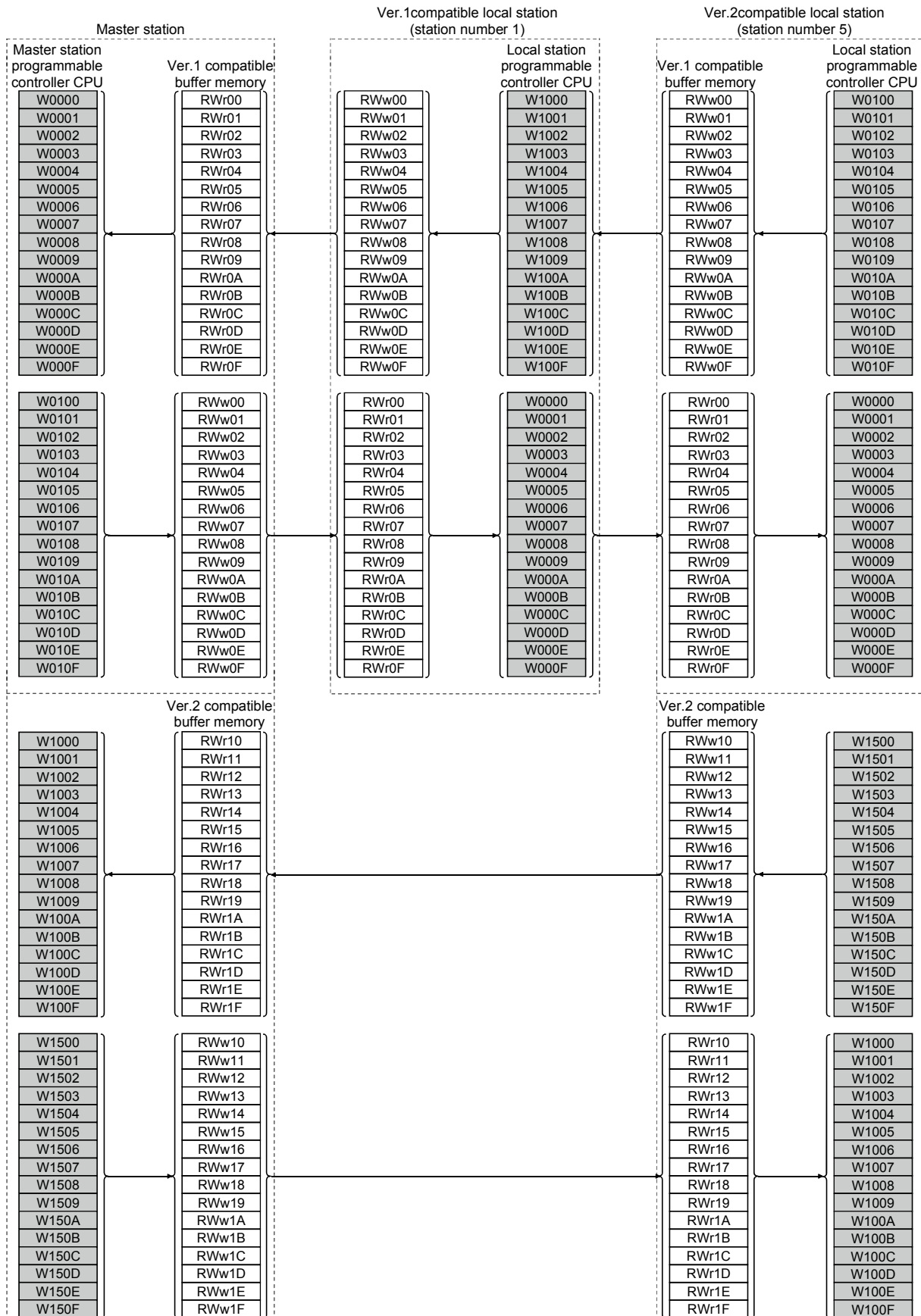
The shaded areas indicate the devices that are actually used.

[Remote input (RX) and remote output (RY)]

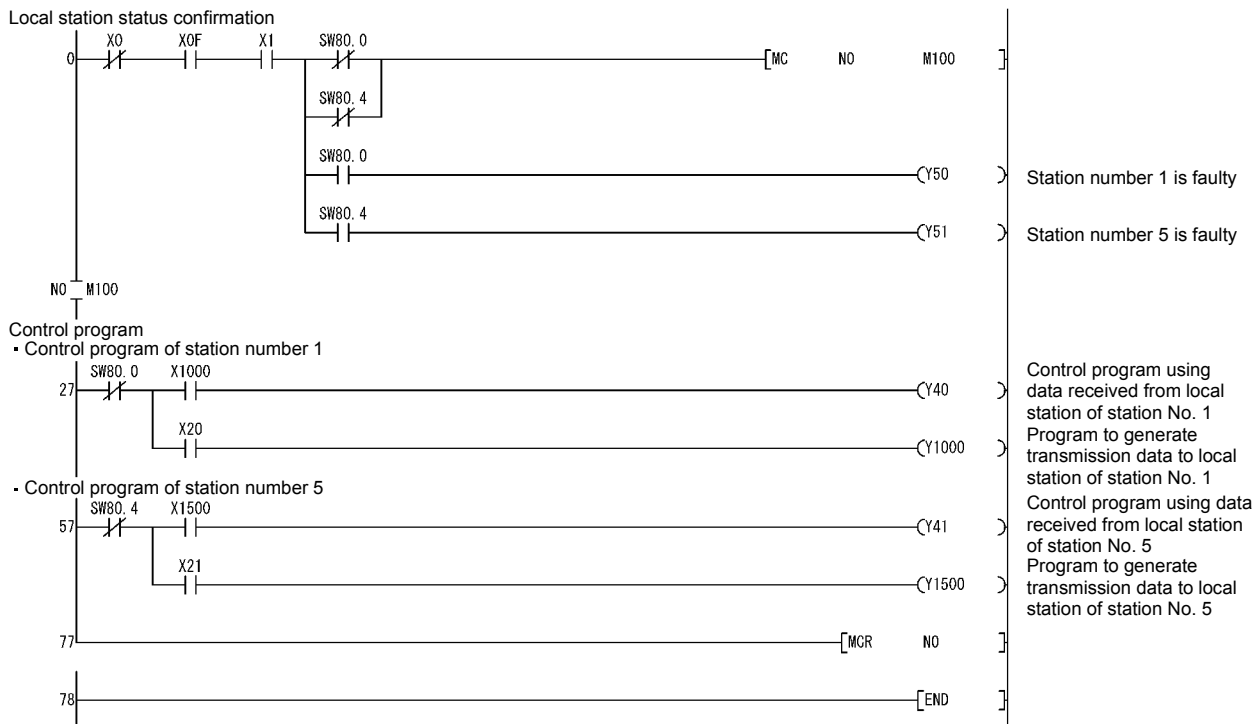


□..... The last two bits cannot be used for communication between the master and local stations.

[Remote registers (RWw and RWr)]

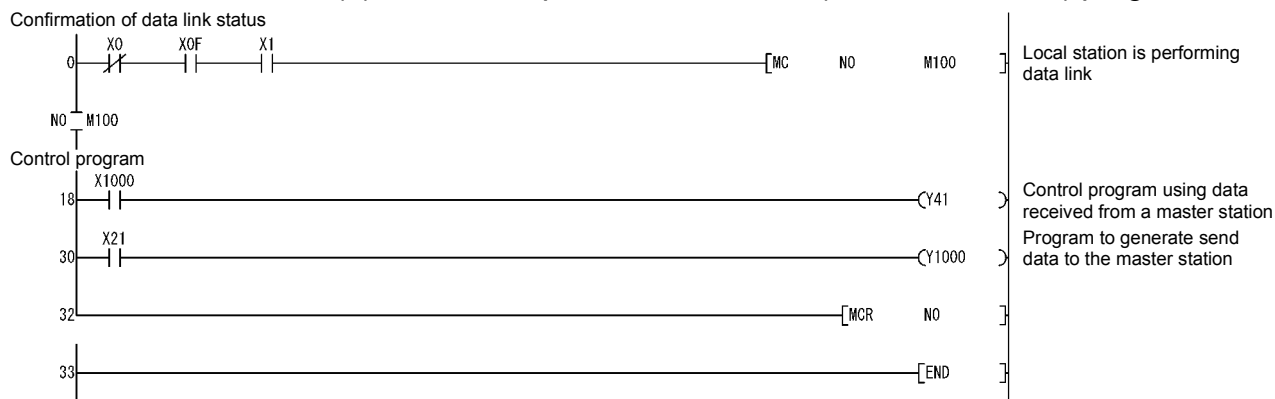


(1) Master station program

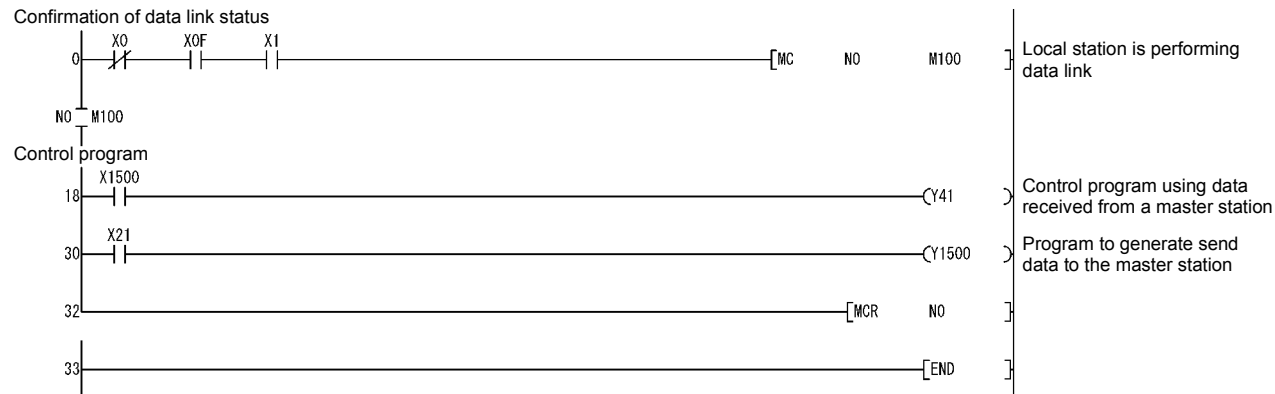


(2) Local station program

(a) Ver.1 compatible local station (station number 1) program



(b) Ver.2 compatible local station (station number 5) program



REMARK

By configuring an interlock with remote I/O (RX/R_Y), cyclic data can be secured on a per-station (4-word) basis.
For details, refer to Remark in Section 11.2.4.

11.4.5 Performing the data link

Turn on the power to the local station first, and then turn on the power to the master station to start the data link.

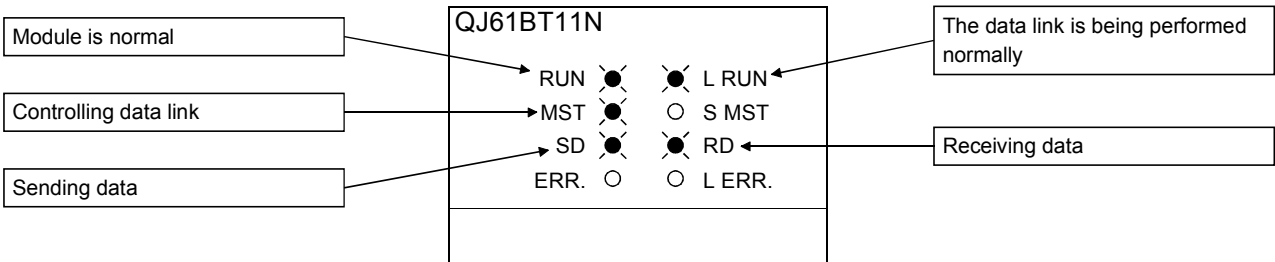
(1) Confirming the operation with the LED display

The following diagram shows the LED display status of the master station and the local station when the data link is being performed normally.

(a) LED display of the master station

Make sure that the LED display shows the following status:

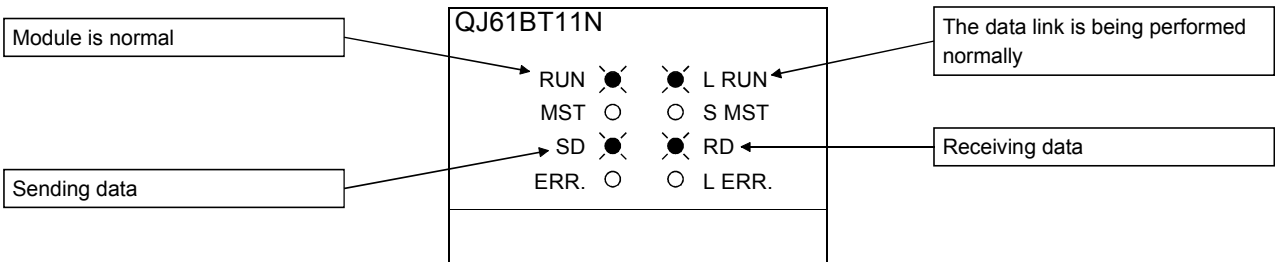
● : On ○ : Off



(b) LED display of the local station

Make sure that the LED display shows the following status:

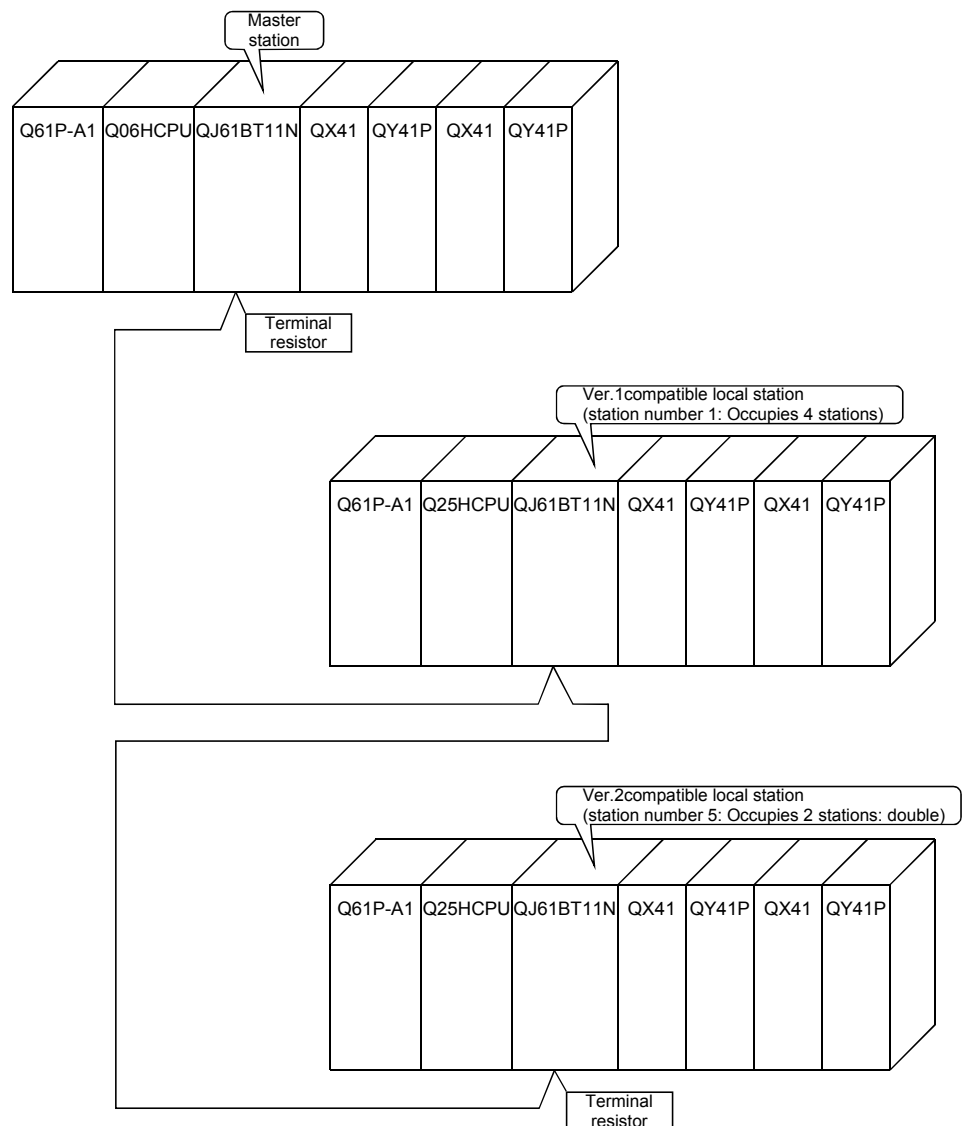
● : On ○ : Off



(2) Confirming the operation with the sequence program

Using the sequence program, confirm that the data link is being performed normally.

- 1) When X20 of the master station is turned on, Y41 of the local station of station No. 1 turns on.
- 2) When X21 of the local station of station No. 1 is turned on, Y40 of the master station turns on.
- 3) When X21 of the master station is turned on, Y41 of the local station of station No. 5 turns on.
- 4) When X21 of the local station of station No. 5 is turned on, Y41 of the master station turns on.



12 COMMUNICATION BETWEEN THE MASTER STATION AND INTELLIGENT DEVICE STATIONS

The communication method between the master station and intelligent device stations is different for each intelligent device station.

For more details on the communication between the master station and intelligent device stations, see the manual for each intelligent device station.

MEMO

13 TROUBLESHOOTING

This chapter describes the details of the problems that may occur in the CC-Link System, and lists the check items and procedures for each of the possible problems.

13.1 Verification upon Problem Occurrence

The following lists the details of the check items and procedures for each problem occurrence.

13

Description of problem	Check item	Check procedure
Unable to perform data link for the entire system.	Are there any disconnected cables?	• Check the cable connection visually or with a line test. • Check the line status (SW0090).
	Are terminal resistors connected to the terminal stations located at each end of the CC-Link system?	Connect the supplied terminal resistors to the terminal stations located at each end of the CC-Link system.
	Are correct terminal resistors connected?	Connect the appropriate terminal resistors that match the cable type used for the terminal stations located at each end of the CC-Link system. (See Section 7.5.)
	Has an error occurred at the master station's programmable controller CPU?	Check the error code of the programmable controller CPU and take corrective action.
	Are the CC-Link parameters set in the programmable controller CPU of the master station?	Check the contents of the parameters for the programmable controller CPU of the master station.
	Does the sequence scan time exceed the tolerance for each transmission speed when using the synchronous mode? 10 Mbps : 50 ms 5 Mbps : 50 ms 2.5 Mbps : 100 ms 625 kbps : 400 ms 156 kbps : 800 ms	Switch to the asynchronous mode, or reduce the transmission speed.
	Has an error occurred at the master station?	• Check the host parameter status (SW0068). • Check the switch setting status (SW006A). • Check the Loading status (SW0069). • Check to see if the "ERR." LED on the master station is flashing. (See Section 13.2.)
Unable to receive input from a remote I/O station.	Is the corresponding remote I/O station performing data link?	• Check the LED display on the corresponding remote I/O station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data read from the correct address of remote input RX (buffer memory)?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)?	Check parameter information (SW0067).
	Is the corresponding remote I/O station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).

Description of problem	Check item	Check procedure
Unable to receive input from a remote I/O station.	Is the corresponding station set as a reserved station?	- Check the parameters. - Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	- Check the station number setting. - Check the loading status (SW0069). - Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	- Check the loading status (SW0069). - Check the station number overlap status (SW0098 to SW009B). - Check the loading/parameter consistency status (SW009C to SW009F).
	Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously?	- Check the sequence program. - Check the automatic refresh parameter settings.
Unable to output data from a remote I/O station.	Is the corresponding remote I/O station performing data link?	- Check the LED display on the corresponding remote I/O station. - Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data written to the correct address of remote output RY (buffer memory)?	- Check the sequence program. - Check the automatic refresh parameter settings.
	Is the master station parameter information area being used (CPU built-in internal parameters, default parameters) correct?	Check parameter information (SW0067).
	Is the corresponding remote I/O station number recognized by the master station?	- Check the parameters. - Check the total number of stations (SW0070). - Check the max. communication station number (SW0071). - Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	- Check the parameters. - Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	- Check the station number setting. - Check the loading status (SW0069). - Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	- Check the loading status (SW0069). - Check the station number overlap status (SW0098 to SW009B). - Check the loading/parameter consistency status (SW009C to SW009F).
	Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously?	- Check the sequence program. - Check the automatic refresh parameter settings.
Unable to receive remote input (RX) of a remote device station.	Is the corresponding remote device station performing data link?	- Check the LED display on the corresponding remote device station. - Check the other station data link status of the master station. (SW0080 to SW0083)

Description of problem	Check item	Check procedure
Unable to receive remote input (RX) of a remote device station.	Is data read from the correct address of remote input RX (buffer memory)?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)?	Check parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	• Check the station number setting. • Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	• Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B). • Check the loading/parameter consistency status (SW009C to SW009F).
	Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously?	• Check the sequence program. • Check the automatic refresh parameter settings.
	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.
Unable to turn on/off remote output (RY) of a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED display on the corresponding remote device station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data read from the correct address of remote output RY (buffer memory)?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)?	Check parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	• Check the station number setting. • Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	• Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B). • Check the loading/parameter consistency status (SW009C to SW009F).

Description of problem	Check item	Check procedure
Unable to turn on/off remote output (RY) of a remote device station.	Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously?	• Check the sequence program. • Check the automatic refresh parameter settings.
	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.
Unable to receive data to the remote register RWr in a remote device station.	Is the corresponding remote device station performing data link?	• Check the LED display on the corresponding remote device station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data read from the correct address of remote register RWr (buffer memory)?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)?	Check parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	• Check the station number setting. • Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	• Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B). • Check the loading/parameter consistency status (SW009C to SW009F).
	Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously?	• Check the sequence program. • Check the automatic refresh parameter settings.
Unable to write data to the remote register RWw in a remote device station.	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.
	Is the corresponding remote device station performing data link?	• Check the LED display on the corresponding remote device station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data written from the correct address of remote register RWw (buffer memory)?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the correct master station parameter information area being used (CPU built-in parameters, default parameters)?	Check parameter information (SW0067).
	Is the corresponding remote device station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station specified status (SW0074 to SW0077).

Description of problem	Check item	Check procedure
Unable to write data to the remote register RWw in the remote device station.	Are there any overlap station numbers?	• Check the station number setting. • Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	• Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B). • Check the loading/parameter consistency status (SW009C to SW009F).
	Are the refresh set with the automatic refresh parameters and the refresh executed with the FROM/TO instructions performed simultaneously?	• Check the sequence program. • Check the automatic refresh parameter settings.
	Is the remote device station initialization procedure registration being executed?	Check if the remote device station initialization procedure registration instruction (SB000D) is on.
Unable to communicate from the master station (remote output RY) to a local station (remote input RX).	Is the corresponding local station performing data link?	• Check the LED display on the corresponding local station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data written to the correct address of remote output RY (buffer memory) of the master station?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is data read from the correct address of remote input RX (buffer memory) of the local station?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	• Check the station number setting. • Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	• Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B). • Check the loading/parameter consistency status (SW009C to SW009F).
Unable to communicate from a local station (remote output RY) to the master station (remote input RX).	Is the corresponding local station performing data link?	• Check the LED display on the corresponding local station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data written to the correct address of remote output RY (buffer memory) of the local station?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is data read from the correct address of remote input RX (buffer memory) of the master station?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).

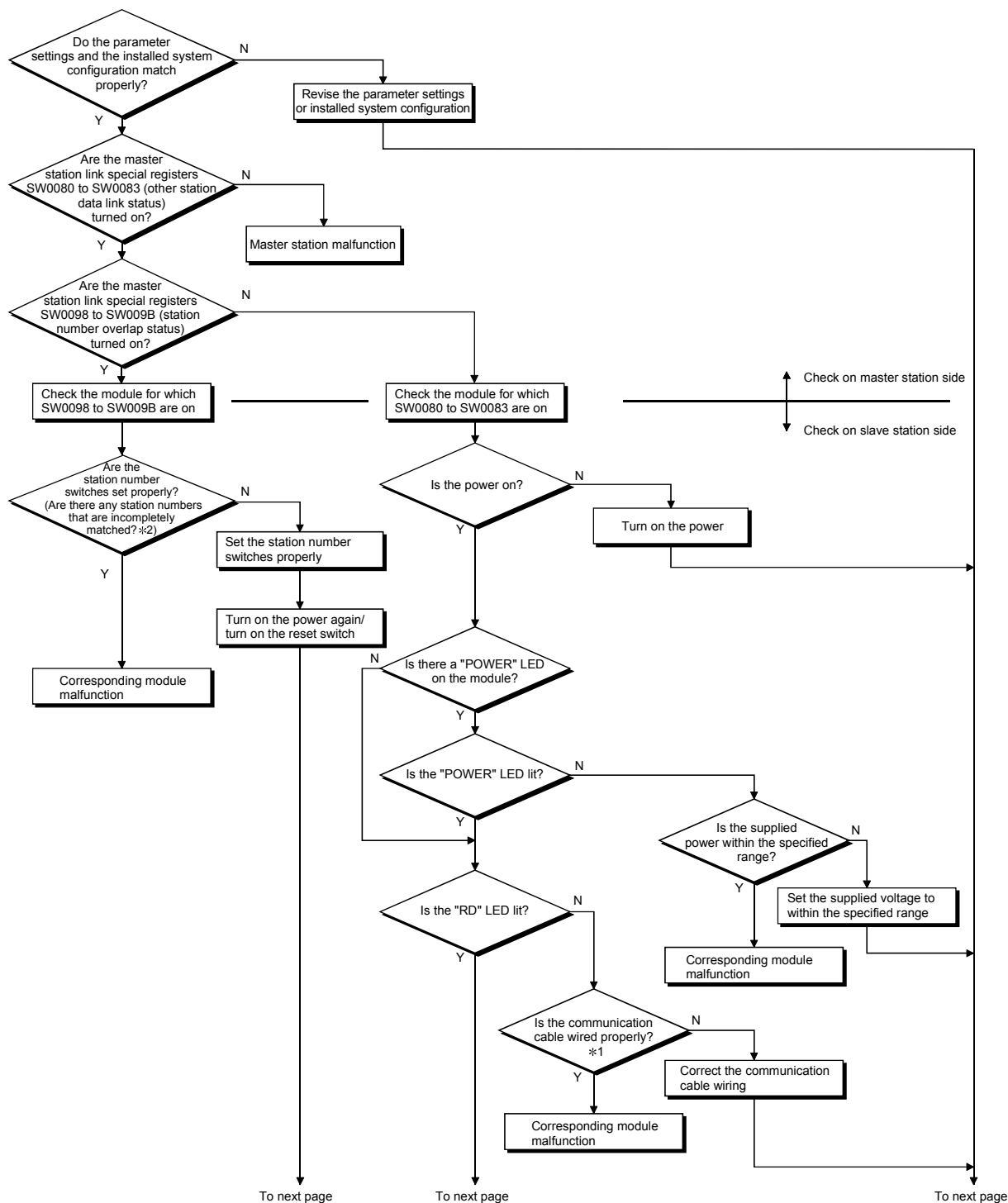
Description of problem	Check item	Check procedure
Unable to communicate from a local station (remote output RY) to the master station (remote input RX).	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	• Check the station number setting. • Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	• Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B). • Check the loading/parameter consistency status (SW009C to SW009F).
Unable to communicate from the master station (remote register RWw) to a local station (remote register RWr).	Is the corresponding local station performing data link?	• Check the LED display on the corresponding local station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Do the number of occupied stations settings for a local station match to the station information for a master station?	
	Is data written to the correct address of remote register RWw (buffer memory) of the master station?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is data read from the correct address of remote register RWr (buffer memory) of the local station?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is the corresponding local station number recognized by the master station?	• Check the parameters. • Check the total number of stations (SW0070). • Check the max. communication station number (SW0071). • Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	• Check the parameters. • Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	• Check the station number setting. • Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	• Check the loading status (SW0069). • Check the station number overlap status (SW0098 to SW009B). • Check the loading/parameter consistency status (SW009C to SW009F).
Unable to communicate from a local station (remote register RWw) to the master station (remote register RWr).	Is the corresponding local station performing data link?	• Check the LED display on the corresponding local station. • Check the other station data link status of the master station. (SW0080 to SW0083)
	Is data written to the correct address of remote register RWw (buffer memory) of the local station?	• Check the sequence program. • Check the automatic refresh parameter setting.
	Is data read from the correct address of remote register RWr (buffer memory) of the master station?	• Check the sequence program. • Check the automatic refresh parameter setting.

Description of problem	Check item	Check procedure
Unable to communicate from a local station (remote register RWW) to the master station (remote register RWR).	Is the corresponding local station number recognized by the master station?	- Check the parameters. - Check the total number of stations (SW0070). - Check the max. communication station number (SW0071). - Check the number of connected modules (SW0072).
	Is the corresponding station set as a reserved station?	- Check the parameters. - Check the reserved station specified status (SW0074 to SW0077).
	Are there any overlap station numbers?	- Check the station number setting. - Check the loading status (SW0069). - Check the station number overlap status (SW0098 to SW009B).
	Do the settings match?	- Check the loading status (SW0069). - Check the station number overlap status (SW0098 to SW009B). - Check the loading/parameter consistency status (SW009C to SW009F).
Unable to operate the local station at the specified number of occupied stations.	Is the QJ61BT11 of function version A set to occupy 2 or 3 stations.	Set the number of occupied stations to 1 or 4.
Unable to stop data link.	Is the data link stop (SB0002) turned on?	- Check the sequence program. - Check the automatic refresh parameter settings.
	Has an error occurred?	Check the data link stop result (SW0045).
Unable to restart data link.	Is the data link restart (SB0000) turned on?	- Check the sequence program. - Check the automatic refresh parameter setting.
	Has an error occurred?	Check the data link restart result (SW0041).
	Is the corresponding station disconnected?	- Check the cable connection visually or with a line test. - Check the parameters (for local station). - Check the operation status of the programmable controller CPU in the corresponding station.
The remote station/local station/intelligent device station/standby master station does not start up.	Do the parameters for the number of modules and station information match the settings of the modules that do not start up?	Check the parameters.
	Are there any overlap station numbers?	Check the station number setting.
The local station/standby master station does not start up and the "ERR." LED turns on.	Check that the station number of the local station (including the number of occupied stations) is not 65 or more.	Check the station number setting switches and parameter of the local station/standby master station.
	Does the mode of the master station match the mode of the local station/standby master station?	Check the parameters of the master station and local station/standby master station.
	Check that the parameter of the master station that will return to the system by the standby master function has not been rewritten.	Check the parameter of the master station.
Faulty stations cannot be detected.	Is the station set as an error invalid station?	Check the parameters.
	Is the station number overlapped elsewhere?	Check the station number setting.
Faulty stations are generated depending on transmission speed.	Can the faulty station be identified using the other station data link status (SW0080 to SW0083)?	- Check the switch settings for the faulty station. - Check that the cable is properly wired. - Check that the shield of the cable is grounded. - Connect the terminal resistor that matches the cable type used to the terminal stations located at each end of the CC-Link system.
	If the transmission speed is reduced to a lower level such as 156 kbps, can communication be performed without producing an error?	
When a dedicated instruction is executed, the abnormal completion bit turns on.	Has an error occurred?	- Check the error code for the programmable controller CPU. - Check the error code for the master station. - Check the operation status of the programmable controller CPUs for both the master station and the corresponding local station.
The remote device station is not operating normally.	Are there any errors in the initial settings of the remote device station?	- Check the parameters. - Check the sequence program.
When multiple remote stations are powered off at 156 kbps, the "L RUN" LED goes off temporarily.	What is the setting for the retry count?	- Increase the transmission speed. - Reduce the retry count.
CC-Link cannot be started automatically.	Has a value been set for the intelligent function module switch setting?	Disable the intelligent function module switch setting of GX Developer.
The abnormal completion bit turns on when the dedicated instruction (G(P).RLPASET) is executed.	Is the switch 4 setting of the intelligent function module switch settings correct?	Set switch 4 of the intelligent function module switch settings of GX Developer to 0100.
	Are the various settings specified by the G(P).RLPASET instruction correct?	- Check the error code for the programmable controller CPU. - Check the error code for the master station. - Check the operation status of the programmable controller CPU for the master station.
	Has the parameter setting method been changed without turning the power supply to the programmable controller system off and back on, or resetting the programmable controller CPU?	Turn the power supply to the programmable controller system off and back on, or reset the programmable controller CPU.
If the condition returns to normal, the disconnected data link error station does not return to the system automatically.	Has the module been changed for the one having the different number of occupied stations and station type during data link?	Change the module for the one having the same number of occupied stations and station type. When changing the number of occupied stations and/or station type, reset the master station after changing.

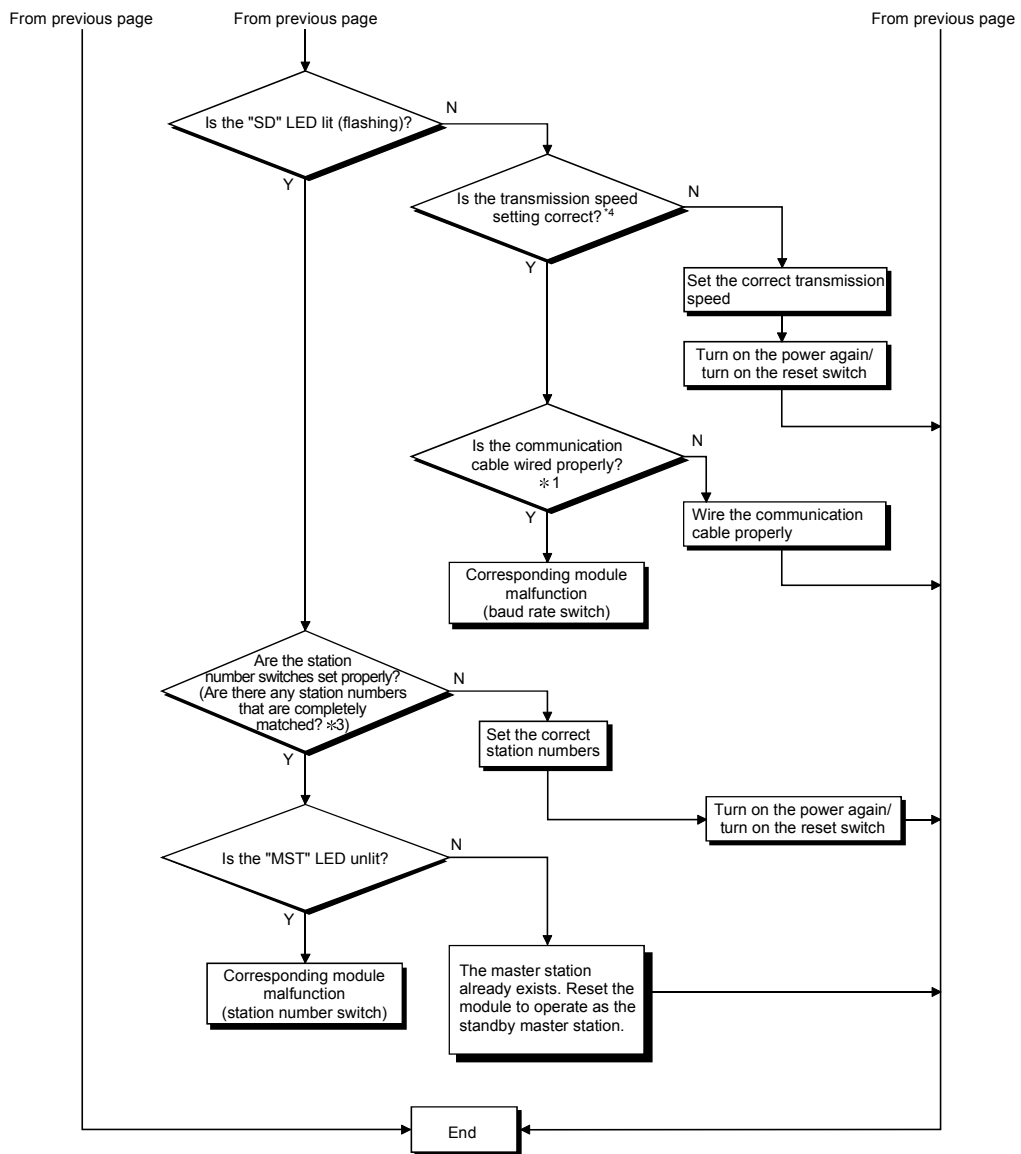
Description of problem	Check item	Check procedure
GX Developer cannot communicate with the other station programmable controller CPU.	Check the error code in the Error dialog box of GX Developer.	Check the error code list and take corrective action.
	Does the programmable controller CPU of the station set in "Transfer setup" have an error?	Check the error code of the programmable controller CPU.
	Is the station set in "Transfer setup" executing data link?	Check whether the "L RUN" LED of the corresponding station is on or not.
LINK PARA.ERROR (Error code 3105) occurs on the standby master station after module replacement.	Does the module support the data link start by standby master station?	Replace it with a module whose first 5 digits of serial No. is 07112 or later.
The standby master station does not start data link control when the master station went down.	Is there any disconnected cable?	• Check the cable connection visually or with a line test. • Check the line status (SW0090).
	Are terminal resistors connected to the terminal stations of the CC-Link system?	Connect the supplied terminal resistors to the terminal stations of the CC-Link system.
	Are correct terminal resistors connected?	Connect terminal resistors that match the cable type to the terminal stations of the CC-Link system. (See Section 7.5.)
Initialization procedure registration of the corresponding station stops and is not completed. (The execution procedure number in the remote device station initialization procedure registration execution individual information (SW0110 to SW011F) has stopped.)	Is the station participating in the data link?	Confirm the other station communication status (SW0080 to SW0083). Reset the remote device station, and retry the operation after the station has rejoined the data link. Or, remove the station from the specification area for remote device station to be initialized (SW0014 to SW0017), and retry the operation.
	Is the station set as a reserved station?	Confirm the reserved station specification status (SW0074 to SW0077). Correct the network parameters, and retry the operation after establishing the data link.
	Is the parameter setting for remote device station initialization procedure registration correct?	Confirm the network parameters. Correct the network parameters, reset the remote device station and retry the operation.
The master station crashed and the data link stopped after remote device station initialization procedure registration was instructed.	Does the ready signal (X1B) of the remote device station remain OFF after the data link is established?	Monitor the remote input (RX) of the remote device station. Reset the remote device station and retry the operation.
Switching of master operation*1 occurred after remote device station initialization procedure registration was instructed.	Does the ready signal (X1B) of the remote device station remain OFF after the data link is established?	Monitor the remote input (RX) of the remote device station. Reset the remote device station and retry the operation.
Initialization processing ended in error.	Check the error code.	Check the remote device station initialization procedure instruction result (SW005F). Check the error code list and remedy the problem.

*1 Station specification of the remote device station initialization procedure registration is available for the station operating as a master in the redundancy system configuration or master stations.

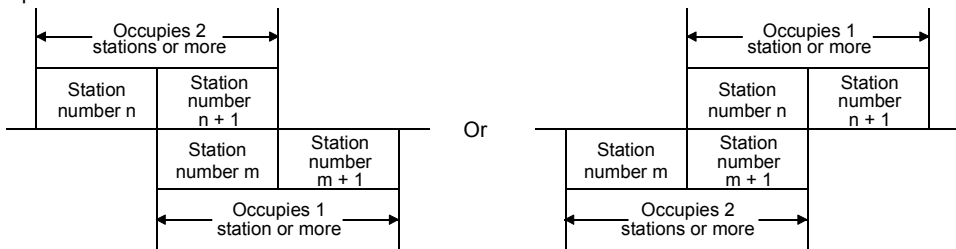
13.2 Troubleshooting Procedures When the "ERR." LED of the Master Station is Flashing or When Normal Data cannot be Sent/Received During Data Link



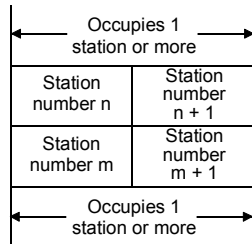
*1: Check for short-circuits, reversed connection, disconnection, terminal resistors, FG connection, overall distance, and distance between stations.



*2 Incomplete match



*3 Complete match



*4 The transmission speed test allows checking whether the transmission speed setting of the slave station matches that of the master station. (See Section 7.9.)

13.3 Error Codes

When a trouble such as data link failure has occurred, error cause can be identified by an error code.

13.3.1 How to check error codes

Error codes can be checked on GX Developer and GX Works2. (Refer to (1) and (2) in this section)

They can also be checked in link special registers (SW). (Refer to (3) in this section)

(1) Checking with GX Developer

On GX Developer, select [Diagnostics] → [System monitor], and then click the **Module's Detailed Information** button.



(The "Error contents • Disposal" section is displayed in GX Developer Version 8.17T or later.)

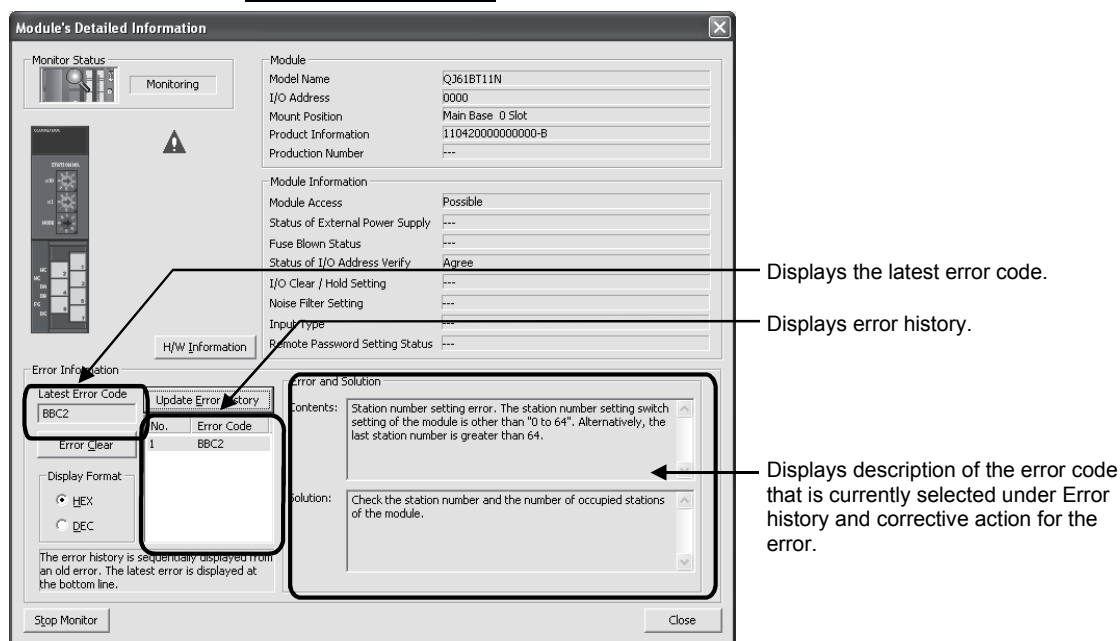
(2) Checking with GX Works2

Error codes that are corresponding to the errors occurred in the QJ61BT11N can be checked by following either procedure (a) or (b) described below.

(a) Checking on the "Module's Detailed Information" screen

Error code, error contents, and corrective action are displayed.

On GX Works2, select [Diagnostics] → [System Monitor], and then click the **Detailed Information** button.



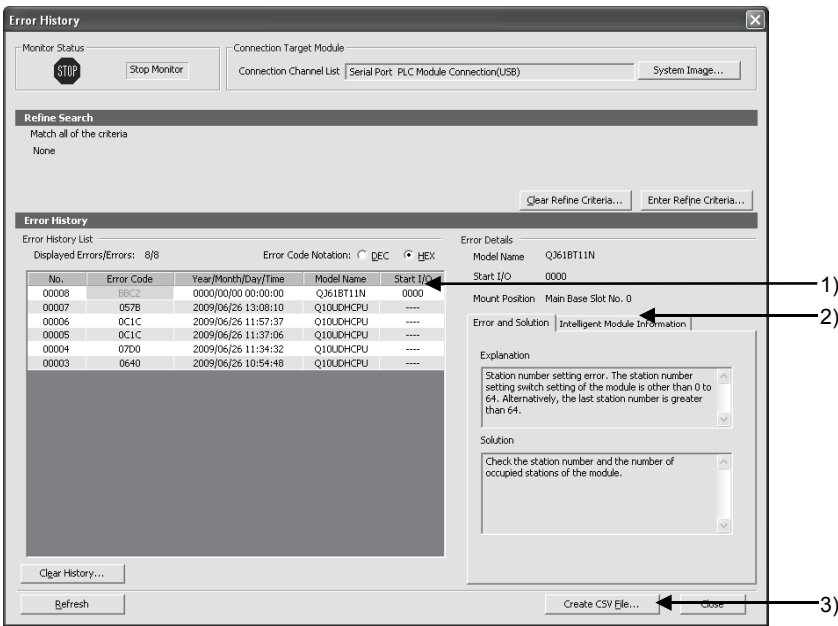
(b) Checking on the "Error History" screen*1

On this screen, errors including those occurred in other modules are displayed in chronological order, and the data can be output in a CSV file. Error code and date and time of error occurrence can be checked even after the programmable controller was powered off and then on or after the programmable controller CPU is reset.

On GX Works2, select [Diagnostics] → [System Monitor], and then click the **System Error History** button.

*1: Available on the programmable controller CPU, QJ61BT11N, and GX Works2 when those versions are respectively as follows.

Item	Version
Programmable controller CPU	Universal model QCPU with the first five digits of serial No. 11043
QJ61BT11N	QJ61BT11N with the first five digits of the serial No. 11042
GX Works2	Version 1.12N or later



1) Error History List

Error log of the module is displayed.

For errors occurred during initial processing of the programmable controller CPU, the date and time will be 0000/00/00 00:00:00, therefore the displayed order under Error history list is not in the order in which the errors occurred. (Example: Station number setting error)

2) Error and Solution, Intelligent Module Information

- Error and Solution

The error description and corrective action for the error, which is currently selected under "Error History List", are displayed.

- Intelligent Module Information

The status of a QJ61BT11N when the error, which is currently selected under "Error History List", had occurred is displayed. ^{*1}

*1: When the error that simultaneously occurs with a network error is selected, the status right before the error occurrence may be displayed under Intelligent Module Information.

For the QJ61BT11N, the following will be displayed.

Item	Description
Action status	Operation status of the host station
Data link status	Data link status of the host station
Other station data link status (SW0080 to SW0083)	Data link status of each station 0: Normal 1: Data link error occurred
Line status (SW0090)	Line status
Master station information (SB0070)	Data link status
Standby master station information (SB0071)	Availability of the standby master station
Scan mode setting information (SB0072)	Settings of the scan mode
Operation specification when CPU is down status (SB0073)	Operation specification status when the CPU is down, which is set by parameters
Reserved station specified status (SB0074)	Reserved station specified status which is set by parameters
Error invalid station specified status (SB0075)	Error invalid station status which is set by parameters
Temporary error invalid station setting information (SB0076)	Whether the temporary error invalid station is set
Parameter receive status (SB0077)	Status of the parameter reception from the master station
Host station switch change detection (SB0078)	Changing status of the setting switches of the host station that is in data link
Master station return specification information (SB0079)	Whether the "Type" setting is set to "Master station" or "Master station (Duplex function)" in Network parameter
Host master/standby master operation status (SB007B)	Whether the host station is operating as the master or standby master
Slave station refresh/compulsory clear setting status in case of programmable controller CPU STOP (SB007C)	Slave station refresh/compulsory clear setting status in case of programmable controller CPU stop which is set by parameters
Dedicated instruction	Dedicated instruction on which an error has occurred
Target station number	Station number of the transient transmission target station When it is not transient transmission error, "No Information" is displayed.

3) **Create CSV File** button

Click this button to output the module error history in a CSV file.

POINT

- (1) If errors have frequently occurred in the QJ61BT11N, "**HST.LOSS**" may be displayed instead of an error code in the Error Code column.

No.	Error Code	Year/Month/Day/Time	Model Name	Start I/O
00008	*HST.LOSS*	2009/06/28 11:01:15	QJ61BT11N	0000

If too many "**HST.LOSS**" are displayed, increase the number of errors to be collected per scan in the "PLC RAS" tab of the "Q Parameter Setting" dialog box.

For setting, refer to the user's manual (Function Explanation, Program Example) for the CPU module used.

- (2) When the same errors consecutively occurred, only the error code for the first occurred is displayed on the "Error History" screen.

(3) Checking in link special registers (SW)

Error codes can be checked in link special registers (SW).

For details, refer to Section 8.4.

13.3.2 Error code list

Table 13.1 lists the error codes.

When the standby master station is operating as the master station, the detectability is identical to that of the master station.

When the standby master is operating as a local station, the detectability is identical to that of the local station.

Table 13.1 Error code list (1/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
4000 to 4FFF	(Errors detected by the programmable controller CPU)	—	Take corrective actions, referring to the troubleshooting section of the CPU User's Manual (Hardware Design, Maintenance and Inspection).	—	—
7000 to 7FFF	(Errors detected by serial communication module, etc)	—	Take corrective actions, referring to the troubleshooting section of the Serial Communication Module User's Manual	—	—
B10C	Message transmission function unsupported	The message transmission function was executed for the remote device station that does not support the function.	Check the station No. of the target station. Or, check if the target station supports the message transmission function.		
B110	Transient data can not be received.	A line error has occurred.	Check the line.	○	○
B111	Transient data receiving order error	A line error has occurred.	Check the line.	○	○
B112	Transient data length error	A line error has occurred.	Check the line.	○	○
B113	Transient data ID error	A line error has occurred or an instantaneous power failure has occurred at the send station.	Check the line, or check the supply power and power supply module of the send station.	○	○
B115	Link error	A line error has occurred.	Check the line.	○	○
B116	Packet error	A line error has occurred.	Check the line.	○	○
B120	Forced termination of the remote device station initialize procedure registration function	In the remote device station initialize procedure registration function, the specification of the remote device station initialize procedure registration was turned off before all procedures were completed.	Do not turn the specification of the remote device station initialize procedure registration off until all procedures are completed.	○	×
B124	Error at a station on which the remote device station initialize procedure registration function was executed	The specification of the remote device station initialize procedure registration function was turned on at a station other than the master station.	Turn on the remote device station initialization procedure registration instruction on the master station (station No.0).	×	○
B125	Parameter not set error of the remote device station initialize procedure registration function	The specification of the remote device station initialize procedure registration function was turned on without setting the remote device station initialize procedure registration.	Turn on the specification of the remote device station initialize procedure registration function after setting the remote device station initialize procedure registration.	○	×
		Bits corresponding to other than the head station number were turned ON in the remote device station initialization processing station specification area, and remote device station initialization procedure registration was instructed.	Turn ON only the head station number in the remote device station initialization processing station specification area.		
B201	Corresponding station error during sending	A data link error occurred at the corresponding station during transient transmission.	Check the communication status of other stations, whether or not a temporary error invalid station is specified, or if the corresponding station is stopped.	○	○
B205	Transient target station error	A transient request was issued to other than the intelligent device station.	Check the target station.	○	○
B301	Processing request error during link stop	Line test request was issued while the link was stopped.	Perform a line test while the link is being established	○	○
B302	Specified station number setting error	The specified station number exceeded the highest communication station number during temporary error invalid request/temporary error invalid cancel request.	Specify a station number that is no greater than the highest communication station number.	○	×

Table 13.1 Error code list (2/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability								
				Master station	Local station							
B303	Specified station number not set error	The station number was not specified during temporary error invalid request/temporary error invalid cancel request.	Set a specified station number. (SW0003, SW0004 to SW0007)	○	×							
B304	Line test error station detected	An error was detected in a remote station, intelligent device station or standby master station when a line test was performed.	Check that the remote station, intelligent device station or standby master station is operational and that the cable is not disconnected.	○	×							
B306	Specified station number setting error	A station number other than the head station number was specified during temporary error invalid request/temporary error invalid cancel request.	Specify a head station when temporary error invalid request/temporary error invalid cancel request is requested.	○	×							
B307	All stations data link error	All stations were in data link error status when one of the following requests was made: • SB0000 (data link restart) • SB0002 (data link stop)	Request again after the data link becomes normal.	○	○							
B308	Station number setting error (installation status)	The station number of the slave station is outside of the range between "1 and 64".	Set the station number of the slave station within the range between "1 and 64".	○	×							
B309	Station number overlap error	The station number of the connected module was duplicated (including number of occupied stations). However, this excludes the duplicate head station number.	Check the module station number.	○	×							
B30A	Loading/parameter consistency error	The station types of the module are different from parameter settings. Example) <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 rowspan="2">Intelligent device</td><td>Remote I/O</td></tr><tr><td>Remote device</td></tr></table>	Connected module	Parameter setting	Remote device	Remote I/O	Intelligent device	Remote I/O	Remote device	Set the correct parameters.	○	×
		Connected module	Parameter setting									
Remote device	Remote I/O											
Intelligent device	Remote I/O											
	Remote device											
The mode is inconsistent between the master station and a local or standby master station. • The modes of the master station and standby master station are different.	After correcting the parameters of the master station, or the local or standby master station, reset the programmable controller CPU.											
B30B	Loading/parameter consistency error	The contents of the installation status and network parameters do not match.	Set the contents of the installation status and network parameters to match.	○	×							
B30C	Standby master station specification error	Master station switching was instructed to a station other than the standby master station.	Specify the station number that corresponds to the standby master station.	○	○							
B30D	Initial status	Temporary error invalid station specification, line test request, or data link stop/restart request, etc. was issued before starting the link.	Issue the request after the data link is started.	○	○							
B30E	Unsupported error	In the function started by SB/SW, an attempt was made to execute the function, which is supported by only the master station, at the local station.	Execute the corresponding function from the master station.	×	○							
B30F	Temporary error invalid station specification error	A temporary error invalid station was specified while the data link is being performed upon automatic CC-Link startup.	Specify a temporary error invalid station while the data link is performed with parameters set using GX Developer or the dedicated instruction.	○	×							
B310	Data link restart error	Data link restart (SB0000) was executed for the station that was performing a data link.	Execute Data link restart (SB0000) for the station that has stopped a data link with Data link stop (SB0002).	○	○							

Table 13.1 Error code list (3/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B311	Data link stop error	Data link stop (SB0002) was executed for the station that had stopped a data link.	Execute Data link stop (SB0002) for the station that is performing a data link.	○	○
B312	Standby master station absence error	Forced master to standby master switching (SB000C) was executed in the system where no standby master station exists or in the system where the standby master station had become faulty.	After starting the data link of the standby master station, execute Forced master to standby master switching (SB000C).	○	×
B313	All station fault error	Forced master to standby master switching (SB000C) was executed in the system where all stations had become faulty.	After starting the data link of the standby master station, execute Forced master to standby master switching (SB000C).	○	×
B314	Switching target error	Forced master to standby master switching (SB000C) was executed for any station other than the master station.	Execute Forced master to standby master switching (SB000C) for the master station.	×	○
B315	Forced master station switching error	Forced master switching (SB000C) was instructed again while the master station was being switched to the standby master station.	Check ON/OFF of Forced master switching (SB000C).	○	×
B317	Network startup setting mode error	The RLPASET instruction was executed for a module whose parameters have been set by GX Developer. The parameter setting was changed without turning the power supply to the programmable controller system off and back on, or resetting the programmable controller CPU.	Use the RLPASET instruction according to the procedure below. 1. Clear the settings of the network parameters and refresh parameters of the target module using GX Developer. 2. Set the type of I/O assignment setting in GX Developer to "intelli." 3. Set switch 4 of the intelligent function module switch setting in GX Developer to 0100 _H . 4. Turn the power supply to the programmable controller system off and back on, or reset the programmable controller CPU.	○	×
B31A	Data linking	Data link has already been started when the master station duplication error cancelling is instructed.	Do not instruct the master station duplication error cancelling during data linking.	○	×
B31B	Transmission speed test execution error	The transmission speed test was executed during data link.	Set Data link stop (SB0002) to ON and then Transmission speed test request (SB000B) to ON.	○	×
B31C	System error	—	Please consult your local Mitsubishi representative.	○	○
B31D					
B31E					
B31F					
B320					
B321					
B384	Station number setting error (parameter)	The station number (including the number of occupied stations) of the station information parameters was set to "other than 1 _H to 40 _H ."	Set within the range of "1 _H to 40 _H ."	○	×
B385	Total number of stations error (parameter)	The total number of occupied stations set with the station information parameter exceeded 64.	Set a parameter value of 64 or less.	○	×
B386	Number of occupied stations setting error (parameter)	The number of all occupied stations in the station information parameter was set to "0".	Set the occupied station number to a value between "1 and 4".	○	×
B387	Delay time setting error (parameter)	The delay time setting in the master station network parameters is out of the setting range.	Set a value within the setting range.	○	×
B388	Station type setting error (parameter)	The station type in the station information parameter was set to "other than 0 to 2".	Set to a value between "0 and 2".	○	×
B38B	Remote device station setting error (parameter)	The number of remote device stations was set to "43 stations or more" with the station information parameter.	Set the remote device station to "42 stations or less" with the station information parameter.	○	×

Table 13.1 Error code list (4/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B38C	Intelligent device station setting error (parameter)	The number of intelligent device stations (including local stations) was set to "27 stations or more" with the station information parameter.	Set the intelligent device station to "26 stations or less" with the station information parameter.	○	×
B38D	Invalid station specified error (parameter)	"Other than module head station number" or "station number not specified in the parameter" was set with the invalid station specification parameter. <Example of other than head station number> A bit other than that for station number 5 was ON for a module occupies 4 stations (station numbers 5 to 8).	Set the "Head station number of the module". Do not specify any of the stations not specified with the parameter.	○	×
B38E	Communication buffer assignment error (parameter)	The total size of the communication buffers in the station information parameter exceeded 4 k words.	Set the total size of the communication buffers to 4 k words or less.	○	×
B38F	Automatic update buffer assignment error (parameter)	The total size of the automatic update buffer in the station information parameter exceeded 4 k words.	Set the total size of the automatic update buffer to 4 k words or less.	○	×
B390	Standby master station specification error (parameter)	The standby master station parameter was set to a value other than "1 to 64".	Specify the standby master station to a value within the range from "1 to 64".	○	×
B391	Retry count setting error (parameter)	The retry count parameter was set to a value other than "1 to 7".	Set a value within the range from "1 to 7".	○	×
B392	Operation when CPU is down specified error (parameter)	The operation when the CPU is down specification parameter was set to a value other than "0 or 1".	Set "0 or 1".	○	×
B393	Scan mode specification error (parameter)	The scan mode parameter was set to a value other than "0 or 1".	Set "0 or 1".	○	○
B394	Number of automatic return stations setting error (parameter)	The number of automatic return stations parameter was set to a value other than "1 to 10".	Set a value within the range from "1 to 10".	○	×
B396	Station number overlap error (parameter)	A duplicate station number was specified with the station information parameter.	Set so that station numbers are not duplicated.	○	×
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: Number of remote I/O stations B: Number of remote device stations C: Number of intelligent device stations (including local stations)	Set the parameter so that it meets the condition shown on left.	○	×
B398	Number of occupied stations setting error (parameter)	The number of occupied stations in the station information parameter was set to a value other than "1 to 4".	Set a value within the range from "1 to 4".	○	×
B399	Number of connected modules setting error (parameter)	The number of connected modules parameter was set to a value other than "1 to 64".	Set a value within the range from "1 to 64".	○	×
B39A	Standby master station specification error (loading status)	The station number set with the station number setting switches of the standby master station differs from that set in the "standby master station No." network parameter of the master station, or the station set in the "standby master station No." network parameter of the master station is a local station.	Change the parameter setting of the master station, or change the station number setting of the local/standby master station, and then reset the programmable controller CPU of the local/standby master station.	×	○
B39B	Reserved station setting error	All stations were set as reserved stations.	Check the reserved station settings.	○	×
B39C	Standby master station setting error	Any other than Intelligent device station has been set to the station type for the "Standby master station No." specified in the master station network parameter. The mode setting is different between the master and standby master stations.	Specify the standby master station as an intelligent device station. Make the same setting to the master and standby master stations.	○	×
B39D	Reserved station 0 points setting error	Reserved station 0 points setting has been made in the remote net additional mode.	Change the mode to the remote net ver. 2 mode.	○	×
		Reserved station 0 points setting has been made for the station that is not a reserved station.	Set the station of reserved 0 points setting as a reserved station.		

Table 13.1 Error code list (5/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B39E	8/16-point remote I/O station setting error	Remote I/O station points setting is 8/16 points in the remote net additional mode.	Change the mode to the remote net ver. 2 mode.	○	×
		8/16 points setting has been made for the station other than the remote I/O station.	8 points setting and 16 points setting have been made for the same remote I/O station.		
		Make 8/16 points setting for the same remote I/O station.	Make either 8 points setting or 16 points setting for the remote I/O station.		
B39F	Remote net additional mode station number illegal	In the remote net additional mode, the "maximum station number of ver. 1 compatible slave stations" is greater than the "minimum station number of ver. 2 compatible slave stations" in the network parameter setting.	In the remote net additional mode, make network parameter setting so that the "maximum station number of ver. 1 compatible slave stations" is less than the "minimum station number of ver. 2 compatible slave stations".	○	×
B3A0	Mode illegal (between master and local/standby master stations)	Model illegal has occurred between the master and local/standby master stations. - The mode differs between the master and standby master stations. - The local station is set to the remote net additional mode, and the master station is set to other than the remote net additional mode. - The local station is in the remote net ver. 2 mode or remote net additional mode, and the master station is in the remote net ver. 1 mode.	After correcting the mismatch of modes between the master and local/standby master stations, reset the programmable controller CPU.	×	○
B3A1	Standby master setting illegal	At the time of parameter setting with dedicated instruction, an illegal value has been set to switch 5 of the intelligent function module switch setting.	Set a correct value to switch 5 of the intelligent function module switch setting.	○	×
B3A2	Remote I/O net mode station type illegal	At the time of parameter setting with dedicated instruction, the station type of other than the remote I/O station has been set in the remote I/O net mode.	Set all station types to the remote I/O station.	○	×
B3A3	Assignment error	In the remote net Ver.2 mode or remote net additional mode, total points for remote stations set in the station information has exceeded the maximum of 8192.	Check the points for remote stations in the station information setting.	○	×
B3A4	Parameter mismatch	When the standby master station was operating as the master station with the master station duplex function, the network parameter setting of the faulty master station was changed.	Return the network parameter setting of the master station to the original value.	○	×
B3A5	Mode illegal (parameter)	The mode set in the control data of the G(P).RLPASET instruction differs from the mode set with switch 3 of the intelligent module switch setting.	Check the control data of the G(P).RLPASET instruction and the switch 3 setting of the intelligent module switch setting.	○	×
B401	Parameter change error	Parameter change was executed during transient request.	Change the parameter after all transient requests are completed or before any are requested.	○	○
B404	Response error	A response from the requested station was not returned within the watchdog time period.	Set a longer watchdog time. If an error persists, check the requested module and cables.	○	○
B405	Transient applicable station error	A transient request was made to a remote I/O station or a remote device station.	Set the corresponding station to a local station or an intelligent device station.	○	○
B410	Receive buffer size error	The receive buffer size of the dedicated instruction is less than the response data size.	Check the receive buffer size.	○	○
B411	Data length outside of range	The number of read/write points in the control data of the dedicated instruction is outside the setting range.	Change the number of read/write points to within the setting range.	○	○

Table 13.1 Error code list (6/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B412	Station number outside of range	The station number in the control data of the dedicated instruction is outside the setting range.	Change the station number to within the setting range.	○	○
B413	Request error	Multiple dedicated instructions were executed for the same station.	Check the sequence program.	○	○
B414	Interlock signal data outside of range	The setting of the interlock signal storage device of the G(P).RIRCV or G(P).RISEND instruction is outside the setting range.	Change the setting of the interlock signal storage device to within the setting range.	○	×
B418	Received data size error	Data exceeding the receivable data size were received with the message transmission function.	Set a value of the received data size or more for the receivable data size.	○	×
B601	Request type error	An unsupported request was received.	Check the contents of the request, as well as the target station number.	○	○
B602	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then send the requests (transient overload status).	○	○
B603	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then send the requests (transient overload status).	○	○
B604	Line test in processing	Transient transmission was sent when a line test was in progress.	Wait a while and then retransmit.	○	×
B605	Transient storage buffer could not be obtained	Transient storage buffer could not be obtained.	Wait a while and then retransmit.	○	○
B607	Target station CPU error	There is an error in the target station's CPU.	Check the target CPU.	○	○
B771	Transient request overload error	There are too many transient requests to the corresponding station.	Wait a while and then retransmit (transient overloaded status).	○	○
B774	Transient request error	The target station was not an intelligent device station.	Check if the target station is an intelligent device station.	○	○
B778	Response time out	A response was not received from the requested station.	Check the requested module and cables.	○	○
B780	Module mode setting error	A transient transmission was executed even though the target station was set to the I/O mode.	Set to the remote net mode.	○	○
B782	Station number specification error	The transmission destination and source stations were the same when other station connection was specified.	Check the transmission destination station number, or change to host connection.	○	○
B783	Transient storage buffer error	An error occurred in the transient storage buffer when a transient transmission of greater than 1 k was being performed.	Wait a while and then retransmit.	○	○
B801	Access code setting error	A non-existing access code/attribute was set.	Set a correct access code/attribute.	○	○
B802	Access code error	An access code that does not exist was used.	Use the correct access code.	○	○
B803	Data points error	The number of data points were out of range.	Set the number of data points to within 1 to 960 bytes.	○	○
B804	Attribute definition error Transient transmission unsupported station specification error	The attribute definition was invalid. Alternatively, transient transmission was performed even though the target station does not support transient transmission.	Review the attribute definition. Check the designation of the target station number, as well as the function version and software version of the target local station.	○	○
B805	Data points error	The number of data was out of range.	Set the range to within 1 to 100 when writing, and 1 to 160 when reading.	○	○
B807	Device No. error	The start device No. is out of range. Or, the address was not a multiple of 16 when the bit device was accessed.	Correct the start device No. Or, set the address to a multiple of 16 when accessing the bit device.	○	○
B80D	Setting range error	The specified combination (addresses and points) exceeded the valid processing range.	Set so that the number of processing points does not exceed the device range.	○	○
B814	File register capacity setting error	The file register capacity was not specified.	Specify the file register capacity.	○	○

Table 13.1 Error code list (7/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B815	Module mode setting error	A transient transmission was executed when the target station was set to the I/O mode.	Set to the intelli mode.	○	○
B823	Remote control mode error	The mode setting of the remote control was incorrect.	Check the mode specification.	○	○
B903	Transient request error	A transient request was issued to a station that has not secured a communication buffer area.	Secure a communication buffer area with a parameter.	○	○
B904	Communication buffer size setting error	The communication buffer size of the corresponding station was out of range when a dedicated instruction was executed.	Set the communication buffer size of the corresponding station within the range.	○	○
B905	Transient data length error	When the dedicated instruction is executed, the transient data length is greater than the communication buffer size of the corresponding station.	Make the communication buffer size of the corresponding station greater than the transient data length.	○	○
BA19	Corresponding station error	The corresponding station that is being tested stopped communication during line test 1.	Check the cable and the corresponding station.	○	×
BA1B	All stations error	All stations stopped communications during line test 1.	Check the cables.	○	×
BB01	Concurrent execution error	Any of the following were attempted to be executed to the same station. (Including the same requests) • Message transmission function • Remote device station initialization procedure registration function • G(P).RISEND or G(P).RIRCV instruction • Remote device station access from a peripheral.	Execute a request after completion of another processing.	○	×
BBC1	Mode setting error	"Remote I/O net mode" is set for the mode setting on a station other than station No. 0.	To set "Remote I/O net mode", set the station number setting switch to the 0 position.	○	×
BBC2	Station number setting error	The station number setting switch setting of the module is other than "0 to 64". Alternatively, the last station number is greater than 64.	Check the station number and the number of occupied stations of the module.	○	○
BBC5	Master station duplication error	Multiple master stations exist on the same line. Alternatively, line noise was detected at power on.	Reduce the number of master stations on the same line to one. Alternatively, if data link starts when turning on the SB007 (Master station duplication error canceling request), check the line status. ^{*1}	○	×
BBCA	Standby master station duplication error	Multiple standby master stations exist on the same line.	Reduce the number of standby master stations on the same line to one. Alternatively, check the line status.	×	○
BC01	All stations data link error (Message transmission function)	A data link error occurred on all stations during a message transmission.	After the data link status is recovered, perform the message transmission again.	○	×
BC03	Message transmission target station failure	The target station specified for the message transmission function is in any of the following status. • No network parameter is set. • The specified station No. is not the head station number. • The station is set as a reserved station. • A data link error (including All stations data link error) has occurred.	Check network parameters or remote device stations' operations.	○	×
BC04	Message transmission target station error	The message transmission was performed for any other than remote device stations.	Check the target station.	○	×
BC05	Station No. out of range (Message transmission function)	The station No. specified for the message transmission function is outside of the range between "1 and 64".	Check the specified station No.	○	×

*1 The QJ61BT11N whose first 5 digits of serial number are "09112" or later is supported.

For the QJ61BT11N whose first 5 digits of serial number are "09111" or earlier, reset the programmable controller CP

Table 13.1 Error code list (8/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
BC06	Message transmission function executing station invalid	Execution of the message transmission function was attempted from other than the master station.	Execute the message transmission function on the master station.	×	○
BC07	Send data size out of range	In the message transmission function, the send data size is outside the range.	Change the send data size so that it will be within the range.	○	×
BC50	Message transmission handshake failure	With the message transmission function, abnormal data were received.	Check the sequence program to see if any prohibited remote output (RY) has not been accessed. If the same error persists after checking the above, the master module or remote device station may be faulty. Please consult your local Mitsubishi representative.	○	×
BC51		During execution of message transmission, a data link error occurred on the station.	Check the operation of the target remote device station.	○	×
		During execution of message transmission, some parameters were changed.	Stop the data link, and then change parameters.	○	×
		With the message transmission function, abnormal data were received.	Check the sequence 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	In the message transmission function, a communication timeout has occurred.	Increase the value for Monitoring time setting (SW0009). If the error occurs again, check the target module and cables.	○	×
		Data link stop (SB0002) was executed during the message transmission.	Stop data link after completion of message transmission.	○	×
BC53	Message transmission handshake timeout	In the message transmission function, a communication timeout has occurred.	Increase the value for Monitoring time setting (SW0009). If the error occurs again, check the target module and cables.	○	×
		Data link stop (SB0002) was executed during the message transmission.	Stop data link after completion of message transmission.	○	×
BC54	Message transmission handshake failure	With the message transmission function, abnormal data were received.	Execute the message transmission function again. If the same error persists, the master module or remote device station may be faulty. Please consult your local Mitsubishi representative.	○	×
BC55				○	×
BC57	Requests overlapped error	Executions of multiple requests for message transmission or remote device station access from a peripheral were attempted to the same station.	Execute a request after completion of another processing.	○	×
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					
BC5B	Abnormal response received	With the message transmission function, an abnormal response was received.	Check the operation of the target remote device station.	○	×

Table 13.1 Error code list (9/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
BC5C	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.	○	×
BC5D					
BC5E					
BC5F					
BC60	Invalid number of simultaneously executed message transmissions	The message transmission function was executed simultaneously for 5 or more remote device stations.	Simultaneously execute the function for 4 stations or less.	○	×
BC70	No. of concurrent execution error (Remote device station access)	Too many remote device station accesses were requested from peripherals.	Execute four requests or less at the same time.	○	×
BC71	Unsupported function error (Remote device station access)	Execution of the remote device station access function was attempted from other than the master station.	Execute the function from the master station.	×	○
BC72	Target station error (Remote device station access)	The target of remote device station access from the peripheral is any of the following. • Not exist among network parameters. • Not have the start station No. • Set as a reserved station. • Has a data link error. (including errors on all stations)	Check the parameters or operation of the target station.	○	×
BC73	Target station specification error (Remote device station access)	The target of the remote device station access from the peripheral is a remote I/O station.	Check the specified target station No. and station type.	○	×
BC74	Device No. error (Remote device station access)	Device No. for "RX", "RY", "RWw", or "RWr" is outside the valid range for the target station.	Check the parameters and valid device No. of the target station.	○	×
BC75	All-stations data link error (Remote device station access)	An all-stations data link error occurred during execution of the remote device station access from the peripheral.	Issue the request after starting data link.	○	×
BC76	Timeout (Remote device station access)	Timeout occurred during the remote device station access from the peripheral.	Set a longer timeout time in the application on the request source, or check the operation of the target slave station.	○	×
BD85	Hardware error detection	A hardware error was detected.	There is most likely a hardware error in either the QJ61BT11N, the CPU module, the base unit or other modules. Please consult your local Mitsubishi representative.	○	○
BF11	System error	————	Please consult your local Mitsubishi representative.	○	○
BF12					
BF13					
BF14					
BF15					
BF16					
BF17					
BF18					
BF19					
BF1A					
BF1B					
BF1C					
BF20					
BF30					
BF31					
BF32					
BF33					
BF34					
BF35					
BF36					
BF37					

Table 13.1 Error code list (10/10)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
BF38	Execution result read error (Remote device station access)	An error is detected in the process of reading the execution result of the remote device station access from the peripheral.	- Check the application of the request source. - Check for remote device station access from another peripheral.	○	○
BF39	Request procedure error (Remote device station access)	An error in the request procedure is detected during the remote device station access from the peripheral.	- Check the application of the request source. - Check for remote device station accesses from multiple peripherals. - Check if any value is written in the system area.	○	○
BFFB	Transient request overload error	There are too many transient requests to the corresponding station.	Wait for a while before transmitting again (transient overload status).	○	○
BFFE	CPU monitoring timer time out	The CPU monitoring timer timed out.	Check the operation of the target station.	○	○
C000 to CFFF	(Errors detected by the Ethernet module)	—	Take corrective actions, referring to the troubleshooting section of the Ethernet Interface Module User's manual.	—	—
E000 to EFFF	(Errors detected by the CC-Link IE controller network module)	—	Take corrective actions, referring to the troubleshooting section of the CC-Link IE Controller Network Reference Manual.	—	—
F000 to FFFF	(Error detected by the MELSECNET/H, MELSECNET10 network system)	—	Take corrective actions, referring to the troubleshooting section of the MELSECNET/H, MELSECNET/10 Network System Reference Manual	—	—

13.4 CC-Link Diagnostics

Check the status of each module after all the modules have been connected using CC-Link dedicated cables, and verify that data link can be performed normally.
It is also possible when the QJ61BT11N is mounted on the remote I/O station of MELSECNET/H.

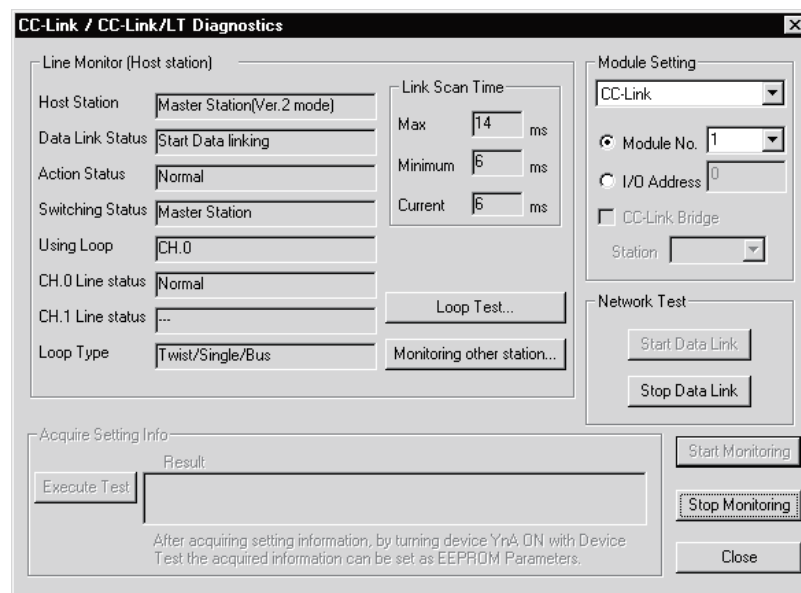
(1) Host monitoring

This function monitors the items such as the data link status of the host (the station to which peripheral devices are connected).

(a) Operating procedure

[Diagnostics] → [CC-Link / CC-Link/LT diagnostics]

- 1) Select "CC-Link" for "Module Setting".
- 2) Specify the target module of Host monitoring for "Module No." or "I/O Address".
- 3) Click the **Start Monitoring** button.



(b) Monitoring items

- 1) Host station
Indicates the type (master station, local station, standby master station) of the monitored station and the mode* of CC-Link.
For a local station, the station number is also displayed.
*Not displayed in the remote net ver. 1 mode.
- 2) Data link status
Displays the data link status of the host.
- 3) Action status
Displays the operating status of the host.
- 4) Switching status
Displays whether the data link is controlled by the master station or standby master station.
- 5) Using loop
Displays the line in use.
- 6) Line status
Displays the line status.
- 7) Loop type
Displays the line type.

POINT

When conducting a network test, do not perform write to buffer memory address 5E0H.

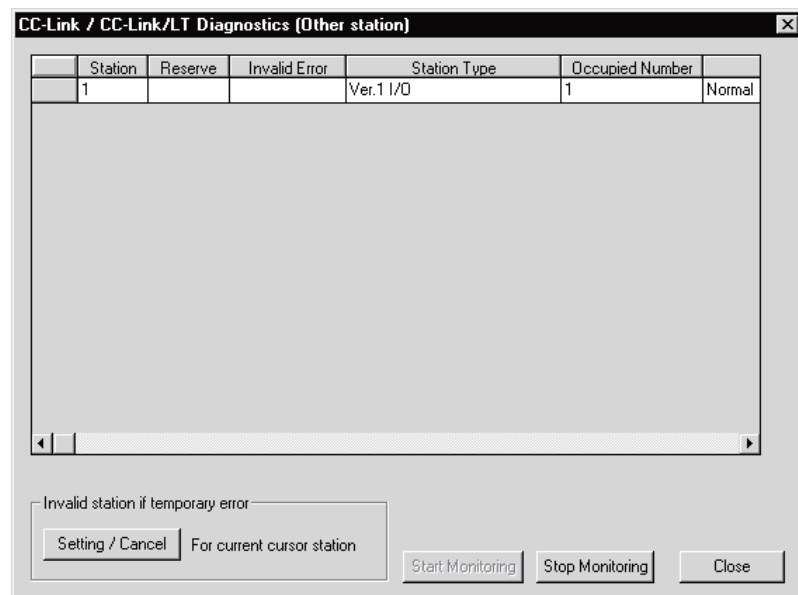
(2) Other station monitoring

This function monitors the items such as the data link status of other stations (stations other than the one to which peripheral devices are connected).

(a) Operating procedure

[Diagnostics] → [CC-Link / CC-Link/LT diagnostics]

- 1) Select "CC-Link" for "Module Setting".
- 2) Specify the target master module of Monitoring other station for "Module No." or "I/O Address".
- 3) Click the **Start Monitoring** button.
- 4) Click the **Monitoring other station** button.

**(b) Monitoring items**

- 1) Station
Displays the head station number of each station.
- 2) Reserve
Displays whether or not a reserved station is set.
 "*" : Reserved station is set.
 " " : Reserved station is not set.
- 3) Invalid error
Displays whether or not an error invalid station is set.
 "*" : Error invalid station is set.
 " " : Error invalid station is not set.

4) Station type

Displays the station type.

The CC-Link compatible version is also displayed in the remote net ver. 2 mode or remote net additional mode.

"Intelli": Local station, intelligent device station and standby master station

"I/O" : Remote I/O station

"Device" : Remote device station

5) Number of occupied stations

Displays the number of occupied stations.

6) Status

Displays the link status of the module.

7) Transient error

Displays whether or not an error occurred during transient transmission.

"*": Error occurred.

" ": Error did not occur.

8) Expanded cyclic setting*

Displays the expanded cyclic setting.

9) Remote station points*

Displays the numbers of remote input and output (RX, RY) points of the remote, local, intelligent device and standby master stations.

*Not displayed in the remote net ver. 1 mode.

POINT
When making temporary error invalid station setting, do not perform write to buffer memory addresses 5E0H, 603H to 607H.

(3) Loop test

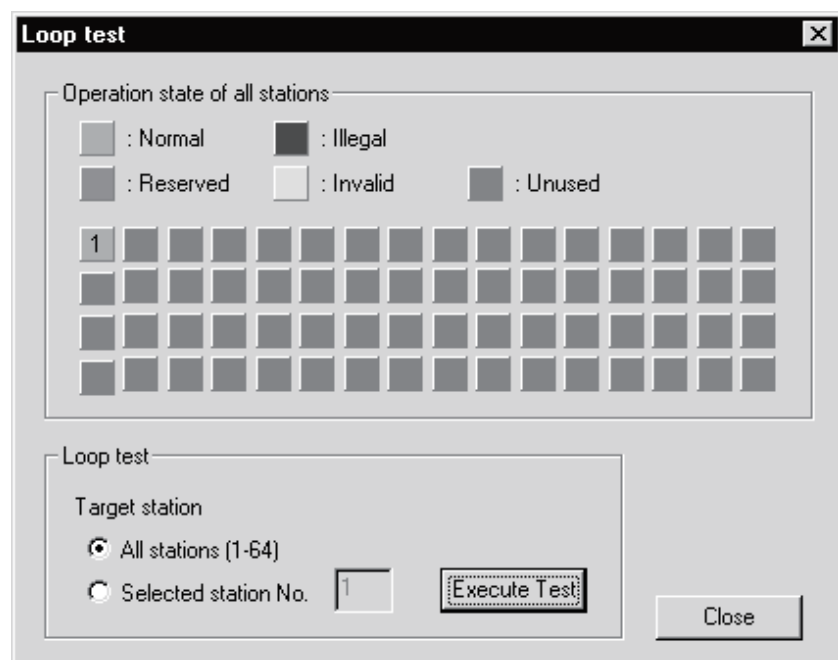
Checks the operating status of the connected remote stations, local stations, intelligent device stations and standby master station.

Normal stations are displayed "blue", abnormal stations "red", reserved stations "green", error invalid stations "yellow", and unused stations "gray".

(a) Operating procedure

[Diagnostics] → [CC-Link / CC-Link/LT diagnostics]

- 1) Select "CC-Link" for "Module Setting".
- 2) Specify the target master module of loop test for "Module No." or "I/O Address".
- 3) Click the **Start Monitoring** button.
- 4) Click the **Loop Test** button.
- 5) When checking the communication status of all stations
Select "All stations" for "Target station", and click the **Execute Test** button.
- 6) When checking the communication status of specific modules
Select "Selected station No." for "Target station", specify the station number, and click the **Execute Test** button.

**POINT**

When conducting a loop test, do not perform write to buffer memory addresses 5E0H, 608H.

(4) H/W Information

This function displays the operation and setting statuses of the master module, local modules, and standby master module.

(a) Operating procedure

[Diagnostics] → [System monitor]

- 1) Select the QJ61BT11N.
- 2) Click the **Module Detailed Information** button.
- 3) Click the **H/W Information** button.



(The "Error contents • Disposal" section is displayed in GX Developer Version 8.17T or later.)

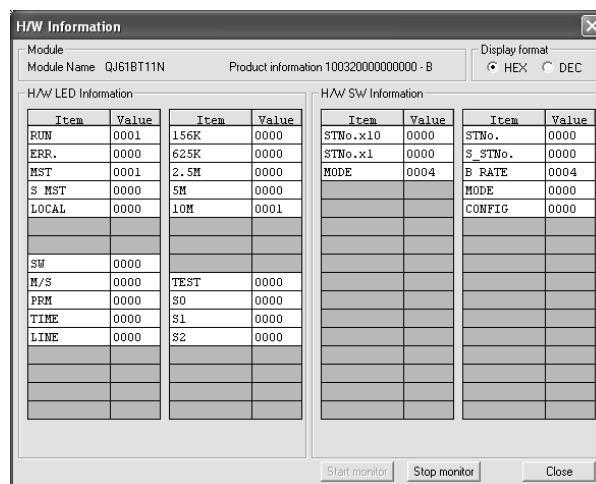
(b) Product information

The function version and serial No. are displayed as follows.

10032000000000-B

↑ Function Version B

↑ Serial No. (first 5 digits)



(c) H/W LED Information

The H/W LED Information displays the following data link information.

Item	Value
RUN	1: When the module is operating normally 0: At watchdog timer error
ERR.	1: All stations are faulty Switching between 0 and 1: There is a faulty station
MST	1: Set to the master station
S MST	1: Set to the standby master station
LOCAL	1: Set to a local station
SW	1: Error in switch setting
M/S	1: A master station already exists on the same line
PRM	1: There is an error in the parameter contents
TIME	1: The data link monitoring timer was activated
LINE	1: The cable is broken or the transmission path is affected by noise, etc.
156K	1: A transmission speed of 156 kbps is selected
625K	1: A transmission speed of 625 kbps is selected
2.5M	1: A transmission speed of 2.5 Mbps is selected
5M	1: A transmission speed of 5 Mbps is selected
10M	1: A transmission speed of 10 Mbps is selected
TEST	1: An offline test is being executed
S0	Not used
S1	Not used
S2	Not used

(d) H/W SW Information

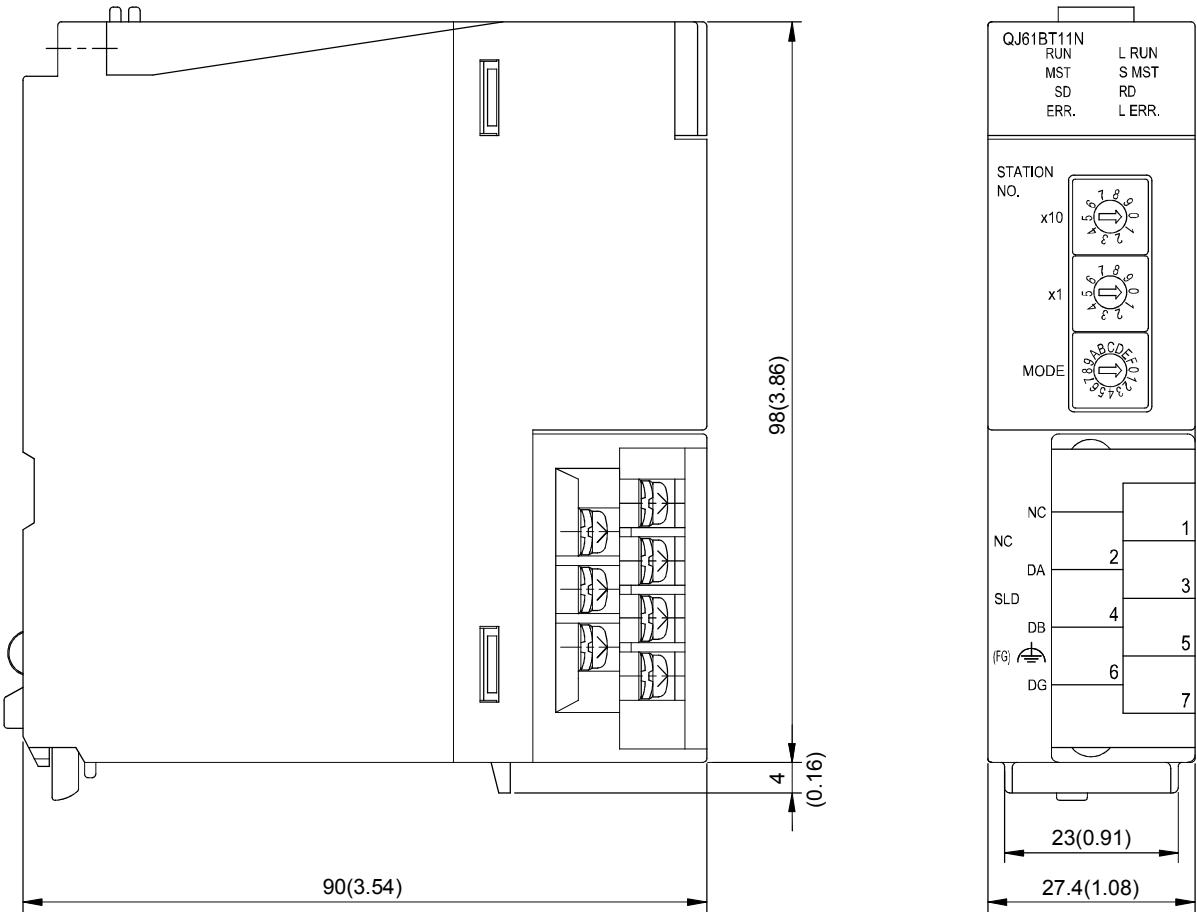
The H/W SW Information displays the following information.

Item	Value
STNo.x10	Setting value of station number setting switch X10
STNo.x1	Setting value of station number setting switch X1
MODE	Setting values of transmission speed and mode setting switches
STNo.	Station number of relevant module when the power supply is turned on
S MSTNo.	Station number of the standby master station set by parameter (0: No standby master station specification)
B RATE	Setting of transmission speed
MODE	Mode setting status
CONFIG	SW62 (module operation status)

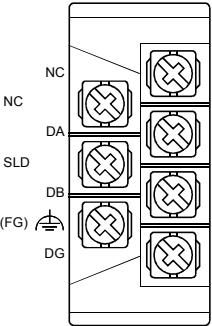
APPENDIXES

Appendix 1 External Dimensions

This section describes the external dimensions of the QJ61BT11N.



[Terminal block diagram with the cover open]



Unit: mm (inch)

Appendix 2 Dedicated Instructions

Using dedicated instructions, the QJ61BT11N is capable of the following:

- Transient transmission to local stations and intelligent device stations
- Message transmission to remote device stations

Appendix 2.1 Dedicated instruction list, applicable devices, and precautions

(1) Dedicated instruction list

The following table lists the dedicated instructions that can be used for each of these stations:

Target station	Instruction	Description	Reference page
Master station Local station	G(P).RIRD	Reads data from the buffer memory or the programmable controller CPU device of the specified station.	Appendix 2.2
	G(P).RIWT	Writes data into the buffer memory or the programmable controller CPU device of the specified station.	Appendix 2.3
Intelligent device station	G(P).RIRD	Reads data from the buffer memory of the specified station.	Appendix 2.2
	G(P).RIWT	Writes data into the buffer memory of the specified station.	Appendix 2.3
	G(P).RIRCV	Automatically performs handshaking with the specified station and reads data from the buffer memory of that station. Available for modules that have handshake signals (e.g. AJ65BT-R2(N)).	Appendix 2.4
	G(P).RISEND	Automatically performs handshaking with the specified station and writes data into the buffer memory of that station. Available for modules that have handshake signals (e.g. AJ65BT-R2(N)).	Appendix 2.5
	G(P).RIFR	Reads data in the automatic update buffer of the specified station. Available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).	Appendix 2.6
	G(P).RITO	Writes data into the automatic update buffer of the specified station. Available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).	Appendix 2.7
Master station	G(P).RLPASET	Sets the network parameters for the master station and starts up the data link.	Appendix 2.8
Remote device station	G(P).RDMSG	Performs a message transmission to a remote device station. Available for remote device stations that support the message transmission function.	Appendix 2.9

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) Available devices

The following devices are available for the dedicated instructions:

Internal devices		File register	Constant
Bit ^{*1}	Word		
X, Y, M, L, F, V, B	T, ST, C, D, W	R, ZR	—

*1: Word device bit designation can be used for bit data.

Word device bit designation is done by specifying [Word device] . [Bit No.]

(Bit numbers must be given in hexadecimal.)

For example, bit 10 of D0 is designated as [D0.A].

However, bit designation is not allowed for timers (T), retentive timers (ST) and counters (C).

(3) Precautions

(a) Precautions for using Monitoring time (SW0009) and Dedicated instruction retry count setting (SW000B)

- The Dedicated instruction retry count setting (SW000B) is applicable to the following dedicated instructions. (See Section 8.4.2.)

Instruction	Station executing dedicated instructions	
	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	○	×

○: Applicable, ×: N/A

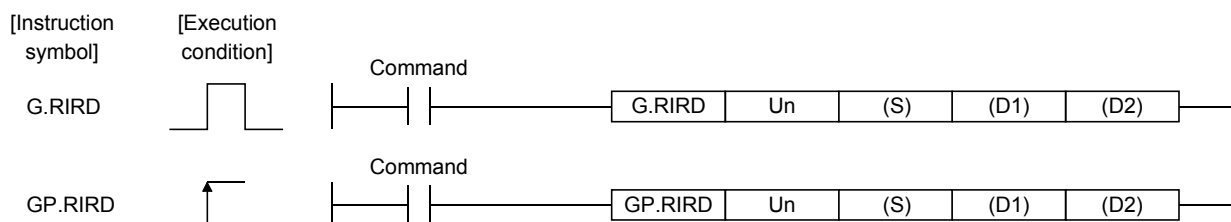
Set the Dedicated instruction retry count setting when the error completion device turns ON due to noise. If this setting is made, frequency of this turn-ON will be greatly reduced. Note that no retry is performed when the target station has been disconnected at the time of dedicated instruction execution.

- Before execution of dedicated instructions, set the Monitoring time (SW0009) and Dedicated instruction retry count setting (SW000B).

Appendix 2.2 G(P).RIRD

The G(P).RIRD instruction reads the data for the specified points from the buffer memory or the programmable controller CPU device of the specified station.

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



Set data

Device *1	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
(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 to be stored.	Within the range of the specified device	
(D2)	Device that is turned ON for one scan upon completion of reading. (D2) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

Control data

Device	Item	Set data	Setting range	Set by																							
(S) + 0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) 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	b15 <table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> b8 b7 <table border="1" style="border-collapse: collapse; width: 40px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> b0 <table border="1" style="border-collapse: collapse; width: 20px; height: 20px;"><tr><td> </td></tr></table>																									

*1: For details, refer to the manual for the local station or the intelligent device station from which data are read.

When the random access buffer is specified, specify the start address of the random access buffer as 0.

*2: The value indicates the maximum number of data to be read.

Specify the value within the buffer memory capacity of the local station or the intelligent device station, or the receive buffer area setting range set by a parameter.

*3: When reading device data from the programmable controller CPU other than the QCPU (Q mode), QCPU (A mode) or QnACPU/AnUCPU, the setting range shall be 1 to 32 words.

(1) Buffer memory in the CC-Link

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

(2) Device memory in the programmable controller CPU

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

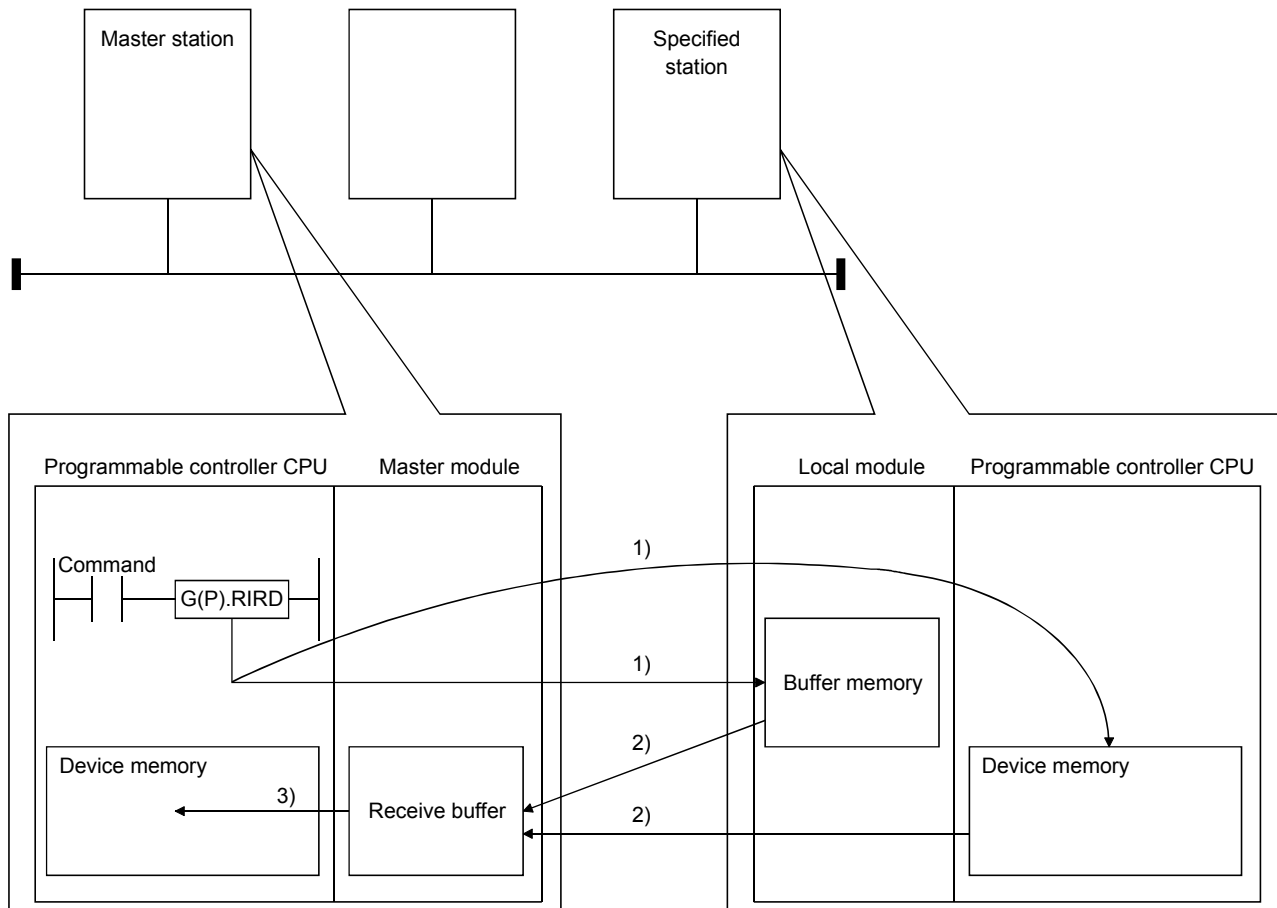
* Devices other than shown above cannot be accessed.

When accessing a bit device, specify it with 0 or a multiple of 16.

* The extended data register of address D65536 or higher, and the extended link register of address W10000 or higher cannot be specified.

(3) Functions

(a) Operation chart for the RIRD instruction



- 1) Accesses the buffer memory specified by (S)+2 and (S)+3 of the station specified by (S)+1, or the programmable controller CPU device.
- 2) Stores the data that has been read in the receive buffer of the master module.
- 3) Stores the data that has been read after the device specified in (D1), and the device specified by (D2) turns on.

- (b) The G(P).RIRD instruction can be executed to multiple local stations or intelligent device stations simultaneously.

Note that concurrent execution of multiple instructions including other dedicated instruction(s) (refer to Appendix 2) is not allowed to the same local station or intelligent device station.

Create a program in which a flag remains on until the instruction is completed.

- (c) There are two types of interlock signals for the G(P).RIRD instruction: the completion device (D2) and status display device at completion (D2) + 1.

1) Completion device

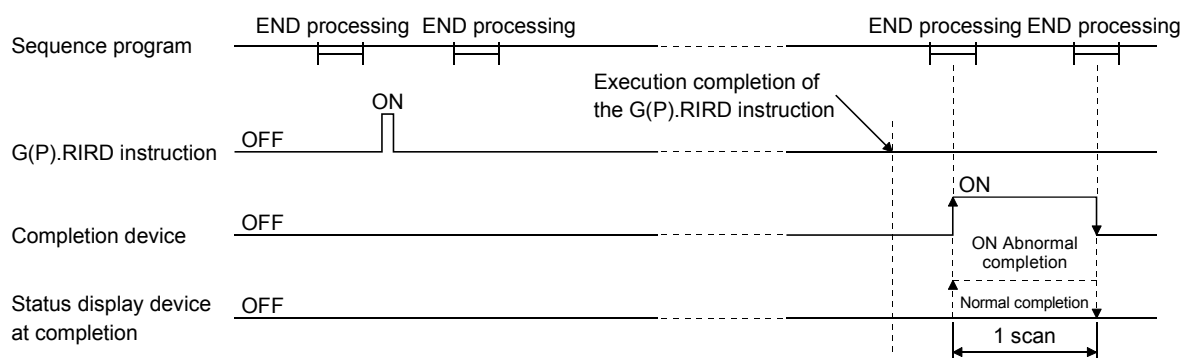
Turns ON in the END processing of the scan where the G(P).RIRD instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion

Turns ON and OFF depending on the completion status of the G(P).RIRD instruction.

Normal completion : Stays OFF and does not change.

Abnormal completion: Turns ON in the END processing of the scan where the G(P).RIRD instruction is completed, and turns OFF in the next END processing.



- (d) Multiple dedicated instructions cannot be executed for the same station. Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON. The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.
- (e) The basic number of steps of the G(P).RIRD instruction is 8 steps.
- (f) The receive buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

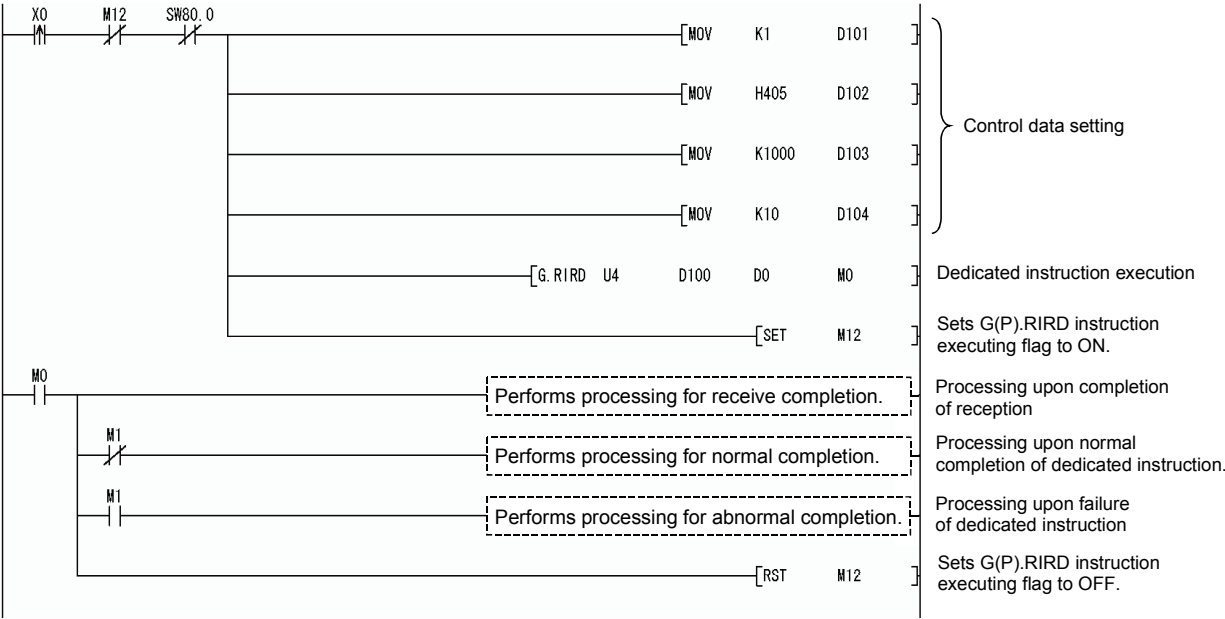
(4) Operation error

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

Error code	Description of operation error
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 an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range.
	Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

(5) Program example

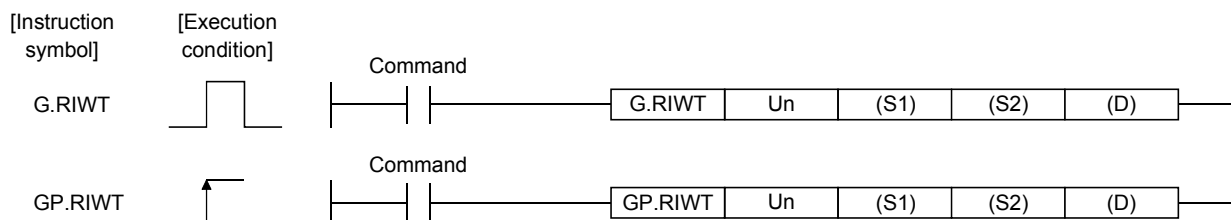
When X0 is turned ON, 10-word data are stored from the area starting D1000 in a local station (station No.1), which is connected to the master module in the I/O No. position of X/Y40 to X/Y5F, into the area starting from D0.
(When the link special register (SW) refresh device is set to SW0)
M12 is the RIRD instruction executing flag.



Appendix 2.3 G(P).RIWT

The G(P).RIWT instruction writes the data for the specified points, to the buffer memory or the programmable controller CPU device of the specified station.

Set data	Usable devices									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K, H	S	
(S1)	—	○			—			—	—	—
(S2)	—	○			—			—	—	—
(D)		○			—			—	—	—



Set data

Device* ¹	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
(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 write data is to be stored.	Within the range of the specified device	
(D)	Device that is turned ON for one scan upon completion of writing. (D) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

Control data

Device	Item	Set data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) 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		See (1) and (2).	User
(S1) + 3	Buffer memory address or device number	Specify the buffer memory start address or device start number.	* 1	User
(S1) + 4	Number of points to write	Specify the write data count (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 the random access buffer is specified, specify the start address of the random access buffer as 0.
- *2: The value indicates the maximum number of data to be written.
Specify the value within the buffer memory capacity of the local station or the intelligent device station, or the send buffer area setting range set by a parameter.
- *3: When writing device data to the programmable controller CPU other than the QCPU (Q mode), QCPU (A mode) or QnACPU/AnUCPU, the setting range shall be 1 to 10 words.

(1) Buffer memory in the CC-Link

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

(2) Device memory in the programmable controller CPU

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

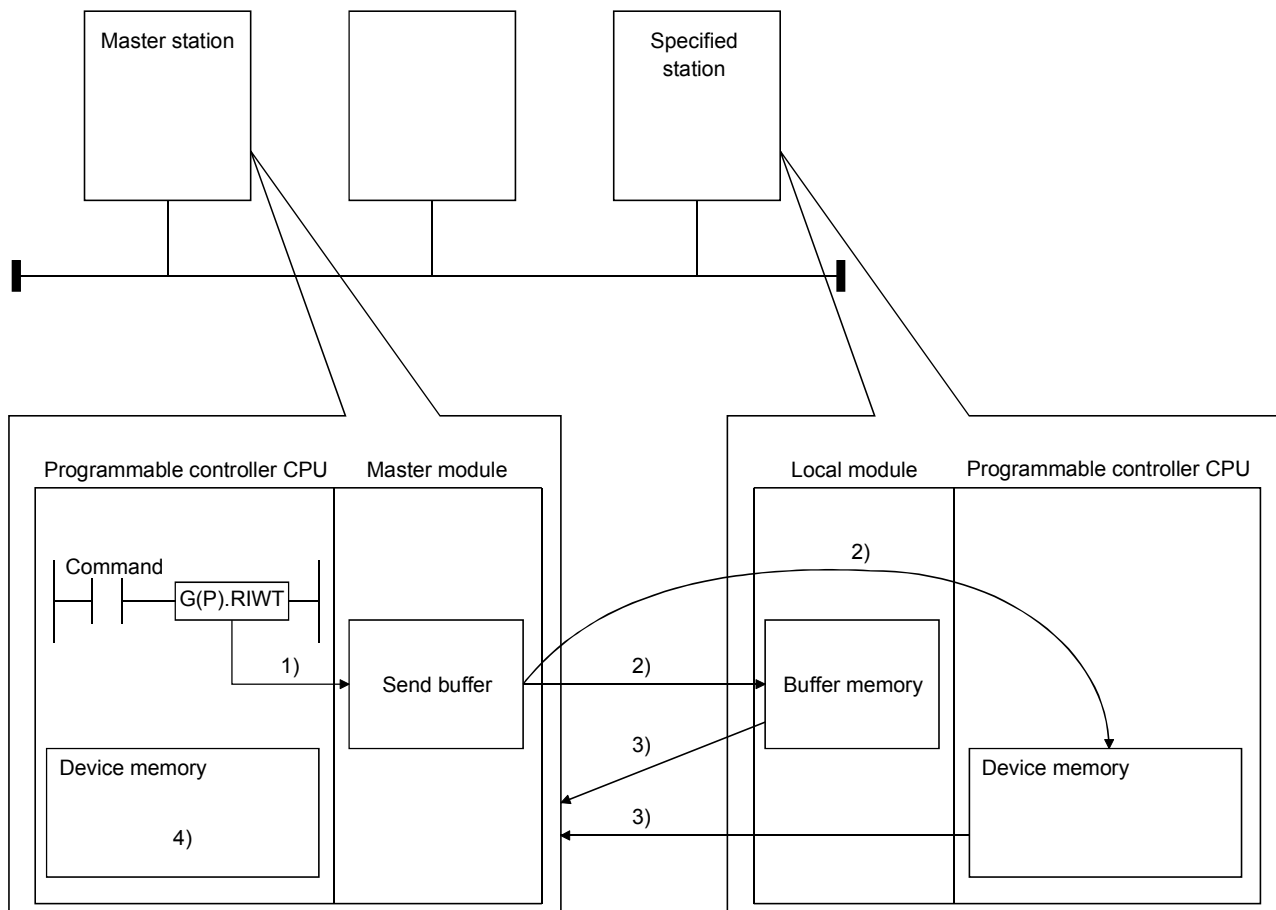
* Devices other than shown above cannot be accessed.

When accessing a bit device, specify it with 0 or a multiple of 16.

* The extended data register of address D65536 or higher, and the extended link register of address W10000 or higher cannot be specified.

(3) Functions

(a) Operation chart for the G(P).RIWT instruction



- 1) Stores the data to be written to the specified station in the send buffer of the master module.
 - 2) Writes the data specified by (S2) to the buffer memory specified by (S1)+2 and (S1)+3 of the station specified by (S1)+1 or to the programmable controller CPU device.
 - 3) The specified station returns the write complete response to the master station.
 - 4) The device specified by (D) turns ON.
- (b) The G(P).RIWT instruction can be executed to multiple local stations or intelligent device stations simultaneously.
 Note that concurrent execution of multiple instructions including other dedicated instruction(s) (refer to Appendix 2) is not allowed to the same local station or intelligent device station.
 Create a program in which a flag remains on until the instruction is completed.

- (c) There are two types of interlock signals for the G(P).RIWT instruction: the completion device (D) and the status display device at completion (D) + 1.

1) Completion device

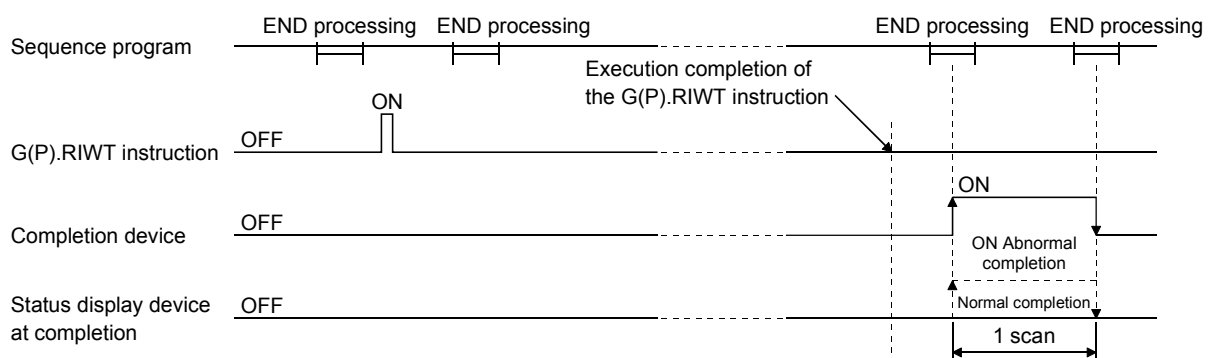
Turns ON in the END processing of the scan where the G(P).RIWT instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion

Turns ON and OFF depending on the completion status of the G(P).RIWT instruction.

Normal completion : Stays OFF and does not change.

Abnormal completion: Turns ON in the END processing of the scan where the G(P).RIWT instruction is completed, and turns OFF in the next END processing.



- (d) Multiple dedicated instructions cannot be executed for the same station.

Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON.

The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.

- (e) The basic number of steps of the G(P).RIWT instruction is 8 steps.

- (f) The send buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

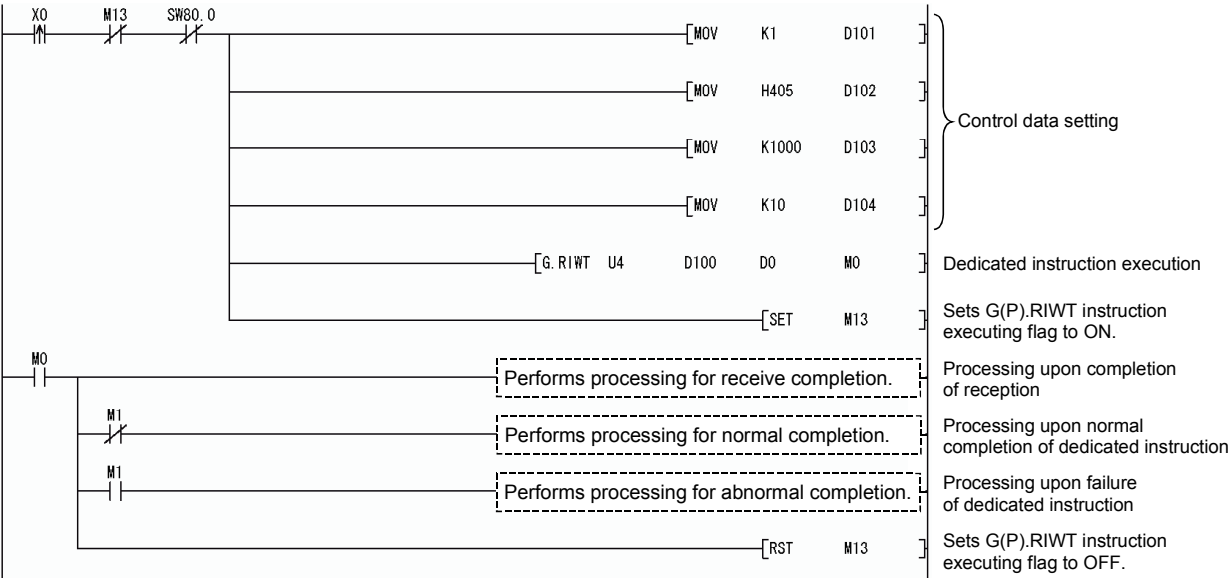
(4) Operation error

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

Error code	Description of operation error
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 an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range. Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

(5) Program example

When X0 is turned ON, 10-word data are stored from the area starting D0 in a local station (station No.1), which is connected to the master module in the I/O No. position of X/Y40 to X/Y5F, into the area starting from D1000.
(When the link special register (SW) refresh device is set to SW0)
M13 is the G(P).RIWT instruction executing flag.

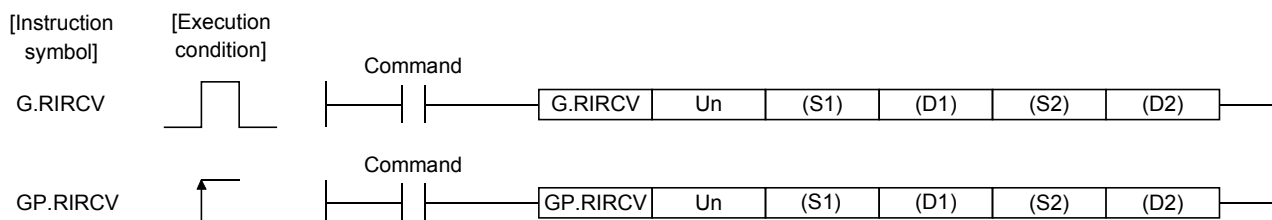


Appendix 2.4 G(P).RIRCV

The G(P).RIRCV instruction automatically performs handshaking with an intelligent device station and reads data from the buffer memory of the specified intelligent device station.

Available for modules that have handshake signals (e.g. AJ65BT-R2(N)).

Set data	Usable devices									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K, H	S	
(S1)	—	○			—			—	—	—
(D1)	—	○			—			—	—	—
(S2)	—	○			—			—	—	—
(D2)		○			—			—	—	—



Set data

Device *1	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
(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 to be stored.	Within the range of the specified device	
(S2)	Start number of the device in which the interlock signals are stored.	Within the range of the specified device	
(D2)	Device that is turned ON for one scan upon completion of reading. (D2)+1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

Control data

Device	Item	Set data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) 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 "0004H".	0004H	User
(S1) + 3	Buffer memory address	Specify the buffer memory start address.	*1	User
(S1) + 4	Number of points to read	Specify the read data count (in word units).	1 to 480 *2	User

*1: See the manual for the intelligent device station from which data will be read.

*2: Indicates the maximum number of data items that can be read.

Specify the buffer memory capacities of the intelligent device station and the receive buffer area setting range to be set with a parameter.

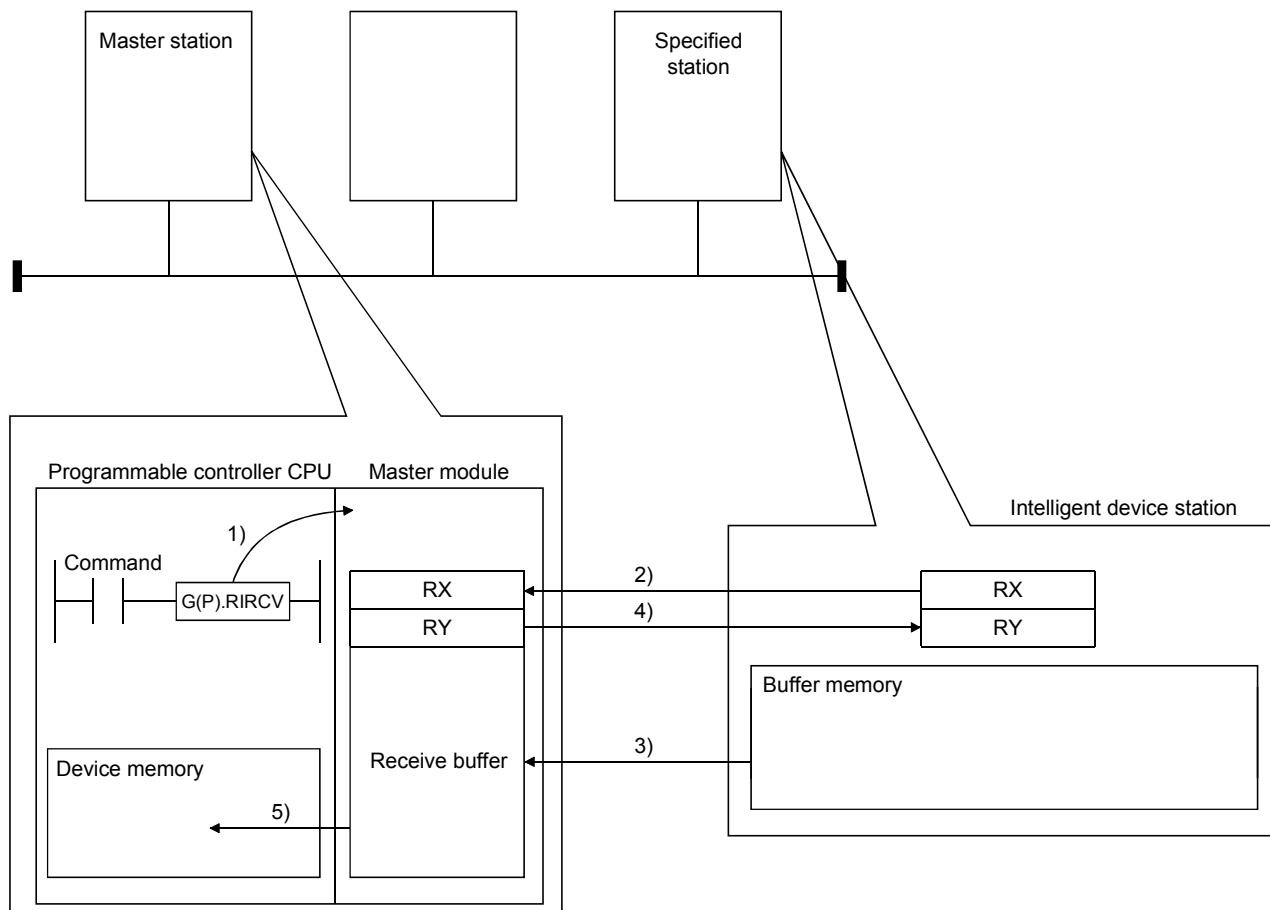
Interlock signal storage devices

Device	Item	Set data	Setting range	Set by
(S2) + 0	b15 to b8 b7 to b0 0 RY	RY: Request device	0 to 127	User
		Set the upper 8 bits to 0.	0	User
(S2) + 1	b15 to b8 b7 to b0 RWr *1 RX	RX : Completion device	0 to 127	User
		RWr : Error code storage device If none, set to FF _H .	0 to 15 FF _H	User
(S2) + 2	b15 to b0 completion mode	0: Complete with the contents of 1 device (RX _n). 1: Complete with the contents of 2 devices (RX _n and RX _n +1). (RX _n +1 turns ON at an abnormal completion.)	0/1	User

*1: The same error code as that for the control data completion status is stored in the error code storage device.

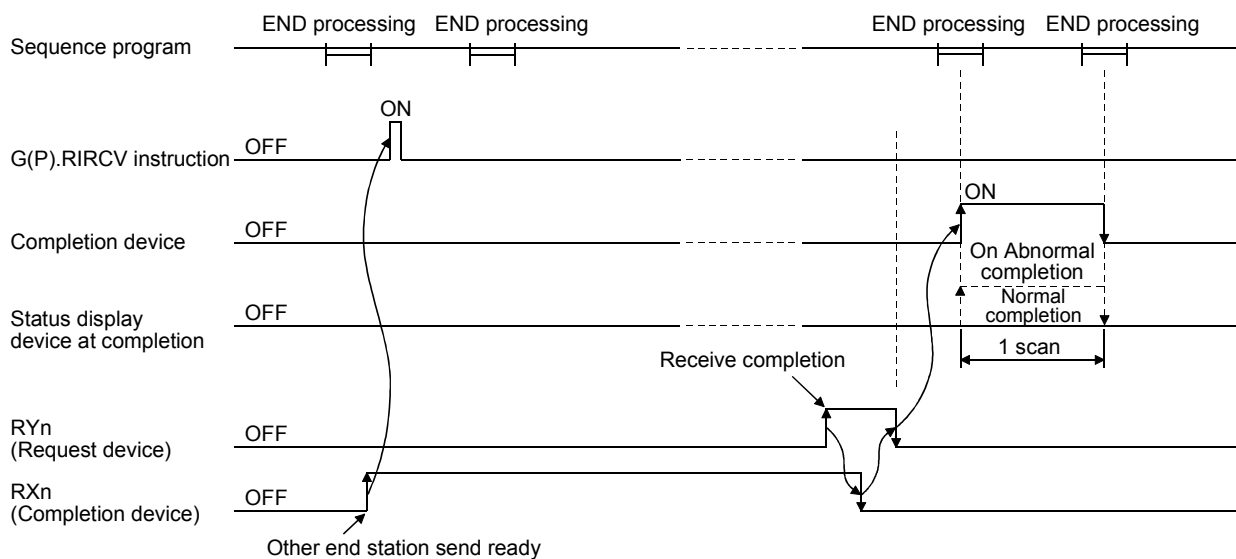
(1) Functions

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



- 1) Instructs the master module to read data from the buffer memory specified in (S1)+2 and (S1)+3 of the station specified in (S1)+1.
- 2) The master module monitors the remote input (RX) specified in (S2)+1.
- 3) When the remote input (RX) specified in (S2)+1 turns ON from OFF, the master module reads data from the buffer memory of the specified station.
Read data are stored in the receive buffer of the master module.
- 4) The master module turns the remote output (RY) specified in (S2)+0 ON.
When the remote input specified in (S)+1 turns OFF from ON, the remote output specified in (S2)+0 turns OFF.
- 5) Data read out from the specified station are stored in the device specified in (D1) and subsequent devices, and a device specified in D2 turns ON.

- (b) The G(P).RIRCV instruction can be executed to multiple intelligent device stations simultaneously.
 Note that concurrent execution of multiple instructions including other dedicated instruction(s) (refer to Appendix 2) is not allowed to the same local station or intelligent device station.
 Create a program in which a flag remains on until the instruction is completed.
- (c) There are two types of interlock signals for the G(P).RIRCV instruction: the completion device (D2) and the status display device at completion (D2)+1.
- 1) Completion device
 Turns ON in the END processing of the scan where the G(P).RIRCV instruction is completed, and turns OFF in the next END processing.
 - 2) Status display device at completion
 Turns ON and OFF depending on the completion status of the G(P).RIRCV instruction.
 Normal completion: Stays OFF and does not change.
 Abnormal completion: Turns ON in the END processing of the scan where the G(P).RIRCV instruction is completed, and turns OFF in the next END processing.



- (d) Multiple dedicated instructions cannot be executed for the same station.
 Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON.
 The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.
- (e) The basic number of steps of the G(P).RIRCV instruction is 10 steps.
- (f) The receive buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

(2) Operation error

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

Error code	Description of operation error
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 an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range.
	Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

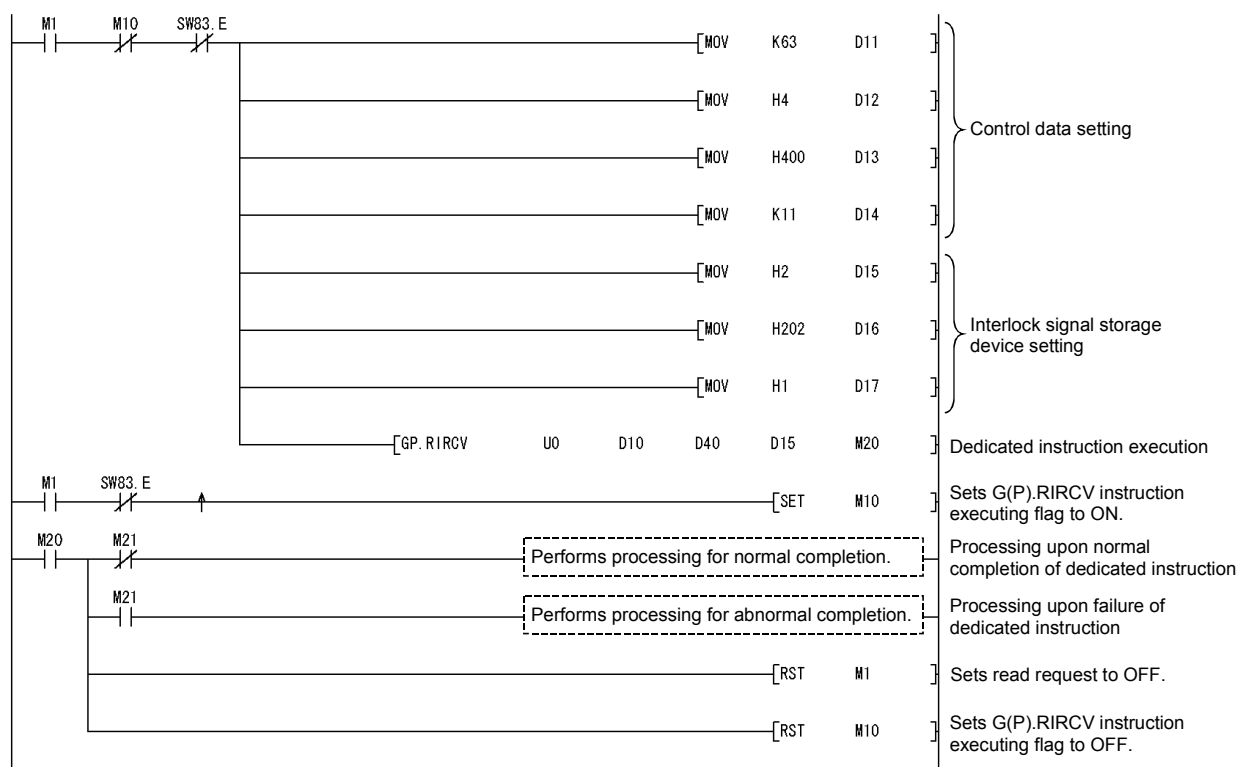
(3) Program example

When M1 turns ON, 11-word data in the buffer memory address 400H and later of the intelligent device station No.63 (AJ65BT-R2(N)), which is connected to the master module installed in the position of I/O No. X/Y00 to X/Y1F, are read out to the area starting from D40.

The settings of the interlock signal storage device are as follows: request device RY2, completion device RX2, error code storage device RWr2, and completion mode 1.

Also, set the link special register (SW) refresh device to SW0.

M10 is the G(P).RIRCV instruction executing flag.

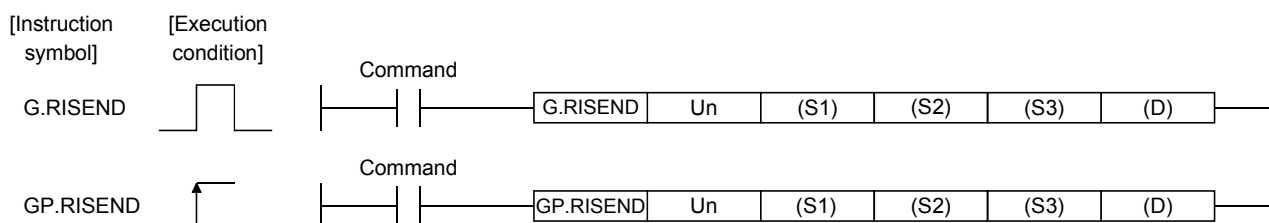


Appendix 2.5 G(P).RISEND

The G(P).RISEND instruction automatically performs handshaking with an intelligent device station and writes data to the buffer memory of the specified intelligent device station.

Available for modules that have handshake signals (e.g. AJ65BT-R2(N)).

Set data	Usable devices									
	Internal device (System, user)		File register	Link direct device J□□		Intelligent function module device U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K, H	S	
(S1)	—	○			—			—	—	—
(S2)	—	○			—			—	—	—
(S3)	—	○			—			—	—	—
(D)		○			—			—	—	—



Set data

Device*1	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
(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 write data is to be stored.	Within the range of the specified device	
(S3)	Start number of the device in which the interlock signals are stored.	Within the range of the specified device	
(D)	Device that is turned ON for one scan upon completion of writing. (D)+1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

Control data

Device	Item	Set data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) 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 "0004H".	0004H	User
(S1) + 3	Buffer memory address	Specify the buffer memory start address.	*1	User
(S1) + 4	Number of points write	Specify the write data count (in word units).	1 to 480 *2	User

*1: See the manual for the intelligent device station to which data will be written.

*2: Indicates the maximum number of data items that can be written.

Specify the buffer memory capacities of the intelligent device station and the receive buffer area setting range to be set with a parameter.

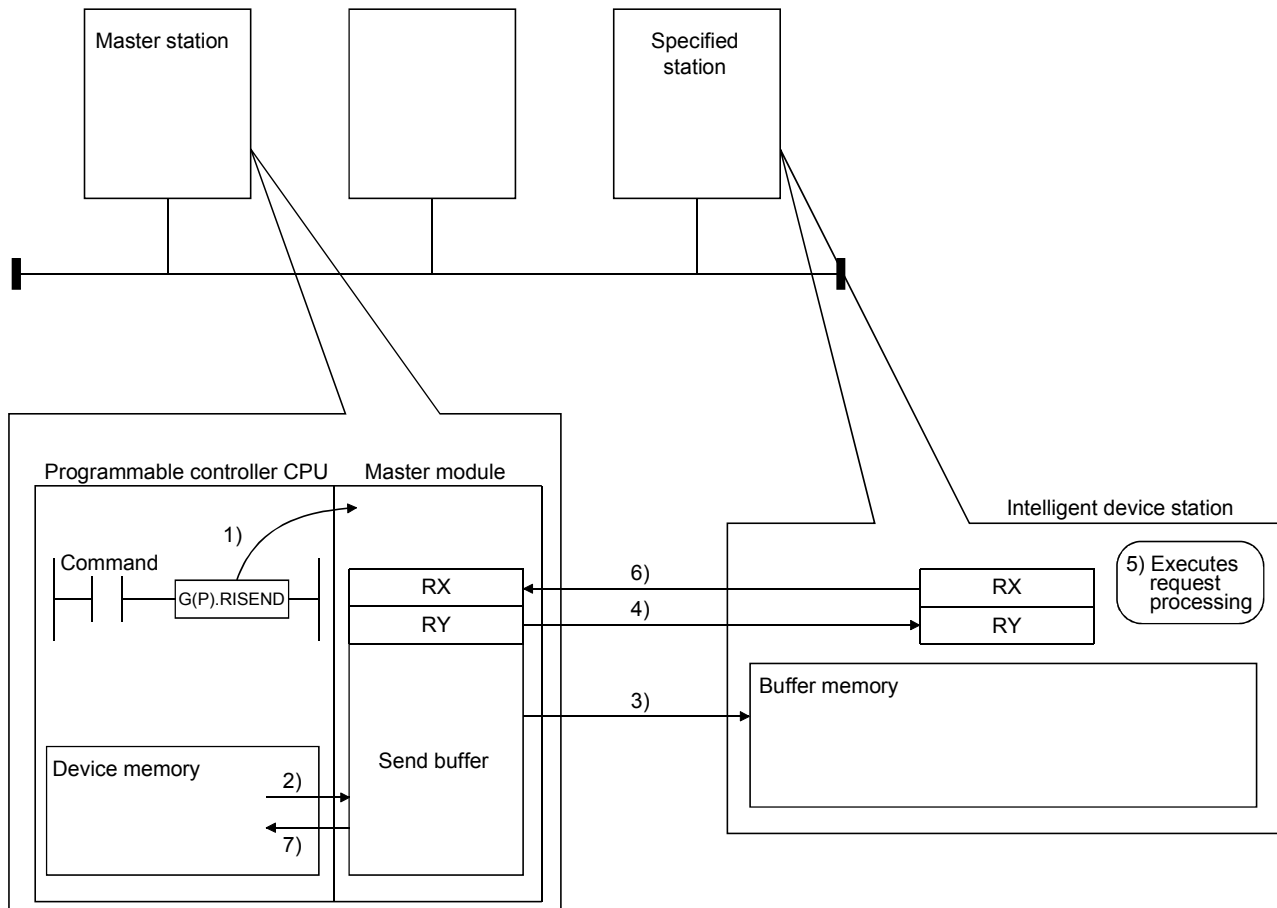
Interlock signal storage devices

Device	Item	Set data	Setting range	Set by
(S3) + 0	b15 to b8 b7 to b0 0 RY	RY: Request device	0 to 127	User
		Set the upper 8 bits to 0.	0	User
(S3) + 1	b15 to b8 b7 to b0 RWr *1 RX	RX : Completion device	0 to 127	User
		RWr : Error code storage device If none, set to FF _H .	0 to 15 FF _H	User
(S3) + 2	b15 to b0 Completion mode	0: Complete with the contents of 1 device (RX _n). 1: Complete with the contents of 2 devices (RX _n and RX _n +1). (RX _n +1 turns ON at an abnormal completion.)	0/1	User

*1: The same error code as that for the control data completion status is stored in the error code storage device.

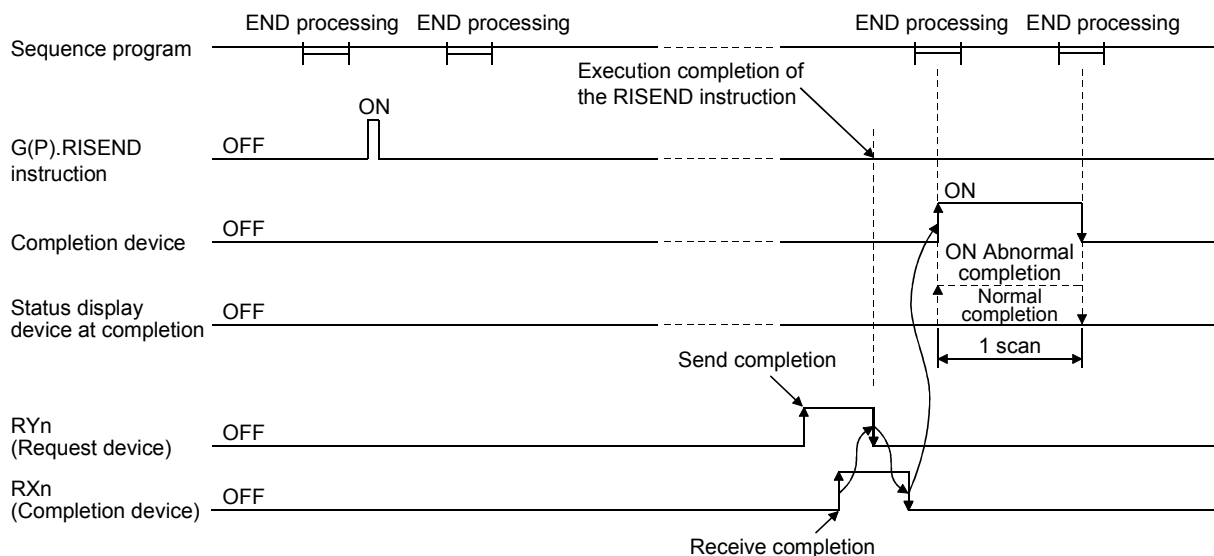
(1) Functions

(a) Operation chart for the G(P).RISEND instruction



- 1) Instructs the master module to write data to the buffer memory specified in (S1)+2 and (S1)+3 of the station specified in (S1)+1.
- 2) Data to be written to the specified station are stored in the send buffer of the master module.
- 3) Data are written to the buffer memory specified in (S1)+2 and (S1)+3 of the station specified in (S1)+1.
- 4) The master module turns the remote output (RY) specified in (S3)+0 ON.
- 5) The station specified in (S1)+1 performs processing for the remote output (RY).
- 6) Upon completion of the processing for the remote output (RY), the station specified in (S1)+1 turns the remote input (RX) specified in (S3)+1 ON and the remote output (RY) specified in (S3)+0 turns OFF. Also, the response showing completion of write to the master module is returned.
- 7) The device specified in (D) turns ON.

- (b) The G(P).RISEND instruction can be executed to multiple intelligent device stations simultaneously.
 Note that concurrent execution of multiple instructions including other dedicated instruction(s) (refer to Appendix 2) is not allowed to the same local station or intelligent device station. Create a program in which a flag remains on until the instruction is completed.
- (c) There are two types of interlock signals for the G(P).RISEND instruction: the completion device (D) and the status display device at completion (D)+1.
- 1) Completion device
 Turns ON in the END processing of the scan where the G(P).RISEND instruction is completed, and turns OFF in the next END processing.
 - 2) Status display device at completion
 Turns ON and OFF depending on the completion status of the G(P).RISEND instruction.
 Normal completion : Stays OFF and does not change.
 Abnormal completion: Turns ON in the END processing of the scan where the G(P).RISEND instruction is completed, and turns OFF in the next END processing.



- (d) Multiple dedicated instructions cannot be executed for the same station.
 Since it takes several scans until the processing of the dedicated instruction is completed, execute the next dedicated instruction after the completion device has turned ON.
 The next dedicated instruction executed before completion of the previously executed dedicated instruction is ignored.
- (e) The basic number of steps of the G(P).RISEND instruction is 10 steps.
- (f) The send buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

(2) Operation error

In the following cases, operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

Error code	Description of operation error
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 an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range.
	Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

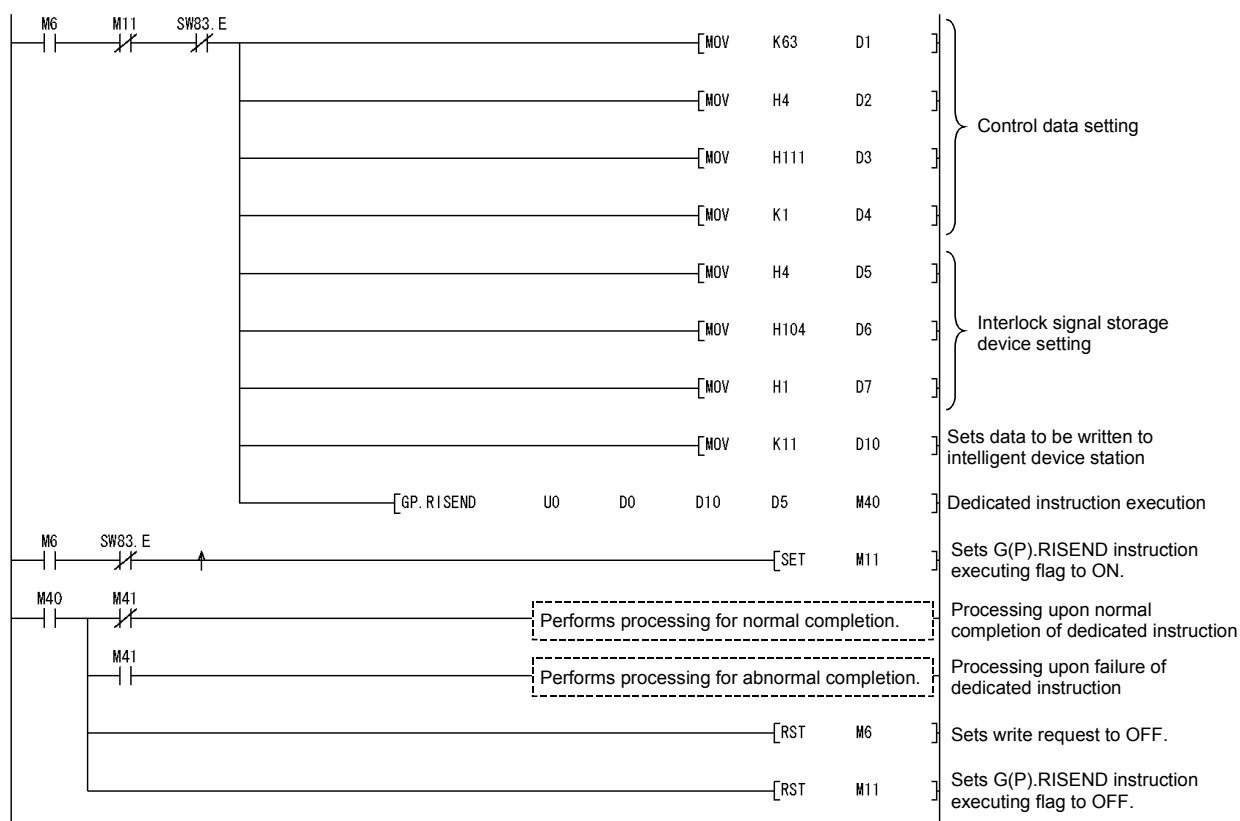
(3) Program example

When M6 turns ON, 1-word data are written to D10 from the buffer memory address 111H of the intelligent device station No.63 (AJ65BT-R2(N)), which is connected to the master module installed in the position of I/O No. X/Y00 to X/Y1F.

The settings of the interlock signal storage device are as follows: request device RY4, completion device RX4, error code storage device RWr1, and completion mode 1.

Also, set the link special register (SW) refresh device to SW0.

M11 is the G(P).RISEND instruction executing flag.



Appendix 2.6 G(P).RIFR

The G(P).RIFR instruction reads the data from the automatic update buffer of the specified station.

Available for modules that have the automatic update buffer (e.g. AJ65BT-R2 (N)).

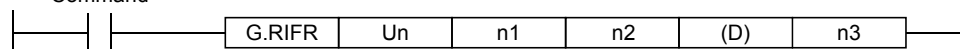
Set data	Usable devices									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K, H	S	
n1	○	○			—			○	—	—
n2	○	○			—			○	—	—
(D)	—	○			—			—	—	—
n3	○	○			—			○	—	—

[Instruction
symbol]

[Execution
condition]

Command

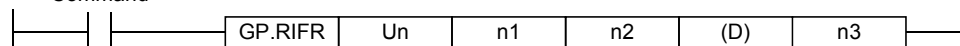
G.RIFR



GP.RIFR



Command



Set data

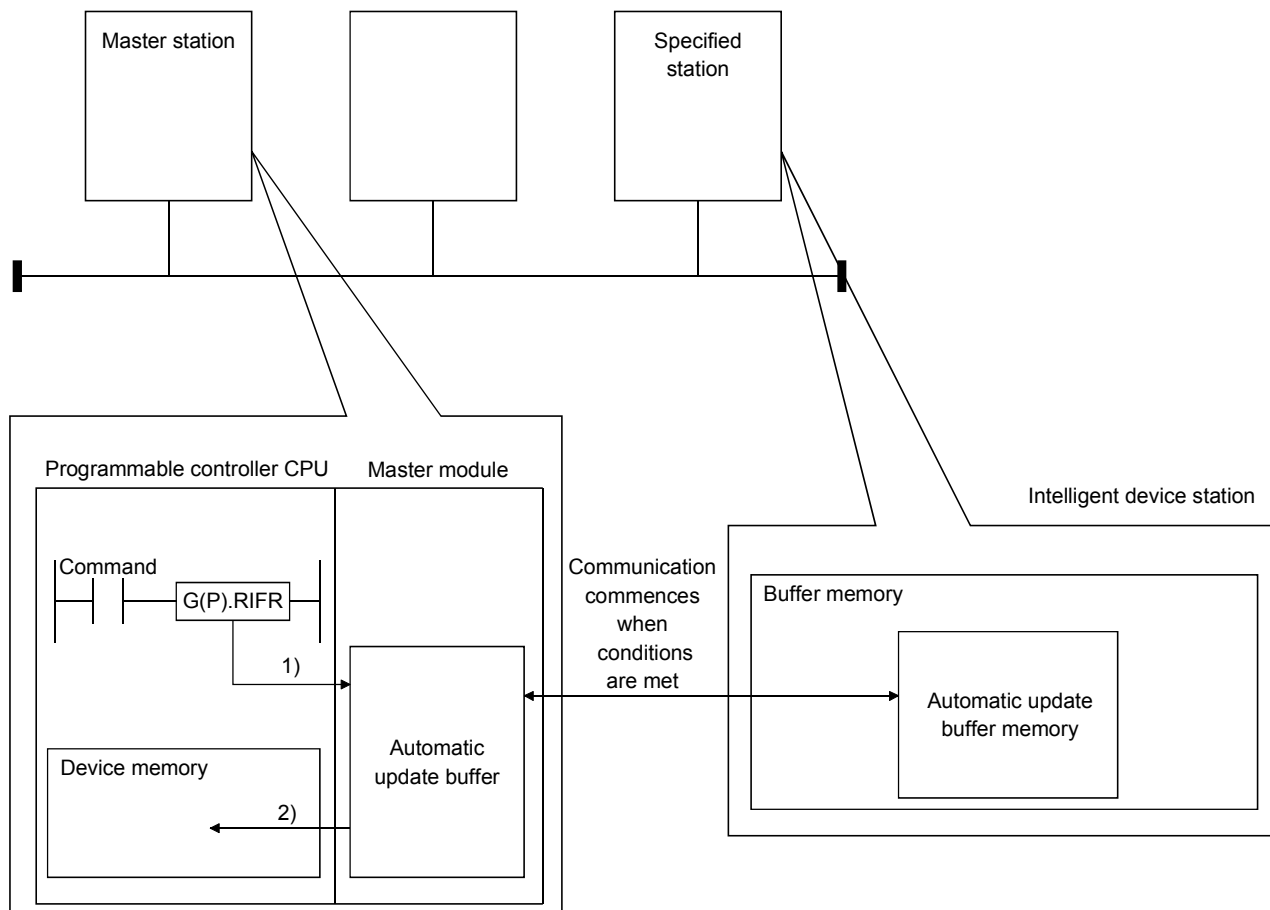
Device	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
n1	Intelligent device station number	1 to 64	
	Random access buffer specification	FFH	
n2	The offset value of the automatic update buffer of the intelligent device station specified by the master station or the random access buffer.	Between 0 and parameter setting value *1	
(D)	Start number of the device to which read data is to be stored.	Within the range of the specified device	Device
n3	Number of points to read	0 to 4096 *2	Binary 16 bits

*1: The value set in the station information settings of the network parameters of the GX Developer.

*2: No processing will be performed when set to "0".

(1) Functions

(a) Operation chart for the G(P).RIFR instruction



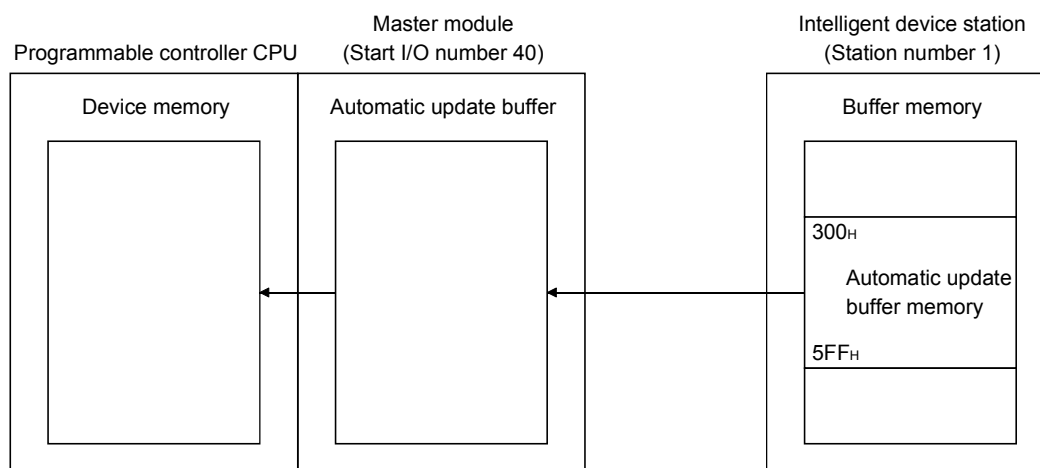
- 1) Accesses the automatic update buffer specified by n1 and n2 of the master module specified by Un.
 - 2) Stores the data read after the device specified by (D).
- (b) The G(P).RIFR instruction reads data when it is executed. However, this instruction cannot be executed simultaneously at more than one location for the same intelligent device station.
 - (c) The maximum points that can be read by the G(P).RIFR instruction are 4096.
 - (d) The basic number of steps of the G(P).RIFR instruction is 9 steps.
 - (e) The automatic update buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

(2) Operation error

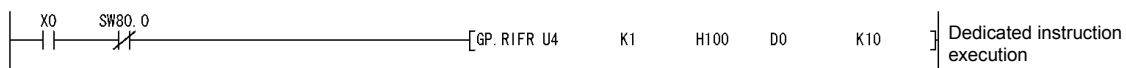
In the following cases, operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

Error code	Description of operation error
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 an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the setting for number of points to read (n3) is outside of the setting range.
	When the station number specified with n1 does not exist.

(3) Program example



When X0 is turned ON, the following example program reads 10-word data to D0 or succeeding addresses from the automatic update buffer offset value of 100 (400_H of the intelligent device station) in the master module.
(When the link special register (SW) refresh device is set to SW0)

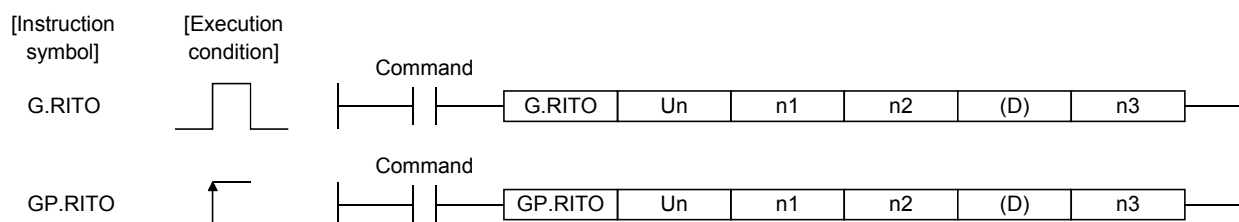


Appendix 2.7 G(P).RITO

The G(P).RITO instruction writes data to the automatic update buffer of the specified station.

Available for modules that have the automatic update buffer (e.g. AJ65BT-R2(N)).

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



Set data

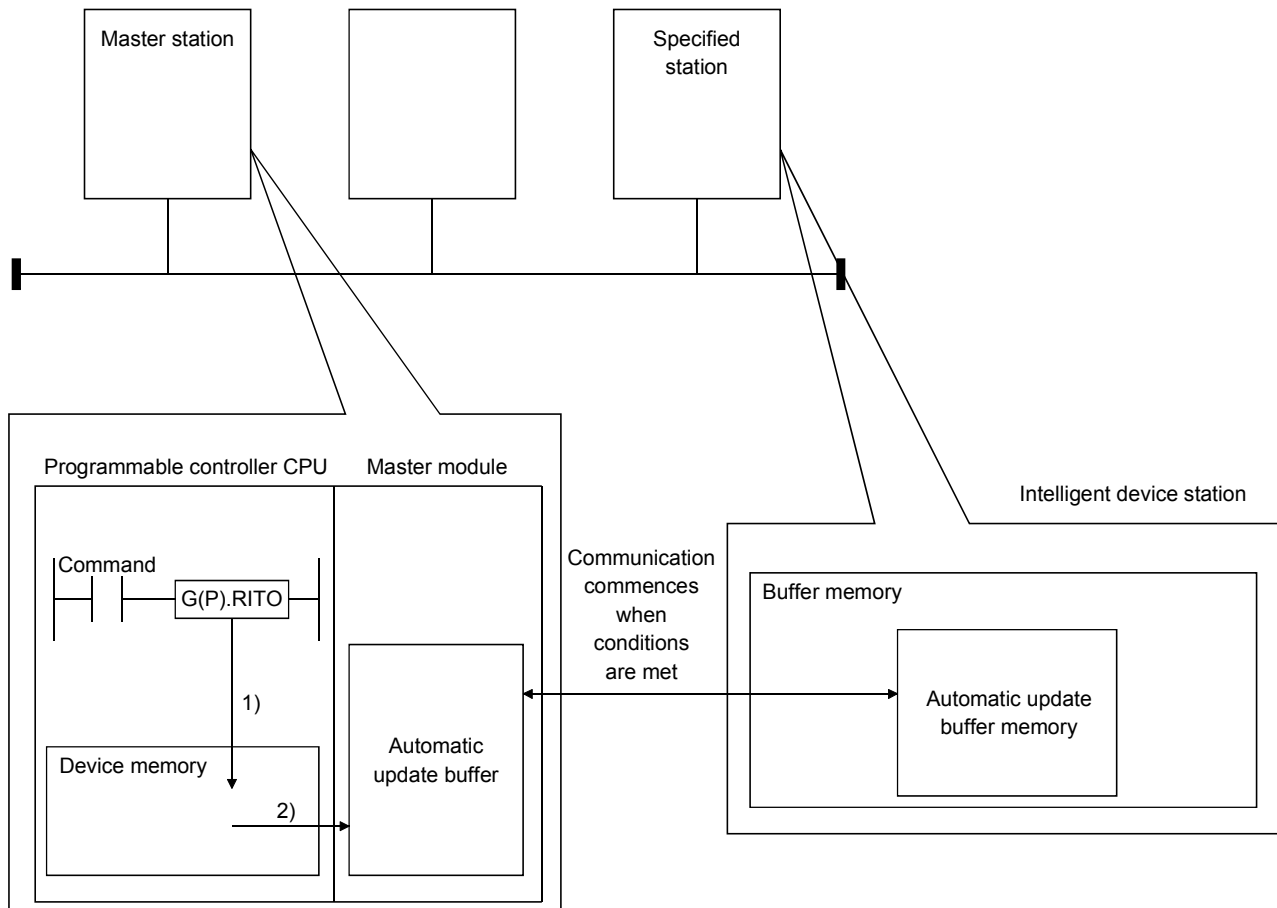
Device	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
n1	Intelligent device station number	1 to 64	
	Random access buffer specification	FFH	
n2	The offset value of the automatic update buffer of the intelligent device station specified by the master station or the random access buffer.	Between 0 and parameter setting value *1	
(D)	Start number of the device to which write data is to be stored.	Within the range of the specified device	Device
n3	Number of points to write	0 to 4096 *2	Binary 16 bits

*1: The value set in the station information settings of the network parameters of the GX Developer.

*2: No processing will be performed when set to "0".

(1) Functions

(a) Operation chart for the G(P).RITO instruction



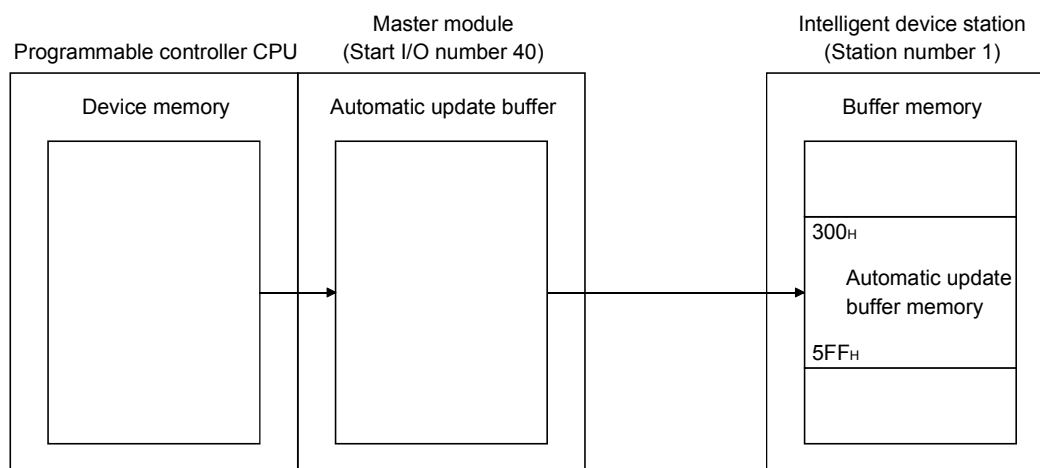
- 1) Accesses the device after the device specified by (D) of the master module specified by Un.
 - 2) Writes to the automatic update buffer specified by n1 and n2.
- (b) The G(P).RITO instruction writes data when it is executed. However, this instruction cannot be executed simultaneously at more than one location for the same intelligent device station.
 - (c) The maximum points that can be read by the G(P).RITO instruction are 4096.
 - (d) The basic number of steps of the G(P).RITO instruction is 9 steps.
 - (e) The automatic update buffer assignment is performed using the "Station information setting" of the network parameters of the GX Developer. For more details, see Section 6.2.

(2) Operation error

In the following cases, operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

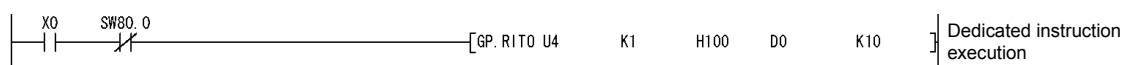
Error code	Description of operation error
2112	When the module specified by Un is not an intelligent function module.
	When the module specified by Un is not a special function module.
4002	When an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the setting for number of points to write (n3) is outside of the setting range.
	When the station number specified with n1 does not exist.

(3) Program example



When X0 is turned ON, the following example program writes 10-word data from D0 to the automatic update buffer offset value starting from 100 (400H of the intelligent device station) in the master module.

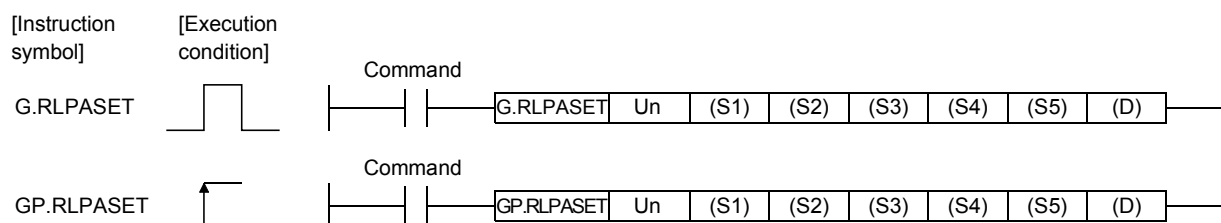
(When the link special register (SW) refresh device is set to SW0)



Appendix 2.8 G(P).RLPASET

Set the network parameter to the master station and start up the data link.

Set data	Usable devices									
	Internal device (System, user)		File register	Link direct device J□\□		Intelligent function module device U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K, H	S	
(S1)	—	○		—			—	—	—	
(S2)	—	○		—			—	—	—	
(S3)	—	○		—			—	—	—	
(S4)	—	○		—			—	—	—	
(S5)	—	○		—			—	—	—	
(D)	○			—			—	—	—	



Master station set data

Device * ¹	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
(S1)	Start number of the device in which control data is stored.	Within the range of the specified device	Device name
(S2) * ²	Start number of the device in which slave station setting data is stored.	Within the range of the specified device	
(S3) * ²	Start number of the device in which reserved station specification data is stored.	Within the range of the specified device	
(S4) * ²	Start number of the device in which error invalid station specification data is stored.	Within the range of the specified device	
(S5) * ²	Start number of the device in which send, receive and automatic refresh buffer assignment data is stored.	Within the range of the specified device	
(D)	Device that is turned ON for one scan upon completion of reading. (D)+1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

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

*2 When the setting data for (S2) to (S5) are not to be set, specify a dummy device.

Control data

Device	Item	Set data	Setting range *2	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0: Error code	—	System
(S1) + 1	Setting flag	Specifies whether the individual setting data from (S2) to (S5) is valid or invalid. 0: Invalid *1 1: Valid b15 b14 b13 b4 b3 b2 b1 b0 0 to 0 Slave station setting data (S2) Reserved station specification data (S3) Error invalid station specification data (S4) Send, receive and automatic refresh buffer assignment data (S5) Mode 00: Remote net (Ver.1 mode) 01: Remote net (Additional mode) 10: Remote net (Ver.2 mode) 11: Not used	—	User
(S1) + 2	Number of connected modules involved in communication	Sets the number of connected slave stations.	1 to 64	
(S1) + 3	Number of retries	Sets the number of retries to a communication faulty station.	1 to 7	
(S1) + 4	Number of automatic return modules	Sets the number of slave stations that can be returned per one link scan.	1 to 10	
(S1) + 5	Operation specification when CPU is down	Specifies the data link status when a master station programmable controller CPU error occurs. 0: Stop 1: Continue	0, 1	
(S1) + 6	Scan mode specification	Specifies either the synchronous or asynchronous mode for sequence scan. 0: Asynchronous 1: Synchronous	0, 1	
(S1) + 7	Delay time setting	Set 0 for the delay time.	0	

*1: For the setting data specified invalid, default parameter will be applied.

*2: Setting a value outside the setting range results in abnormal completion.

Slave station setting data

Device	Item	Set data	Setting range	Set by
(S2) + 0 to (S2) + 63	Setting for 1 to 64 modules *3	The type of slave station, number of occupied slave stations and station number are set as follows. The default parameter settings are "0101_H to 0140_H" (station number: 1 to 64, number of occupied slave stations: 1, type of slave station: remote I/O station).	—	User
		Setting of the station number 1 to 64 (BIN setting)	1 to 40 _H	
		Setting of the number of occupied slave stations	1 to 4 _H	
		Setting of the type of slave station Ver.1compatible remote device station *4	0 to F _H	

*3: Perform the settings for as many connected modules involved in communication as has been specified by the control data.

*4: Setting a value outside the setting range in the slave station type setting results in abnormal completion.

Reserved station specification data

Device	Item	Set data	Setting range	Set by
(S3) + 0 to (S3) + 3	Setting for 1 to 64 modules *5	Specify reserved stations. *6 0: Not specified 1: Specified	—	User
		1 to 64 in the table indicate station numbers.		
		Default parameter setting is "0: Not specified" for all stations.		

*5: Perform the settings for station numbers up to the largest station number set by the slave station setting data.

*6: Specify only the head station number of a module in the case of a remote station, local station or intelligent device station that occupies 2 or more stations.

Error invalid station specification data

Device	Item	Set data	Setting range	Set by					
(S4) + 0 to (S4) + 3	Setting for 1 to 64 modules * 7	Specify the error invalid station. * 8 0: Not specified 1: Specified	—	User					
(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
		1 to 64 in the table indicate station numbers.							
		Default parameter setting is "0: Not specified" for all stations.							

*7: Perform the settings for station numbers up to the largest station number set by the slave station setting data.

*8: Specify only the head station number of a module in the case of a remote station, local station or intelligent device station that occupies 2 or more stations.

The reserved station specification is given the higher priority if both error invalid station and reserved station specifications are made for the same station.

Send, receive and automatic refresh buffer assignment data

Device	Item	Set data	Setting range	Set by	
(S5) + 0 to (S5) + 77	Setting for 1 to 26 modules *9	Specify assignments of buffer memory size at transient transmission to local stations and intelligent device stations.		User	
		(S5)+0	Send buffer size		Settings for the first module
		(S5)+1	Receive buffer size		
		(S5)+2	Automatic refresh buffer size		
			to		
		(S5)+75	Send buffer size		Settings for the 26th module
		(S5)+76	Receive buffer size		
		(S5)+77	Automatic refresh buffer size		
			The default parameter settings are "send buffer size: 40H, receive buffer size: 40H, automatic refresh buffer size: 80H."		

Send/receive buffer *10: 0H (no setting), 40H to 1000H 0 (word) (no setting) 64 to 4096 (words)
Automatic refresh buffer *11: 0H (no setting), 80H to 1000H 0 (word) (no setting) 128 to 4096 (words)

*9: Perform the settings for stations specified as local stations or intelligent device stations in the slave station setting data, starting from the smallest station number.

*10: Keep the total size of the send and receive buffer sizes at 1000H (4096 (words)) or less.

Specify the size of data to be sent and received plus 7 words for the send and receive buffer sizes, respectively.

Setting a value outside the setting range results in abnormal completion.

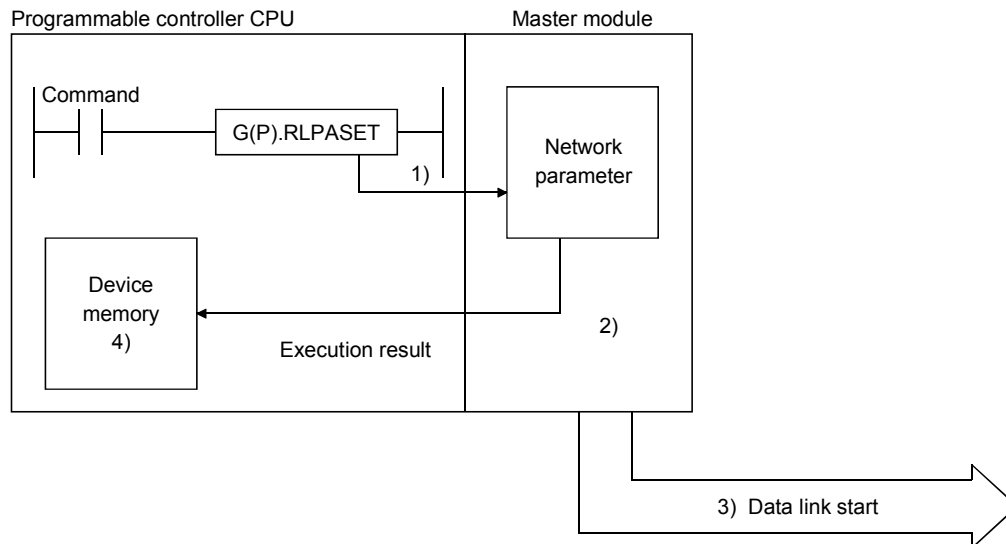
*11: Keep the total size of the automatic refresh buffer sizes at 1000H (4096 (words)) or less.

Specify the necessary automatic refresh buffer size for each intelligent device station.

Setting a value outside the setting range results in abnormal completion.

(1) Functions

(a) Operation chart for the G(P).RLPASET instruction.



- 1) Pass the network parameters set in (S1) to (S5) to the master module specified by Un.
- 2) The master module 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) It is only possible to execute one G(P).RLPASET instruction at a time.

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

1) Completion device

Turns ON in the END Processing of the scan where the G(P).RLPASET instruction is completed, and turns OFF in the next END processing.

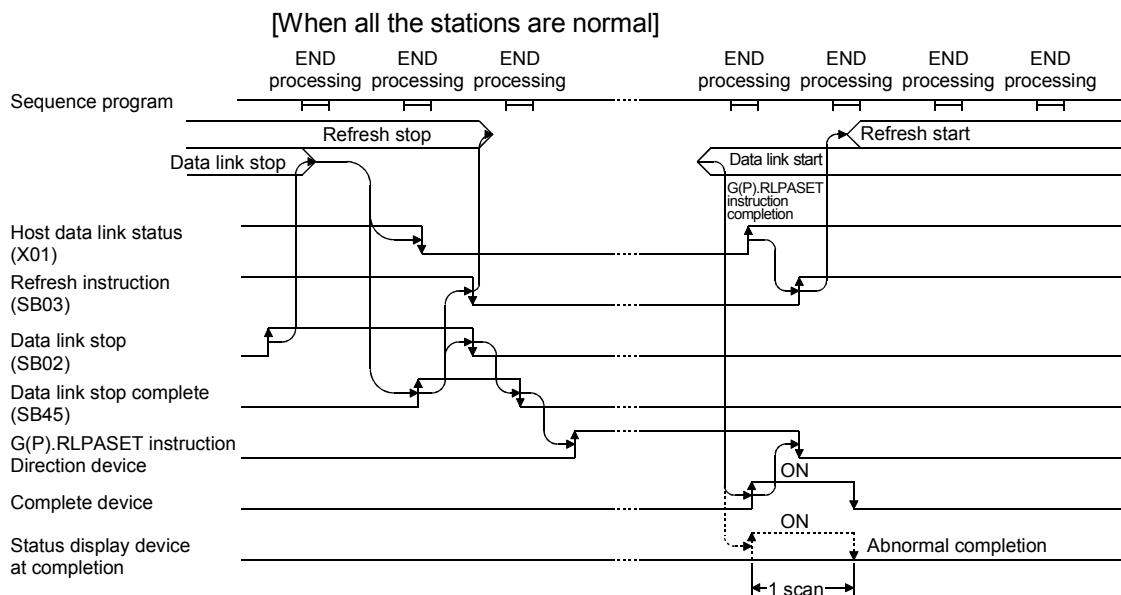
2) Status display device at completion

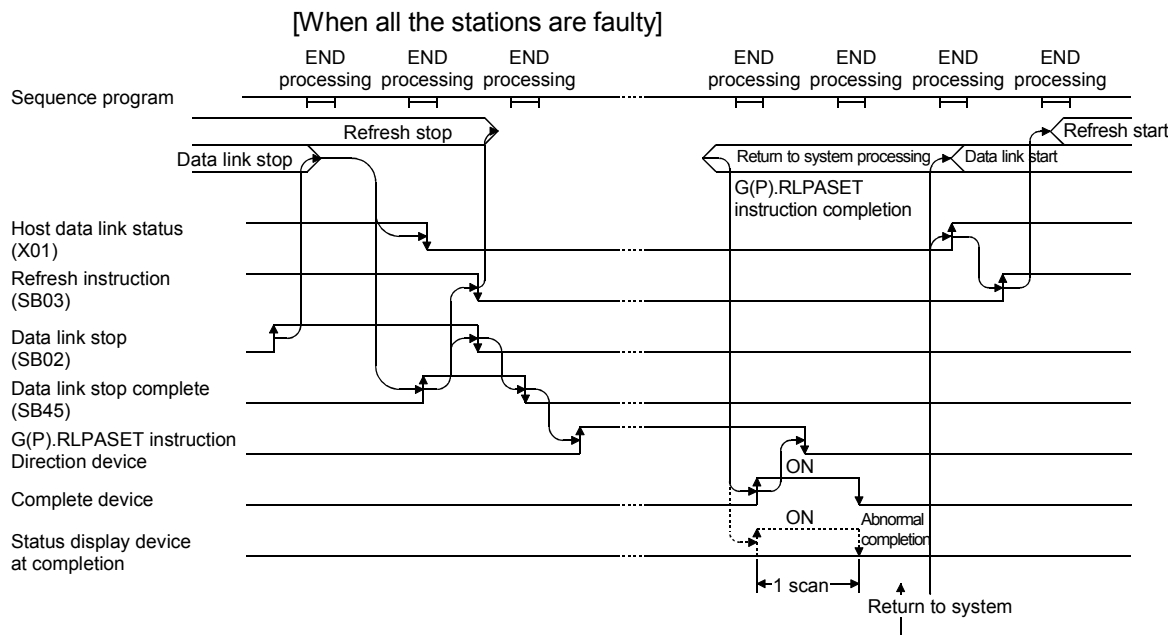
Turns On and OFF depending on the completion status of the G(P).RLPASET instruction.

Normal completion : Stays OFF and does not change.

Abnormal completion : Turns ON in the END processing of the scan where the G(P).RLPASET instruction is completed, and turns OFF in the next END processing.

(D) After executing the G(P).RLPASET instruction, turn on SB0003 (refresh instruction) to refresh cyclic data.





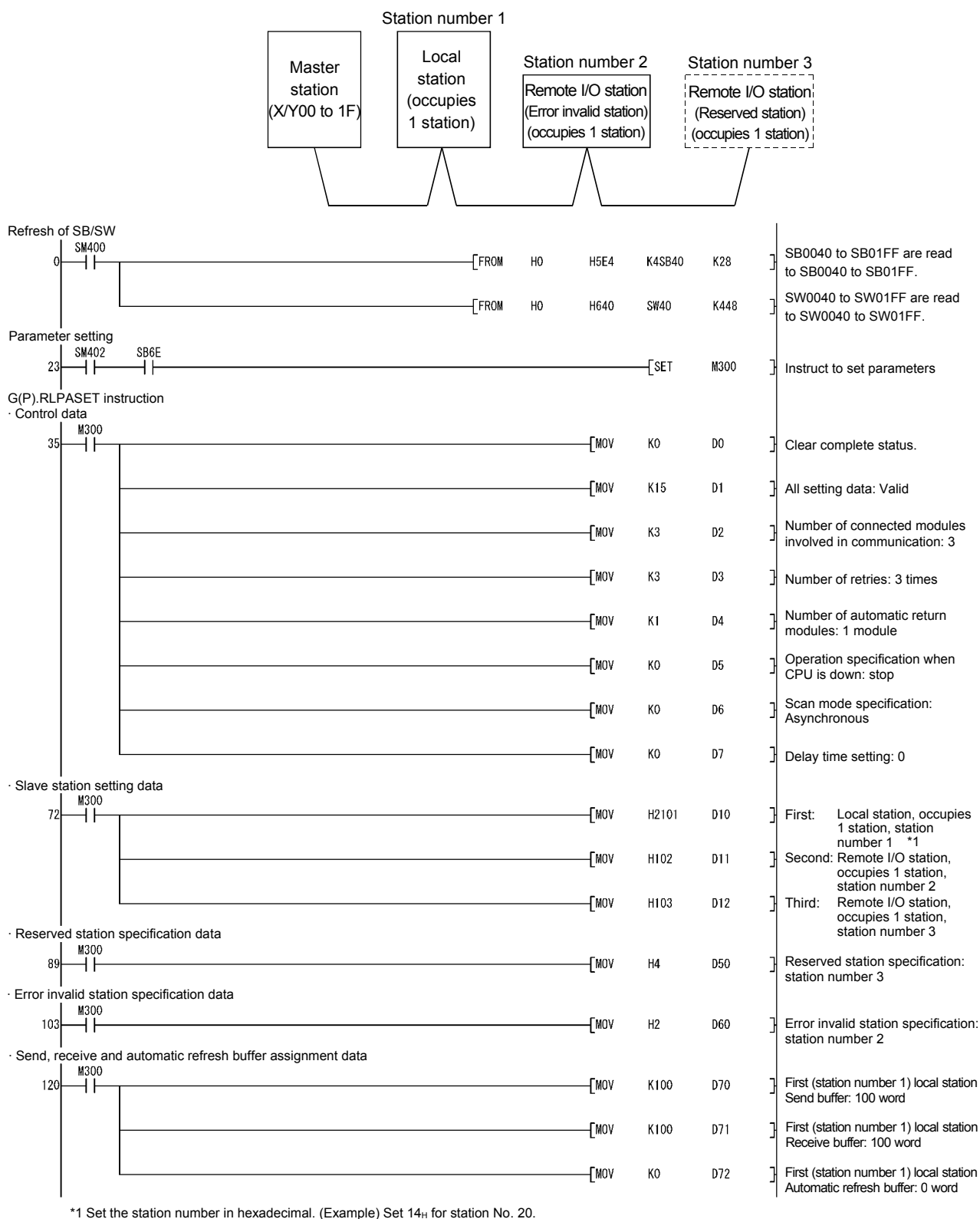
(2) Operation error

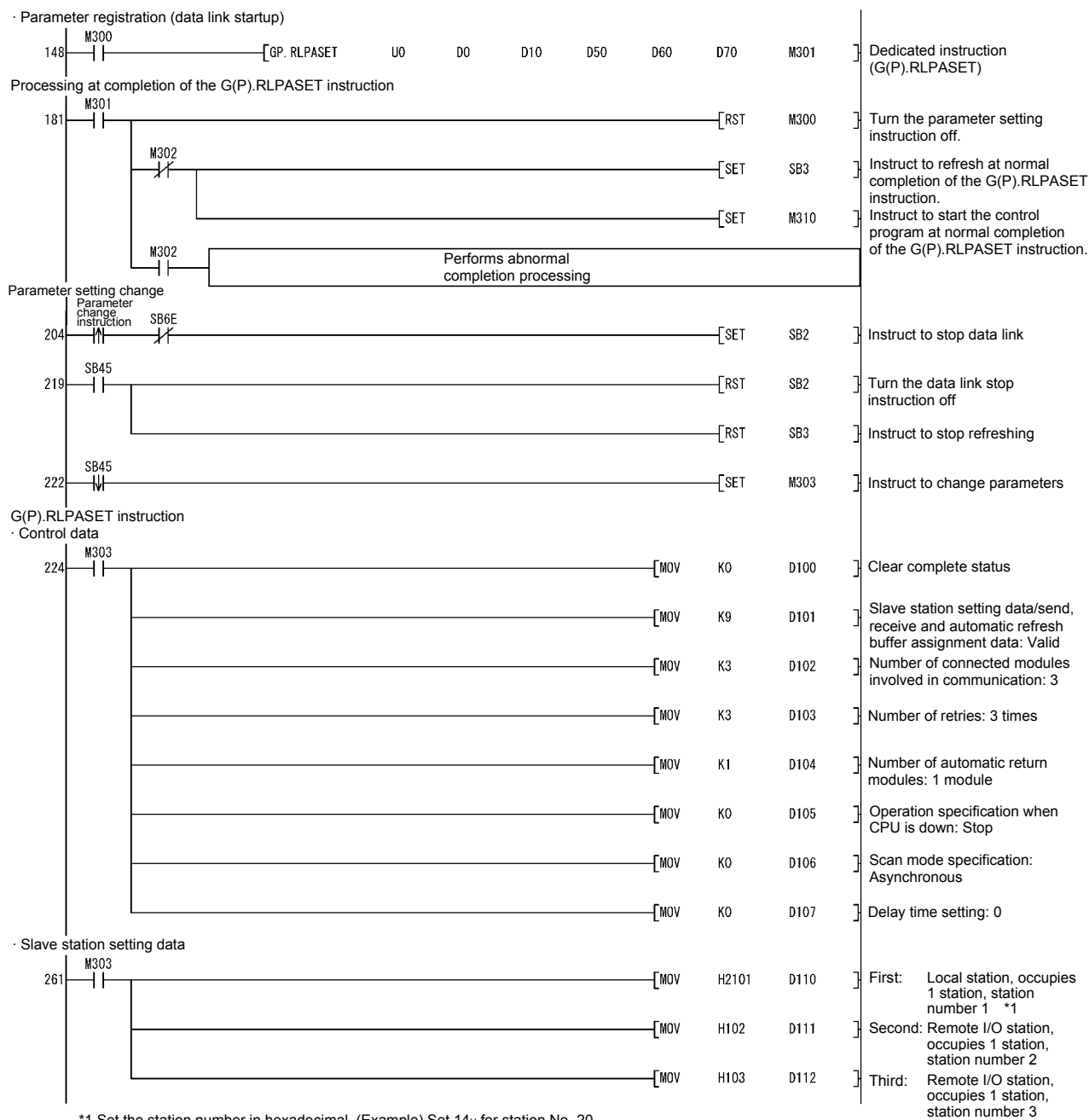
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

Error code	Description of operation error
2112	When the module specified by Un is not an intelligent function module.
4002	When an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data cannot be used.
4101	When the number of points for data used in the instruction exceeds the available range, or storage data and constants of a device specified by the instruction exceeds the available range (including dummy devices). The number of points required for each data is shown below. - Control data : 8 points - Slave station setting data : 64 points - Reserved station specification data : 4 points - Error invalid station specification data : 4 points - Send, receive and automatic refresh buffer assignment data : 78 points Example: Assume that data link registers D0 to D12287 are available for the Q02CPU. If the device head number of the slave station setting data is set to D12284 because there are only 4 slave stations, the programmable controller CPU nonetheless checks the range from D12284 to D122347 (for 64 stations) and an error indicating that the available range is exceeded occurs.

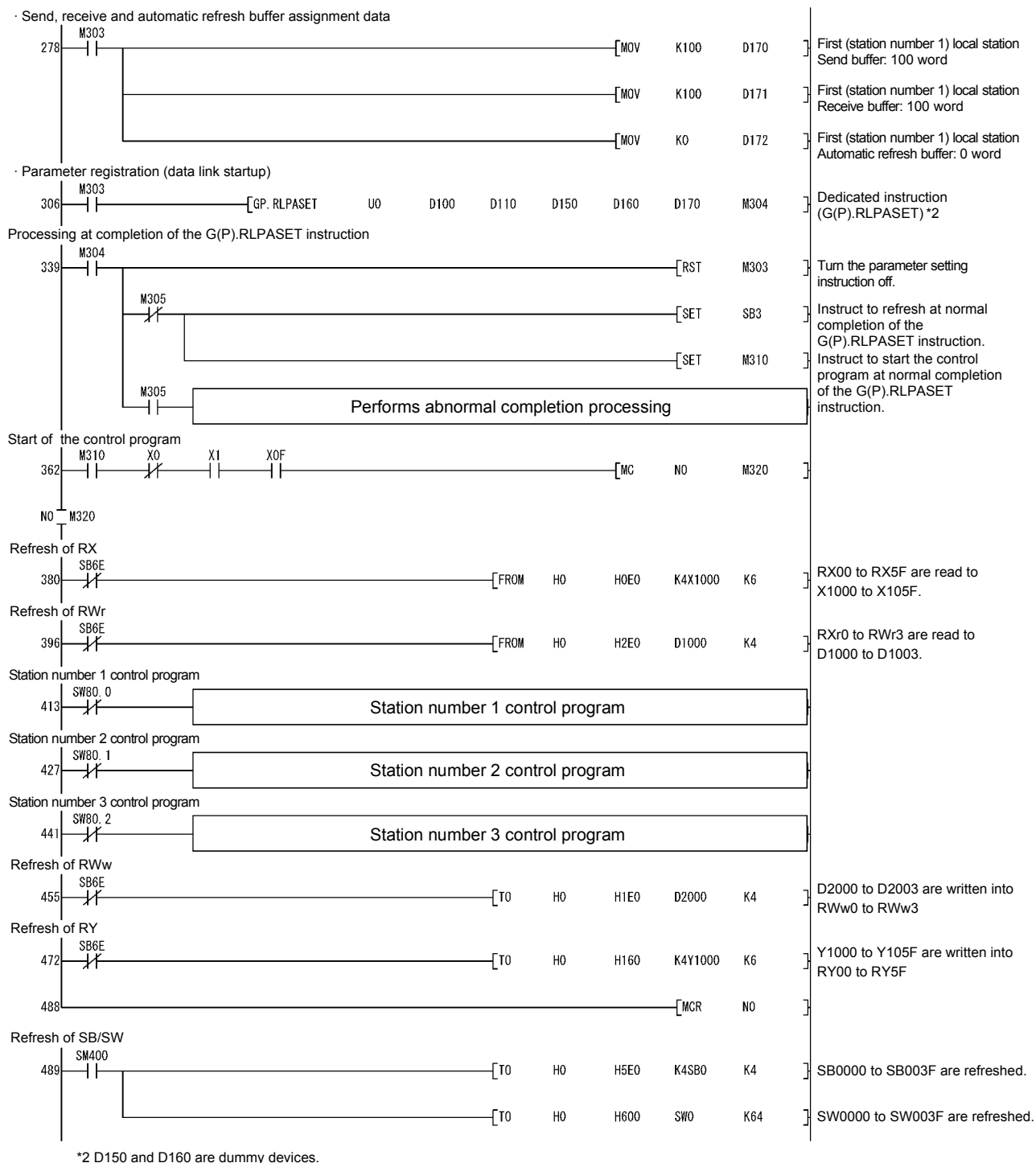
(3) Program example

This program sets the network parameters for the master module mounted at the I/O numbers X/Y00 to X/Y1F and starts the data link.





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

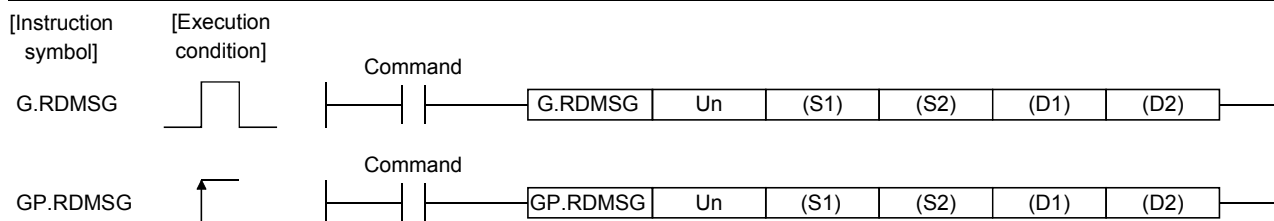


Appendix 2.9 G(P).RDMSG

With this instruction, a message is sent to a remote device station. (The first five digits of serial No. must be 10032 or later.)

This instruction is available for remote device stations that support the message transmission function.

Set data	Usable devices									
	Internal device (System, user)		File register	Link direct device J □□		Intelligent function module device U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K, H	S	
(S1)	—	○			—			—	—	—
(S2)	—	○			—			—	—	—
(D1)	—	○			—			—	—	—
(D2)		○			—			—	—	—



Set data

Device* ¹	Description	Setting range	Data type
Un	Start I/O number of the module	0 to FEH	Binary 16 bits
(S1)	Start No. of the device in which control data are stored	Within the range of the specified device	Device name
(S2) * ²	Start No. of the device that stores data to be sent	Within the range of the specified device	
(D1) * ²	Start No. of the device that stores received data	Within the range of the specified device	
(D2)	Device that is turned ON for one scan upon completion of reading. (D2) + 1 also turns ON at an abnormal completion.	Within the range of the specified device	Bit

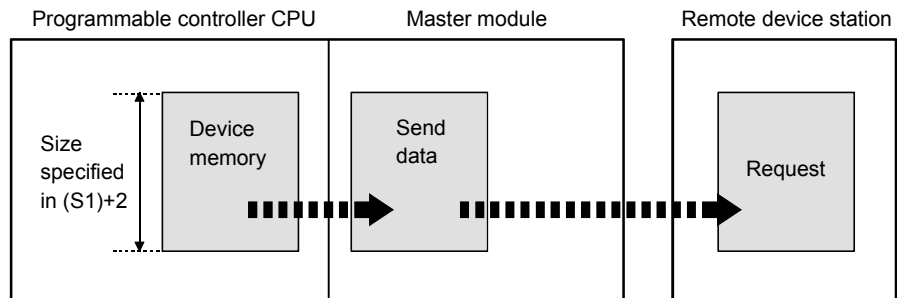
*1 The file register of each of the local device and the program cannot be used as a device for setting data.

*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.

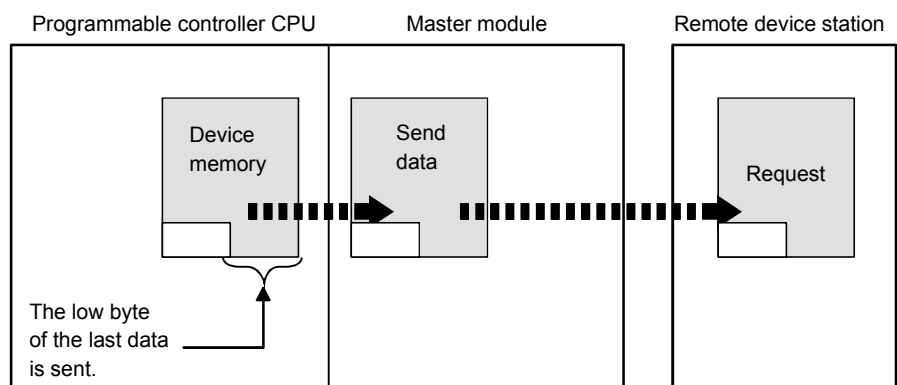
Control data

Device	Item	Set data	Setting range	Set by
(S1) + 0	Completion status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0: Error code	—	System
(S1) + 1	Station number	Specify the station number of the remote device station.	1 to 64	User
(S1) + 2	Send data size	Specify a send data size (in bytes).	1 to 255 (See (1).)	User
(S1) + 3	Receivable data size	Specify the maximum size of the device that stores received data (in bytes).	0 to 255 (See (2).)	User
(S1) + 4	Receive data size	The size of received data (in bytes) is stored.	0 to 255 (See (2).)	System

(1) Send data size



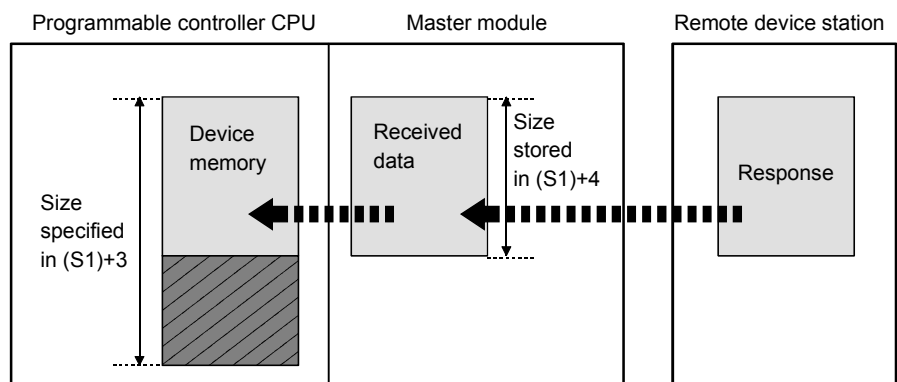
When the send data size $((S1)+2)$ is an odd number of bytes, the low byte of the last data is sent as the last byte.



(2) Receivable data size and receive data size

Set a receivable data size $((S1)+3)$ so that it will satisfy the following conditional expression:

$$\text{Receivable data size } ((S1)+3) \geq \text{Receive data size } ((S1)+4)$$

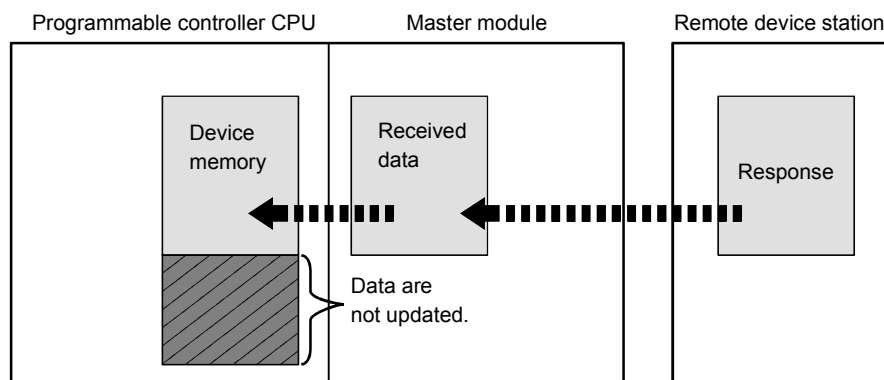


If the receivable data size $((S1)+3)$ is smaller than the receive data size $((S1)+4)$, data sent from a remote device station cannot be received.

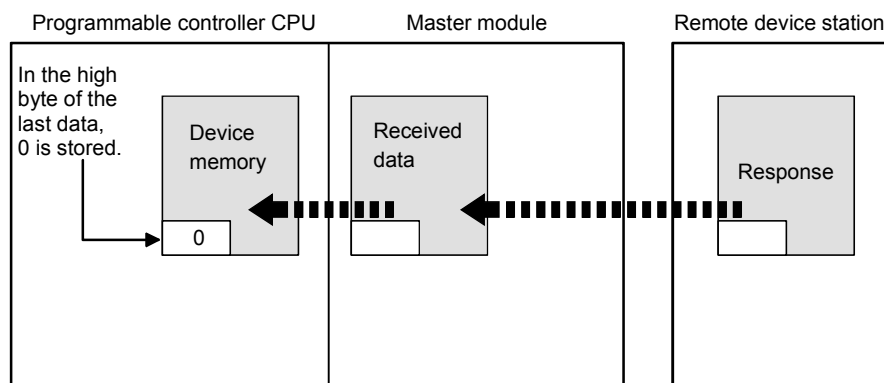
The G(P).RDMSG instruction will fail (error code: B418H).

The following explains the operations when the receivable data size $((S1)+3)$ is not equal to the receive data size $((S1)+4)$.

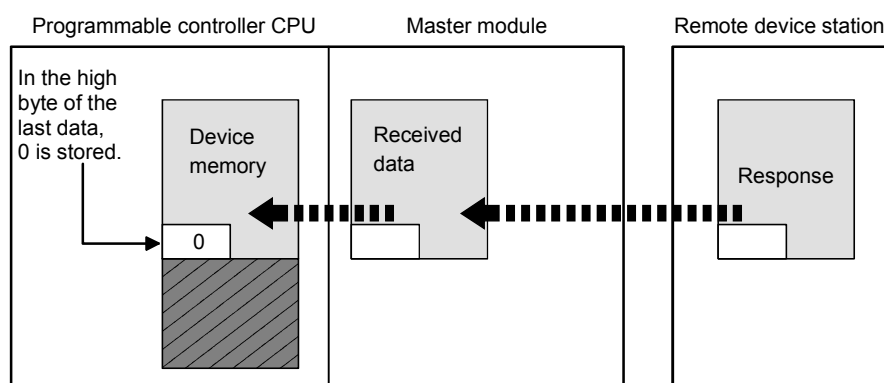
(a) Receivable data size $((S1)+3) >$ Receive data size $((S1)+4)$



(b) When the receivable data size $((S1)+3)$ is an odd number of bytes

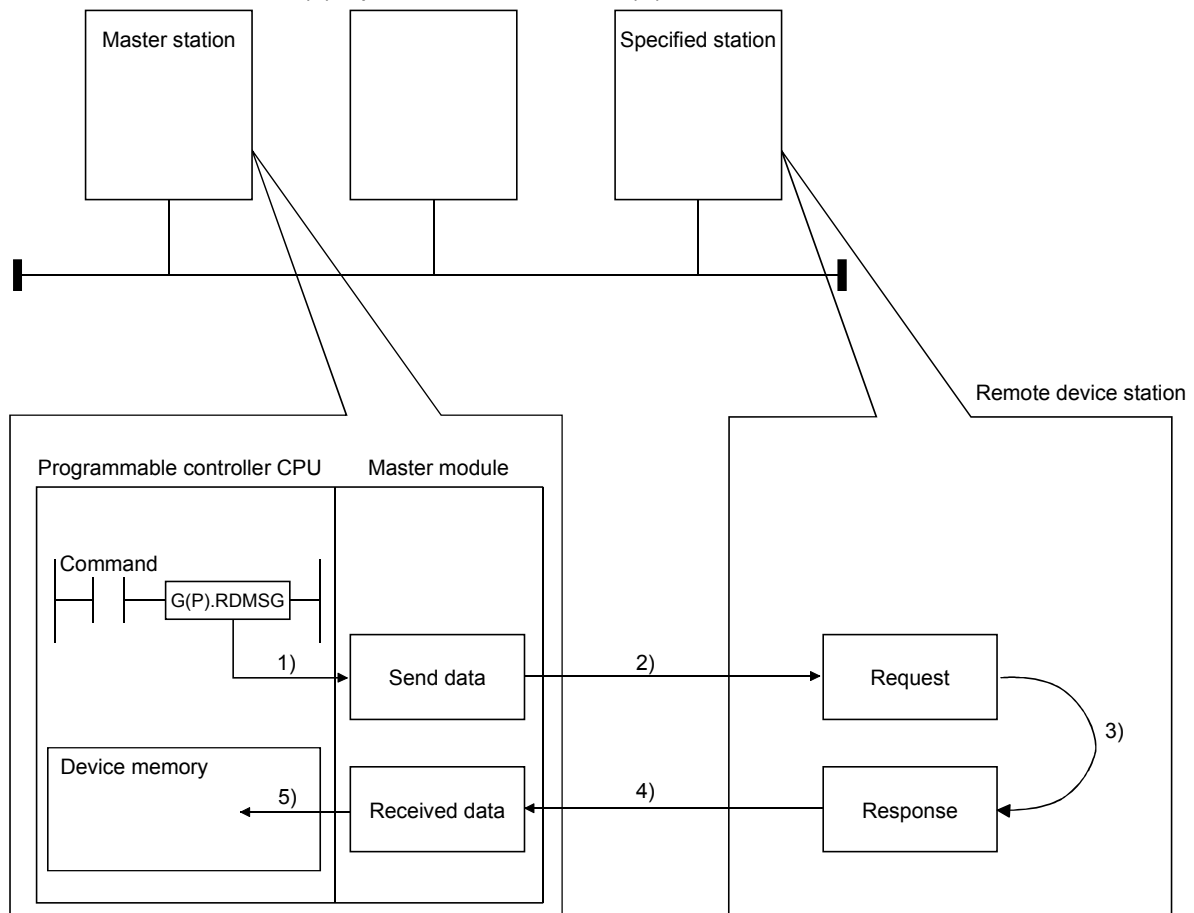


(c) When the receive data size $((S1)+4)$ is an odd number of bytes (when data received from a remote device station is an odd number of bytes in length)



(3) Functions

(a) Operation chart for 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.

(c) 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) (see Appendix 2) is not allowed.

Design the program so that the next dedicated instruction will be executed after Completion device (D2) is turned ON.

(d) There are two types of interlock signals for the G(P).RDMSG instruction: the completion device (D2) and status display device at completion (D2) + 1.

1) Completion device

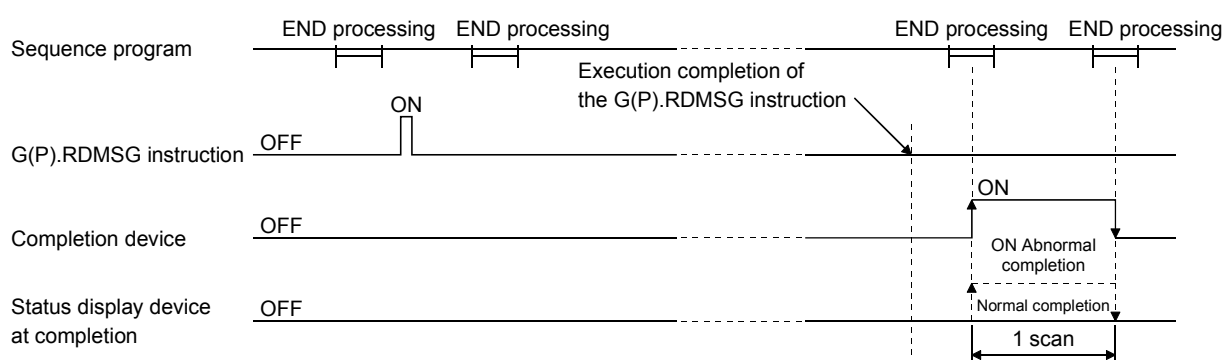
Turns ON in the END processing of the scan where the G(P).RDMSG instruction is completed, and turns OFF in the next END processing.

2) Status display device at completion

Turns ON and OFF depending on the completion status of the G(P).RDMSG instruction.

Normal completion: Stays OFF and does not change.

Abnormal completion: Turns ON in the END processing of the scan where the G(P).RDMSG instruction is completed, and turns OFF in the next END processing.



(e) The basic number of steps of the G(P).RDMSG instruction is 10 steps.

(4) Operation error

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

Error code	Description of operation error
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 an attempt was made to execute an unsupported instruction.
4003	When the number of devices in the instruction is incorrect.
4004	When the instruction specifies a device that cannot be used.
4100	When the instruction contains the data that cannot be used.
4101	When the number of data set to be used exceeds the allowable range. Or, when the storage data or constants of the device specified with the instruction exceeds the allowable range.

(5) Program examples

For program examples, refer to the manual for the remote device station that supports the message transmission function.

Appendix 3 Differences Between the New and Previous Models

The following lists the differences between the QJ61BT11N and older models:

	QJ61BT11N	QJ61BT11	A (1S) J61BT11	A (1S) J61QBT11
Startup procedure	Startup using the parameters of the master station CPU (Yn6 and Yn8 cannot be used)	Startup using the parameters of the master station CPU (Yn6 and Yn8 cannot be used)	Startup using Yn6, Yn8 and dedicated instructions	Startup using Yn6, Yn8, and master station CPU parameters
Remote device station initialization procedure registration function	Yes	Yes	No	No
Module reset function using the sequence program	No	No	Yes	Yes
Access to other stations via the CC-Link	Yes	Yes	No	No
Parameter settings using FROM/TO instruction	Not supported	Not supported	Supported	Supported
Parameter settings using dedicated instruction	Supported	Supported	Supported	Not supported
Parameter settings using GX Developer	Supported	Supported	Not supported	Supported
Standby master function	The master station that is down can recover	The master station that is down can recover	The master station that is down cannot recover	The master station that is down cannot recover
Event issuance for the interrupt program	Supported	Supported	Not supported	Not supported
Parameter verification test	No	No	Yes	Yes
E ² PROM	No (CPU parameters)	No (CPU parameters)	Yes	Yes
Expanded cyclic setting	Yes	No	No	No
Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP	Yes	No	No	No

Appendix 4 Precautions when Changing from AJ61QBT11 to QJ61BT11N

- (1) The following dedicated instructions for AJ61QBT11 cannot be used in QJ61BT11N.

Instruction	Description
CCL, CCLEND	Performs mail box registration for intelligent device and remote device instructions.
SPCCLR	Performs interrupt command to intelligent device instruction.
SPCBUSY	Reads remote station status.
SEND	Sends data (message) to designated transmission destination station (QnACPU).
RECV	Reads data (message) that has been sent by SEND instruction.
READ, SREAD	Designated station QnACPU word device data read by local station.
WRITE, SWRITE	Data from local station written to designated station QnACPU word device data.
REQ	Sends and executes transient (such as remote RUN/STOP) requests to other stations.

- (2) The conditions setting switches for AJ61QBT11 shown below cannot be used on QJ61BT11N.

Use the GX Developer and set the CC-Link network parameters.

Number	Setting Description
SW1	Station type
SW4	Input status of data link error station
SW5	Number of occupied stations

Appendix 5 Precautions when Changing from QJ61BT11 to QJ61BT11N

- (1) When the remote net mode of the QJ61BT11 is used, use the remote net ver. 1 mode of the QJ61BT11N for changing.
- (2) When the remote I/O net mode of the QJ61BT11 is used, use the remote I/O net mode of the QJ61BT11N for changing.
- (3) When the remote net ver. 2 mode/remote net additional mode is set to the master station of the QJ61BT11, an error (error code: B399H, B983H, B984H) occurs.

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B399	Number of connected modules setting error (parameter)	The number of connected modules parameter was set to a value other than "1 to 64".	Set a value within the range from "1 to 64".	○	×
		The remote net ver. 2 mode/remote net additional mode has been set to the master station of the QJ61BT11.	Set to the remote net ver. 1 mode/remote I/O net mode.		
B983	Model illegal	The remote net ver. 2 mode/remote net additional mode has been set to the master station of the QJ61BT11.	Set to the remote net ver. 1 mode/remote I/O net mode.	○	○
B984	Model illegal	The remote net ver. 2 mode/remote net additional mode has been set to the master station of the QJ61BT11.	Set to the remote net ver. 1 mode/remote I/O net mode.	○	×

- (4) When the remote net ver. 2 mode/remote net additional mode is set to the local station of the QJ61BT11, the local station operates in the remote net ver. 1 mode.

Appendix 6 CPU-dependent Function Availability

The following table indicates whether the functions are available or not depending on the CPU.

Functions		QCPU (Q mode) (except Basic model QCPU)	Basic model QCPU	QJ72LP25-25/ QJ72LP25G/ QJ72LP25GE/ QJ72BR15
Basic functions	Communication with remote I/O station	○	○	○
	Communication with remote device station	○	○	○
	Communication with local station	○	○	○
	Communication with intelligent device station	○	○	○
	Parameter setting with GX Developer	Network parameter	○	○
		Automatic refresh parameter	○	○
	Parameter setting with dedicated instruction	○	○	×
Functions for improving system reliability	Slave station cut-off function	○	○	○
	Automatic return function	○	○	○
	Data link status setting when the master station programmable controller CPU has an error	○	○	○
	Setting the status of input data from a data link faulty station	○	○	○
	Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP	○	○	○
	Standby master function	○	○	×
	Block guarantee of cyclic data per station	○ * 2	×	×
Handy functions	Remote device station initialization procedure registration function	○	○	○
	Event issuance for the interrupt program	○	○ * 1	×
	Automatic CC-Link startup	○	○	○
	Remote net mode	○	○	○
	Remote I/O net mode	○	○	×
	Reserved station function	○	○	○
	Error invalid station setting function	○	○	○
	Scan synchronous function	Synchronous mode	○	×
		Asynchronous mode	○	○
	Temporary error invalid station setting function	○	○	○
	Data link stop/restart	○	○	○
	Station number overlap checking function	○	○	○
	Multiple CPU system support	○ * 3	○ * 3	×
Functions for transient transmission	Transient transmission	○	○	○

○: Available ×: Unavailable

*1: Supported by Basic model QCPU, starting with function Ver. B.

*2: Supported by the High Performance model QCPU, and Process CPU, whose first five digits of serial No. is 08032 or later.

*3: The Q00JCPU and Q00UJCPU cannot be used in any multiple CPU system configuration.

Appendix 7 Functional upgrade of the QJ61BT11N

Whether the QJ61BT11N supports the upgraded function or not can be confirmed with the first 5 digits of serial No. as shown below.

Function	First five digits of serial No.
Data link start by standby master station	07112 or later
Block guarantee of cyclic data per station	08032 or later
Specification of remote device station to be initialized	08032 or later
Dedicated instruction retry count setting	08102 or later
Transmission speed test	10032 or later
Message transmission function (G(P).RDMSG instruction)	10032 or later
Display of module's error history	11042 or later

Appendix 8 Parameter Setting Checklist

This checklist may be used to set the parameters required to configure a CC-Link system.

Please make a copy of this checklist and use it as needed.

For more details, see Sections 6.3 to 6.6.

Appendix 8.1 Parameter setting checklist

Parameter setting checklist

Item		Setting range	Setting value
Start I/O No.		0000 to 0FE0	0000
Operational settings	Data link disorder station setting	Input data hold/clear Default: Clear	Hold/clear
	Case of CPU STOP setting	Refresh/clears compulsorily Default: Refresh	Refresh/Clears compulsorily
	Block guarantee of cyclic data per station	Disable/Enable Default: Disable	Disable/Enable
	Number of occupied stations	Occupies 1 to 4 stations Default: Occupies 1 station	
	Expanded cyclic setting	Single/double/quadruple/octuple Default: single	
Type		Master station Master station (Duplex function) Local station Standby master station Default: Master station	Master station Master station (Duplex function) 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 Off line 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 Off line
All connect count		1 to 64 Default: 64	modules
Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote input (RX)		Device name: Select from X, M, L, B, D, W, R or ZR	
Ver.2 Remote output (RY)		Device name: Select from Y, M, L, B, T, C, ST, D, W, R or ZR	
Ver.2 Remote register (RW _r)		Device name: Select from M, L, B, D, W, R or ZR	
Ver.2 Remote register (RW _w)		Device name: Select from M, L, B, T, C, ST, D, W, R or ZR	
Special relay (SB)		Device name: Select from M, L, B, D, W, R, SB or ZR	
Special register (SW)		Device name: Select from M, L, B, D, W, R, SW or ZR	
Retry count		1 to 7 Default: 3	times
Automatic reconnection station count		1 to 10 Default: 1	modules
Standby master station No.		Blank, 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 information setting		Set 0.	

Appendix 8.2 Station information setting checklist

Station information setting checklist

Station No.	Station type	Expanded cyclic setting	Number of occupied stations	Remote station points	Reserve/invalid station select	Intelligent buffer select (Word)		
						Send	Receive	Automatic
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
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36								
37								

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
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								

INDEX

[A]

Appendixes	App-1
Applicable modules	2-4
Applicable system	2-4
Automatic CC-Link startup	1-11, 4-71
Automatic return function	1-6, 4-28
Automatic update buffer	8-22

[B]

Block guarantee of cyclic data per station ...	4-50
Buffer memory list	8-6

[C]

CC-Link dedicated cable	3-3
CC-Link diagnostics	13-26
CC-Link ver. installation/parameter matching status	8-41
CC-Link version	2-14
Communication between the master station and intelligent device stations	12-1
Communication between the master station and local stations	11-1
Communication between the master station and remote device stations	10-1
Communication between the master station and remote I/O stations	9-1
Communication buffer	8-21
Communication with the remote I/O stations .	4-4
Communication with the local stations	4-11
Communication with the remote device stations	4-6
Compatible CC-Link ver. information	8-41
Compatibility with CC-Link	1-2
Completion status of remote device station initialization procedure	8-29
Connecting the modules	7-9
Connection cable	3-1
CPU monitoring time setting	8-32
Current link scan time	8-35
Cyclic points increase	1-14, 4-86
Cyclic transmission	A-16

[D]

Data link processing time	5-1
Data link restart	8-27

Data link restart acceptance	8-28
Data link restart complete	8-28
Data link restart result	8-33
Data link stop	8-27
Data link stop acceptance	8-28
Data link stop complete	8-28
Data link stop result	8-33
Data link stop/restart	1-13, 4-81
Data link status setting when the master station programmable controller CPU has an error	1-7, 4-29
Dedicated instruction	4-94
Dedicated instruction list	App-2
Delay timer information	8-35
Detailed LED display status	8-34
Details of the I/O signals	8-4
Differences between the new and previous models	App-46

[E]

EMC directive	A-15
Error invalid station setting function ...	1-12, 4-75
Error invalid station specified status	8-30, 8-36
Event issuance for the interrupt program	1-11, 4-68
Example of parameter settings with GX Developer (Remote I/O net mode)	6-49
Example of parameter settings with GX Developer (Remote net additional mode)	6-33
Example of parameter settings with GX Developer (Remote net ver.1 mode)	6-6
Example of parameter settings with GX Developer (Remote net ver.2 mode)	6-19
Example of parameter setting with dedicated instruction	6-54
Execution status of remote device station initialization procedure	8-29
External dimensions	App-1

[F]

Faulty stations are generated depending on transmission speed	13-7
Faulty stations cannot be detected	13-7
Forced master switching	8-28

Forced master switching instruction result ...	8-34
Forced master switching request acknowledgement	8-29
Forced master switching request complete..	8-29

[H]

H/W information.....	13-30
Handling precautions	7-3
Hardware test	7-7
Host line status.....	8-31
Host mater/standby master operation status	8-31
Host mode	8-29
Host monitoring	13-26
Host station number	8-34
Host parameter status.....	8-35
Host standby master station setting status ..	8-29
Host station operation status	8-30
Host station switch change detection	8-30
Host type.....	8-29
How to check the function version.....	2-12

[I]

I/O signal list	8-2
Initial setting of the remote device station	10-7, 10-25, 10-45
Input data status of host data link faulty station	8-29
Installation.....	7-3
Installation environment	7-4
Intelligent device module	A-16
Intelligent device station.....	A-16, 1-1
Intelligent device station communication.....	1-5
Intelligent function module	A-17
Internal current consumption	3-1

[L]

LED indicators	7-5
Line status	8-37
Line test	7-15, 13-29
Line test result	8-39
Line test 1 result	8-39
Line test acceptance status	8-28
Line test complete status	8-29
Line test request.....	8-27
Line test result	8-33
Line test station setting	8-32
Link refresh time.....	5-22
Link scan time.....	5-1

Link special relays (SB)	8-20, 8-27
Link special registers (SW).....	8-21, 8-32
Local module.....	A-16
Local station	A-16, 1-1
Local station automatic refresh parameter settings	6-17, 6-31, 6-46
Local station communication	1-4
Local station network parameter settings	6-14, 6-27, 6-42
Loading status.....	8-35
Loading/parameter consistency status	8-38
Loop test.....	13-29

[M]

Master module	A-16
Master station.....	A-16, 1-1
Master station automatic refresh parameter settings	6-12, 6-25, 6-39
Master station information	8-30
Master station network parameter settings	6-6, 6-19, 6-33
Master station return specification information	8-30
Master switching request acknowledgement.....	8-29
Master switching request complete	8-29
Master station transient transmission status	8-31
Master module	A-16
Max. communication station number	8-35
Max. link scan time	8-35
Maximum number of link points	3-1
Maximum overall cable distance	3-1, 3-3, 3-5
Maximum transmission distance	3-1
Message transmission function	App-2, App-41, App-49
Min. link scan time	8-35
Mode selection method	8-43
Mode setting status.....	8-34
Error history of the module	13-13
Module fixing screw	7- 3
Module operating status	8-35
Module status.....	8-28, 8-33
Monitoring time setting	8-32
Mountable base unit	2-4
Mountable modules	2-4
Multiple CPU system support	2-8, 4-83
Multiple temporary error invalid station	

specification..... 8-32

[N]

No. of automatic return stations..... 8-35
No. of retries information..... 8-35
Notes on the system configuration 2-9
Number of host occupied stations 8-30
Number of connected modules..... 8-35
Number of mountable modules 2-4
Number of I/O occupied points 3-1
Number of link points per station 3-1
Number of occupied station 3-1

[O]

Offline test status..... 8-29
Operation specification when
CPU is down status..... 8-30
Other station data link status 8-31, 8-36
Other station fuse blown status 8-31, 8-37
Other station monitoring..... 13-27
Other station switch change status..... 8-31, 8-37
Other station watchdog timer error
occurrence status 8-37
Other station watchdog timer error status 8-31

[P]

Parameter information..... 8-35
Parameter information read
acknowledgement status 8-29
Parameter information read completion
status 8-29
Parameter information read request..... 8-27
Parameter memory 6-1
Parameter receive status 8-30
Parameter setting checklist..... App-50
Parameter setting items 6-3
Parameter setting status 8-30
Parameter setting test result..... 8-33
Parameter setting with dedicated
instruction 1-6, 4-24
Parameter settings 6-1
Part names and settings 7-4
Performance specification..... 3-1
Precautions on programming..... 8-1
Procedure before starting the data link 7-1
Processing time for dedicated instructions... 5-15
Programming 8-1

[R]

Random access buffer..... 8-21
Refresh instruction acknowledgement
status at standby master switching 8-28
Refresh instruction at standby master
switching..... 8-27
Refresh instruction at standby master
switching result..... 8-33
Refresh instruction complete status at
standby master switching 8-28
Refresh instruction when changing parameters
by the dedicated instruction..... 8-27
Remote device station A-16, 1-1
Remote device station communication 1-3
Remote device station initialization
procedure registration function..... 1-11, 4-57
Remote device station initialization
procedure registration instruction 8-28
Remote device station initialization
procedure registration instruction result 8-34
Remote I/O net mode A-16
Remote I/O station A-16, 1-1
Remote I/O station communication 1-2
Remote I/O station points setting 1-14, 4-84
Remote input (RX) 8-11
Remote module..... A-16
Remote net mode A-16, 4-73
Remote net additional mode A-16, 2-2, 4-88
Remote net ver. 1 mode A-16, 2-1
Remote net ver. 2 mode A-16, 2-2, 4-87
Remote output (RY)..... 8-11
Remote register (RW_r) 8-15
Remote register (RW_w)..... 8-15
Remote station..... A-16
Reserved station function 4-74
Reserved station specified status 8-30, 8-36
RDMSG App-41
RIRCV App-14
RIRD..... App-4
RIFR App-24
RISEND..... App-19
RITO App-27
RIWT App-9
RLPASET App-30
RW_r A-17
RW_w..... A-17
RX..... A-17
RY..... A-17

[S]

SB	A-17
Scan mode setting information	8-30
Scan synchronous function.....	1-13, 4-76
Selecting a mode according to the system ..	1-11
Setting checklist	App-50
Setting status of block guarantee of cyclic data per station	8-30
Setting the status of input data from a data link faulty station	1-7, 4-30
Slave station cut-off function.....	1-6, 4-27
Slave station offset, size information	8-18
Slave station refresh/compulsory clear setting in case of programmable controller CPU STOP	1-14, 4-31
Special function module	A-17
Standby master function	1-7, 4-33
Standby master station	A-16
Standby master station information	8-30
Standby master station number.....	8-36
Station information setting checklist	App-51
Station number overlap checking function	1-13, 4-82
Station number overlap status	8-38
Station number setting	7-13
Station number setting switches.....	7-5
Station status at error occurrence.....	5-28
SW	A-17
Switch setting	7-13
Switch setting status	8-30, 8-35
System configuration.....	2-1
System down prevention.....	1-6

[T]

T-Branch connection	7-11
Temporary error invalid acceptance status ..	8-28
Temporary error invalid canceling acknowledgement status	8-28
Temporary error invalid canceling complete status	8-28
Temporary error invalid canceling request...	8-27
Temporary error invalid complete status	8-28
Temporary error invalid request.....	8-27
Temporary error invalid station setting function	1-13, 4-80
Temporary error invalid station setting information	8-30

Temporary error invalid station specification	8-32
Temporary error invalid station specification cancel result.....	8-33
Temporary error invalid station specification result	8-33
Temporary error invalid status.....	8-36
Terminal block.....	7-6
Terminal block screws	7- 3
Terminal block mounting screws	7- 3
Terminal resistor	A-18
The remote device station is not operating normally	13-7
The remote station/local station/intelligent device station/standby master station does not start up	13-7
Tightening torque range	7-3
Total number of stations	8-35
Transient transmission.....	A-16, 1-13, 4-94
Transient transmission status.....	8-31, 8-38
Transmission delay time	5-4
Transmission speed.....	3-1
Transmission speed/mode setting switch	7-6
Transmission speed and mode settings	7-14
Transmission speed setting.....	8-34
Transmission speed test.....	7-19, App-49
Transmission speed test accept status.....	8-31
Transmission speed test completion status..	8-31
Transmission speed test request	8-28
Transmission speed test result.....	8-41
Transmission speed test result for each station.....	8-41
Transmission speed test result for standby master station	8-31

[V]

Ver. 1 compatible slave station	A-17
Ver. 2 compatible slave station	A-17
Ver.2 compatible remote input	8-23
Ver.2 compatible remote output.....	8-23
Ver.2 compatible remote register (RW _r)	8-25
Ver.2 compatible remote register (RW _w).....	8-25

[W]

Weight	3-1
When a dedicated instruction is executed, the abnormal completion bit turns on	13-7
Wiring check.....	7-10

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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]

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 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.
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6. Product application

- (1) In using the Mitsubishi MELSEC programmable controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
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