MITSUBISHI

Changes for the Better

Mitsubishi Programmable
Logic Controller

Training Manual

CC-Link course(Q-series)

• SAFETY PRECAUTIONS •

(Always read these instructions before the exercise.)

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

[EXERCISE PRECAUTIONS]

⚠ DANGER

- Do not touch the terminals while the power is on to prevent electric shock.
- When opening the safety cover, turn off the power or conduct a sufficient check of safety before operation.

⚠ Caution

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

REVISIONS

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

Print date	* Textbook number	Revision
Jan., 2006	SH-080620ENG-A	First edition

CONTENTS

INTRODUCTION

This textbook is a school textbook that allows you to easily understand the CC-Link system using the MELSEC-Q series.
For a good understanding of the CC-Link system features, this textbook describes the basic system on which the remote I/O module or the remote device module is connected using the GX Developer as well as the applied system on which the RS-232C interface module or the inverter is connected.

The related manuals are shown below.

- QJ61BT11 Control & Communication Link System Master/Local Module
  User's Manual ..... SH(NA)-080016

- GX Developer Version 8
  Operating Manual .....SH(NA)-080373E

- AJ65BT-64DAV/DAI Digital-Analog Conversion Module
  User's Manual ..... SH(NA)-3615

- AJ65BT-64AD Analog-Digital Converter Module
  User's Manual ..... SH(NA)-3614

- RS-232C Interface Module type AJ65BT-R2
  User's Manual ..... IB(NA)-66781

- FR-E500-KN Instruction Manual..... IB(NA)-66864

Abbreviations and Terms

The following explains the abbreviations and terms used in this textbook.

Abbreviation and Term	Description
Intelligent function module	Generic term of Q series modules other than the CPU module, power supply module and I/O module that are mounted on the base unit.
Intelligent device station	• Station that can perform the cyclic transmission and transient transmission on the CC-Link system. The local station is classified in the intelligent device station. • The modules corresponding to the intelligent device are the local module installed stations such as AJ65BT-R2, QJ61BT11, etc.
Intelligent device module	Module that operates as an intelligent device station. (AJ65BT-R2, etc.)
Error invalid station setting	• Setting to prevent the slave stations which cannot join the data link due to the power OFF from being treated as data link faulty stations. (Refer to Section 1.1) • Set in the network parameters for the CC-Link.
Offline test	• Function to check if the module operates normally or not without connecting to the CC-Link. • Consists of the hardware test (operation check for each module by itself), line test (module connecting status check) and parameter verification test (set parameter contents check). Executable tests vary depending on the module.
Station	• Aggregate of a device (or module) that can be the transmission source or destination of data on the CC-Link system data link. And also devices that can be connected by CC-Link and on which station No. 1 to 64 can be set. (Refer to Section 1.2) • The following stations can be treated with the CC-Link system: Master station, Local station ,Remote I/O station, Remote device station and Intelligent device station
Number of stations	Total number of occupied stations for all the slave stations that configures one CC-Link system.
Station number (Station No.)	• Number assigned to each module for representing the modules connected to the CC-Link system. Station numbers can be set with the station number setting switch of a module. • For the station number assignment to each module, the following rules are set for the CC-Link system. 0 : Number for the master module that controls and manages data link. 1 to 64 : Numbers for the slave station modules (I/O module, AD/DA conversion module, inverter, etc.) • Station numbers are used for the following purpose: Data link management. Distinction between source and destination when transmitting information between modules. • Station numbers must be assigned not to duplicate numbers for other stations considering the occupied station numbers of each slave station.
Slave station (Slave station of data link)	• Station that is connected to the master module of the CC-Link system and of which data link is controlled by the master station. (Generic term of stations except for master station) • The following shows the slave station types: Local station, Remote I/O station, Remote device station, Intelligent device station. • Station numbers, for the CC-Link, assigned to the slave station module are 1 to 64.
Slave station cut-off	Function that disconnects the slave stations, which cannot join the data link due to the power off, etc., from the data link and continues the data link with normally operating modules only.
Cyclic transmission	• Data communication function that communicates information between the master module and the slave station automatically at intervals. • Cyclic transmission can send/receive bit data and word data. Bit data: Remote input (RX), Remote output (RY) Word data: Remote register (RWr (for input), RWw (for output)) • N:N communication can be performed between the master station and the local station, and the output information from any of the stations is sent to all the others. This communication function facilitates the decentralized control system configuration by each control device.

Abbreviation and Term	Description
Automatic return	Function that allows the modules that have been disconnected from the data link due to the power off to automatically reconnect to the data link when they return to the normal status.
Number of occupied stations	• For the CC-Link system, the number of I/O points of bit data per station is 32 points and the number of I/O points of word data per station is 4 points. • Each slave station must occupy the number of stations according to the information amount transmitted from/to other stations. This is called "Number of occupied stations". • The following shows the occupied station numbers of each slave station module connected to the CC-Link system: For the local modules, the users can decide the occupied station numbers (1 to 4 stations) that correspond to the number of points necessary for the information transmission with other stations. Remote I/O station occupies only one station. For the remote device station and the intelligent device station that have a special function, the occupied station numbers are set according to the information amount transmitted with other stations.
Standby master station	• Local station that enables the data link to continue working for the master station when the master station cannot continue the data link due to a malfunction. (Backup station for the master station. Refer to Section 1.1) • Possesses the same function as the master station and operates as a local station when the master station operates normally.
Number of devices	• Number of devices connected to the CC-Link physically. • Set the number of slave stations connected to one CC-Link system to the "All connect count" item of the network parameters for CC-Link.
Special function module	Generic term of A and QnA series modules that are mounted on the base unit, excluding the CPU module, power supply module and I/O module.
Transient transmission	• Data communication function that communicates information between the master module and the slave station (local station, intelligent device station) only when a send request is made. (1:1 communication) • Transient transmission can send/receive word data.
Bit data	• Bit unit information that expresses one data in 1 bit. • Data status is expressed in 0 and 1 (or OFF and ON).
Master station	• PLC CPU station on which the master module that manages the CC-Link system and controls the data link, is mounted. • One CC-Link system requires one master station. • For the mater station, network parameter settings are required for the CC-Link normally. (Refer to Chapter 3 and later for the setting details.) • Station number for the CC-Link set to the master module which is connected to the master station is 0. • Cyclic transmission to all the slave station (N:N communication with local station is also possible) and transient transmission to the local/intelligent device station can be performed.
Master/local module	• Module that can be used as master module and local module. (Set station number switches between master module and local module.) • The following shows the master/local modules: QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11
Master module	• Master/local module to be used by connecting to the master station of the CC-Link system. • The following shows the master/local modules that can be used as master module: QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11
Message	Data to be sent/received by transient transmission.
Reserved station	• Slave station that exists in the network parameters for CC-Link set to the master station but that is not connected to the current CC-Link system. (Refer to Section 1.1) (Slave station that will be connected to the CC-Link system in the future.) • Reserved station is set in the network parameters for CC-Link. • Setting the reserved station enables performing the data link without error occurrence. (The data link to the reserved station is not performed.) When the reserved station is not set, the corresponding station is treated as a data link faulty station.

Abbreviation and Term	Description
Remote I/O station	[Remote I/O station] • Station that can send/receive bit data by cyclic transmission. (Transient transmission is not available) • The modules corresponding to the remote I/O station are AJ65BTB-16D, AJ65SBTB1-16D, etc. • There exists only the remote I/O station that occupies 1 station at present.
Remote I/O net mode	[Remote I/O net mode] • Dedicated mode of the data link that can perform the high speed data transmission in the CC-Link system consisting of the master station and the remote I/O station. (Link scan time can be shortened.) • The data transmission using the transient transmission function of CC-Link is not available.
Remote station	• Generic term for the remote I/O station and the remote device station. • The data link is controlled by the master station.
Remote device station	• Station that has special functions such as the digital-analog conversion and that can send and receive bit and word data by cyclic transmission. (Transient transmission is not available.) • The modules corresponding to the remote device station are AJ65BT-64AD, AJ65BT-64DAV, AJ65BT-64DAI, etc. • The occupied station numbers of the remote device station varies depending on the module.
Remote net mode	• Data link mode of the CC-Link system that can correspond to the data link with all types of the slave stations shown below: Local station, Remote I/O station, Remote device station, Intelligent device station • Cyclic and transient transmissions are available.
Remote module	Generic term of the modules that can be used as remote I/O station or remote device station.
Local station	• PLC CPU station on which the local module of the CC-Link system is mounted. • Module itself is the same as the master module used for the master station. However, the station number setting (1 to 64) and parameter setting vary from those of the master module. (Refer to Chapter 5 for the setting details.) • N:N cyclic transmission and 1:1 transient transmission with the master station and other local stations are available. RX•RY•RWr•RWw of the remote station can also be monitored in the cyclic transmission. Transient transmission can be performed to the master station and other local stations.
Local module	• Master/local module to be used by connecting to the local station of the CC-Link system. • The following shows the master/local modules that can be used as local module: QJ61BT11, AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11
Word data	• Unit of information when data such as numeric values and characters (messages) are treated. • 1 word = 16 bits for MELSEC. • Data status is expressed as follows. (when 1 word = 16 bits) Binary number: 0000000000000000 to 1111111111111111 Decimal number: With sign -32768 to +32767, Without sign 0 to 65535 Hexadecimal: 0_H to $FFFF_H$
A0J2(H)CPU	[A0J2(H)CPU] Generic term of A0J2CPU, A0J2HCPU.
AnACPU	[ANACPU] Generic term of A2ACPU (-S1), A3ACPU. (PLC CPU with data link function is included.)
AnSCPU	[ANSCPU] Generic term of A1SCPU, A1SJCPU (-S3), A2SCPU.
AnSHCPU	[ANSHCPU] Generic term of A1SHCPU, A1SJHCPU, A2SHCPU.
AnUCPU	[ANUCPU] Generic term of A2UCPU (-S1), A3UCPU, A4UCPU.
AnUS(H)CPU	[ANUS(H)CPU] Generic term of A2USCPU (-S1), A2USHCPU-S1.

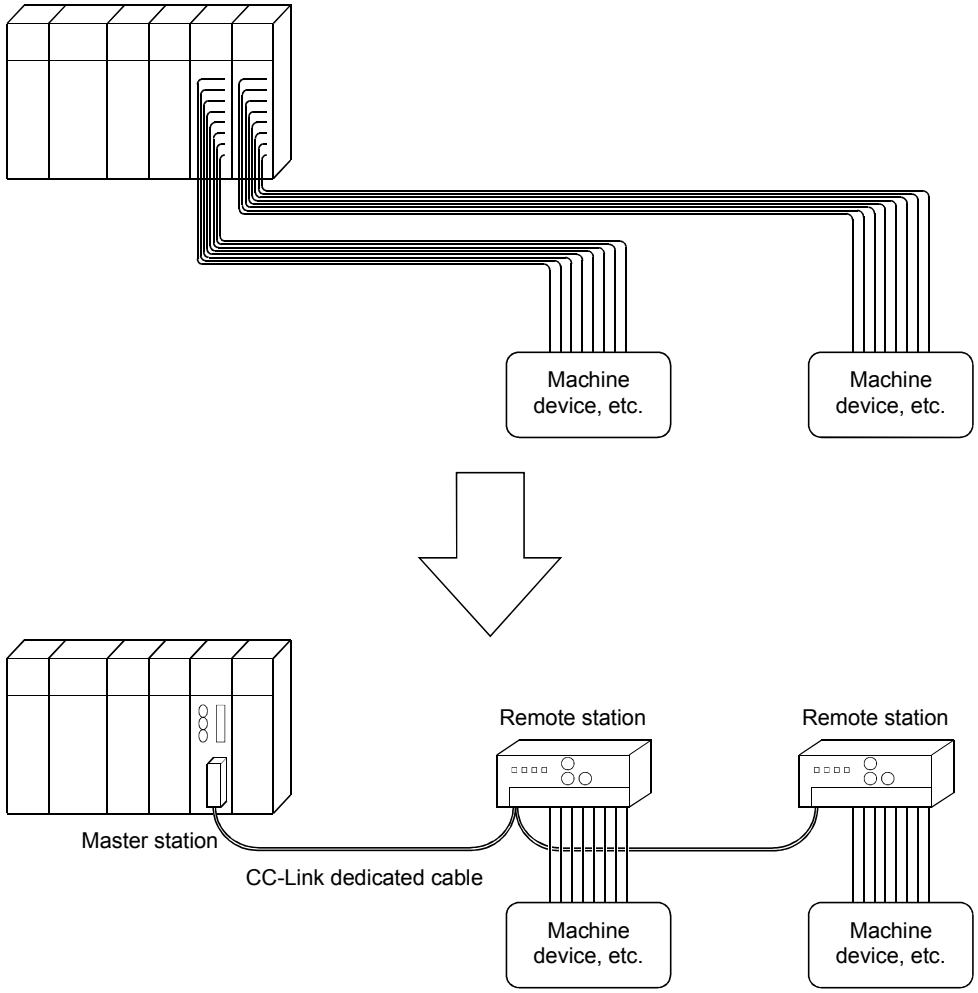
Abbreviation and Term	Description
ACPU	[ACPU] Generic term of the MELSEC-A series PLC CPUs corresponding to the CC-Link system.
QCPU (Q mode)	[QCPU (Q mode)] Generic term of the MELSEC-Q series PLC CPUs (Q mode) corresponding to the CC-Link system. (Q00JCPU, Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q06HCPU, Q12HCPU, Q25HCPU, etc.)
QCPU (A mode)	[QCPU (A mode)] Generic term of Q02CPU-A, Q02HCPU-A, Q06HCPU-A.
QnACPU	[QNACPU] Generic term of Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, Q2ASHCPU-S1, Q2ACPU, Q2ACPU-S1, Q3ACPU, Q4ACPU, Q4ARCPU.
RAS function	[RAS function] Function name that indicates the reliability, availability and serviceability of products. R : Reliability A : Availability S : Serviceability
RX	[RX] • Name of the remote input signal for bit data transmission to each station by cyclic transmission. The area to store this data is expressed as RX for convenience. • For the master station, input data is set as RX.
RY	[RY] • Name of the remote output signal for bit data transmission to each station by cyclic transmission. The area to store this data is expressed as RY for convenience. • For the master station, output data is set as RY.
RWr	[RWR] • Name of the remote register (for reading) that transmits word data to each station by cyclic transmission. The area to store this data is expressed as RWr. • For the master station, input data from the slave station is set as RWr.
RWw	[RWW] • Name of the remote register (for writing) that transmits word data to each station by cyclic transmission. The area to store this data is expressed as RWw. • For the master station, output data to the slave station is set as RWw.
SB	[SB] • Name of the link special relay to indicate the module and data link status of the master station and local station using bit data. The applicable area of the buffer memory to store this data is expressed as SB for convenience. • There are two types of data: one is dedicated to monitoring and the other to monitoring and control.
SW	[SW] • Name of the link special register to indicate the module status and data link status of the master station and local station using word data. The applicable area of the buffer memory to store this data is expressed as SW for convenience. • There are two types of data: one is dedicated to monitoring and the other to monitoring and control.

CHAPTER 1 OVERVIEW

CC-Link (Control & Communication Link) is a data link system which configures a distributed system with efficient wiring and at low cost.
The following describes the features and fundamental structure of CC-Link.

1.1 Features

(1) Efficient wiring and space-saving by distribution
By distributing each module to an equipment device such as a conveyer line and a machine device using the bus type network, the wiring efficiency of the entire system can be accomplished and the effective installation meets the demand for space-saving.



(2) Available for the intelligent device connection
In addition to the cyclic transmission of bit/word data, the transient transmission is also available. Therefore, the data communication can be made with a display, intelligent devices such as the RS-232C interface module, etc. and a personal computer.

(3) Compatible with the safe open field network
With the disclosure of network technology, a lot of domestic and foreign manufacturers are developing a wide array of CC-Link compatible products. Now the open field network in which you can choose the most suitable field device from a variety of options and use it with safety is accomplished.
For details, refer to the CC-Link products catalog or Mitsubishi Electric FA Network Service, MELFANSweb (http://www.nagoya.melco.co.jp).

(4) System establishment suitable to needs

(a) Transmission distance

Though the overall distance differs depending on the transmission speed, it can be connected within 100m (at 10Mbps) to 1.2km (at 156kbps).

(b) Number of connected stations

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

Maximum connectable number of each station is as follows: 64 for a remote I/O station, 42 for a remote device station, and 26 for a local station.

(5) Link points

The communication can be made with 2048 points for the remote input (RX), 2048 for the remote output (RY) and 512 for the remote register (RW) per system.

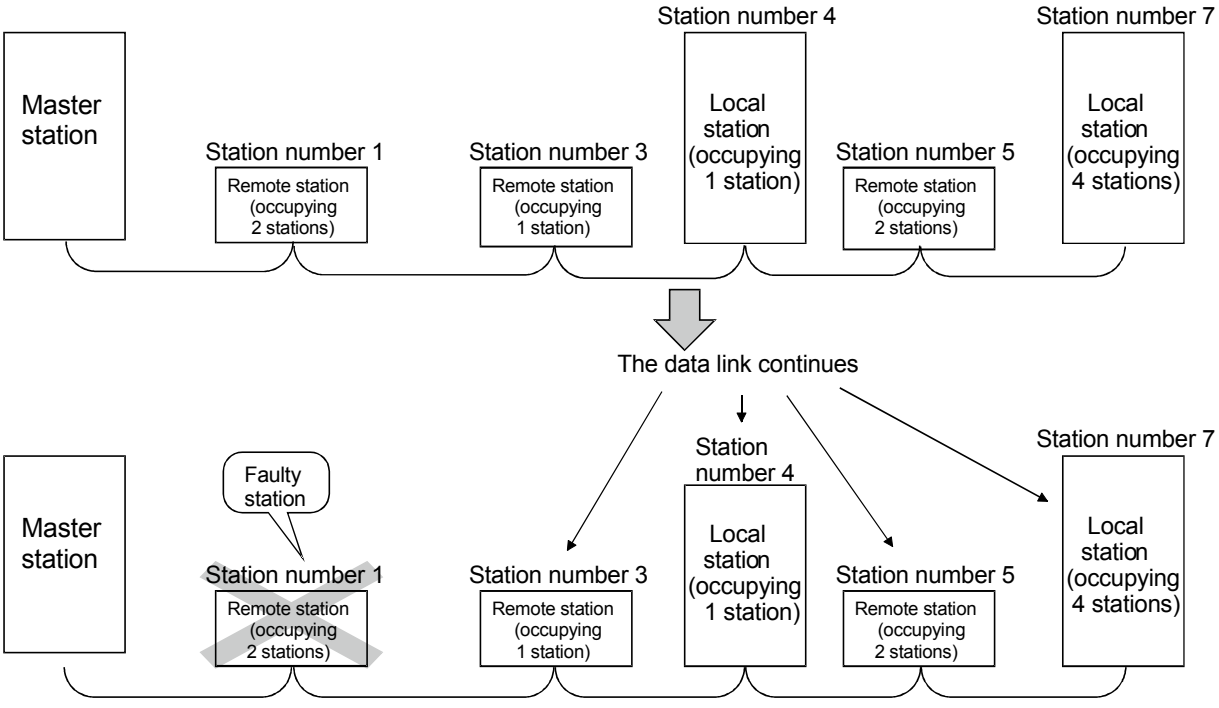
One occupied station of a remote station and a local station can handle 32 points for the remote input (RX), 32 for the remote output (RY), and 8 for the remote register (RW) (RWw: 4, RWr: 4).

(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 the 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 the data link. (Replace the module after turning off the module power)

However, if the cable is disconnected, the data link to all stations is disabled.



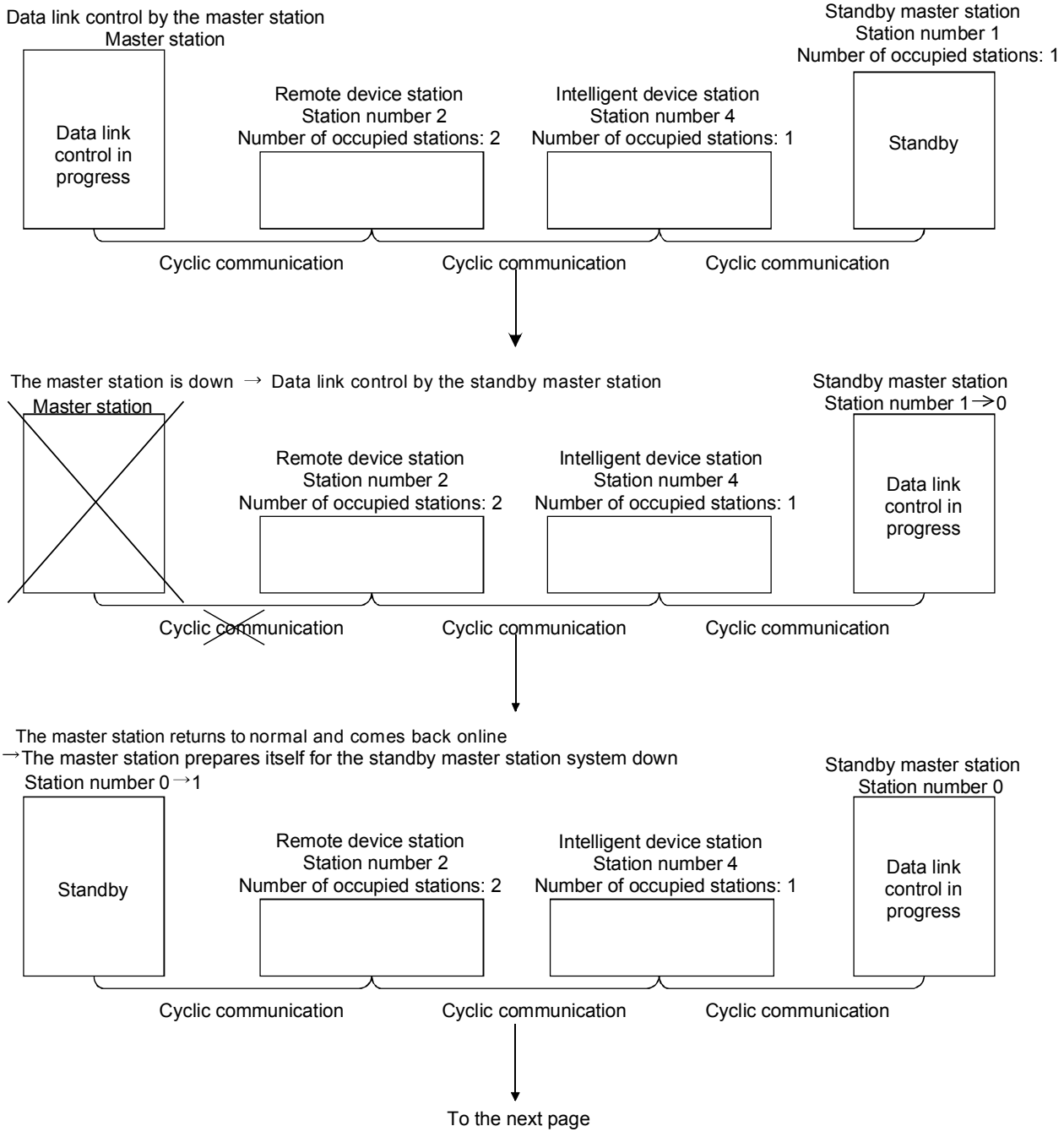
(7) Automatic return function

When a unit that has been cut off from the link due to the power off recovers the normal status, it will join the data link automatically.

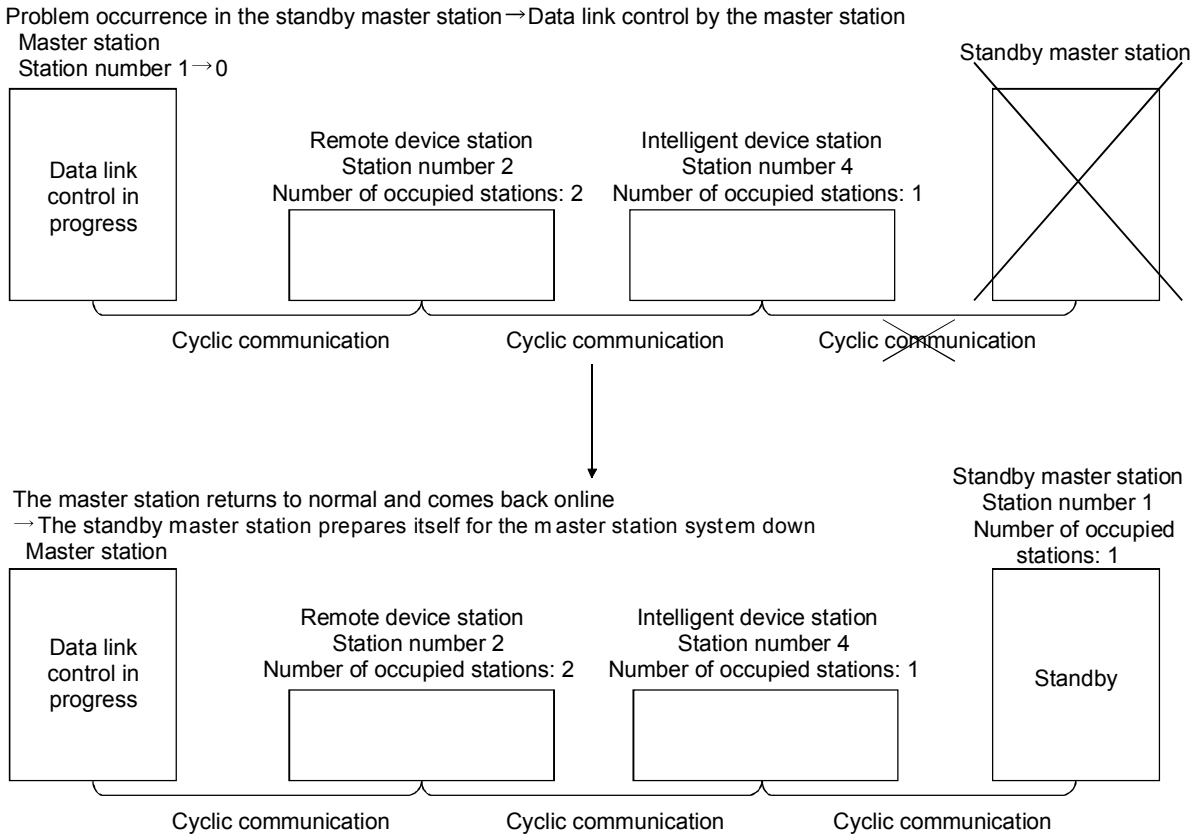
(8) Data link status setting when the master station PLC CPU has an error
The data-link status can be set to either "stop" or "continue" when an error causing the operation to stop such as "SP. UNIT ERROR" occurs in the PLC CPU at the master station.
With errors enabling the operation to continue such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

(9) Input data status setting 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.

(10) Standby master function
This function enables the data link to continue working by switching to a standby master station (a backup station for the master station) if a malfunction occurs in the master station due to a malfunction of the PLC CPU or power supply.
The master station can return to online even during the data link control by the standby master station, and prepares itself for the standby master station system down.



Continued from the previous page



(11) 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.

(12) 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 PLC CPU execute the interrupt program.

(13) Automatic CC-Link startup

By installing the QJ61BT11, 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.

(14) Selecting a mode according to the system

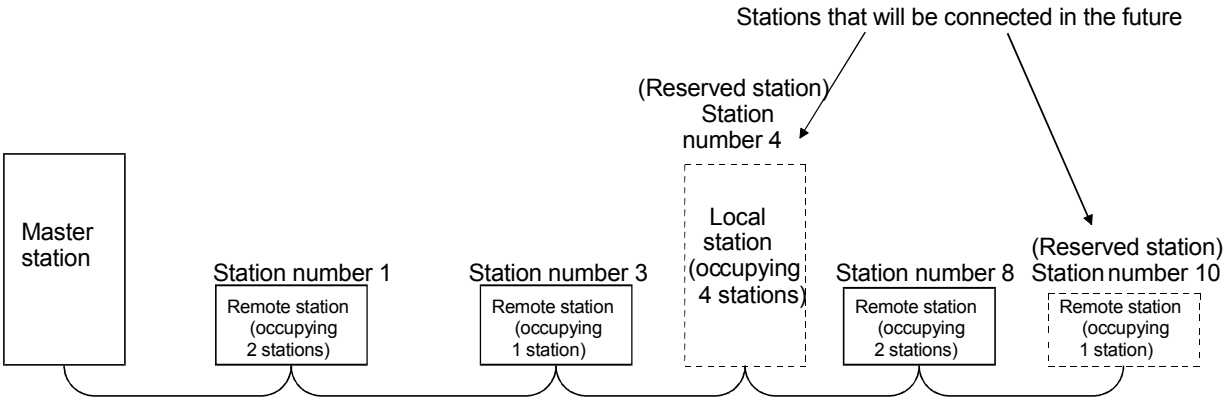
The CC-Link system has two types of modes: remote net mode and remote I/O net mode.

The differences between the two modes are listed in the table below.

	Remote net mode	Remote I/O net mode
Connectable station	Remote I/O station Remote device station Intelligent device station Local station Standby master station	Remote I/O station
Transmission rate	Max. 10 Mbps	Max. 10 Mbps
Link scan time	–	Faster than the remote net mode

(15) Reserved station function

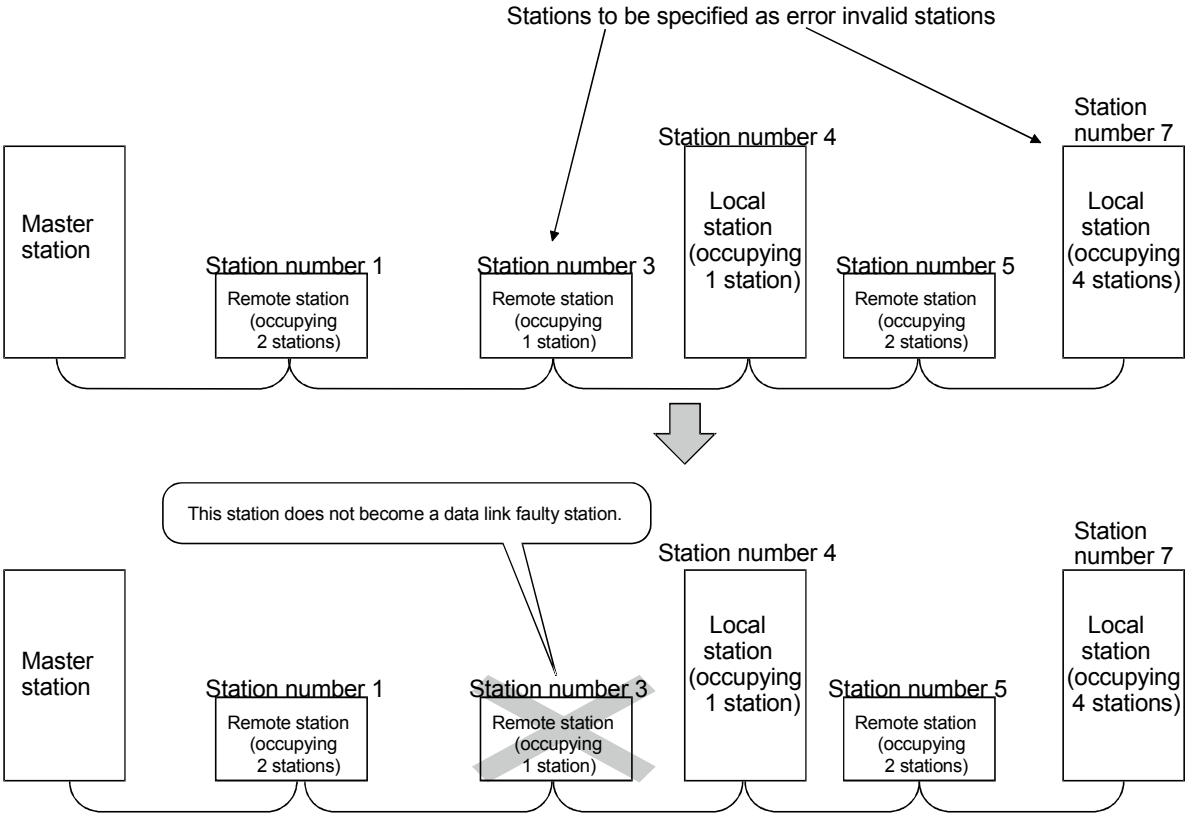
Stations that are not actually connected (stations to be connected in the future) will not be treated as faulty stations if they are specified as reserved stations.



(16) Error invalid station setting function

By setting the network parameters, the module that is powered off in the system configuration will not be treated as a "data link faulty station" by the master station and local stations.

However, caution is required since errors are no longer detected.



(17) Scan synchronous function

This function synchronizes the link scan to the sequence scan.

(18) 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 stations while in online.

The module can be replaced without detecting an error in online.

(19) Data link stop/restart

The data link can be stopped and restarted while it is being used.

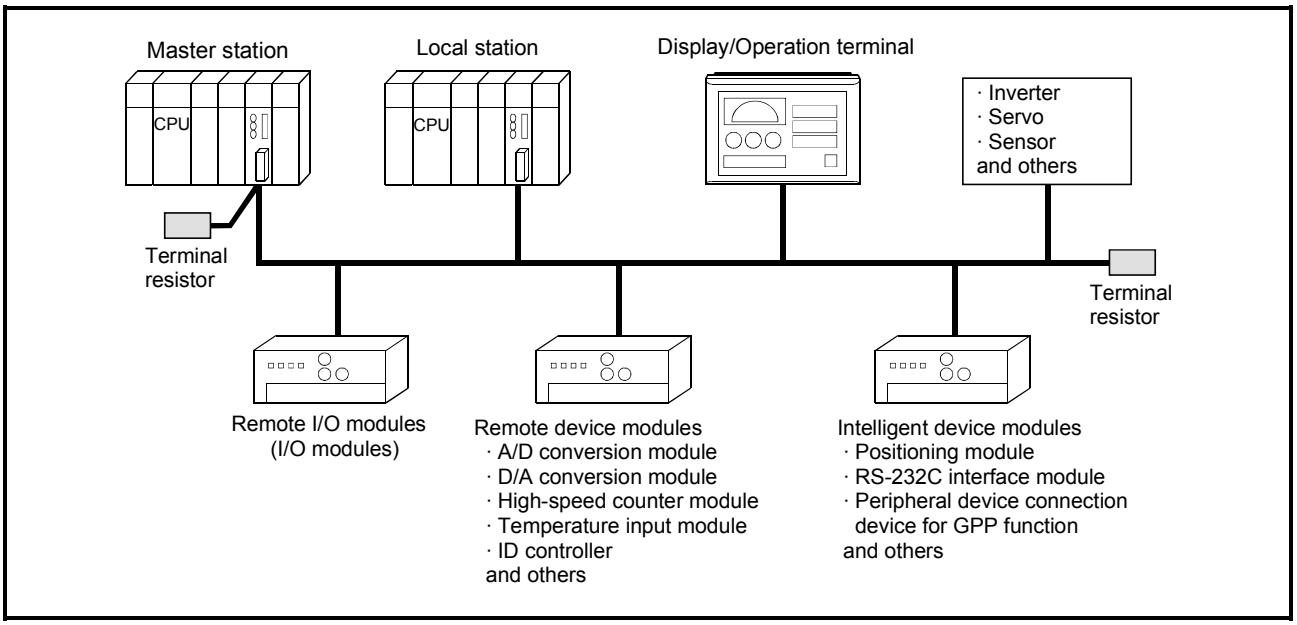
(20) Station number overlap checking function

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

1.2 Structure of CC-Link

The following describes the fundamental configuration and operation mechanism of the CC-Link system.

(1) Basic CC-Link system example



(2) Types of configuration devices

There are roughly four types of stations in the CC-Link system.

• Master station

The master station is a station where the master and local modules are mounted on the base unit and which administrates/controls the entire CC-Link system. Modules are different between Q series (QJ61BT11), QnA series (AJ61QBT11, A1SJ61QBT11) and A series (AJ61BT11, A1SJ61BT11).

• Local station

The local station is a station where the master and local modules are mounted on the base unit and which communicates with the master station or other local stations. Modules are shared with the master module. (Selection of master and local stations: depends on the network parameter setting)

• Remote station

The remote station corresponds to an I/O module or a special function module and actually performs the input and output.

And also other devices (inverter, display, sensor, etc.) Moreover, this station is divided into a remote I/O station (the equivalent of an I/O module) and a remote device station (the equivalent of a special function module; inverter, display, sensor, etc.)

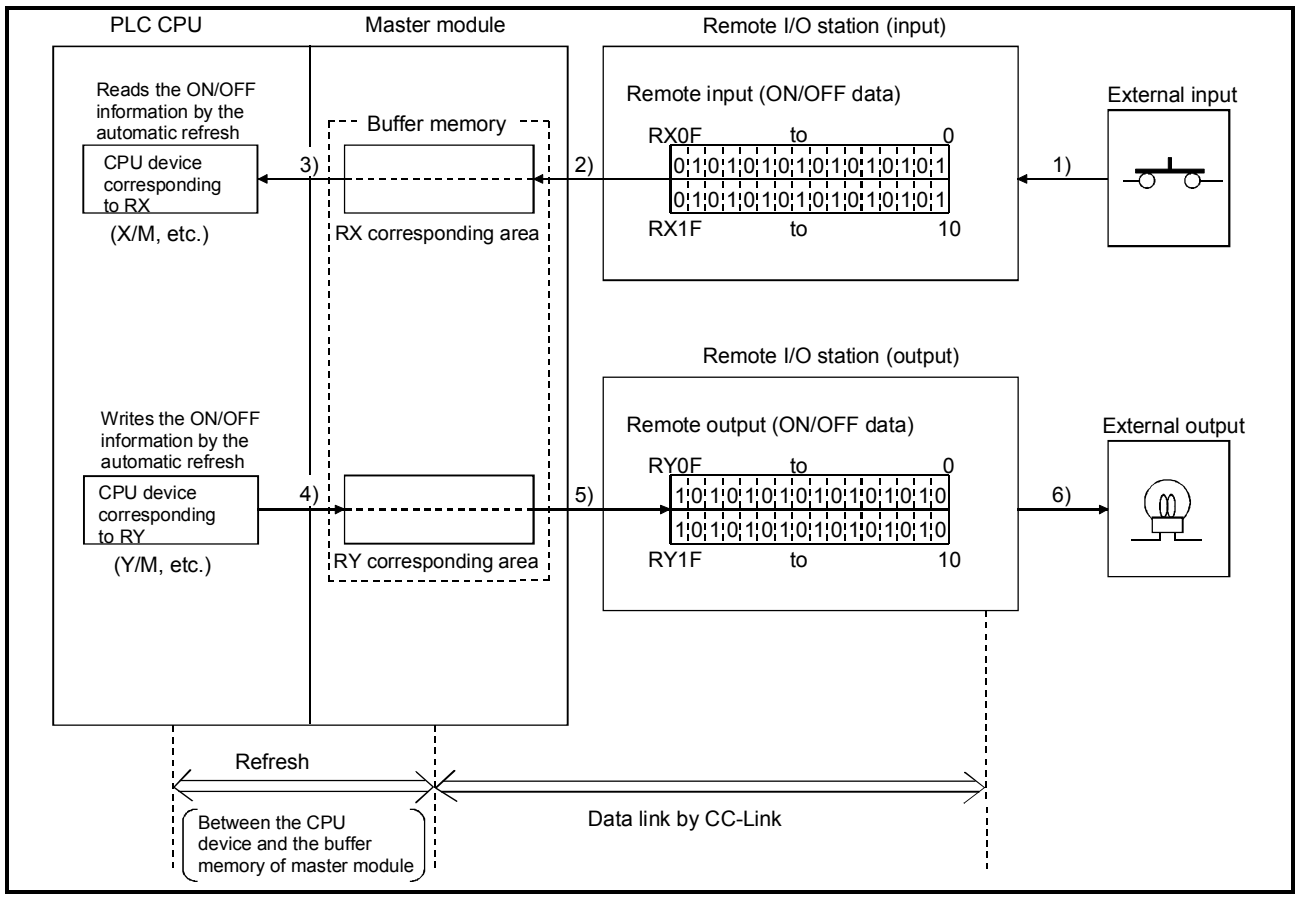
• Intelligent device station

The intelligent device station is a station (RS-232C interface module, positioning module, display, etc.) which can perform the data communication using the transient transmission.

For details, refer to the Master and Local Module User's Manuals, the User's Manual of each module, and the instructions of each device.

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

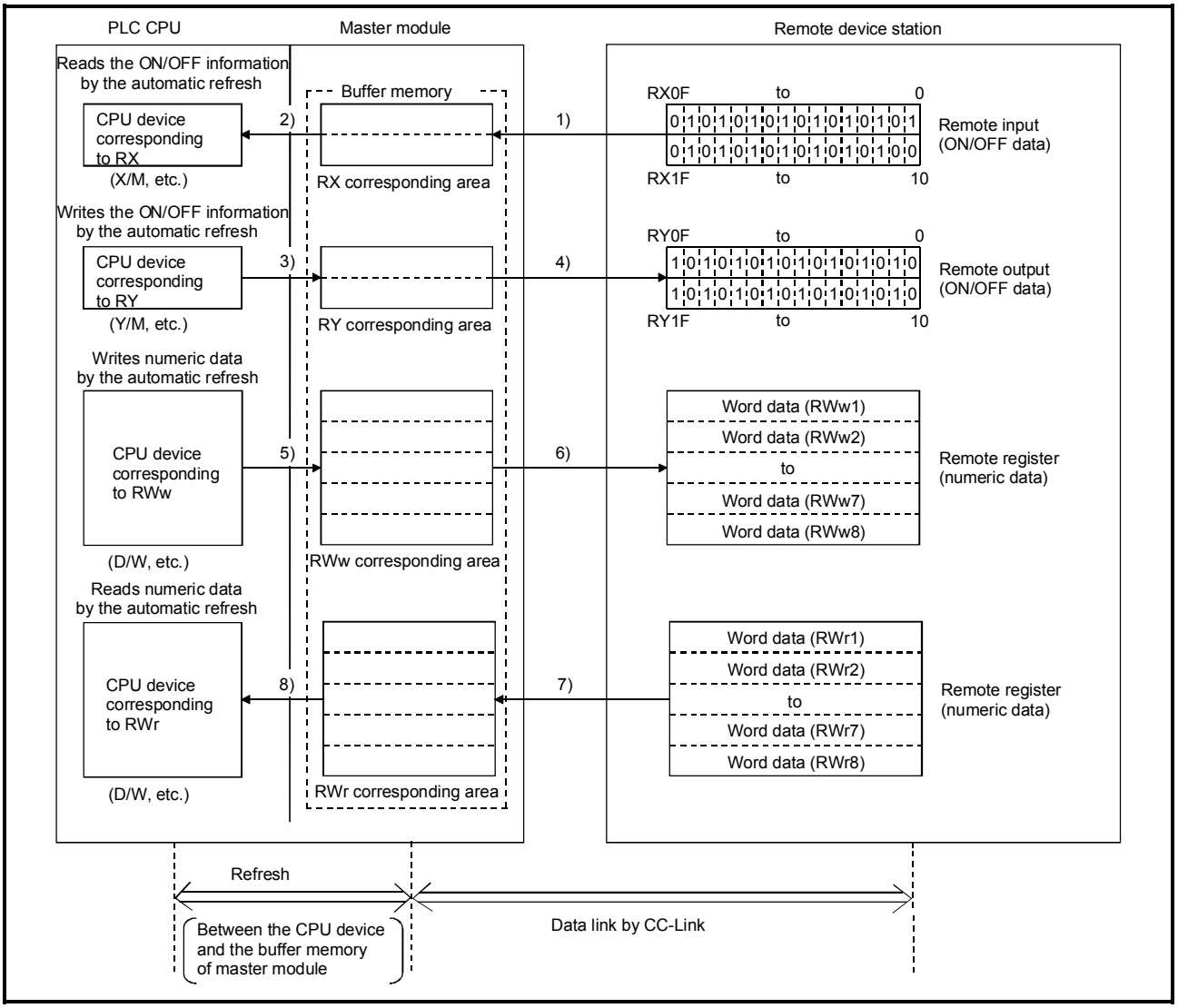
The communication is performed with the ON/OFF information (the remote input RX and the remote output RY) only.



1) A signal is input from an external device to the remote I/O station.
2) The remote input signal (ON/OFF) of the remote I/O station is stored in the buffer memory (the remote input signal area) of the master module by the data link.
3) The remote input signal information of the remote I/O station is read from the buffer memory (the remote input signal area) of the master module to the PLC CPU by the automatic refresh. (Used for a calculation as a device of the PLC CPU)
4) The calculation result is written in the buffer memory (the remote output signal area) of the master module by the automatic refresh.
5) The ON/OFF information stored in the buffer memory of the master module (the remote output signal area) is deployed to the remote output signal of the remote I/O station by the data link.
6) The signal is output to the external device from the remote I/O station.

POINT
"Data link by CC-link" shown in the bottom of the figure is operated by the master module according to the setting condition. “Refresh (between the CPU device and the buffer memory of master module)” is operated by the CPU according to the automatic refresh parameter. The device on the remote side can be used as a device on the CPU side. Note) The refresh method differs depending on the CPU type.

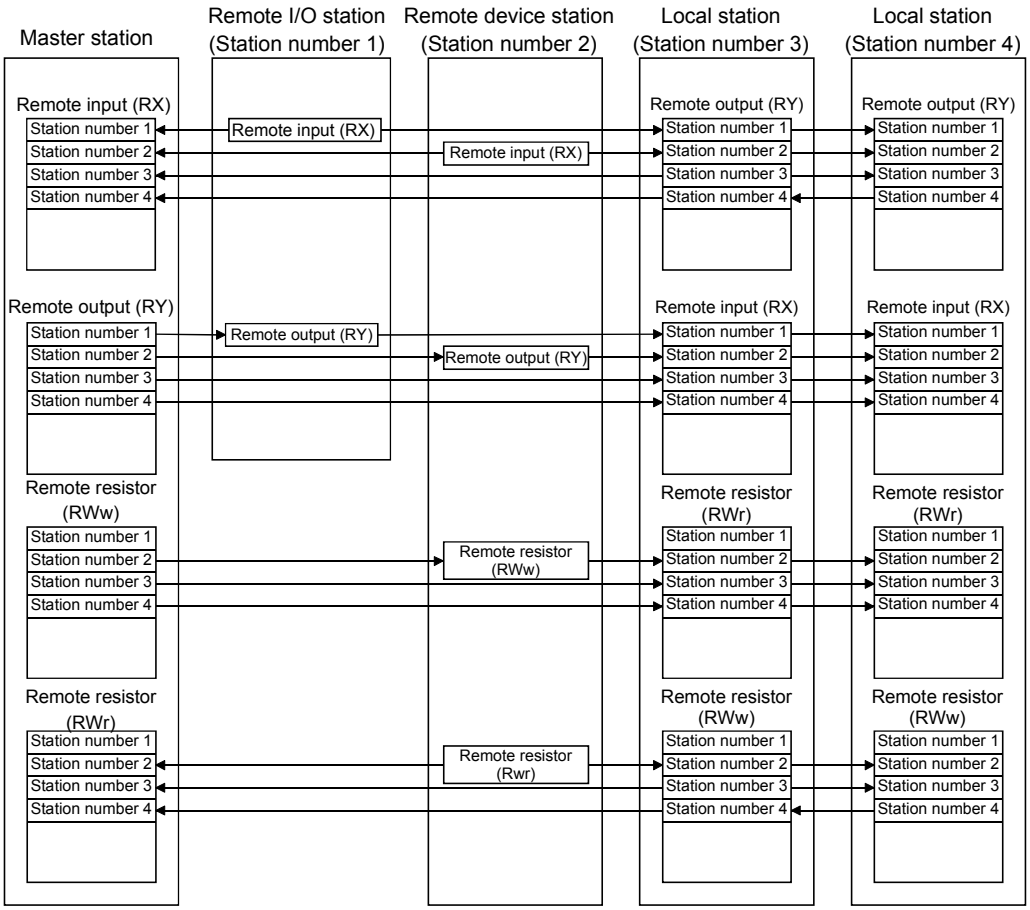
(4) Basic communication mechanism of the CC-Link system (Master station ↔ Remote device station)
The communication is performed with the ON/OFF information (the remote input RX and the remote output RY) and numeric data (the remote register).



1) The remote input signal (ON/OFF) of the remote device station is stored in the buffer memory (the remote input signal area) of the master module by the data link.
2) The remote input signal information of the remote device station is read from the buffer memory (the remote input signal area) of the master module to the PLC CPU by the automatic refresh. (Used for a calculation as a device of the PLC CPU)
3) The calculation result is written in the buffer memory (the remote output signal area) of the master module by the automatic refresh.
4) The ON/OFF information to be stored in the buffer memory of the master module (the remote output signal area) is deployed to the remote output signal of the remote device station by the data link.
5) The numeric data is written in the buffer memory (the remote register transmission area) of the master module by the automatic refresh.
6) The numeric data stored in the buffer memory (the remote register transmission area) of the master module is written to the remote register of the remote device station by the data link.
7) The remote register (the numeric data) of the remote device station is stored in the buffer memory (the remote register reception area) of the master module by the data link.
8) The numeric data of the remote device station is read from the buffer memory (the remote register reception area) of the master module by the automatic refresh.

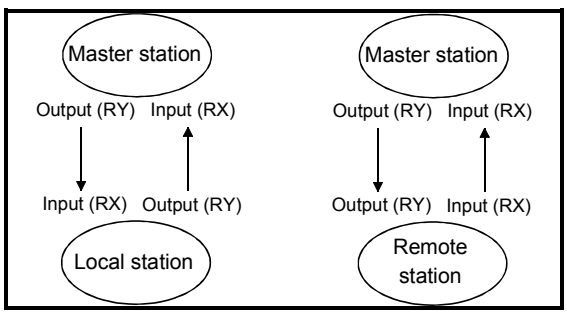
(5) Basic communication mechanism of the CC-Link system (Master station ↔ Local station)

The N:N data communication between the PLC CPUs can be performed according to the bit information (the remote input RX and the remote output RY) and the word information (the remote register).



The master station and the local station have an independent CPU individually so that the RY of the host station corresponds to the RX of the other station in the case of the master station vs the local station as shown below.

The case of the master station vs the remote station differs from the example below.



The case of the remote register RWw and RWr is also the same.

1.3 Comparison of QCUP (Q mode)/QnACPU/ACPU

The CC-Link system can be used on the QnACPU and ACPU/QCPU (A mode).
The following table shows the main differences on functions and controls when using the QCPU (Q mode), QnACPU and ACPU/QCPU (A mode).

Functions	QCPU (Q mode)	QnACPU	ACPU, QCPU (A mode)
Applicable master/local module	QJ61BT11	AJ61QBT11,A1SJ61QBT11	AJ61BT11,A1SJ61BT11
Network parameter (master parameter) settings	• GX Developer *1 • Sequence program (Dedicated instruction)	• GX Developer *1 • Sequence program (FROM/TO instruction)	• GX Configurator-CC • Sequence program (FROM/TO instruction, dedicated instruction)
Device refresh	• Automatic refresh parameter	• Sequence program (FROM/TO instruction) • Automatic refresh parameter*2	• Sequence program (FROM/TO instruction, dedicated instruction)
Data link startup method	• Automatic CC-Link startup *3 (By default settings) • Automatic CC-Link startup (Network parameter settings)	• Sequence program (Master station Y6/Y8: ON) • Automatic CC-Link startup (Network parameter settings)	• Sequence program (Master station Y6/Y8: ON) • Dedicated instruction startup (Network parameter settings)
Registration for the initialization procedure of the remote device station	• GX Developer *4 • Sequence program	• Sequence program	• Sequence program
Access to other stations via CC-Link	Available	Not available	Not available
Standby master function	Master station automatic return Available	Master station automatic return Not available	Master station automatic return Not available
Module reset by the sequence program	Not provided	Provided	Provided
Event issuance for the interrupt program	Available	Not available	Not available
Parameter verification test	Not provided	Provided	Provided
E^2PROM	Not provided (Not required for being sent at the power on or reset)	Provided	Provided

*1: Registered as the network parameter of the PLC CPU.
*2: Included in the network parameter of the PLC CPU.
*3: The automatic CC-Link startup is available for one master module in the default status without network parameter settings.
*4: Registered in the network parameter (the registration for the initialization procedure of the remote device station) of the PLC CPU.

(1) Network parameter settings
For the QCPU (Q mode) and QnACPU, parameters to be set in the master station, local station or standby master station by peripheral devices can be set as network parameters.
As the network parameters are automatically transmitted at the power on or reset of the PLC CPU, the parameter setting program for the master station can be omitted.
*: For the ACPU and QCPU (A mode), the sequence program (the FROM/TO instruction or dedicated instruction) for parameter settings is required.

(2) Device refresh

The QCPU (Q mode) and QnACPU can set the devices on the PLC CPU side corresponding to the devices on the remote side (RX, RY, RWr, RWw, SB and SW) using the automatic refresh parameters.

The sequence program for reading/writing from/to the master station can be omitted by the automatic refresh (update) between the designated devices.

*: For the ACPU and QCPU (A mode), it is necessary to set the refresh using the sequence program (the FROM/TO instruction or dedicated instruction).

(3) Data link startup method

For the QCPU (Q mode) and QnACPU, the sequence program for the data link startup request can be omitted since the master station automatically starts the data link by setting the network parameters for the PLC CPU.

*: For the ACPU, the master station requires the sequence program (Yn6/Yn8 ON or the dedicated instruction for network parameter settings) for the data link startup request.

(4) Initial setting of the remote device station

For the QCPU (Q mode), the initial setting of the remote device station can be registered in the network parameters.

By registering the initial setting of the remote device station, the sequence program can be omitted.

*: The ACPU and QnACPU require the initial setting of the remote device station by the sequence program.

(5) Access to other stations via CC-Link

For the QCPU (Q mode), the access to other stations can be made from the peripheral device (GX Developer) connected to the PLC CPU via the CC-Link system.

*: The access to other stations via the CC-Link system cannot be made from the ACPU and QnACPU. (Partially available if the CC-Link interface board is mounted on the peripheral device side)

(6) Automatic return function of the standby master station

The Q series (QJ61BT11) can automatically return to the system if the master station becomes normal during the data link by the standby master station.

*: The A series (AJ61BT11/A1SJ61BT11) and QnA series (AJ61QBT11/A1SJ61QBT11) cannot automatically return to the data link even if the master station becomes normal during the data link.

(7) Event issuance for the interrupt program

Because the conditions for issuing the events (the interrupt program execution signals) can be set using the network parameters, the number of the program steps is reduced, thus shortening the scan time. The conditions for issuing the events are the ON/OFF status of the designated devices (RX, RY, RWr, SB, and SW), the data match/mismatch status, etc.

*: For the A series and QnA series, it is necessary to use the sequence program for turning ON/OFF the devices and judging the condition of the data match/mismatch.

CHAPTER 2 SPECIFICATIONS AND OPERATIONAL SETTINGS

This chapter explains the CC-Link specifications and operational settings supporting the MELSEC-Q series.
For details, refer to the CC-Link System Master/Local Module User's Manual QJ61BT11.

2.1 Specifications

2.1.1 Performance specifications

Table 2.1 Performance specifications

Item	QJ61BT11
Transmission rate	156kbps/625kbps/2.5Mbps/5Mbps/10Mbps can be selected.
Maximum overall cable distance (Maximum transmission distance)	Depending on the transmission rate.*1
Maximum number of connected stations (for a master station)	64 However, the following conditions must be met: {(1×a)+(2×b)+(3×c)+(4×d)} ≤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 {(16×A)+(54×B)+(88×C)} ≤2304 A: Number of remote I/O stations ≤64stations B: Number of remote device stations ≤42stations C: Number of local stations, standby master station and intelligent device stations ≤26stations
Number of occupied stations (for the local station)	1 to 4 stations*2 (The number of stations can be switched using the GX Developer parameter setting.)
Maximum link points per system	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 Link points per station	Remote I/O (RX, RY): 32 points (local station: 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 → mater station)
Communication method	Polling method
Synchronous method	Flag synchronous method
Encoding method	NRZI method
Transmission path	Bus (RS-485)
Transmission format	Conforming to HDLC
Error control system	CRC($X^{16}+X^{12}+X^5+1$)
Connection cable	CC-Link cable/ high performance CC-Link cable/ CC-Link cable for Ver.1.10 *1
RAS functions	• Automatic return function • Slave station cut-off function • Error detection by the link special relay/register
I/O occupied points	32 points (I/O assignment: Intelligent 32 points)
Internal current consumption (5VDC)	0.46A
Weight	0.12kg

*1: For cables, refer to Appendix 2.
*2: For the function version A, only 1 or 4 stations can be set.

(1) Number of occupied stations and station numbers, and number of modules and number of stations

This section explains the relationship between the number of occupied stations and the station numbers, and between the number of modules and the number of stations.

(a) Number of occupied stations

For the remote I/O station, remote device station and local station, the number of occupied stations are specified for each module.

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

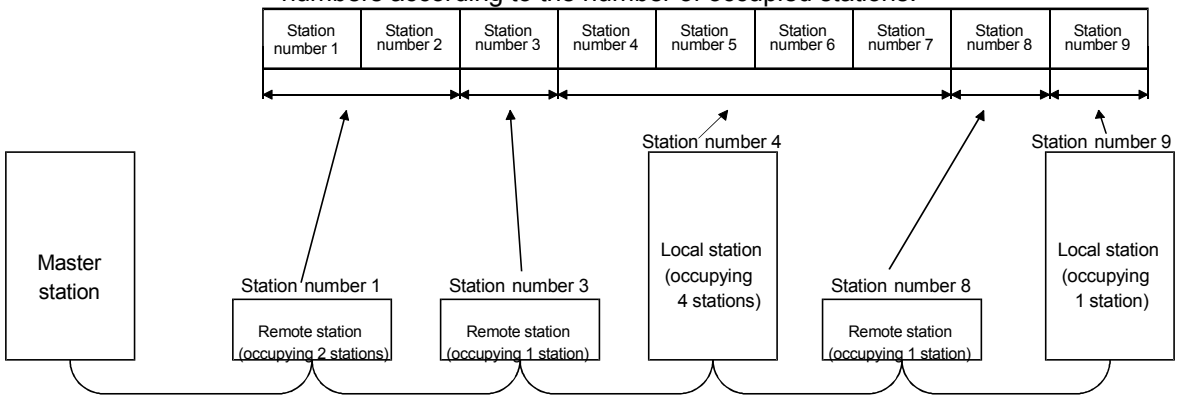
Module		Number of occupied stations
Remote I/O station (8, 16, 32-point module)		1 station
Remote device station	AJ65BT-64AD	2 stations
	AJ65BT-64DAV	2 stations
	AJ65BT-64DAI	2 stations
	AJ65BT-D62 AJ65BT-D62D(S1)	4 stations
	AJ65BT-68TD	4 stations
	AJ65BT-64RD3 AJ65BT-64RD4	4 stations
	AJ65BT-D32ID2	4 stations
	A852GOT	2 or 4 stations
Local station	QJ61BT11	1 to 4 stations* (Switched with parameter settings)
	A8GT-J61BT15	1 or 4 stations
Intelligent device station	AJ65BT-R2	1 station
	AJ65BT-G4	1 station
	AJ65BT-D75P2-S3	4 stations
	A8GT-J61BT13	1 or 4 stations

*: For the function version A, 1 or 4 stations can only be set.

(b) Station number

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

However, when two or more occupied stations are connected, set the station numbers according to the number of occupied stations.



(c) Number of modules and number of stations

Number of modules means the physically counted number of modules.

Number of stations means the number of occupied stations that each module has as described in (a).

In the system configuration example (b), the number of modules is five and the number of stations is nine.

(2) Applicable system

The CPU modules applicable to the QJ61BT11 and notes on the system configuration are described below.

(a) Applicable modules and the number of modules that can be mounted
The CPU modules and network modules (for the remote I/O station) to which the QJ61BT11 can be installed and the number of modules that can be installed are listed in the table below.

1) When setting the parameter using GX Developer

Applicable module		Number of CPUs that can be mounted	Remark
CPU module	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Maximum 4	• High performance model QCPU • It can be mounted only in the Q mode. (*1)
	Q00JCPU Q00CPU Q01CPU	Maximum 2 (*2)	• Basic model QCPU (*1)
Network module	QJ72LP25-25 QJ72BR15	Maximum 4	-

2) When setting the parameter with the RLPASET instructions (the dedicated instructions).

Applicable module		Number of CPUs that can be mounted (*3)	Remark
CPU module	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Maximum 64	• High performance model QCPU • It can be mounted only in the Q mode. (*1)
	Q00JCPU Q00CPU Q01CPU	Maximum 2 (*2)	• Basic model QCPU (*1)

*1 Refer to the User's Manuals (Function Explanation, Program Fundamentals) of the CPU module to be used.
*2 When using the Q00J/Q00/Q01CPUs, use the QJ61BT11, function version B or later.
*3 When using the QJ61BT11 as a local station, set the parameter using GX Developer.
At that time, the maximum number of CPUs mounted is 4.

(b) Restrictions when the Q00J/Q00/Q01CPUs are used for the QJ61BT11

1) Use the QJ61BT11, function version B or later when using the Q00J/Q00/Q01 CPUs.
The QJ61BT11 of the function version A cannot be used.
2) Events for the interrupt programs cannot be generated.
3) The default parameters are set differently at the automatic CC-Link start-up.
For details, refer to Appendix 11.

(c) Mountable base unit

The QJ61BT11 can be mounted on any of the base unit's I/O slots (*4).
However, depending on the combinations with other mounted modules and the number of mountings, there may be cases where the power capacity is insufficient. Be sure to consider the power capacity when mounting a module.

*4 Must be within the I/O point number range of the CPU module and network module (for the remote I/O station).

(d) Applicable software package

The software package available for the QJ61BT11 is listed below:

Product name	Model name	Remark
GX Developer	SWnD5C-GPPW (*5)	Required. MELSEC PLC Programming software. "n" in the model name is 4 or greater.

*5 When the function after the function version B is used and the QJ61BT11 is installed to the remote I/O station, "n" is 6 or greater.
When the QJ61BT11 is installed to the Q00J/Q00/Q01CPUs, "n" should be 7 or greater.

2.1.2 Added/changed functions in function version B of master/local module

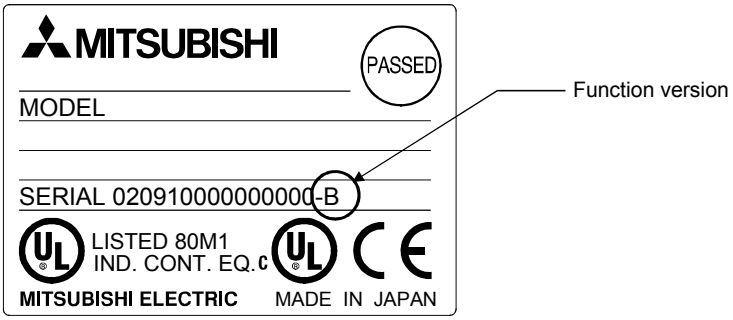
The functions supported by the master/local module for the Q series (QJ61BT11) are different between the function version A and B.(*1)
The following table lists the functions that have been added to or changed in the QJ61BT11 of the function version B.

Table 2.3 Added/changed function list in the function version B

Function	Function summary	Function version and serial No.	Reference section
Support for the multiple CPU system of the QCPU	Allows monitoring of and reading/writing programs from/to any CPU in a multiple CPU system mounted with the QJ61BT11 via the AJ65BT-G4-S3 or other station CPUs.	Function version B	—
Setting for a local station occupying 2 or 3 stations	Allows setting a local station to any number of occupied stations from 1 to 4. (The QJ61BT11 of the function version B is required not only for local stations, but also for the master station.)	Function version B	—
Data link synchronized with the master station sequence scan	Allows the data link in the remote I/O net mode to synchronize the master station sequence scan and the CC-Link link scan. (referred to as a scan synchronous function.)	Function version B	—
CC-Link parameter setting by the RLPASET instruction	Allows setting the network parameters and starting the data link by using the RLPASET instruction (the dedicated instruction). It is possible to mount five or more QJ61BT11 modules and change the parameters while the PLC CPU is running.	Function version B, product that first 5 digits of the serial No. are 03042 or later.	Appendix 4.7
Automatic startup of the CC-Link system including remote device stations and intelligent device stations	Allows the CC-Link startup and the remote input/output as well as refreshing of remote registers, etc. without setting the parameters in a system configuration that includes not only remote I/O stations, but also remote device stations and intelligent device stations.	Function version B	Appendix 11

*1 How to check the function version

1) Checking the "SERIAL field of the rating plate" on the side of the module



2) Checking with GX Developer
The function version can be checked with the system monitor function.

POINT
For details on added/changed functions, refer to the QJ61BT11 Control & Communication Link System Master/Local Module User's Manual.

2.1.3 I/O signal for the master/local module

The section explains the input/output signals for the PLC CPU of the master/local module (QJ61BT11).

I/O signals list

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 2.4 Input/output signal list for QJ71BT11

Signal direction: PLC CPU ← Master/local module				Signal direction: PLC 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			

○: Available

IMPORTANT

The use-prohibited output signals shown in Table 2.4 are accessed by the system and cannot be accessed by the user. In the event that these signals are used (turned on/off) by the user, normal operations cannot be guaranteed.

2.1.4 Master/local module buffer memory

The buffer memory transfers data between the master/local module (QJ61BT11) and the PLC CPU.
The reading and writing of data from/to the PLC CPU are performed by the automatic refresh or the CC-Link dedicated instructions.
The contents of the buffer memory return to the default values when the power is turned OFF or the PLC CPU is reset.
For details, refer to Appendix 10 and the QJ61BT11 Control & Communication Link System Master/Local Module User's Manual.

Buffer memory list

Table 2.5 Buffer memory list (1/2)

Address		Item	Description	Read/write possibility	Availability	
Hexadecimal	Decimal				Master station	Local station
0_H to DF_H	0 to 223	Use prohibited*	—	—	—	—
$E0_H$ to $15F_H$	224 to 351	Remote input (RX)	For the master station: Stores the input status from the remote/local/intelligent device/standby master stations.	Read only	○	—
			For the local station: Stores the input status from the master station.		—	○
160_H to $1DF_H$	352 to 479	Remote output (RY)	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) 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	○	—
			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

* Do not write to any area where use is prohibited. This may cause errors.

Table 2.5 Buffer memory list (2/2)

Address		Item	Description	Read/write possibility	Availability	
Hexadecimal	Decimal				Master station	Local station
$2E0_H$ to $3DF_H$	736 to 991	Remote resister (RWw) 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.		—	○
$3E0_H$ to $5DF_H$	992 to 1503	Use prohibited*	—	—	—	—
$5E0_H$ 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)	○	○
600_H to $7FF_H$	1536 to 2047	Link special register (SW)	Stores the data link status.			
800_H to $9FF_H$	2048 to 2559	Use prohibited*	—	—	—	—
$A00_H$ to FFF_H	2560 to 4095	Random access buffer	The specified data is stored and used by a transient transmission.	Read/write enabled	○	○
1000_H to $1FFF_H$	4096 to 8191	Communication buffer	Stores the send and receive data and the control data when performing a transient transmission (a communication using the communication buffer) with the local station, standby master station, and intelligent device station.	Read/write enabled	○	○
2000_H to $2FFF_H$	8192 to 12287	Automatic update buffer	Stores the automatic update data when performing a transient transmission (a communication using the automatic update buffer) with the AJ65BT-R2.	Read/write enabled	○	○
3000_H to $4FFF_H$	12288 to 20479	Use prohibited*	—	—	—	—

○: Available, —: Not available

* Do not write to any area where use is prohibited. This may cause errors.

2.1.5 Network parameter for data link

Table 2.6 lists the network parameters required for the CC-Link data link.
The network parameters are set in the PLC CPU using GX Developer and transmitted from the CPU to the master module at the power on or reset of the PLC CPU.

Table 2.6 Parameter setting items (1/2)

Setting item	Description
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 the system operation by a single link scan. Default value : 1 (module) Setting range : 1 to 10 (modules)
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)
Operation specification when CPU is down	Specifies the data link status setting when a master station PLC CPU error occurs. Default value : Stop Setting range : Stop : Continue
Scan mode specification	Specifies either the synchronous or asynchronous mode for the sequence scan. Default value : Asynchronous Setting range : Asynchronous : Synchronous
Delay time setting	Sets the link scan interval. (Unit : 50μs) Default value : 0 (Not specified) Setting range : 0 to 100 (0 : Not specified)
Reserved station specification	Specifies the reserved station. Default value : Not specified Setting range : Not specified : Specified
Error invalid station specification	Specifies the error invalid station. Default value : Not specified Setting range : Not specified : Specified
Station information	Sets the type of the connected remote station, local station, intelligent device station and standby master station. Default value :Remote I/O station, occupies 1 station, station number 1 to remote I/O station, occupies 1 station, station number 64 Setting range Station type : Remote I/O station, remote device station, intelligent device station Number of occupied stations : occupies 1 to 4 stations Station number :1 to 64

Table 2.6 Parameter setting items (2/2)

Setting item	Description
Assignments of the communication buffer and automatic update buffer	Specifies the assignments of buffer memory sizes during a transient transmission to the local station, standby master station and 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.

REMARK

The station number at the station information is set by HEX (hexadecimal). Be careful of it.
(The station number setting switch is set with 2 digits decimal.)

POINT

(1) Assignments of the communication buffer and automatic update buffer
- 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) Parameter settings required to perform data link

The parameter settings that are required to perform data link with CC-Link are shown below.
- Parameter settings with GX Developer (Refer to the Assignments of Section 2.2.2 and after Chapter 3)
- Parameter settings by the RLPASET instruction (the dedicated instruction) (Refer to Appendix 4.7)

For the procedure from parameter settings to the data link startup by the RLPASET instruction, refer to the QJ61BT11 Control & Communication Link System Master/Local Module User's Manual.

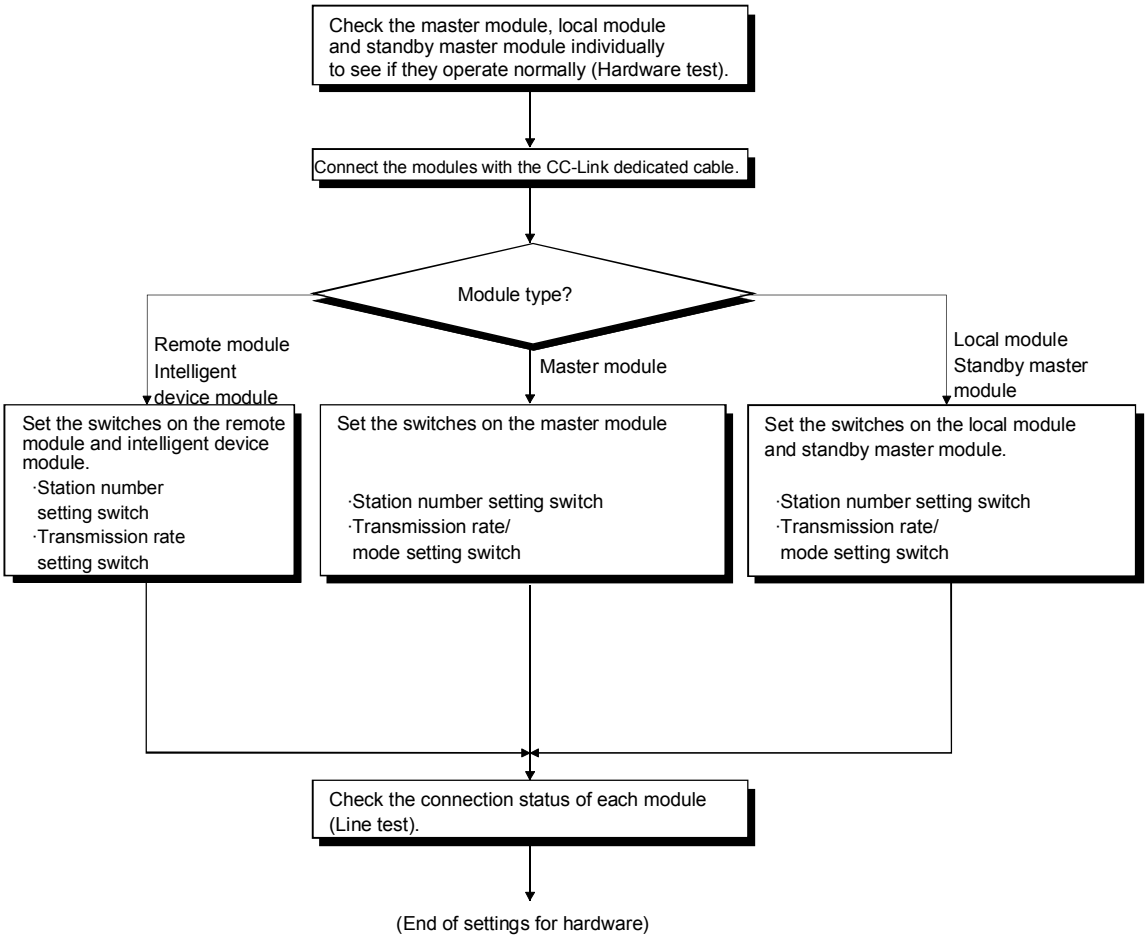
2.2 Operational Settings

2.2.1 Required settings

Basically, settings for hardware (setting switches, cables, etc.) and settings for software (parameters, programs) are required.

(1) Settings for hardware

The settings are performed by the procedure shown below. The details are omitted since they are explained in the exercises after Chapter 3 in this textbook.



(2) Settings for software

The most basic settings required for using the CC-Link system are the following two.

- Network parameters..... Sets the number of connected modules, retries, automatic return modules, etc. in the master station module for the CC-Link system. (Refer to Section 2.1.5)
- Automatic refresh parameters ... Updates the data between the CC-Link side devices (RX/RY, etc.) and the PLC CPU devices (X/Y/M/D, etc.). For the Q series, the settings are made on the same screen as that of the network parameters for the PLC CPU with GX Developer. (Refer to Section 7.1)

For the CC-Link connection inverter and the AC servo motor, specific parameter settings for each equipment are required.

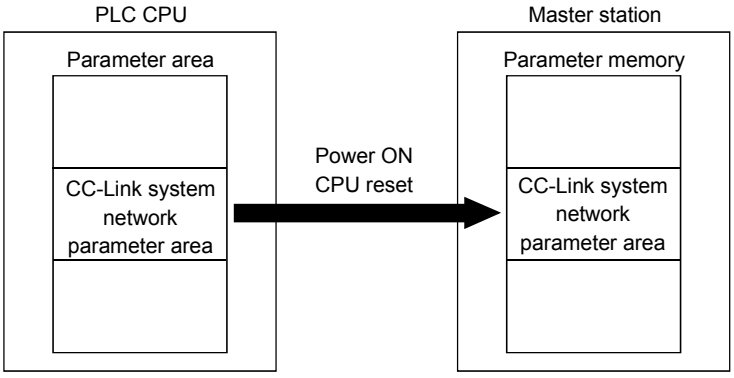
For the RS-232C interface module (AJ65BT-R2), specific buffer memory initialization settings for each module are required.

These are described in the exercises of Chapter 7 and 8 of this textbook.

2.2.2 Settings of network parameters and auto refresh parameters

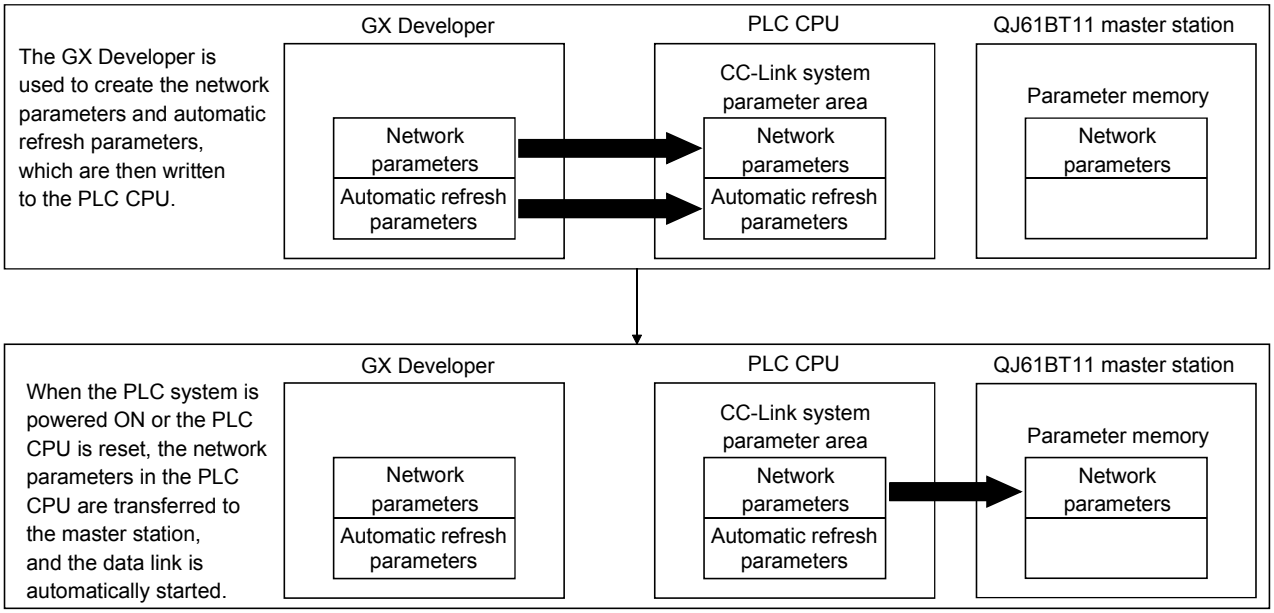
(1) Network parameter settings for the MELSEC-Q series
The network parameters controlling the CC-Link are set with GX Developer and written in the parameter area of the PLC CPU.

(2) Area storing network parameters
The network parameters written in the PLC CPU are transmitted to the parameter memory of the master station at the power on or reset of the PLC CPU.
The parameter memories of the master station are once deleted at the power off or reset of the PLC CPU.
(Transmitted again from the PLC CPU after the power on or reset)



(3) Automatic refresh parameter settings for the MELSEC-Q series
The automatic refresh parameters that update the device between the master/local module and the PLC CPU are set with GX Developer and written in the parameter area of the PLC CPU.
(Automatic refresh parameters are not transmitted to the master station.)
Automatic refresh parameters cannot be set by the sequence programs.
Note) The settings are made on the same screen as that of network parameters with GX Developer.
Writing to the PLC CPU is performed at the same time as network parameters.

(4) Procedure from parameter settings to the data link startup
Follow the procedure below from parameter settings to the data link startup:


The GX Developer is used to create the network parameters and automatic refresh parameters, which are then written to the PLC CPU.
GX Developer
Network parameters
Automatic refresh parameters
PLC CPU
CC-Link system parameter area
Network parameters
Automatic refresh parameters
QJ61BT11 master station
Parameter memory
Network parameters
When the PLC system is powered ON or the PLC CPU is reset, the network parameters in the PLC CPU are transferred to the master station, and the data link is automatically started.
GX Developer
Network parameters
Automatic refresh parameters
PLC CPU
CC-Link system parameter area
Network parameters
Automatic refresh parameters
QJ61BT11 master station
Parameter memory
Network parameters

MEMO

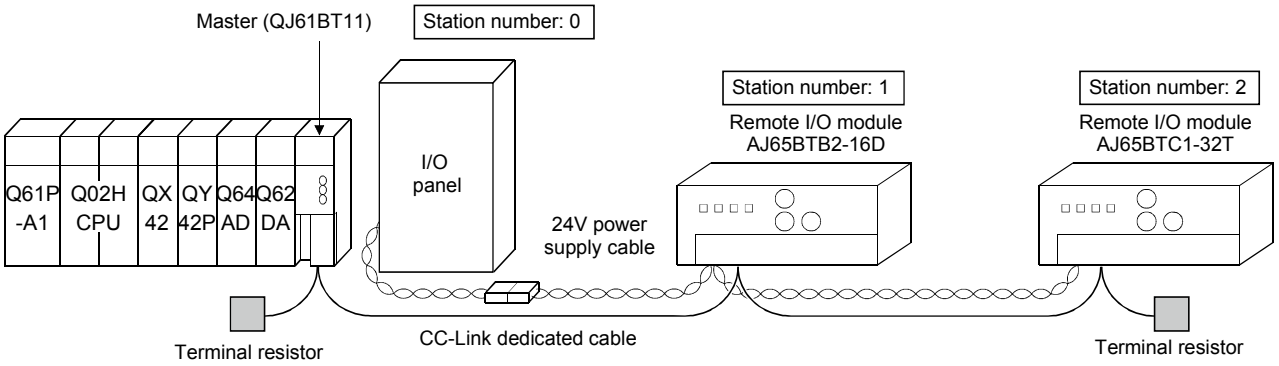
CHAPTER 3 ASSIGNMENT I (REMOTE NET MODE: 1)

In this assignment, the exercise when only remote I/O modules are connected in the CC-Link remote net mode is performed.

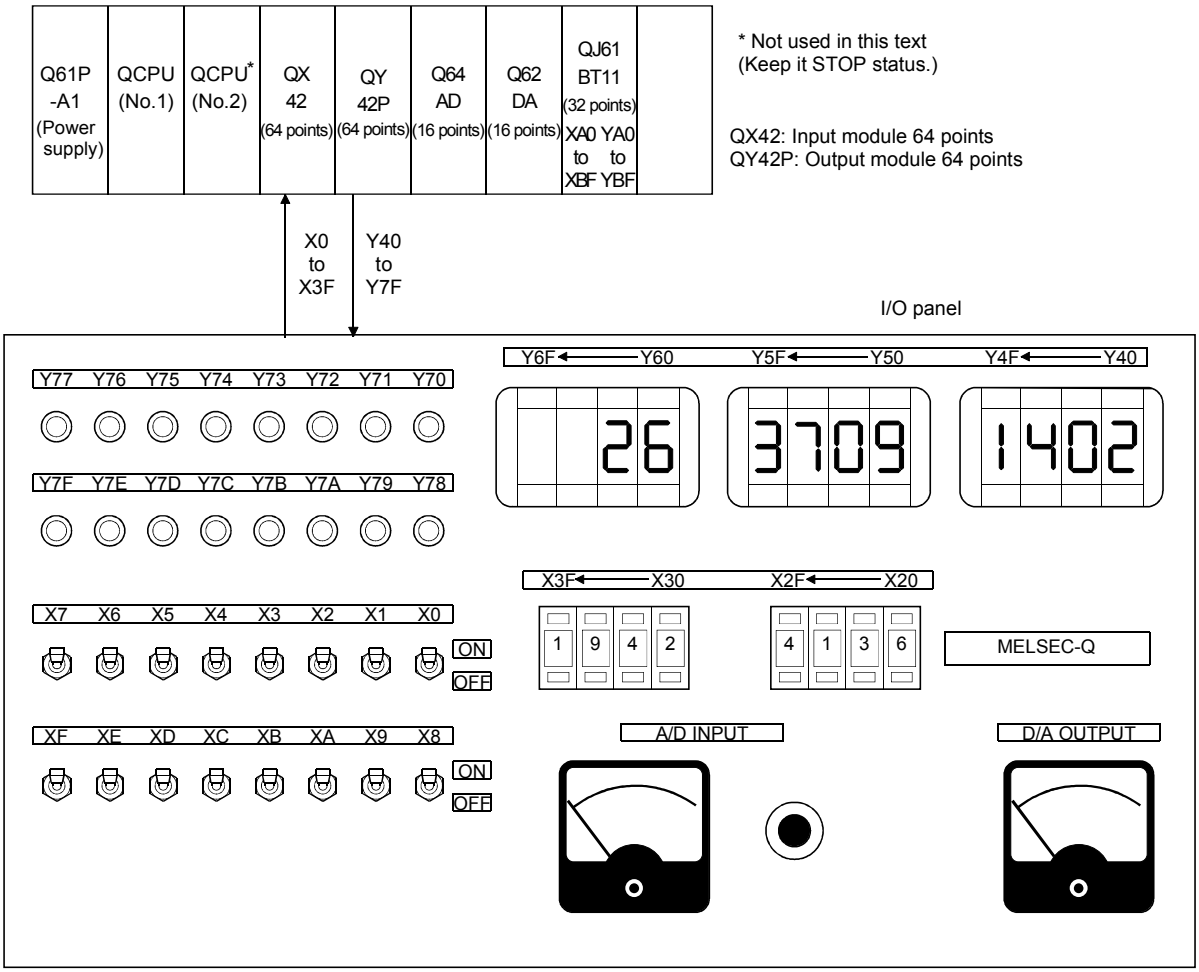
3.1 System Configuration of Exercise

The following shows the system configuration of the exercise in Assignment 1.

(1) Module configuration



(2) I/O assignment



POINT
The exercise of this textbook is performed with the multiple CPU system consisting of two QCPUs. For the exercise in the system configuration of one QCPU, neither the parameter setting for multiple CPU described in this chapter nor the parameter write operation to the second CPU are required. Skip the corresponding explanations.

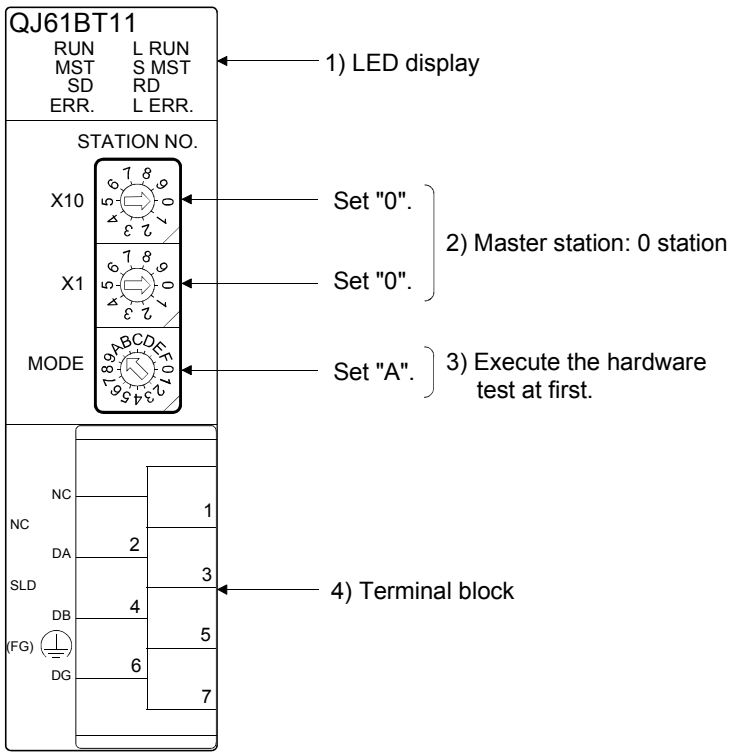
3.2 Module Settings

3.2.1 Names and settings of master module

This section explains the names and settings of the master station QJ61BT11.

(1) QJ61BT11 settings

For details of 1) to 4), refer to the following pages.



(2) Names and descriptions of QJ61BT11

<table>
<tr><th>Number</th><th>Name</th><th colspan="2">Description</th></tr>
<tr><td rowspan="11">1)</td><td rowspan="11">LED display

QJ61BT11
RUN L RUN
MST S MST
SD RD
ERR. L ERR.</td><td colspan="2">Verify the data link status with the LED ON/OFF.</td></tr>
<tr><td>LED name</td><td>Description</td></tr>
<tr><td>RUN</td><td>On : When the module is operating normally
Off : When a watchdog timer error occurs</td></tr>
<tr><td>ERR.</td><td>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, etc.
Refer to Appendix 3 for details regarding SW0058 (the detailed LED display status)
Flashing: There is a communication error in a station</td></tr>
<tr><td>MST</td><td>On: Operating as a master station (during the data link control)</td></tr>
<tr><td>S MST</td><td>On: Operating as a standby master station (during the standby)</td></tr>
<tr><td>L RUN</td><td>On: The data link is being executed</td></tr>
<tr><td>L ERR.</td><td>On: Communication error (Host)
Flashing at fixed intervals: The settings of switches 2) and 3) were changed while the power is on.
Flashing at inconsistent intervals: The terminal resistor is not attached. The module and CC-Link dedicated cable are affected by noise.</td></tr>
<tr><td>SD</td><td>On: During the data sending</td></tr>
<tr><td>RD</td><td>On: During the data receiving</td></tr>
<tr><td>2)</td><td>Station number setting switches

STATION NO.
x10 x1</td><td colspan="2">Set the module station number (The setting at the time of shipment: 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.</td></tr>
</table>

"MST" and "S MST" LED indicator lamp status and station types

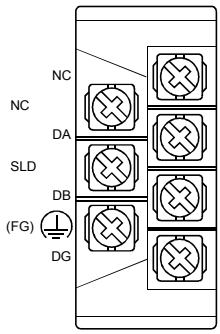
Type of station set	Operation status	
	Operating as a master station (controlling the data link)	Operating as a standby master station (standing by)
Master station	MST ●: On S MST ○: Off	MST ○: Off S MST ●: On
Standby master station	MST ●: On S MST ○: Off	MST ○: Off S MST ●: On
Local station	—	—

●: On, ○: Off

POINT
The settings of the station number setting switch and the transmission rate/mode setting switch become valid when the module power is turned from OFF to ON or the PLC 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 PLC CPU again.

<table>
<tr><th>Number</th><th>Name</th><th>Description</th></tr>
<tr><td>3)</td><td>Transmission rate/mode setting switch

MODE  </td><td>Set the transmission rate and operating conditions for the module (The setting at the time of shipment: 0)
<table>
<tr><th>Number</th><th>Transmission rate settings</th><th>Mode</th></tr>
<tr><td>0</td><td>Transmission rate 156 kbps</td><td rowspan="5">Online</td></tr>
<tr><td>1</td><td>Transmission rate 625 kbps</td></tr>
<tr><td>2</td><td>Transmission rate 2.5 Mbps</td></tr>
<tr><td>3</td><td>Transmission rate 5 Mbps</td></tr>
<tr><td>4</td><td>Transmission rate 10 Mbps</td></tr>
<tr><td>5</td><td>Transmission rate 156 kbps</td><td rowspan="5">Line test (Refer to Section 3.4.3)
When the station number setting switch is set to 0
: Line test 1
When the station number setting switch is set to 1 to 64
: Line test 2</td></tr>
<tr><td>6</td><td>Transmission rate 625 kbps</td></tr>
<tr><td>7</td><td>Transmission rate 2.5 Mbps</td></tr>
<tr><td>8</td><td>Transmission rate 5 Mbps</td></tr>
<tr><td>9</td><td>Transmission rate 10 Mbps</td></tr>
<tr><td>A</td><td>Transmission rate 156 kbps</td><td rowspan="5">Hardware test
(Refer to Section 3.3)</td></tr>
<tr><td>B</td><td>Transmission rate 625 kbps</td></tr>
<tr><td>C</td><td>Transmission rate 2.5 Mbps</td></tr>
<tr><td>D</td><td>Transmission rate 5 Mbps</td></tr>
<tr><td>E</td><td>Transmission rate 10 Mbps</td></tr>
<tr><td>F</td><td colspan="2">Setting not allowed</td></tr>
</table></td></tr>
<tr><td>4)</td><td>Terminal block

 
</td><td>Connect the CC-Link dedicated cable for the data linking.
Refer to Section 3.4.1 for the connection method.

Terminals SLD and FG are connected inside the module.
Since a 2-piece type terminal block is used, the module can be replaced to the terminal block without disconnecting the signal line.
(Replace the module after turning off the module power)</td></tr>
</table>

POINT

(1) The settings of the station number setting switch and the transmission rate/mode setting switch become valid when the module power is turned from OFF to ON or the PLC 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 PLC CPU again.

(2) 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.
If station numbers are not sequential, a vacant station is handled as a "data link faulty station".
When it is not sequential, set a vacant station number as a reserved station.
(The number of connected devices and station information can be specified with the network parameters of the master station.)

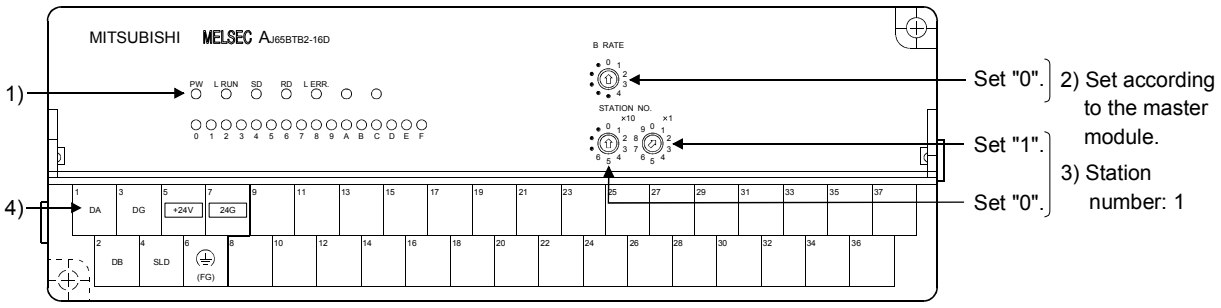
(3) Specify unique station numbers
If duplicate station numbers are specified, an installation error occurs.

(4) Use the same transmission rate for the master station, remote stations, local stations, intelligent device stations and standby master station.
If the setting for even one of the stations is different, the data link cannot be established properly.

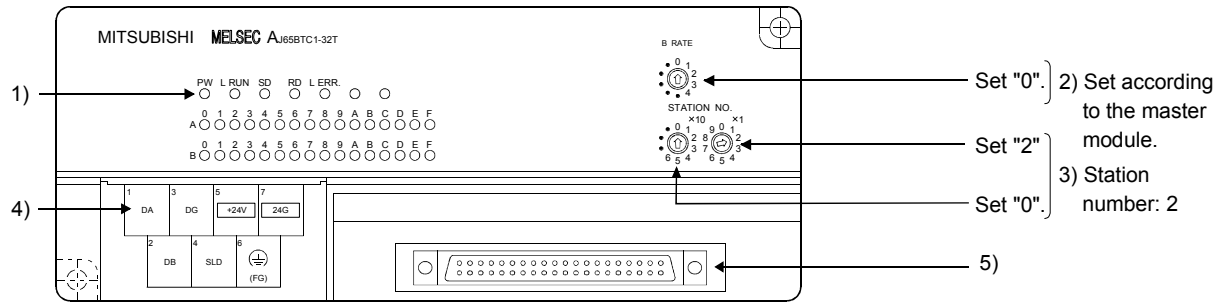
3.2.2 Names and settings of remote I/O modules

This section explains the names and settings of AJ65BTB2-16D and AJ65BTC1-32T.

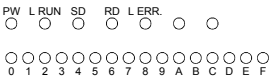
• AJ65BTB2-16D



• AJ65BTC1-32T



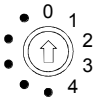
1) Operation display LED



LED name	Description
PW	Turns on when remote I/O module power supply is on.
L RUN	Check if the remote I/O station is data communicating with the master station normally. Turns on when receiving normal data from the master station and turns off at time out. (Turned on by receiving normal data.)
SD	Turns ON due to the data sending.
RD	Turns ON due to the data receiving.
L ERR	Turns ON due to the transmission error (the CRC error). Turns OFF due to the time over (RUN also turns OFF.). Turns ON due to the setting error of station number and transmission speed. (Turns OFF when the settings are corrected and the power is restored.) Flickers when the settings of station number and transmission speed have been changed during the operation (RUN turns ON and the module operates depending on the settings of station number and transmission speed at the power-on.)
0 to F	Displays the I/O ON/OFF status. Turns ON at the ON status and turns OFF at the OFF status.

2) Transmission speed setting switch

B RATE

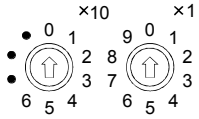


Setting	Transmission speed
0	156Kbps
1	625Kbps
2	2.5Mbps
3	5Mbps
4	10Mbps

Set the transmission speed setting switch within the range from 0 to 4.

3) Station number setting switches

STATION NO.



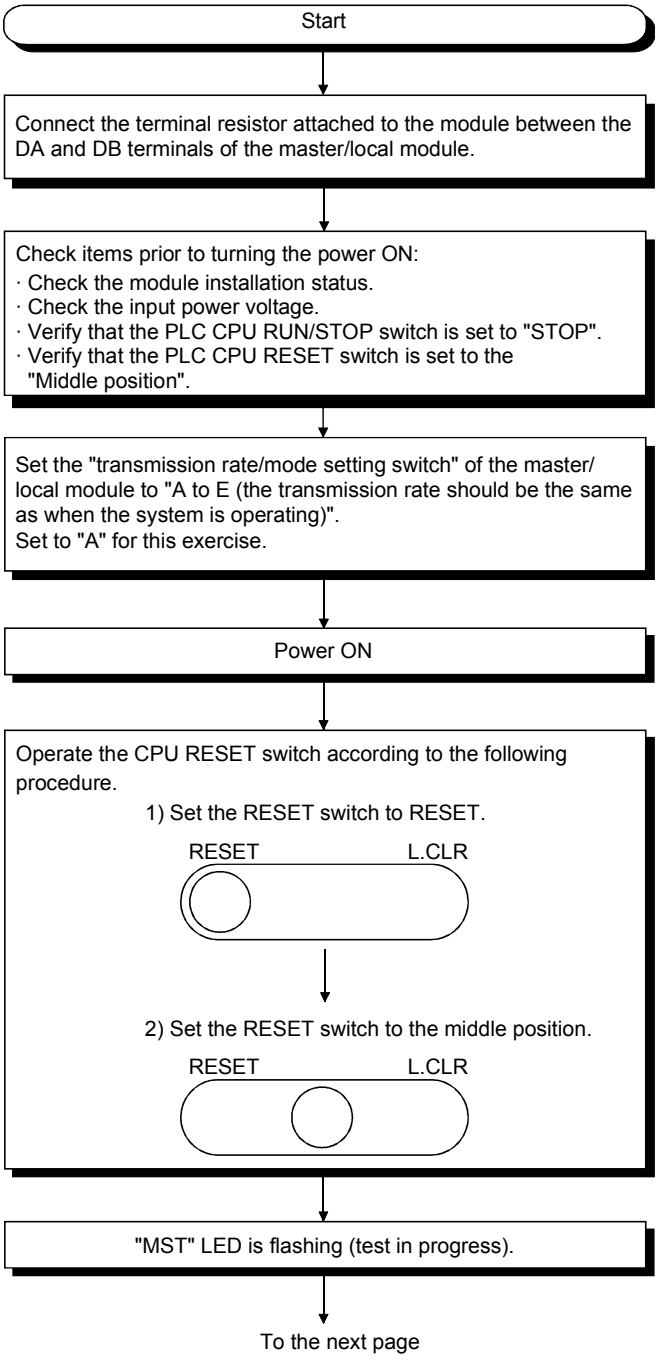
Set the station number within the range from 01 to 64.
The station numbers cannot be duplicated.
" × 10" sets the tens place of the station No.
" × 1" sets the ones place of the station No.

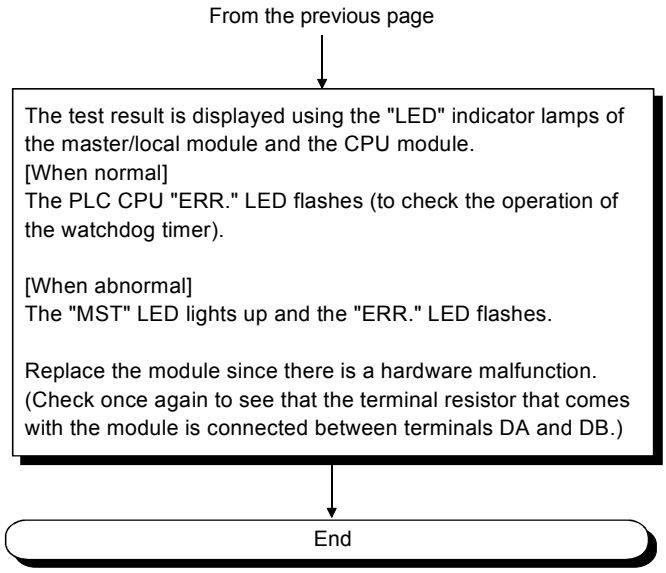
4) Terminal block for external wiring — This is a terminal block for the connection of power supply, transmission and I/O signals.

5) Connector — This is a connector for the connection of I/O signals.

3.3 Single Module Test (Hardware Test)

Confirms that the master/local module operates normally as a single module.
Execute the test with the following procedure:





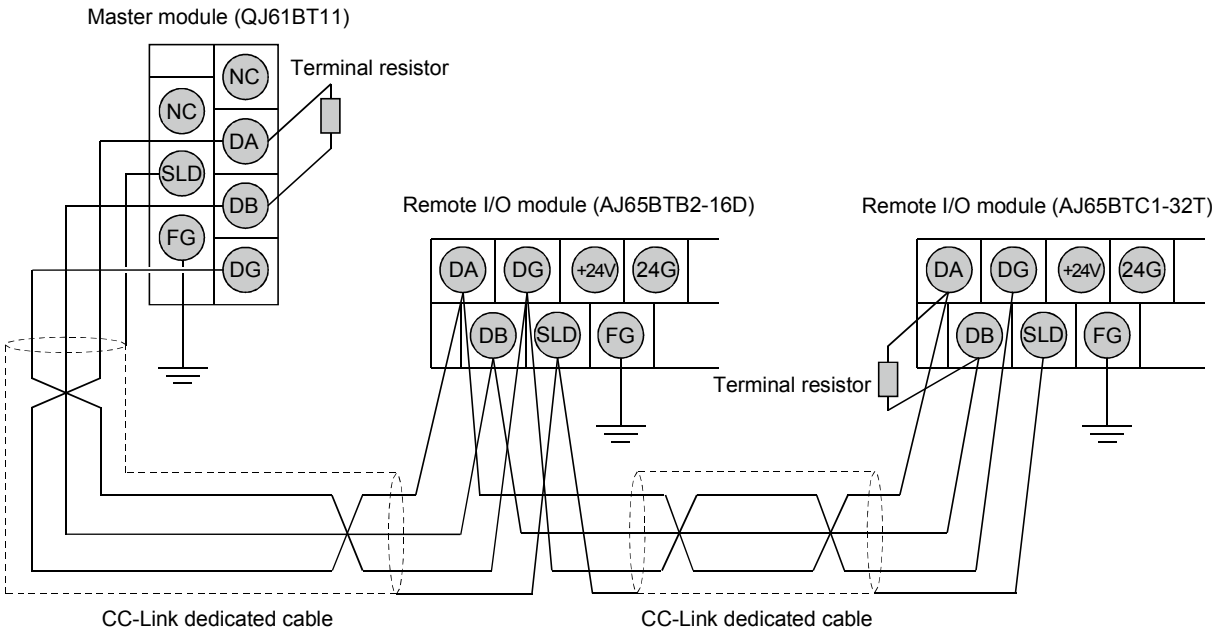
POINT

When the RUN/STOP switch of the PLC CPU is set to "RUN" and a hardware test is performed, the system status become SP. UNIT DOWN and the PLC CPU stops to check the operation of the watch dog timer function.
Make sure that the RUN/STOP switch of the PLC CPU is set to "STOP" and then perform the hardware test.

3.4 Wiring and Connection

3.4.1 Connection of CC-Link dedicated cable

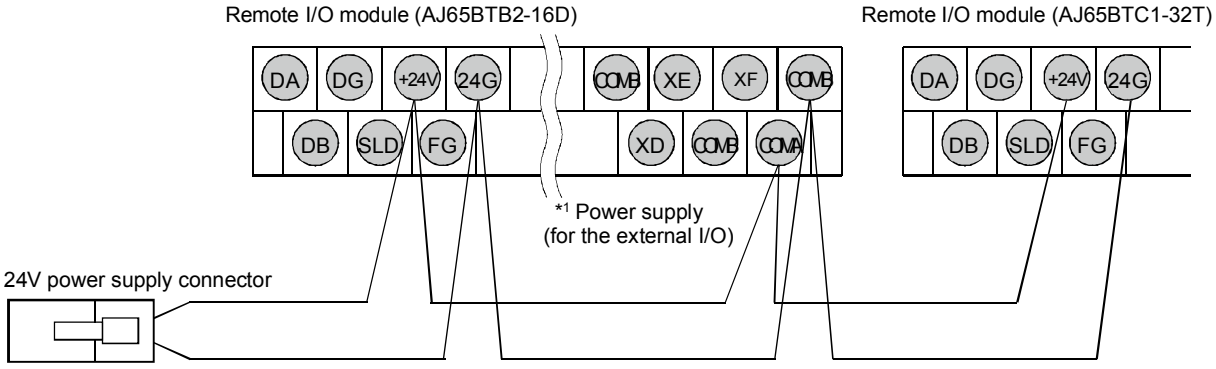
This section explains how to connect the modules using the CC-Link dedicated cables.
When connecting the cables, make sure to turn the power off before wiring.



REMARK
Connect the shielded wire of the CC-Link dedicated cable to "SLD" of each module, and ground both ends of the shielded wire using the D type grounding via "FG". The SLD and FG are connected inside the module.

3.4.2 Connection of 24V power supply cable

This section explains how to connect the 24V power supply cables for the remote I/O module (for the inside of the module and for the external I/O).
When connecting the cables, make sure to turn the power off before wiring.

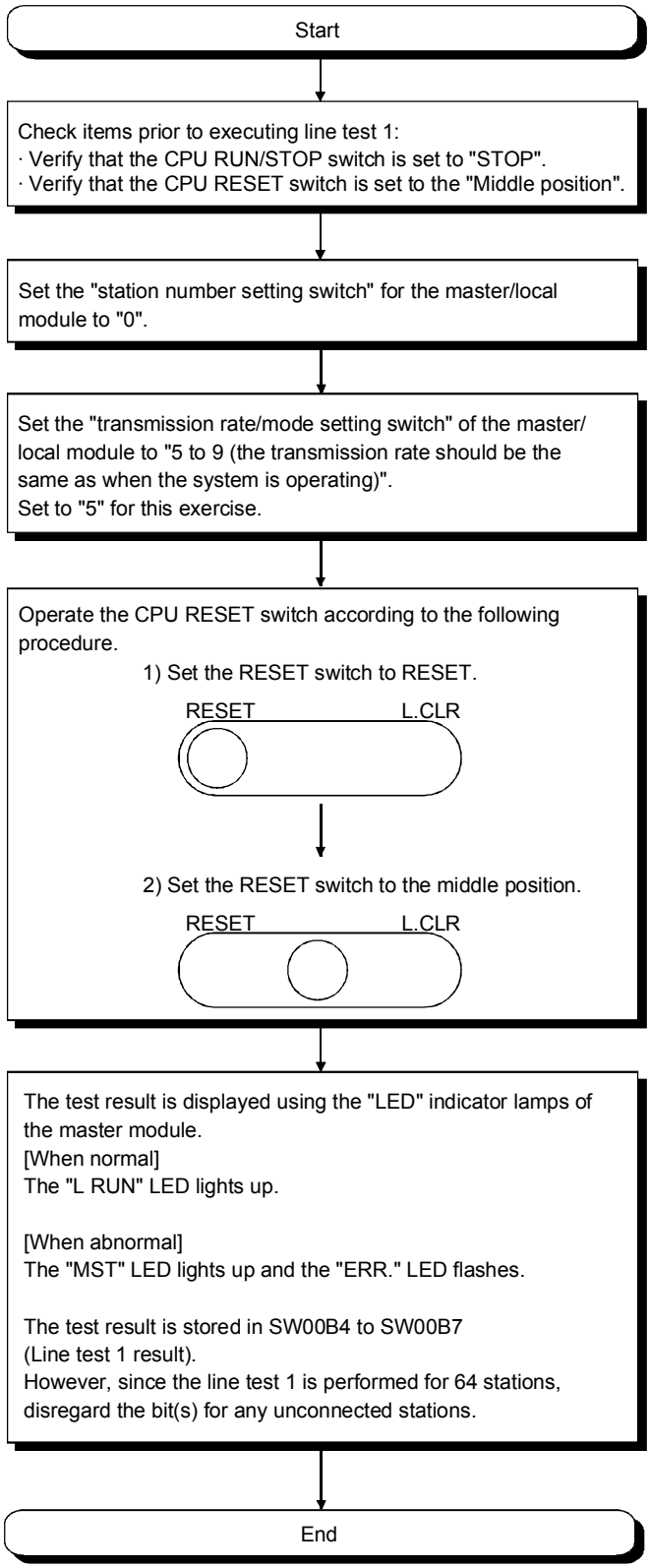


*1: Power supply polarity for the external I/O of AJ65BTB2 is bipolar.
(Either COMA+, COMB- or COMA-, COMB+ is possible.)

*2: CC-Link dedicated cables and terminating resistors are omitted.

3.4.3 Line test

Line test is performed to verify that the CC-Link dedicated cables and terminal resistors are correctly connected.
Perform the line test according to the following procedure.

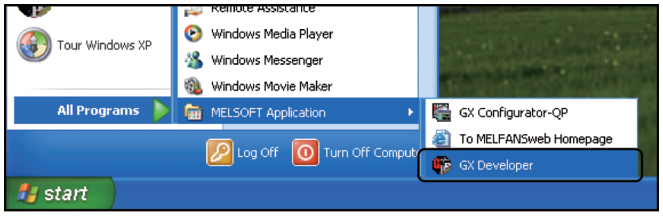


3.5 Parameter Settings and Write

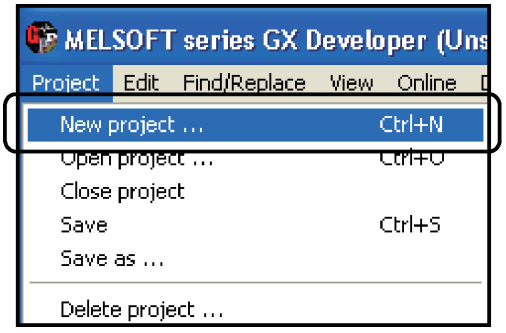
POINT
Set the "Transmission rate/mode setting switch" of the master/local module to "0". (Transmission rate 156 kbps/online mode) After setting, reset the CPU.

3.5.1 Starting GX Developer

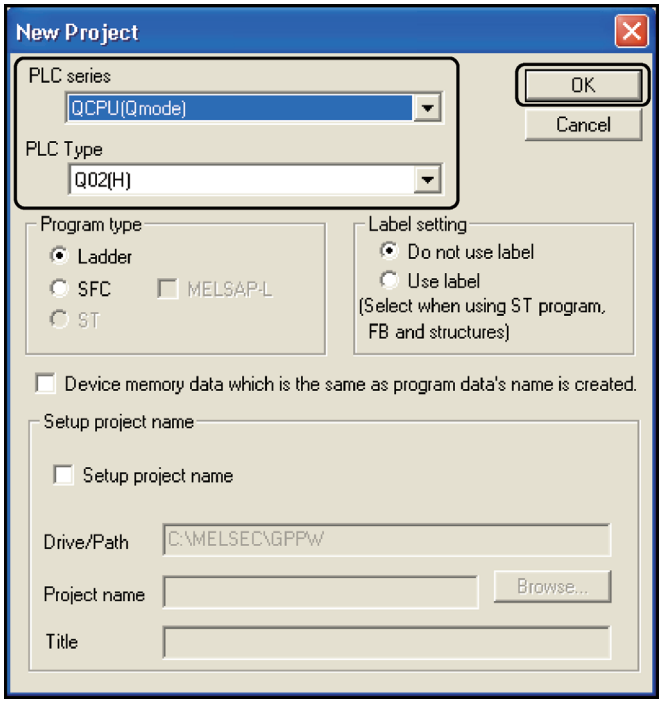
Starts up GX Developer to set the network parameters/automatic refresh parameters for CC-Link.



1) Click Windows [Start] → [All Programs] → [MELSOFT Application] → [GX Developer].



2) After GX Developer starts up, click the [Project] → [New project] menu.



3) Set "PLC series" to "QCPU (Q mode)" and "PLC type" to "Q02(H)", then click the OK button.

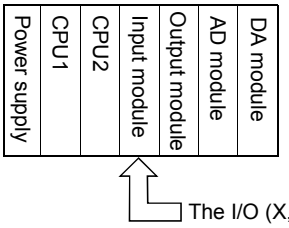
REMARK

As the demonstration machine used in this textbook has the PLC No.2 installed for the multiple CPU configuration, the multiple CPU settings of the PLC parameters is required.
The following describes the operation for the multiple CPU settings.

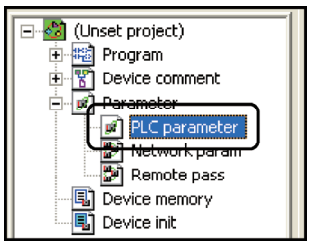
(1) Parameter settings for the multiple CPUs (Not required for one CPU configuration)
For the multiple CPU demonstration machine compatible configuration of the Q series demonstration machines, two CPUs are installed.
Although one QCPU is used in this course, the PLC parameters need to be set to each CPU for the following reason:

Each CPU needs to know which basic base slot the I/O (X/Y) number starts from.

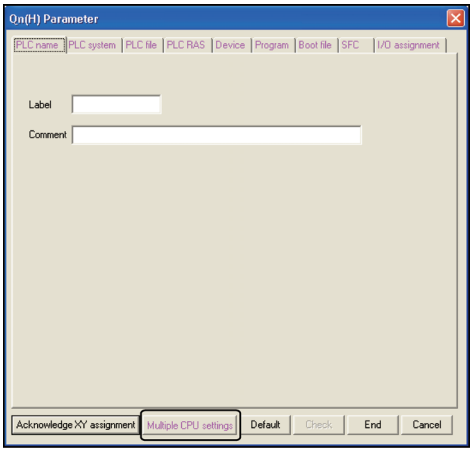
<For the configuration with two CPUs>



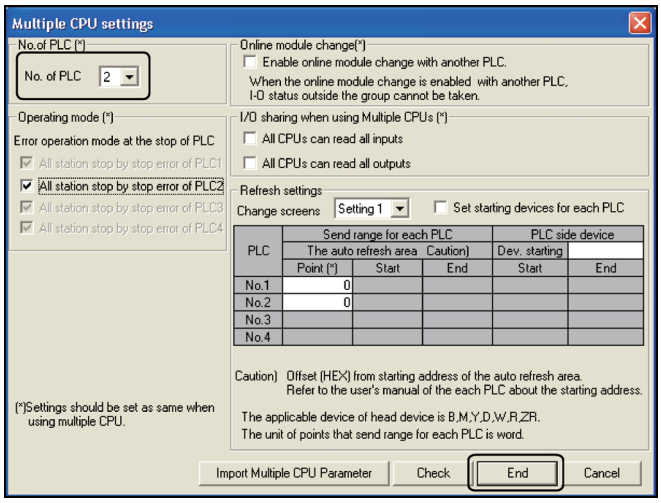
For the "Multiple CPU settings" of the actual parameter setting item, the number of CPUs which are installed on the base is set to two.



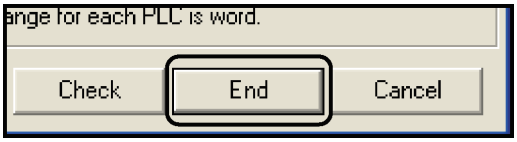
1) Double-click "PLC parameter" in the project list of GX Developer.



2) After the "Qn(H) Parameter" setting dialog box appears, click the Multiple CPU settings button.

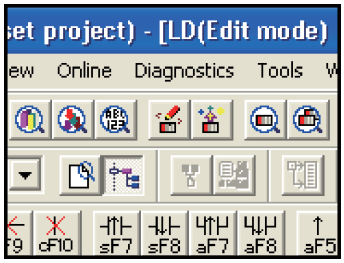


3) Set "No. of PLC" of the "Multiple CPU settings" dialog box to "2", then click the End button.

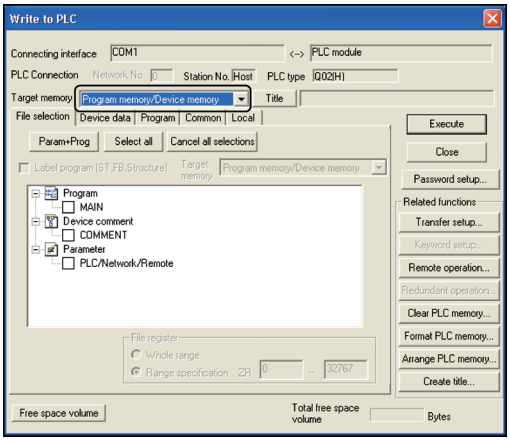


4) Click the End button of the "Qn(H) Parameter" setting dialog box.

(2) Parameter write to the second CPU (Not required for one CPU configuration)



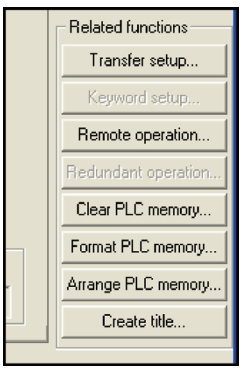
1) Click the button on the toolbar.
(Set the RUN/STOP switch of the QCPU to the STOP status.)



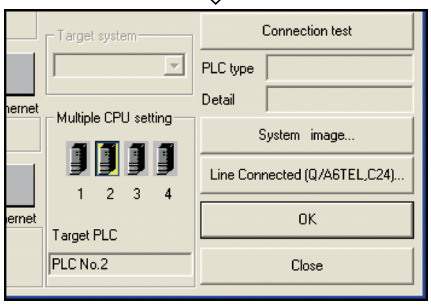
2) After the “Write to PLC” dialog box appears, confirm that "Program memory/Device memory" is displayed for “Target memory”.

(To the next page)

(From the previous page)

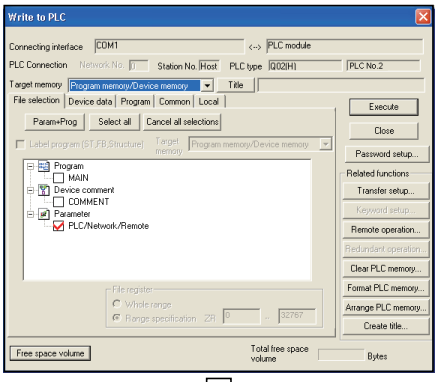


3) Click the Transfer setup button of the “Write to PLC” dialog box to write the parameters in the PLC No.2.



4) The transfer setup dialog box appears.
Click "2" of the "Multiple CPU setting" to select.

5) Click the OK button.



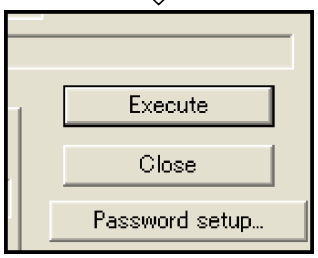
6) Confirm that "PLC No.2" is set for “PLC type”.

7) Check “Parameter (PLC/Network/Remote)”.

8) Click the Execute button.

9) After the dialog box on the left appears when the write is completed, click the OK button.

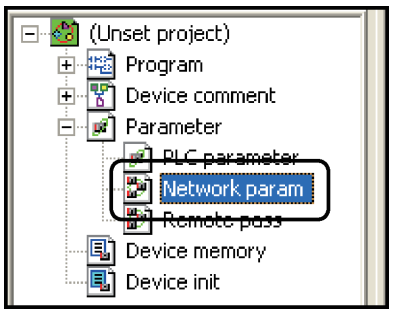
10) Reset “PLC type” to "PLC No.1" by the above steps 3) to 5).



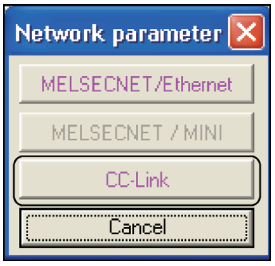
11) Click the Close button to close the dialog box.

3.5.2 Settings and save of network parameters and automatic refresh parameters

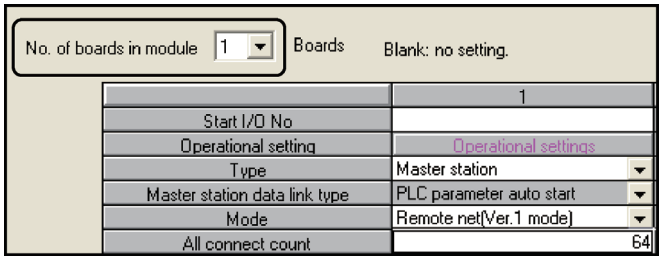
This section explains the operation from setting the network parameters and automatic refresh parameters to saving to a FD.



1) Double-click "Network parameter" from the project data list of GX Developer.



2) After the network parameter selection dialog box appears, click the CC-Link button.



3) As the network parameter setting screen of CC-Link appears, set "1" for "No. of boards in module".

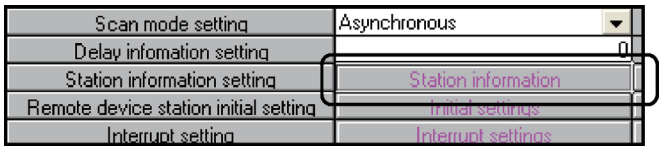
	1
Start I/O No	00A0
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Additional mode)
All connect count	2
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

4) Set as indicated on the left screen.
The settings different from the default are given below.

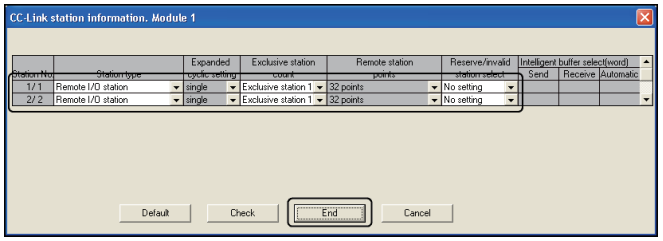
- "Start I/O No." 00A0
- "All connect count" 2
- "Remote input (RX)" X100
- "Remote output (RY)" Y100
- "Special relay (SB)" SB0
- "Special register (SW)" SW0

Continued to the next page

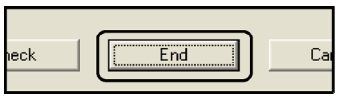
Continued from the previous page



5) Click the Station information button.

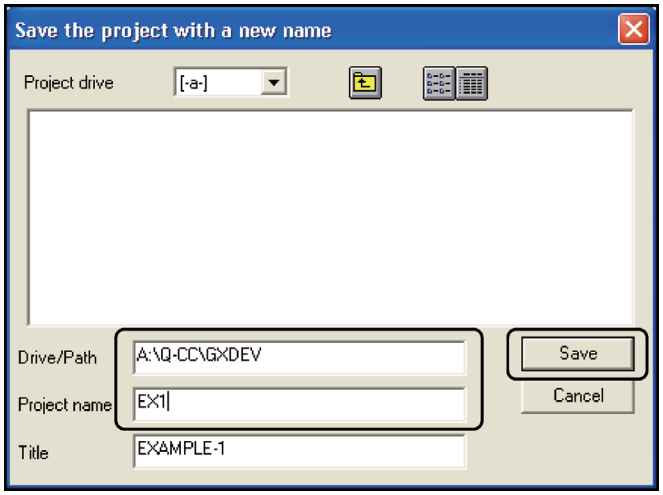


6) After confirming the following settings, click the End button.
- 1/1 Remote I/O station, Exclusive station 1, No setting
- 2/2 Remote I/O station, Exclusive station 1, No setting



7) Click the End button of the network parameter setting dialog box.

8) Click the button.

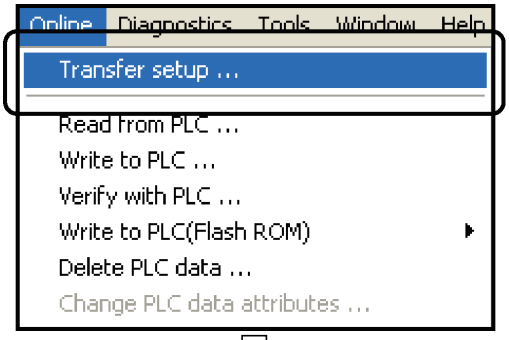


9) Set Drive/Path and Project name, then click the Save button.

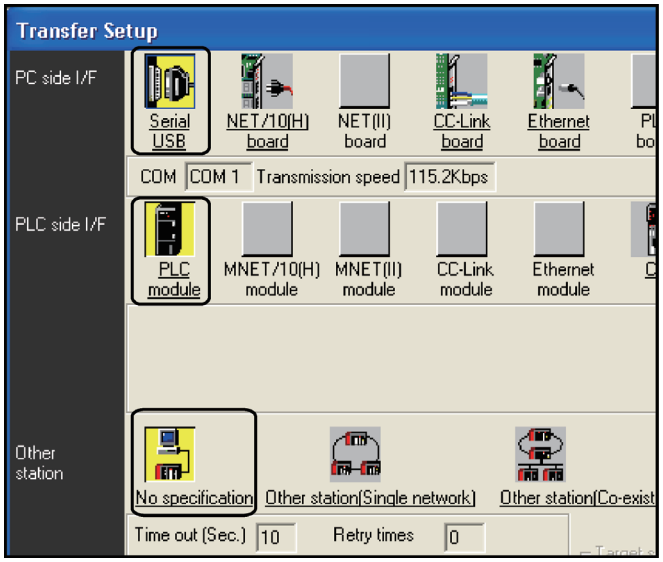
Drive: [-a-] (Floppy disk)
Drive/Path: "A:\Q-CC\GXDEV"
Project name: "EX1"

3.5.3 Transfer setup

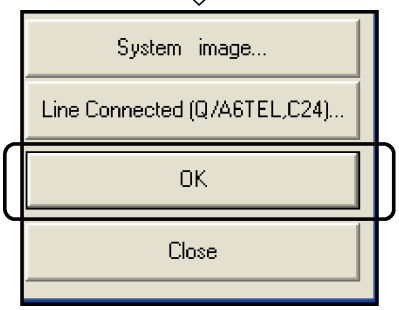
Designates a transfer destination to write parameters to the PLC CPU of the master station.



1) Click the [Online] → [Transfer setup] menu.



2) Confirm the following settings on the "Transfer Setup" screen.
"PC side I/F": "Serial USB"
"PLC side I/F": "PLC module"
"Other station": "No specification"

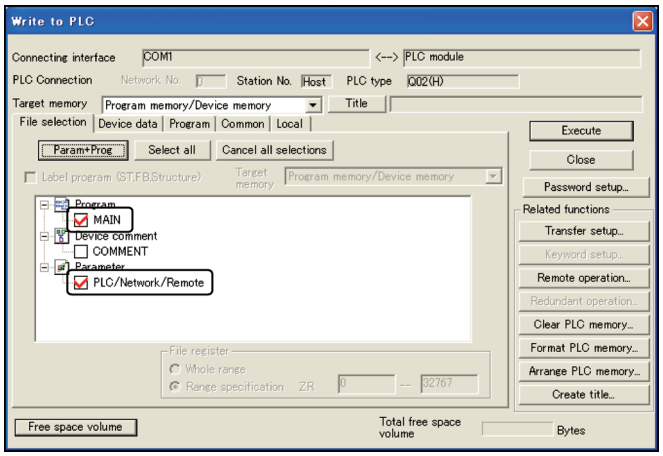


3) Click the OK button.
This completes the transfer setup.

3.5.4 Parameter write

Writes the set network parameters and automatic refresh parameters to the PLC CPU.

1) Click .

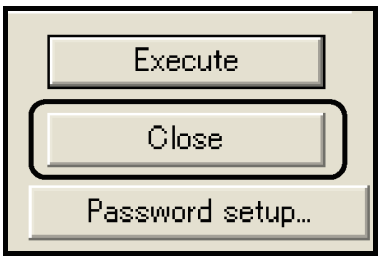


2) Click the Param+Prog button on the "Write to PLC" dialog box and select "MAIN" of Program and "PLC/Network/Remote" of Parameter.

Note: At this point, the program MAIN is only the END instruction.

3) Click the Execute button.

4) The dialog box confirming that the write is completed appears. Click the OK button.

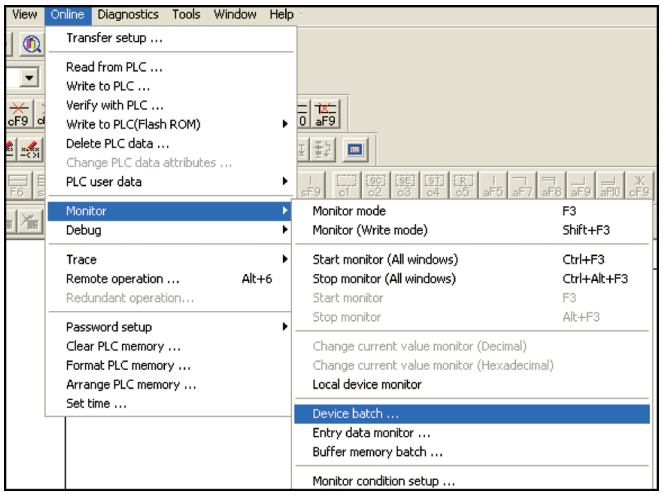


5) Click the Close button to close the "Write to PLC" dialog box.
This completes the parameter write.

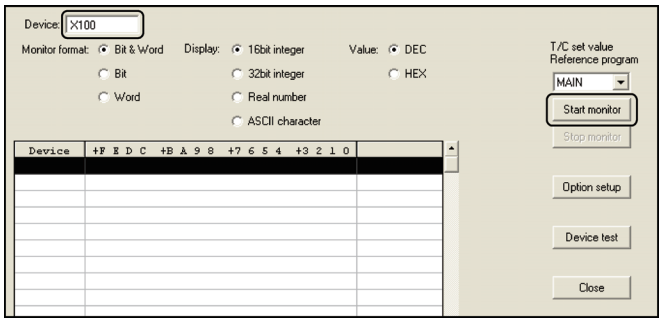
6) Reset the PLC CPU to make the written parameters valid.
This completes the parameter write.

3.6 Device (RX, RY) Monitoring and Test of Remote Station

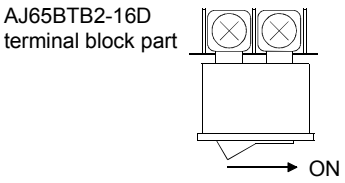
Executes the monitoring and test of the I/O signal of the remote I/O station to check if the network parameters and the refresh parameters are correctly set and if the refresh of the data link and the device is being performed.
Set the RUN/STOP switch on the PLC CPU to STOP.



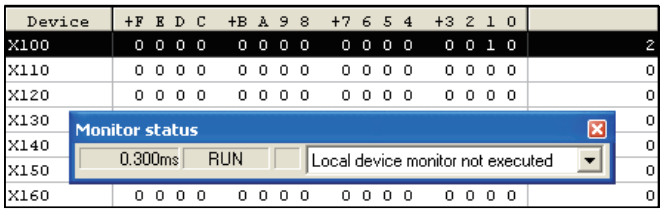
1) Click the [Online] → [Monitor] → [Device batch] menu.



2) Input "X100" in "Device" on the device batch monitor screen, then click the Start monitor button.



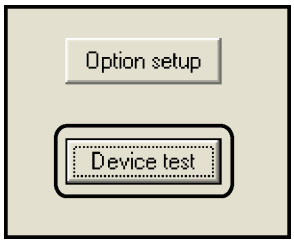
3) Turn ON the switch connected to the terminal block "X1" of the AJ65BTB2-16D.



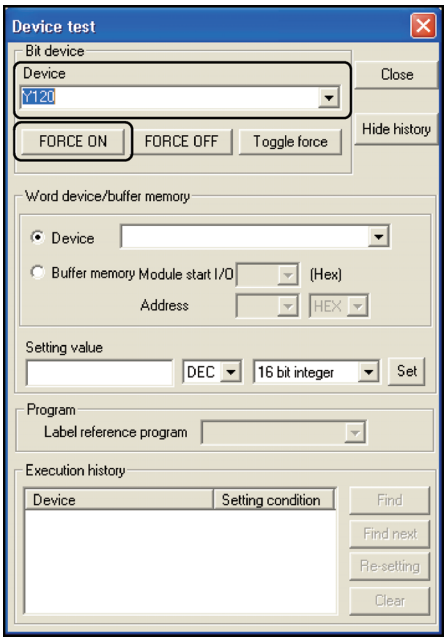
4) Confirm that the input (RX) data link and the refresh have been performed properly by X101's ON on the device batch monitor screen.

Continued to the next page

Continued from the previous page

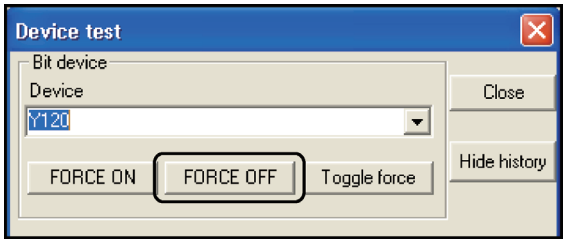


5) Click the Device test button.

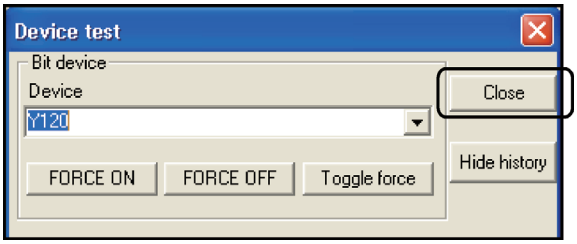


6) The "Device test" dialog box appears. Input "Y120" in "Device" and click the FORCE ON button.

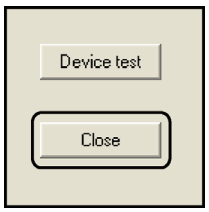
7) Confirm that the output (RY) data link and the refresh have been performed properly by Y0's (LED of "A0") ON of the AJ65BTC1-32T.



8) Click the FORCE OFF button and confirm that Y0 (LED of "A0") of the AJ65BTC1-32T turns off.



9) Click the Close button to close the "Device test" dialog box.



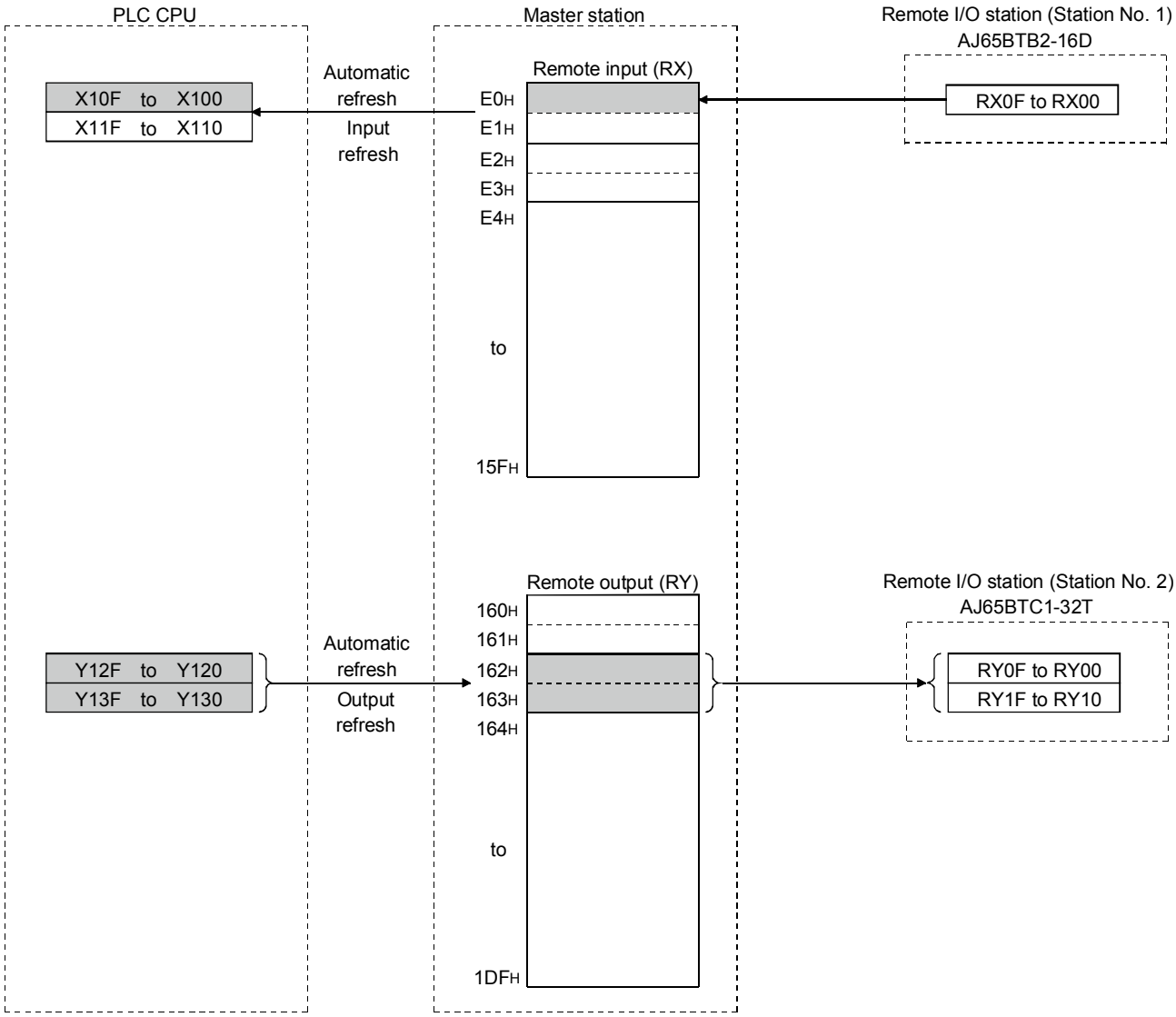
10) Click the Close button of the device batch monitor screen.
The monitoring and test of the remote device are completed.

3.7 Creating Sequence Program

Create a sequence program and write to the PLC CPU.

(1) Refresh support

The following shows the refresh relationship between the PLC CPU, the master station buffer memory and the remote I/O stations.



(2) Setting sheet

(a) Station information setting checklist

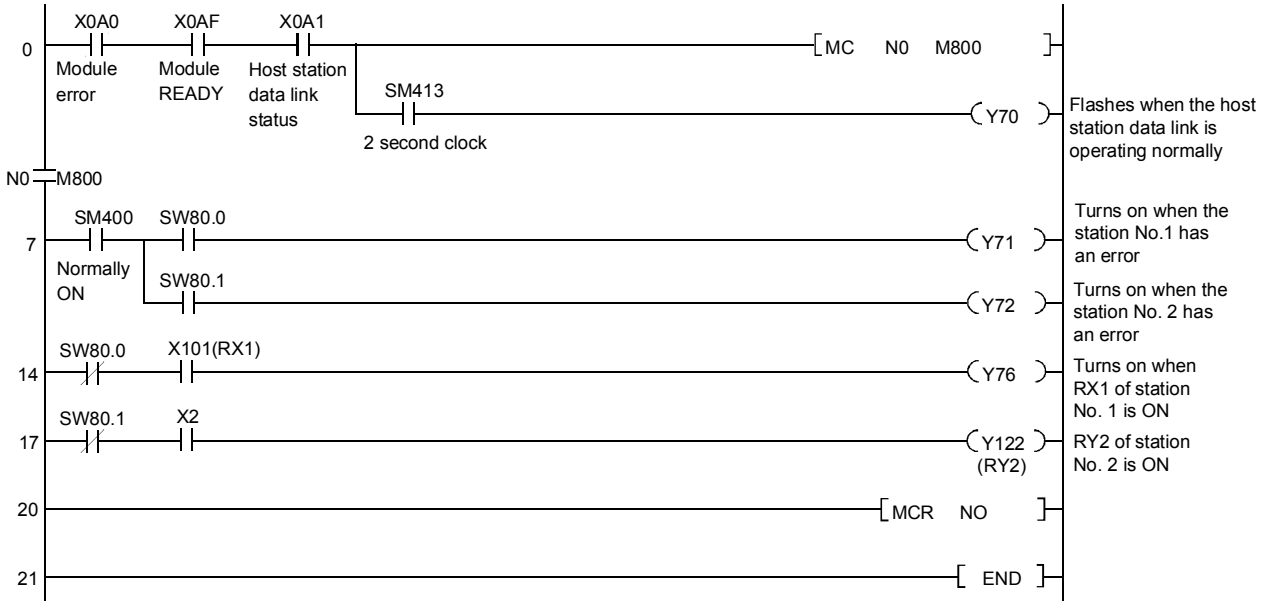
Station No.	Station type	Number of occupied stations	Reserved station/invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic update
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

(b) Device assignment checklist

Device / Station No.	RX → ( )		RY ← ( )		RWw → ( )		RWr ← ( )	
	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program

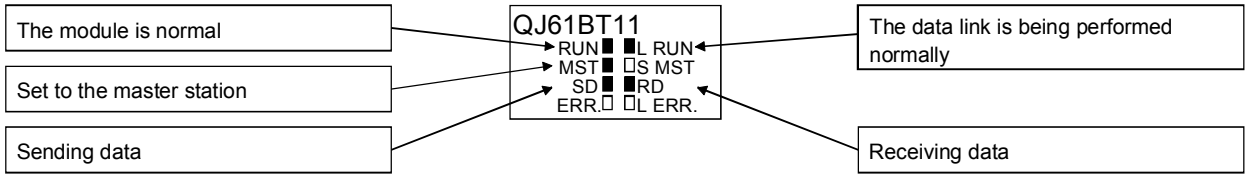
Drive/Path	A:\Q-CC\GXDEV
Project name	EX1



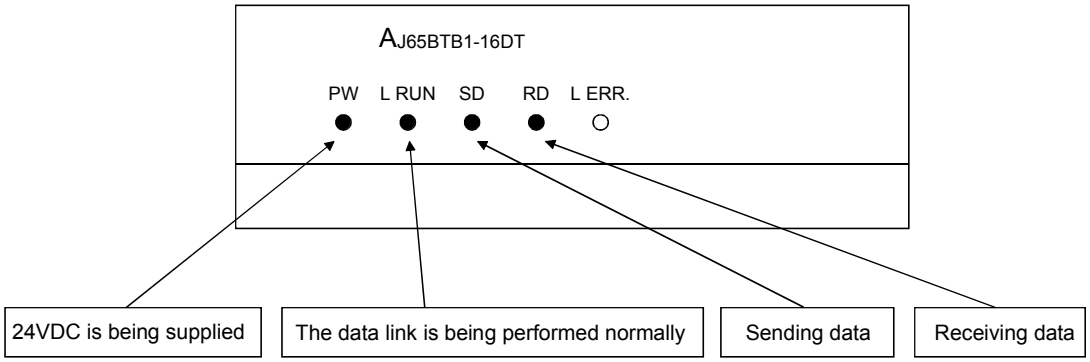
<Reference> Confirming the operation with the LED display

The following diagram shows the LED display status of the master station, remote I/O station, remote device station and local station when the data link is being performed normally.

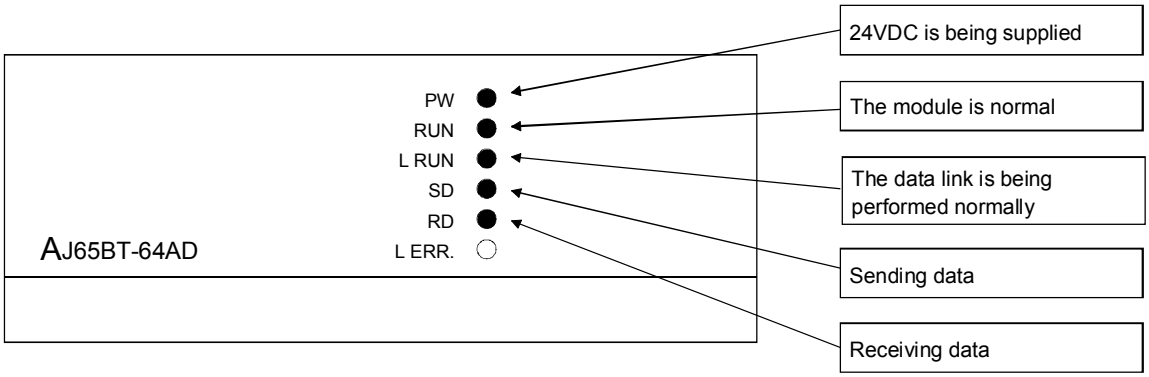
(1) LED display of the master station
Make sure that the LED display shows the following status:



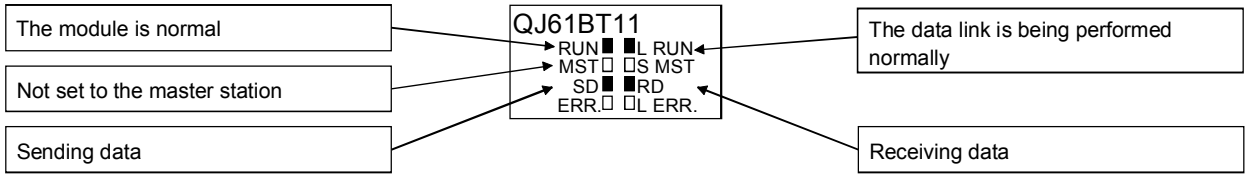
(2) LED display of the remote I/O station
Make sure that the LED display shows the following status:



(3) LED display of the remote device station
Make sure that the LED display shows the following status:



(4) LED display of the local station
Make sure that the LED display shows the following status:



3.8 Communication with the Remote I/O Stations

The output is made from the output module with the signal (RX) input from the remote I/O station by the sequence program.
Also, the output (RY) is made to the remote I/O station with the signal input from the input module.

Switch operation of demonstration machine

1) Reset with the RESET/L.CLR switch on the PLC CPU.

2) Set the RUN/STOP switch on the PLC CPU to RUN.
   Y70 ..... Flashes according to the host data link status (Data link normal)

3) Turn ON the AJ65BTB2-16D terminal block switch.
   Y76 ..... Turns ON due to RX1=ON

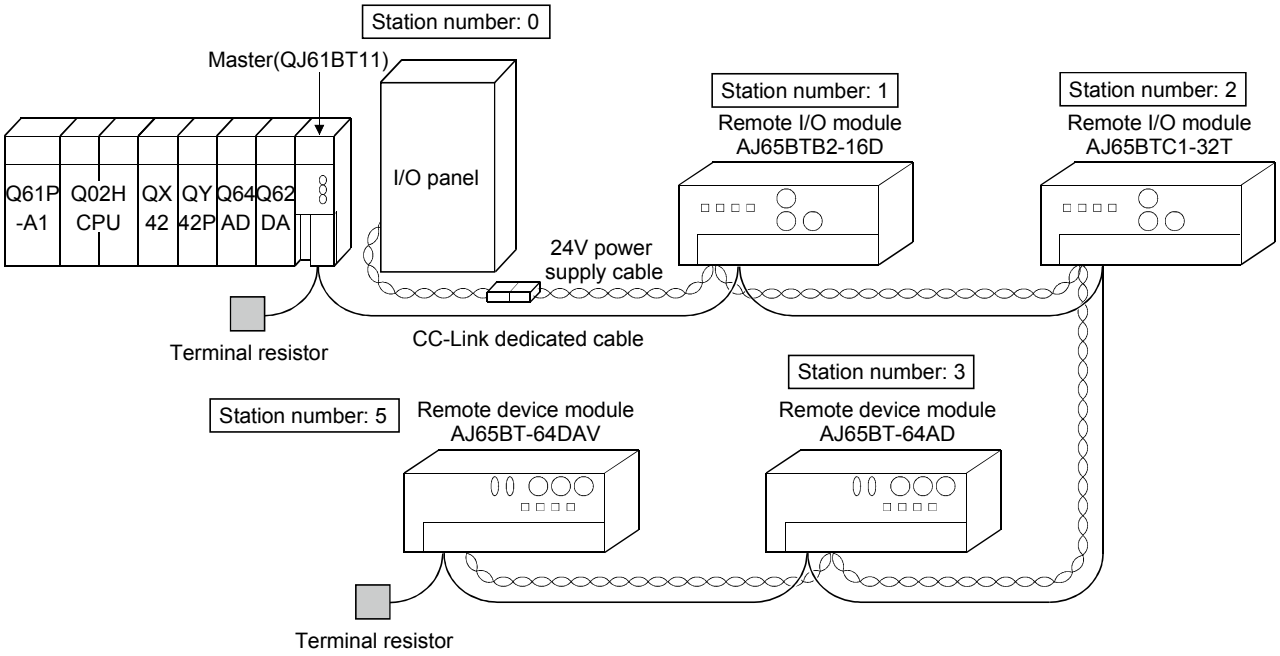
4) Turn X2 ON.
   LED "A2" of AJ65BTC1-32T...Turns ON

CHAPTER 4 ASSIGNMENT II (REMOTE NET MODE: 2)

In this assignment, the exercise when the remote I/O module and the remote device module (AD, DA) are mixed in the CC-Link remote net mode is performed.

4.1 System Configuration of Exercise

The following shows the system configuration of the exercise in Assignment II.



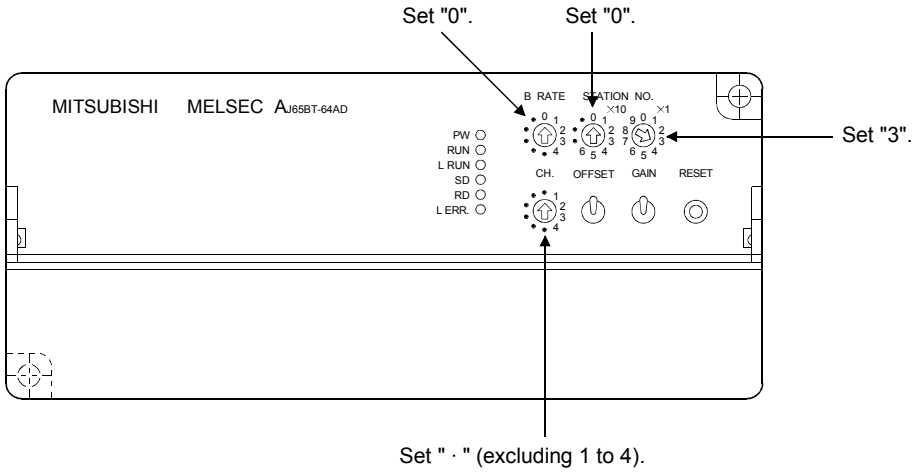
4.2 Settings and Connection of Remote Device Stations

This section explains the settings and connection of the remote device stations (AJ65BT-64AD analog-digital conversion module, AJ65BT-64DAV digital-analog conversion module).

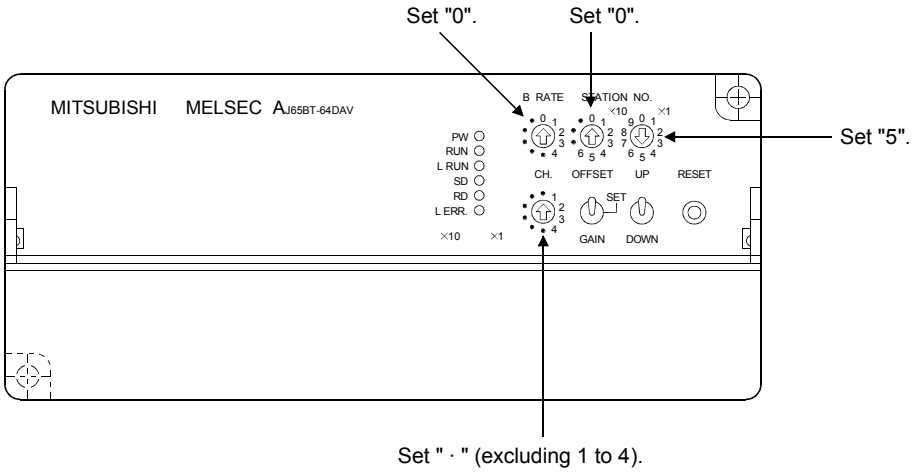
4.2.1 Module settings

The section describes the settings of AJ65BT-64AD and AJ65BT-64DAV.
For details such as functions and specifications of each module, refer to the User's Manual of each module.

(1) AJ65BT-64AD settings
(occupying 2 stations)



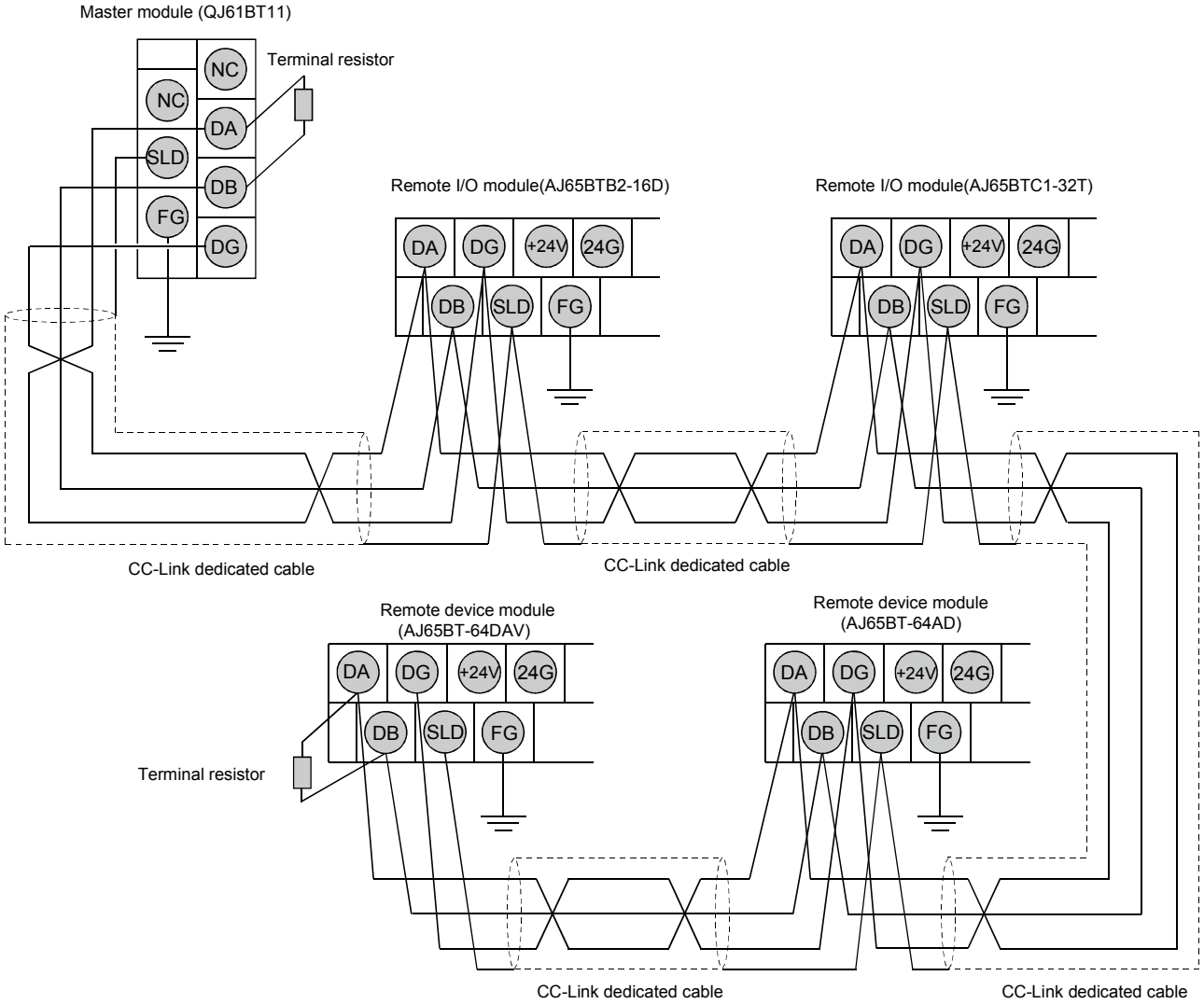
(2) AJ65BT-64DAV settings
(occupying 2 stations)



4.2.2 Module connection

The following shows the connection of CC-Link dedicated cables and terminal resistors in Assignment II.
When wiring a cable such as a CC-Link dedicated cable or 24V power supply cable, make sure to turn the power off before wiring.

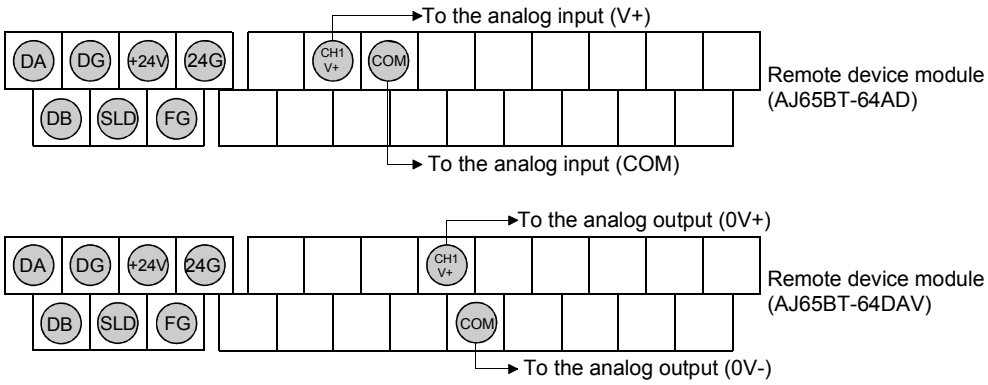
(1) Connection of CC-Link dedicated cable



Confirm whether or not the connection status is normal with the line test after completing the connection of CC-Link dedicated cable or 24V power supply cable. (Refer to Section 3.4.3)

(2) Connection of 24V power supply cable
Perform the same wiring for the 24V power supply cable as that for the remote I/O station.
(Refer to 3.4.2)

(3) Connection of analog input and analog output
For wiring the analog input of AJ65BT-64AD and the analog output of AJ65BT-64DAV, the wiring which has been already connected from the I/O panel is used.



4.3 Setting for the Master Station

The initial settings of the network parameters and remote device stations are made for the master station.
Write to the PLC CPU after the setting.

4.3.1 Settings of network parameters and automatic refresh parameters

The following network parameters and automatic refresh parameters are set.
For the setting operation, refer to Section 3.5.2.

• Network parameters/automatic refresh parameters
[Number of module "1"]

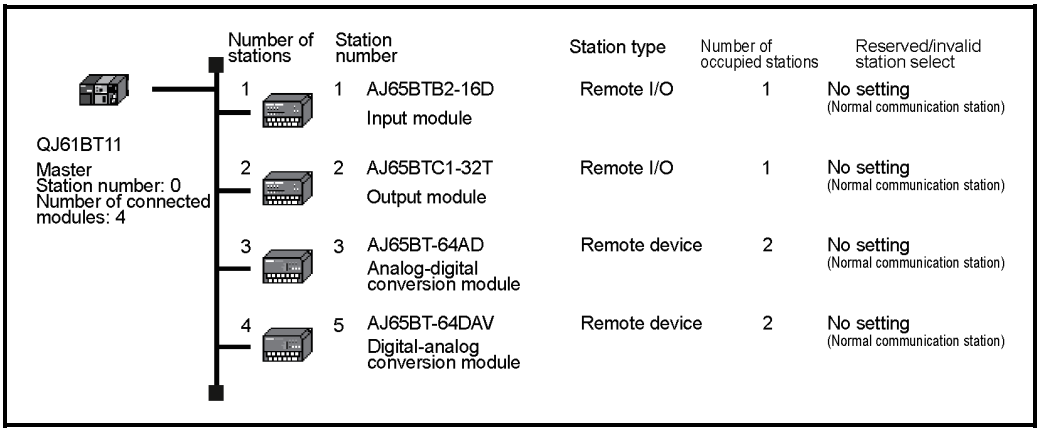
	1
Start I/O No	00A0
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.1 mode)
All connect count	4
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	D100
Remote register(RWw)	D0
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

• Station information

CC-Link station information. Module 1

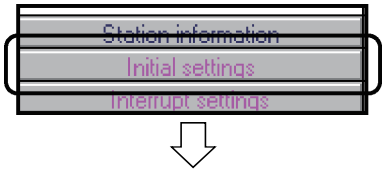
Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select
1/1	Remote I/O station	single	Exclusive station 1	32 points	No setting
2/2	Remote I/O station	single	Exclusive station 1	32 points	No setting
3/3	Remote device station	single	Exclusive station 2	64 points	No setting
4/5	Remote device station	single	Exclusive station 2	64 points	No setting

<Reference> The station information of Assignment II is shown in the figure below

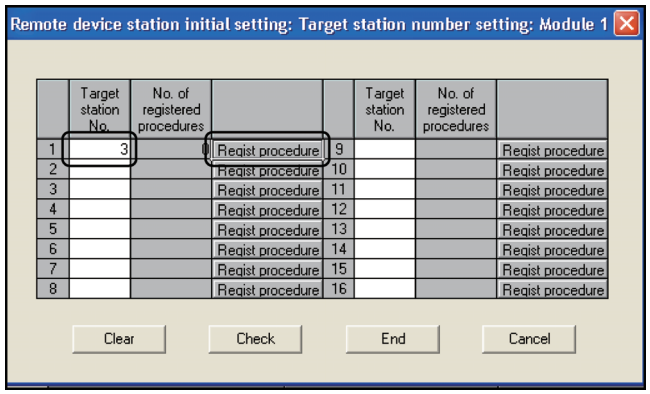


4.3.2 Initialization procedure registration of remote device station

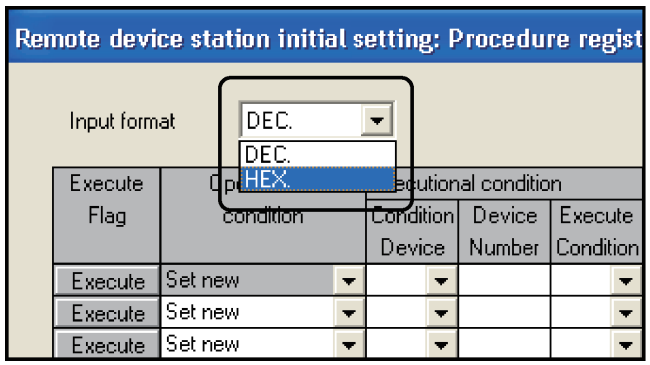
AJ65BT-64AD and AJ65BT-64DAV need the initial settings. (For details, refer to the User's Manual of each module.)
For the master station of the MELSEC-Q series, the initial settings of the remote device station are automatically performed by registering the procedure to the network parameters, and so the sequence program can be simplified.
The following describes the operation of the initialization procedure registration using the initial settings as an example.
The sequence program examples applicable to the registration are given at the end of this section.



1) Click the Initial settings button of the network parameter setting dialog box.

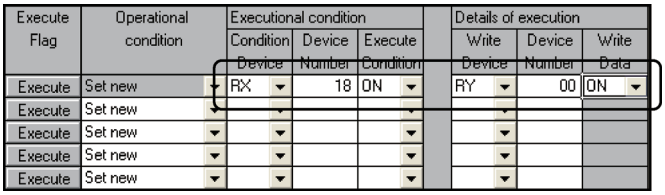


2) The "Remote device station initial setting" dialog box appears. Input "3" in "Target station No." and click "Regist procedure".



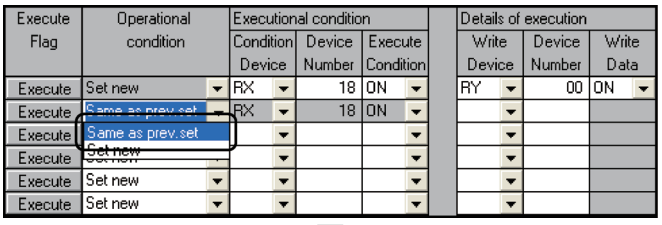
3) The "Remote device station initial setting: Procedure registration" screen appears. Set "HEX." for “Input format”.

Note: Changing the input format between “DEC.” and “HEX.” is possible during the setting.



4) Set the top line as follows.
- "Executional condition" ..... RX, 18, ON
- "Details of execution" ..... RY, 00, ON

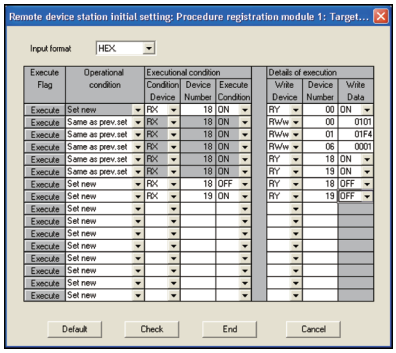
(The above setting means that RY0 turns ON when RX18 turns ON.)



5) Set the "Operational condition" of the second line to "Same as prev. set".
(When "Same as prev. set" is selected, the same condition as the above is selected.)

Continued to the next page

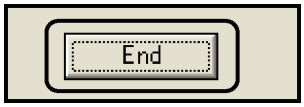
Continued from the previous page



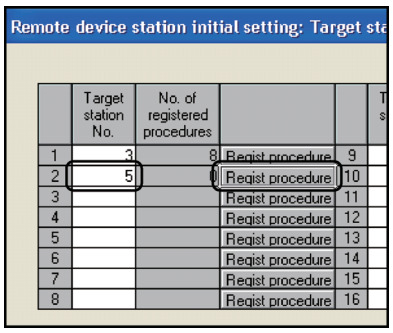
6) Set as indicated on the left with the steps from 4) to 5).

Note 1: Note that the number of RX/RY and RWw/RWr is only for each module and not the serial number for the CC-Link system.

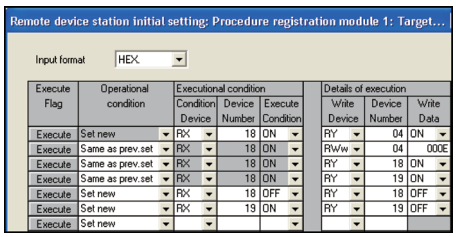
Note 2: The more the initial settings of the remote device station are, the slower the scan time becomes.



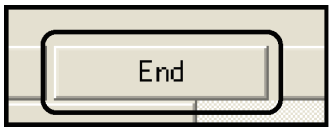
7) Click the [End] button of the "Remote device station initial setting: Procedure registration" dialog box.



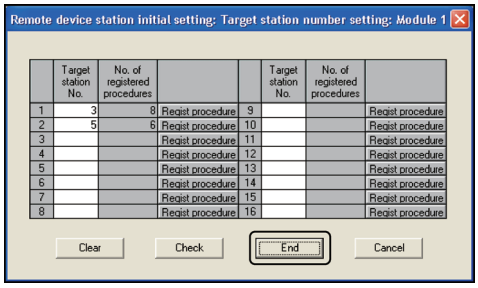
8) Input "5" in "Target station No." in the "Remote device station initial setting" dialog box and click "Regist procedure".



9) Set as indicated on the left screen.



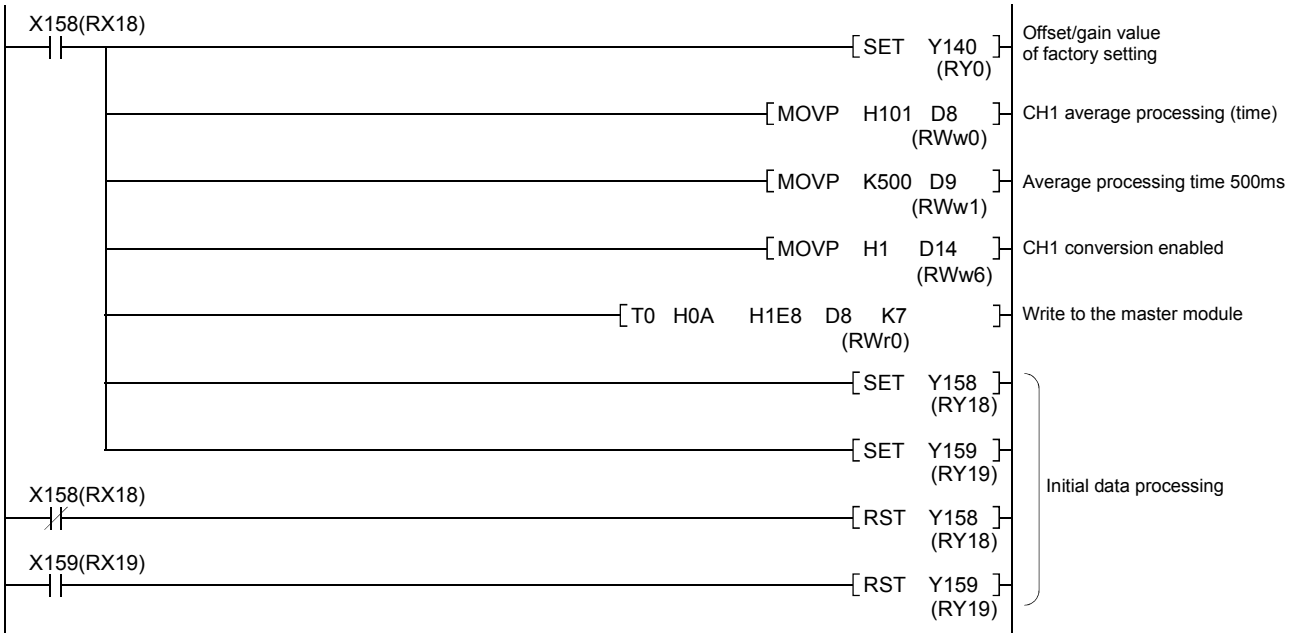
10) Click the [End] button of the "Remote device station initial setting: Procedure registration" dialog box.



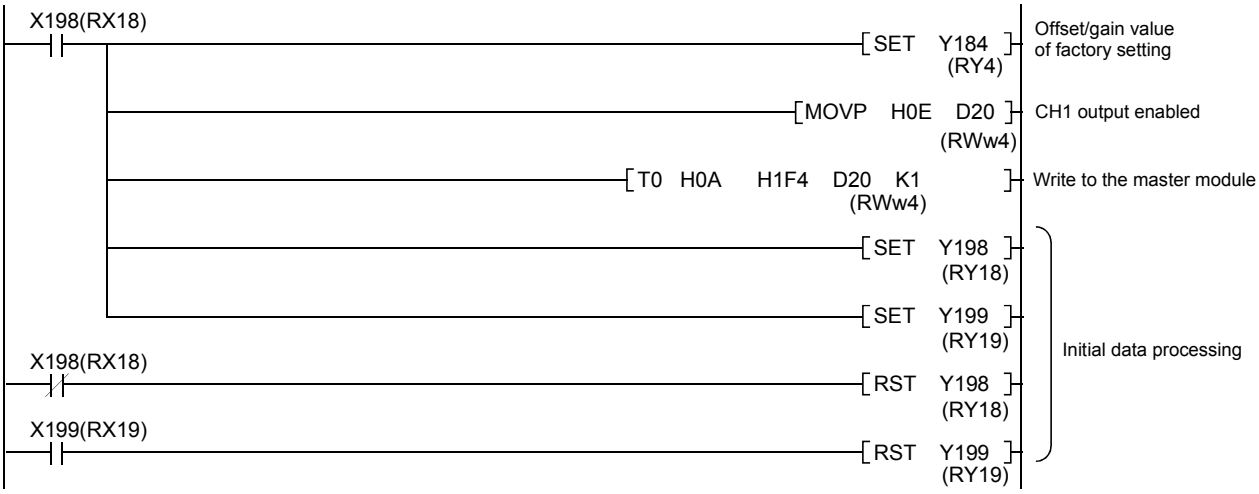
11) Click the [End] button of the "Remote device station initial setting" dialog box.
This completes the initial settings of the remote device station.
After the initial settings are completed, click the [End] button of the network parameter setting screen and write to the PLC CPU.

<Reference> When making the initial settings of Assignment II on the CC-Link of MELSEC-A, the following sequence program is required:

• Initial setting of station number 3 (AJ65BT-64AD)



• Initial setting of station number 5 (AJ65BT-64DAV)



4.4 Sequence Program

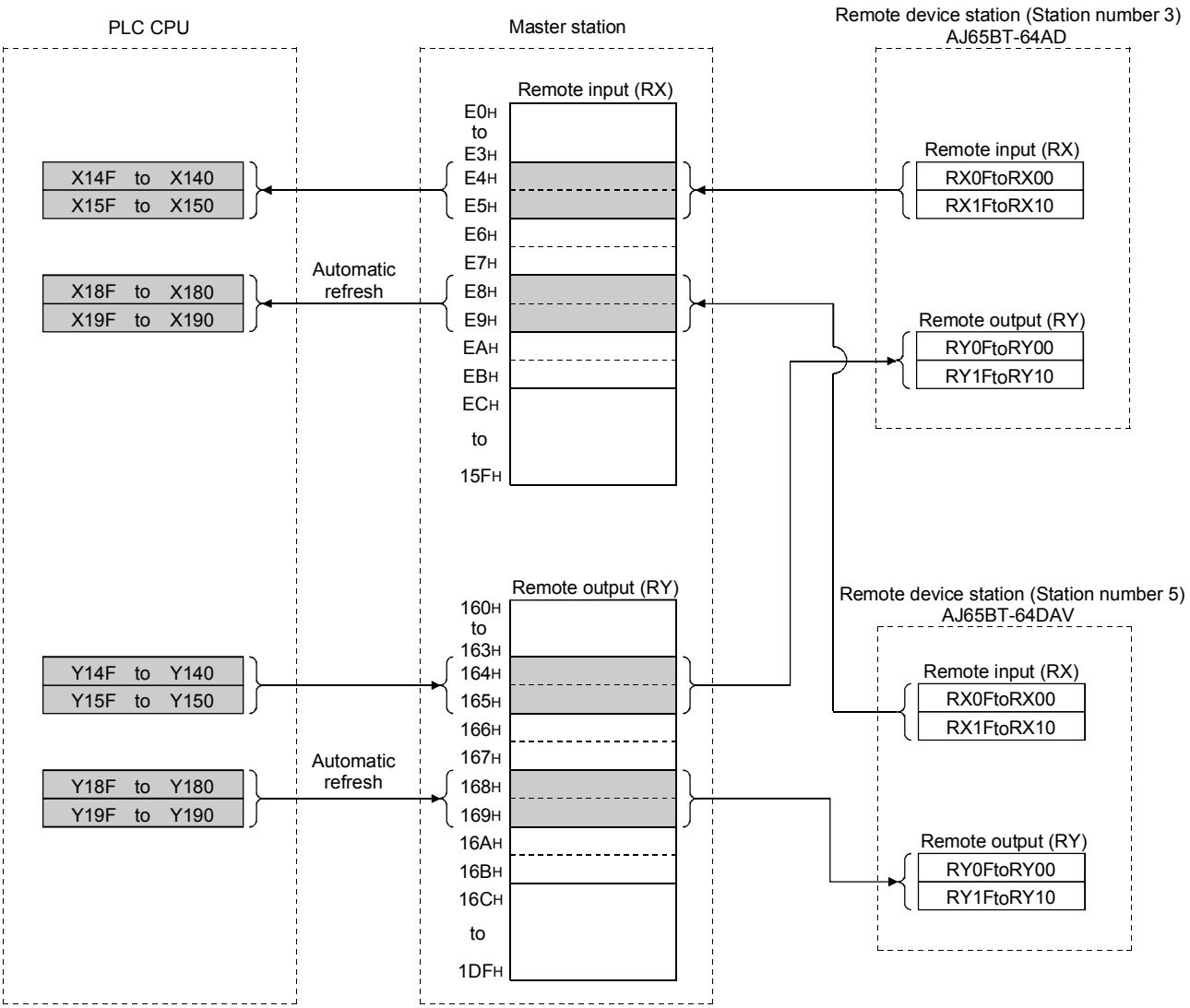
(1) Refresh support

The following shows the refresh relationship between the PLC CPU, the master station buffer memory and the remote device stations.

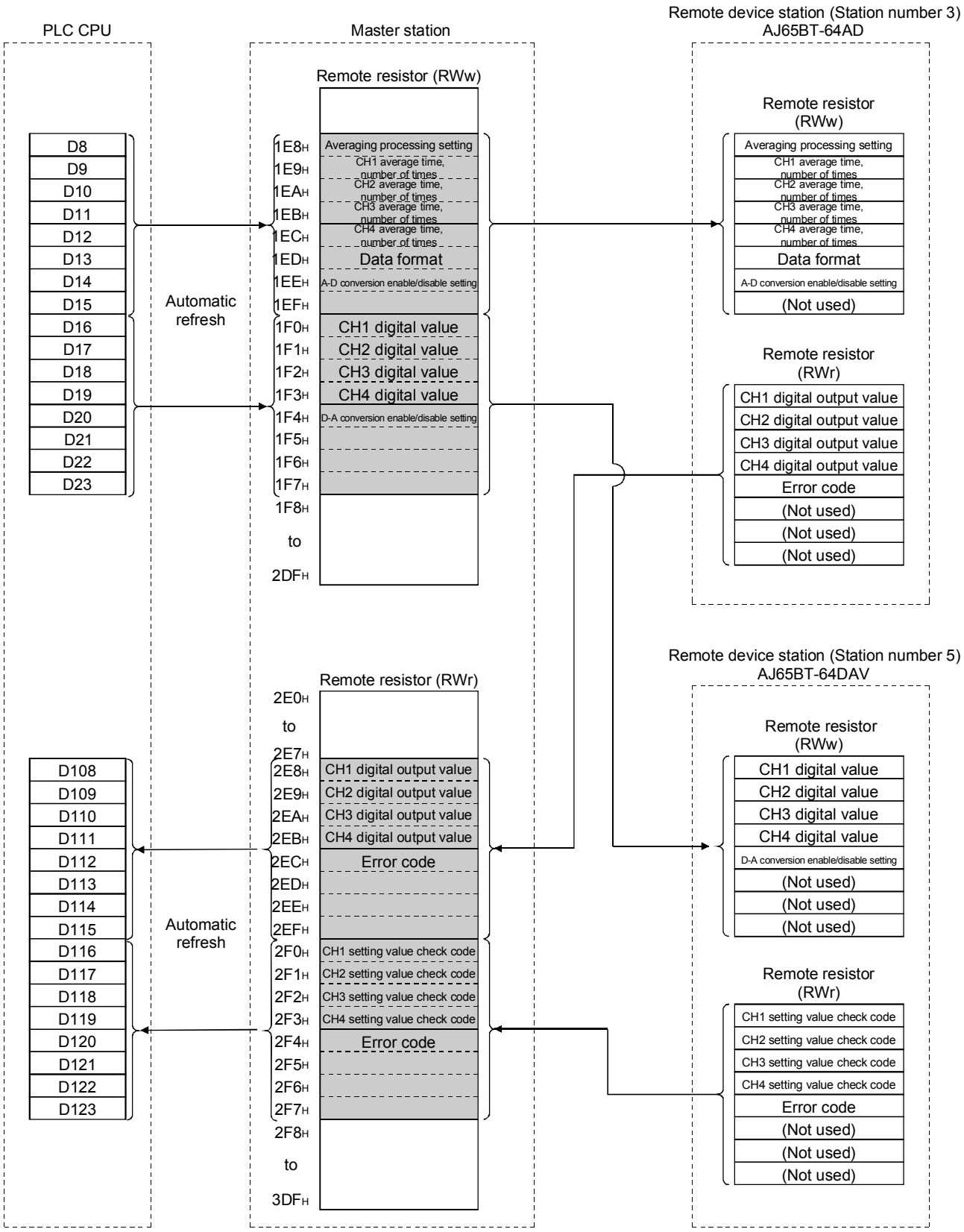
The refresh relationship between the PLC CPU, the master station buffer memory and the remote I/O stations is the same as that of Assignment I.

For details of each remote device station, refer to the User's Manual of each module.

[Remote input (RX), Remote output (RY)]



[Remote resistor (RWw, RWr)]



(2) Setting checklist

(a) Station information setting checklist

Station No.	Station type	Number of occupied stations	Reserved station/disable station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic update
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

(b) Device assignment checklist

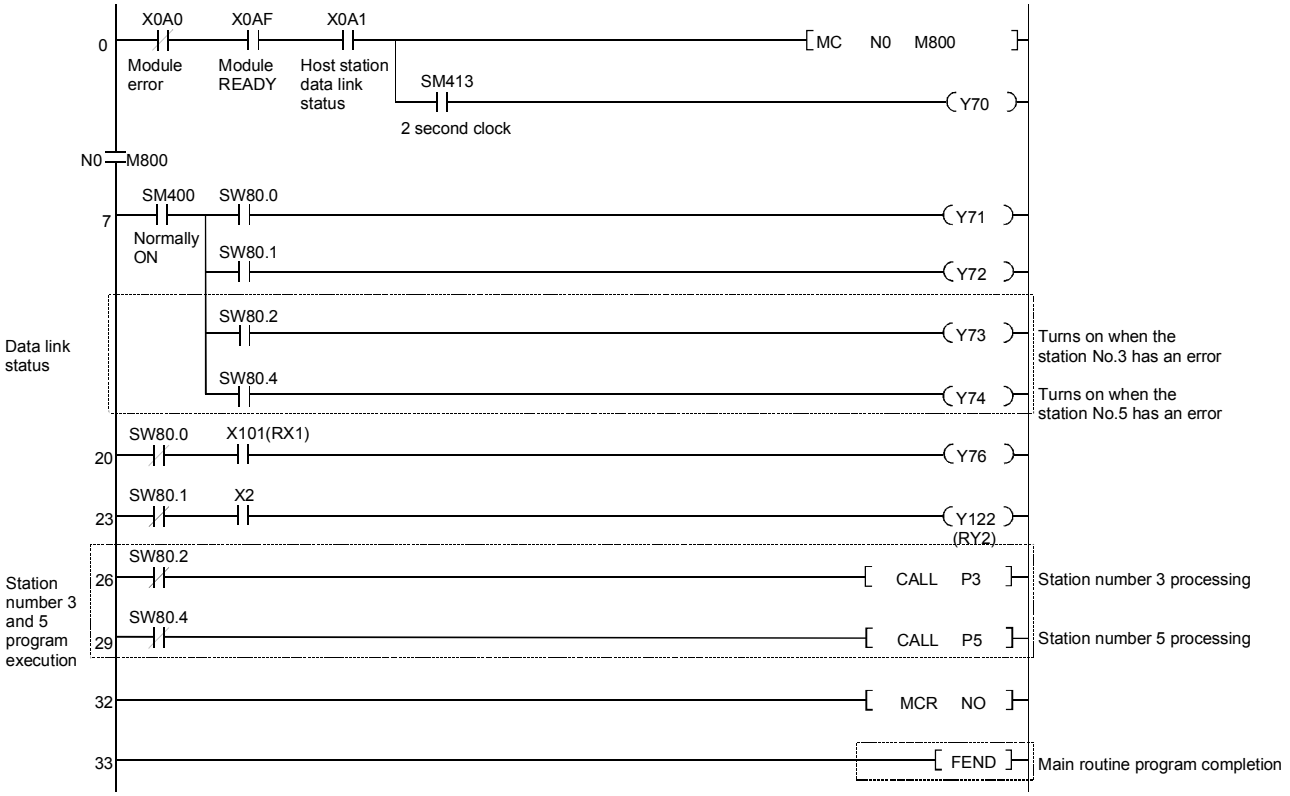
Device / Station No.	RX → ( )		RY ← ( )		RWw → ( )		RWr ← ( )	
	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

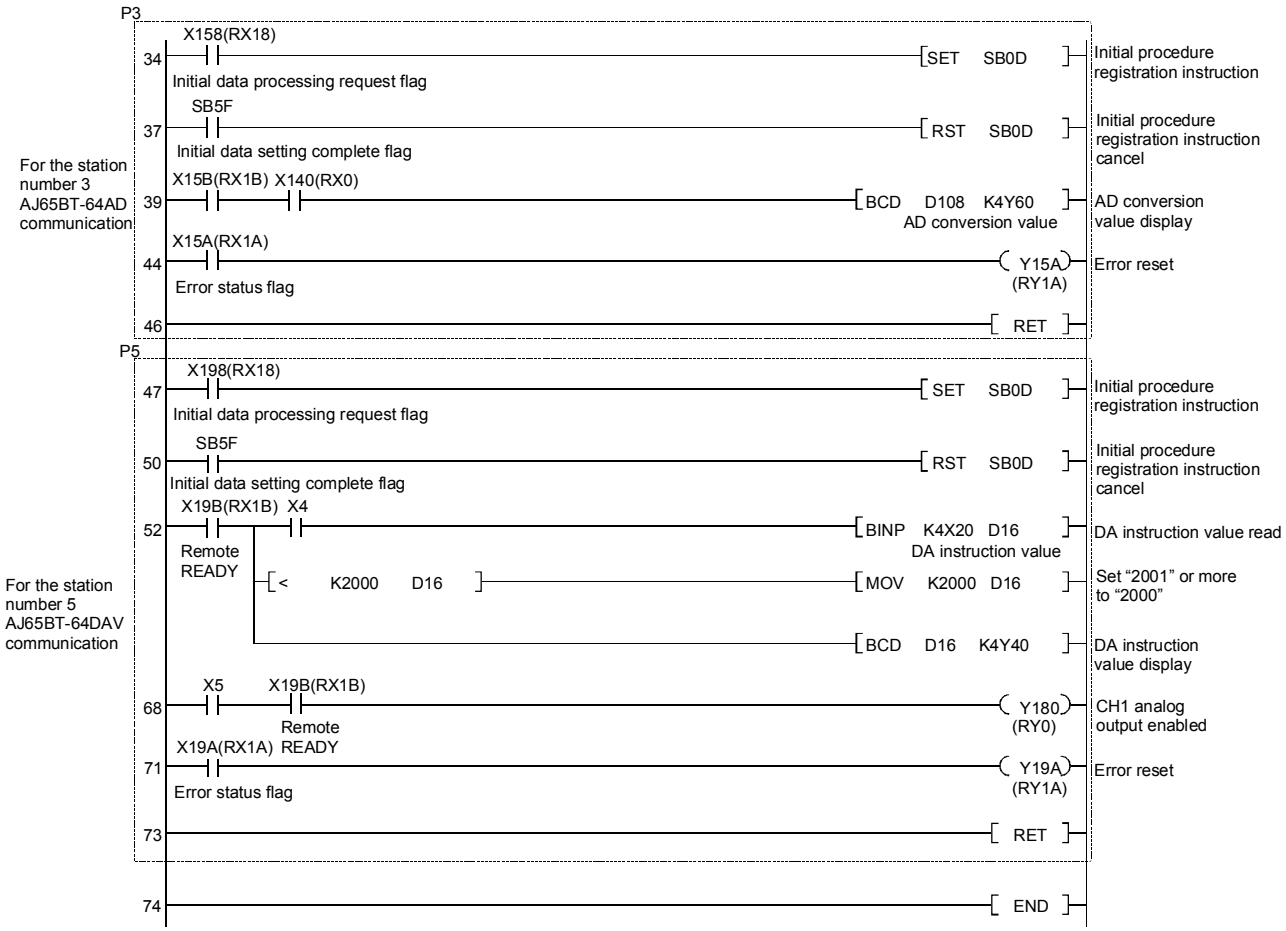
(3) Sequence program

Create the following sequence program and then write it to the PLC CPU.

The broken line (----) part indicates the parts which are added to or changed from the sequence program of Assignment I.

Drive/Path	A:\Q-CC\GXDEV
Project name	EX2




P3
X158(RX18)
34
SET SB0D
Initial procedure registration instruction
Initial data processing request flag
SB5F
37
RST SB0D
Initial procedure registration instruction cancel
Initial data setting complete flag
For the station number 3 AJ65BT-64AD communication
X15B(RX1B) X140(RX0)
39
BCD D108 K4Y60
AD conversion value
AD conversion value display
X15A(RX1A)
44
Y15A (RY1A)
Error reset
Error status flag
46
RET
P5
X198(RX18)
47
SET SB0D
Initial procedure registration instruction
Initial data processing request flag
SB5F
50
RST SB0D
Initial procedure registration instruction cancel
Initial data setting complete flag
X19B(RX1B) X4
52
BINP K4X20 D16
DA instruction value
DA instruction value read
Remote READY
< K2000 D16
MOV K2000 D16
Set “2001” or more to “2000”
For the station number 5 AJ65BT-64DAV communication
BCD D16 K4Y40
DA instruction value display
X5 X19B(RX1B)
68
Y180 (RY0)
CH1 analog output enabled
Remote READY
X19A(RX1A)
71
Y19A (RY1A)
Error reset
Error status flag
73
RET
74
END

4.5 Communication with the Remote Device Station

4.5.1 Communication using the sequence program

The communication with the remote device station can be made using the sequence program written in the PLC CPU.

Switch operation of demonstration machine

1) Reset with the RESET/L.CLR switch on the PLC CPU.

2) Set the RUN/STOP switch on the PLC CPU to RUN.
   Y70 .....Flashes by the host data link status (Normal data link)

3) Y6F-Y60 digital display..... The digital output value is displayed.
   Take off the cover on the top of I/O panel and then turn the I/O volume.
   The digital output value also changes in response to the change of the input voltmeter (A/D INPUT).

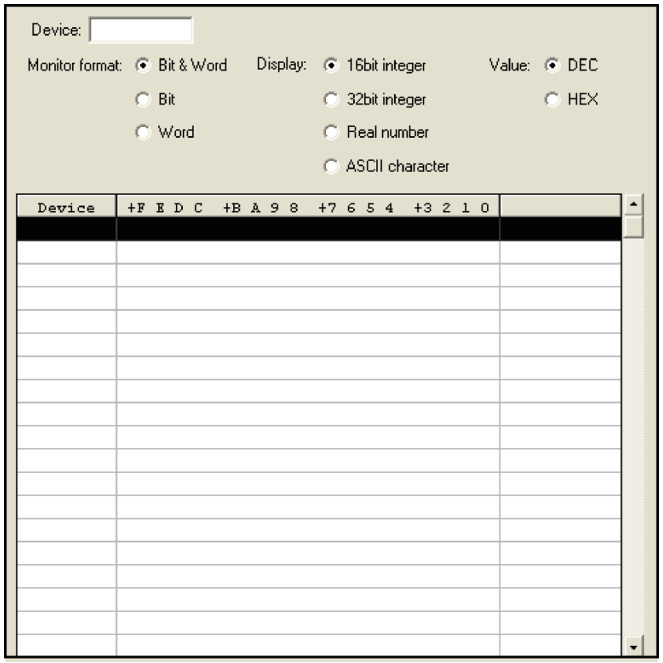
4) By setting the X2F-X20 digital switch to "1,000" as an example, turn X4 ON.
   Y4F-Y40 digital display .....Displays "1,000"

5) Turn X5 ON to DA output.
   The output voltmeter (D/A OUTPUT) on the top of I/O panel indicates approximately 5V.

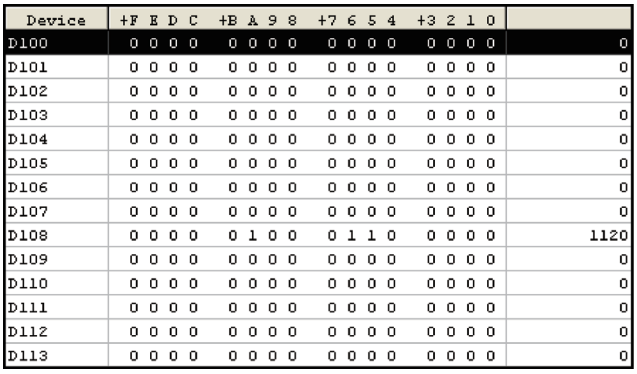
6) By changing the X2F-X20 setting (Range: 0 to 2,000) likewise and turning X4 ON again (ON → OFF → ON), it becomes a corresponding DA output.

4.5.2 Monitoring and test of remote device station

In the communication with the remote device station, the monitoring and test are performed by GX Developer.
For the monitoring and device test, refer to the operation in Section 3.6.

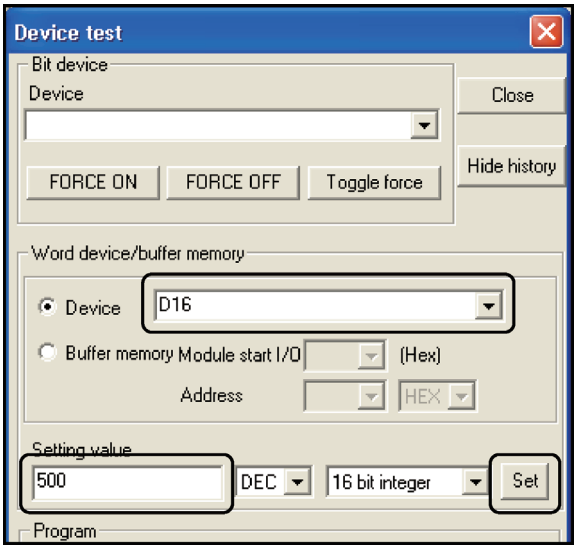


1) Open the device batch monitor screen.



Device	+F E D C	+B A 9 8	+7 6 5 4	+3 2 1 0	
D100	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D101	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D102	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D103	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D104	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D105	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D106	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D107	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D108	0 0 0 0	0 1 0 0	0 1 1 0	0 0 0 0	1120
D109	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D110	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D111	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D112	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0
D113	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0

2) Input "D100" in "Device", then click the [Start monitor] button.
Confirm that the digital output value is stored in D108.



3) Click the [Device test] button, then the "Device test" dialog box appears.
Select "Device" in "Word device/buffer memory", then input "D16".
Input "500" in "Setting value", then click the [Set] button.

4) “500” is stored in the CH.1 digital value setting area of the AJ65BT-64DAV, and the output voltmeter (D/A OUTPUT) indicates approximately 2.5V.
This competes the monitoring and test of the remote device station.

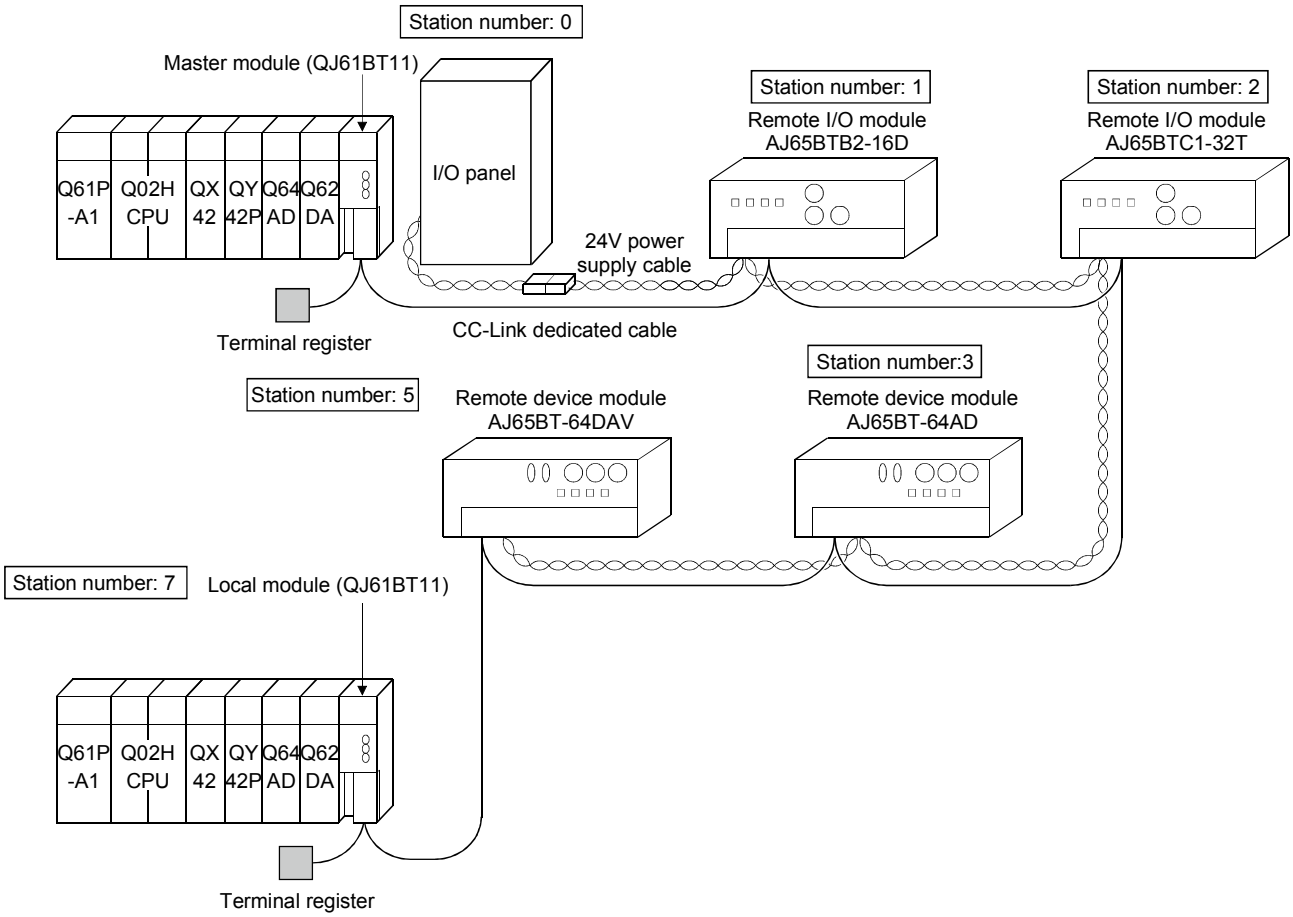
MEMO

CHAPTER 5 ASSIGNMENT 3 (COMMUNICATION BETWEEN THE MASTER STATION AND THE LOCAL STATION)

In this assignment, the exercise when the CC-Link local station is added to the configuration of Assignment II is performed.

5.1 System Configuration of Exercise

The following shows the system configuration of the exercise in Assignment III.

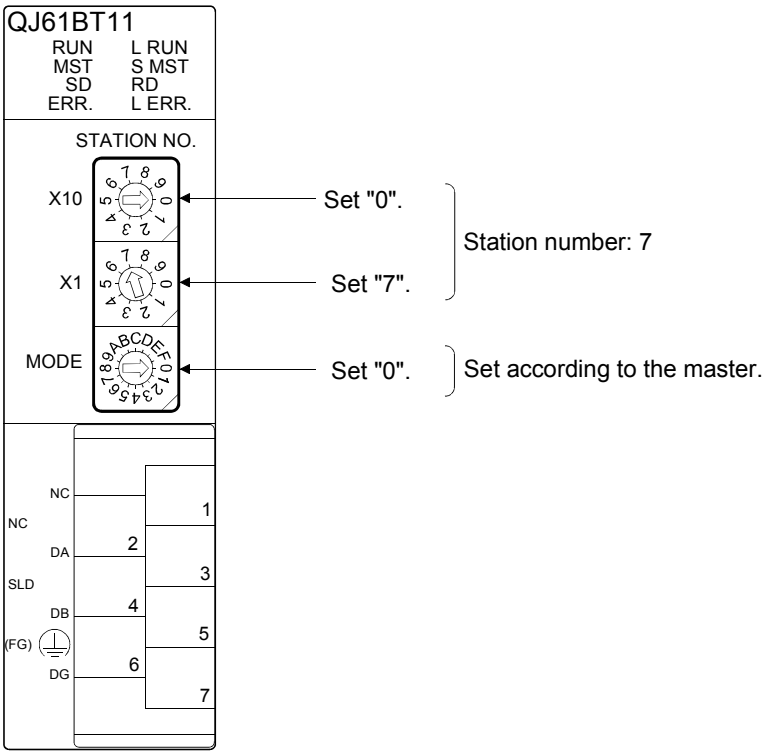


5.2 Settings and Connection of Local Station

This section describes the settings and connection of QJ61BT11 at the local station side.

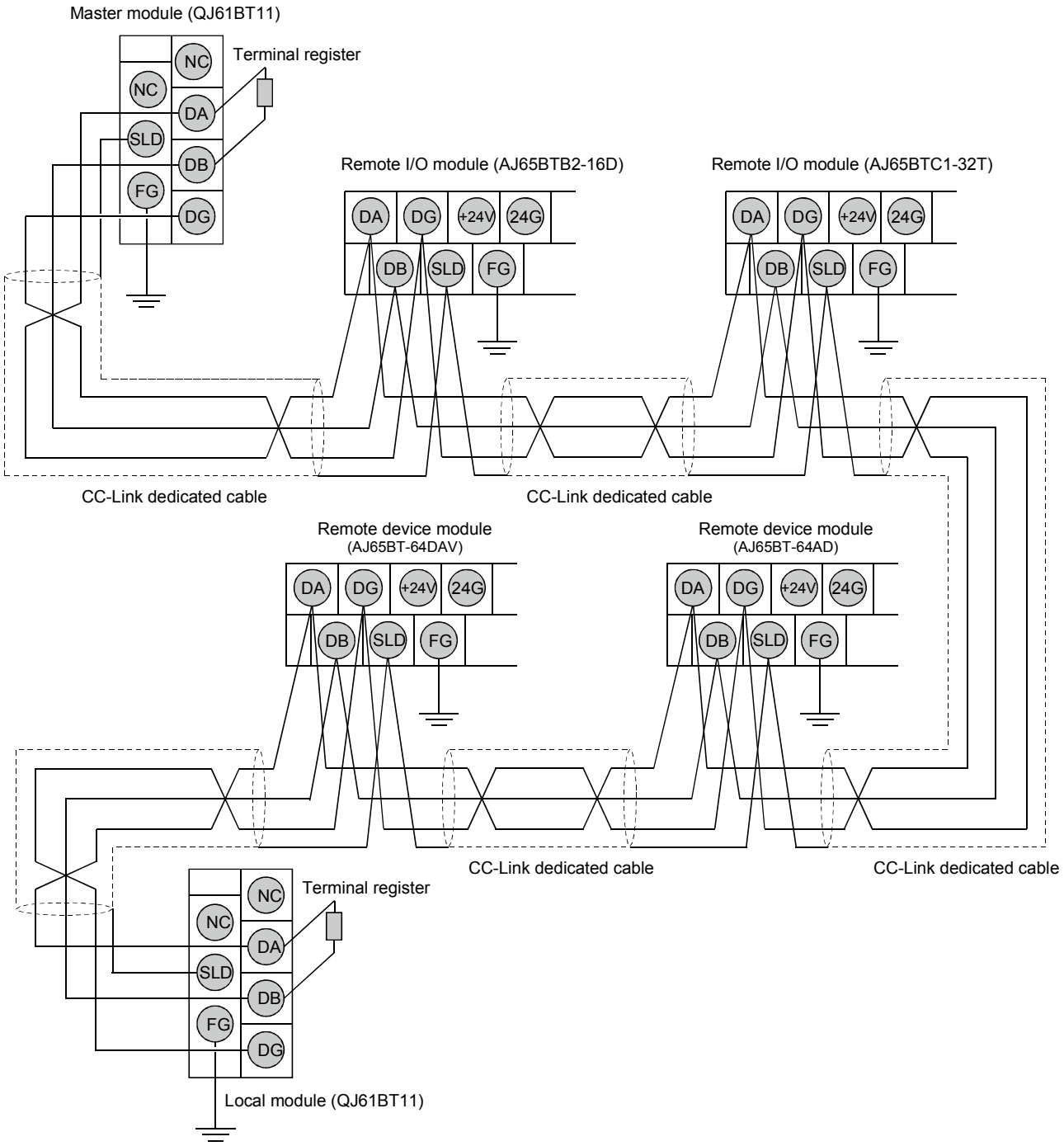
5.2.1 Module settings

This section describes the settings of QJ61BT11 at the local station side.



5.2.2 Module connection

The following shows the connection of CC-Link dedicated cables and terminal resistors in Assignment III.
The connection of 24V power supply cable is the same as that of Assignment II.
When wiring a cable such as a CC-Link dedicated cable, make sure to turn the power off before wiring.



5.3 Settings of Network Parameters and Automatic Refresh Parameters

5.3.1 Network parameters/automatic refresh parameters of master station

Set the following network parameters and automatic refresh parameters to the master station, then write them to the PLC CPU. (The initial settings are the same as those of Assignment II.) For the settings and write operation, refer to Section 3.5.2 to 3.5.4.

• Network parameters/auto refresh parameters

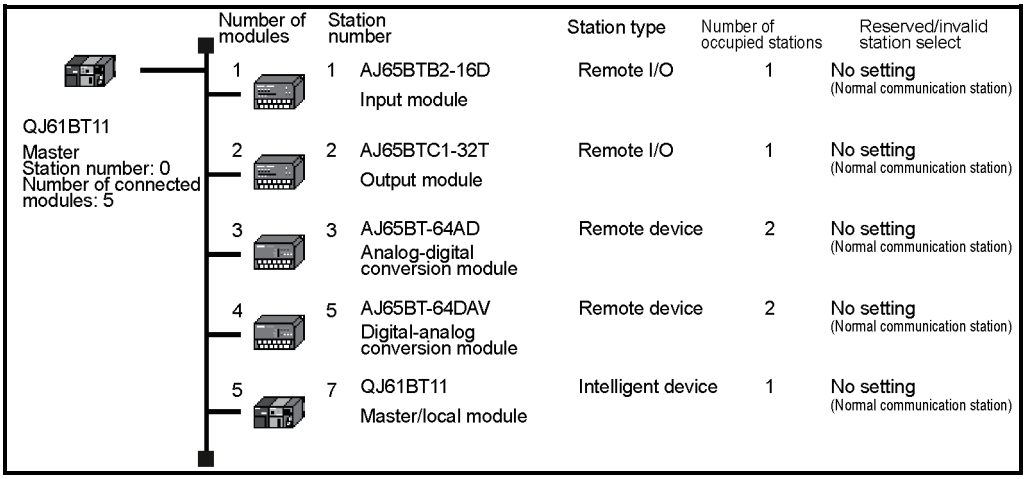
[Number of module "1"]

	1
Start I/O No	00A0
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	5
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	D100
Remote register(RWw)	D0
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

• Station information

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 I/O station	single	Exclusive station 1	32 points	No setting			
3/ 3	Remote device station	single	Exclusive station 2	64 points	No setting			
4/ 5	Remote device station	single	Exclusive station 2	64 points	No setting			
5/ 7	Intelligent device station	single	Exclusive station 1	32 points	No setting	64	64	128

<Reference> The station information of Assignment III is shown in the figure below.



5.3.2 Network parameters/automatic refresh parameters of local station

Set the following network parameters and automatic refresh parameters to the local station, then write them to the PLC CPU.
For the settings and write operation, refer to Section 3.5.2 to 3.5.4.

• Network parameters/automatic refresh parameters
[Number of module "1"]

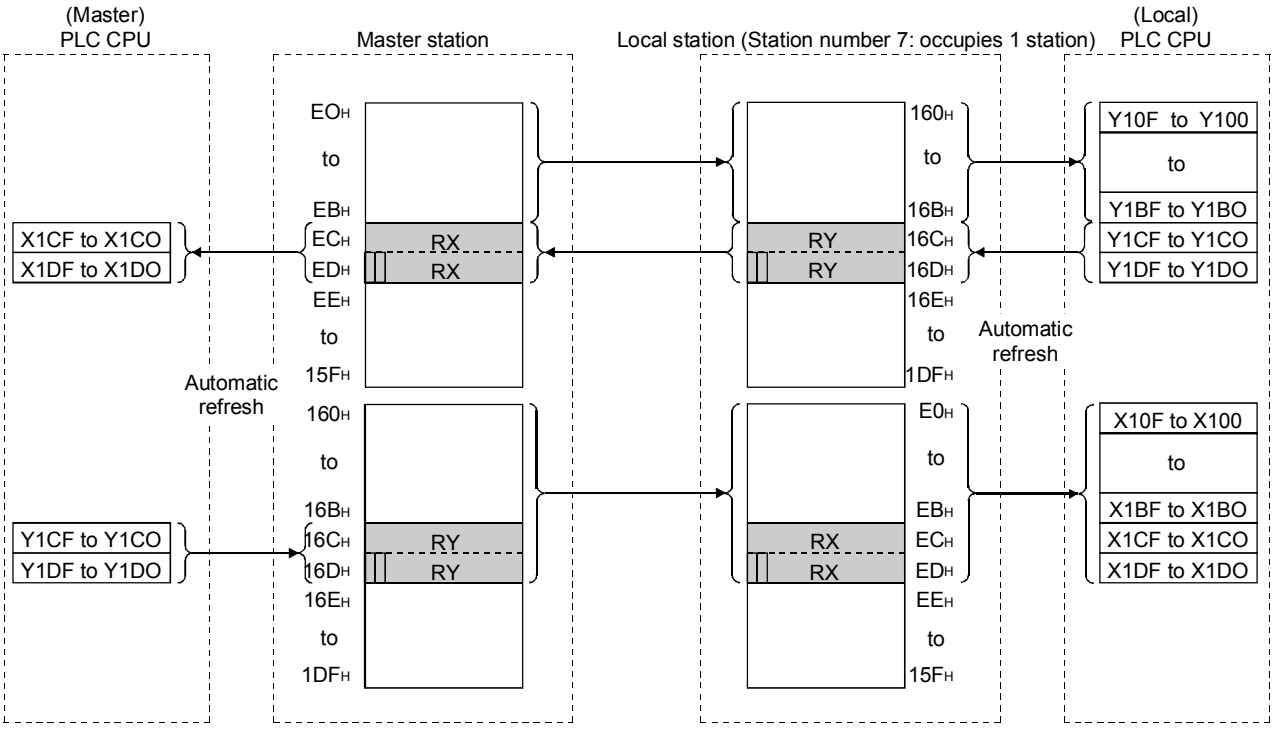
	1
Start I/O No	00A0
Operational setting	Operational settings
Type	Local station
Master station data link type	
Mode	Remote net(Ver.1 mode)
All connect count	
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	D0
Remote register(RWw)	D100
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	
Automatic reconnection station count	
Stand by master station No.	
PLC down select	
Scan mode setting	
Delay infomation setting	
Station information setting	
Remote device station initial setting	
Interrupt setting	Interrupt settings

5.4 Sequence Program

The following shows the refresh relationship between the PLC CPU devices, the master station buffer memory and the local station buffer memory.
The relationship between the PLC CPU, the master station buffer memory and the remote I/O station is the same as that of Assignment II.
Note that RX and RY are crossed between the master station and the local station.
(Refer to Section 1.2 (5).)

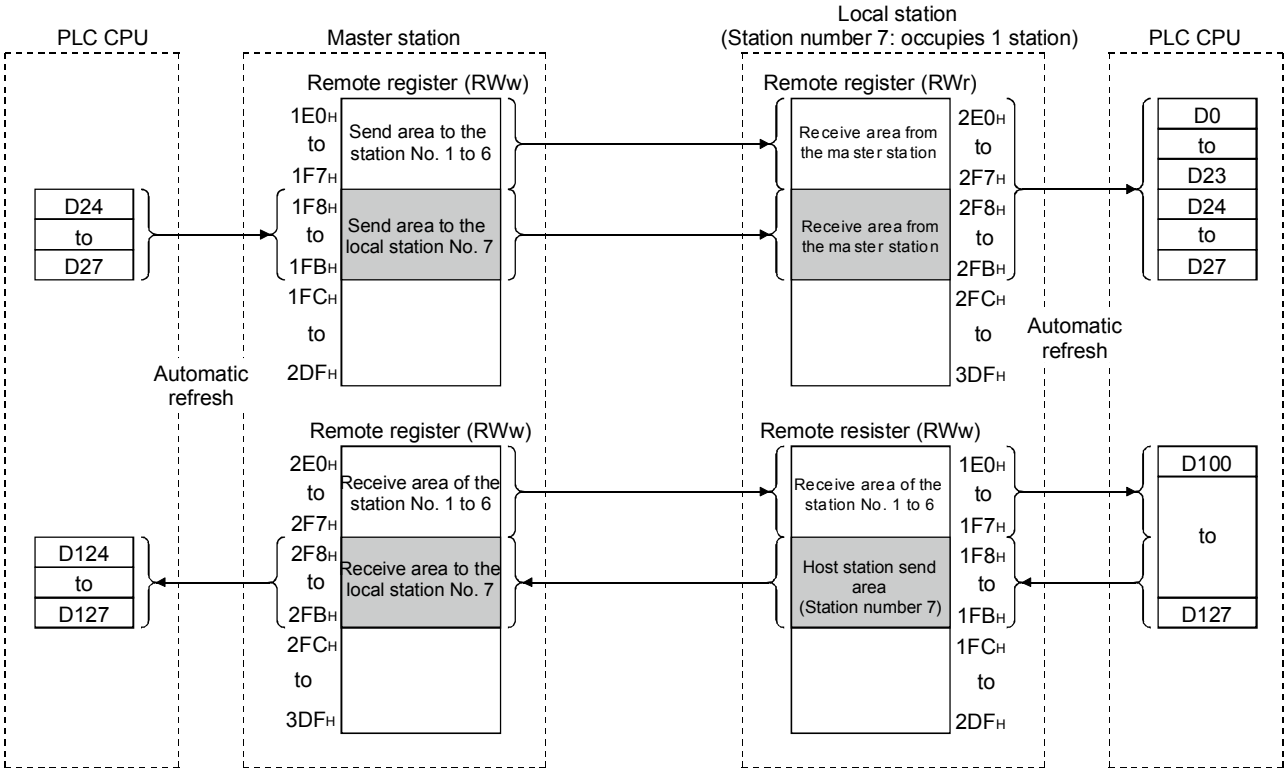
(1) Refresh support

[Remote input (RX), Remote output (RY)]



...The last two bits cannot be used for the communication between the master station and the local station.

[Remote register (RWw, RWr)]



Between the master station and the local station, each data is crossed to be stored.
The following shows the data flow of the master and local stations when the station number is 7 (The number of occupied stations: 1).

Master station		Data flow	Local station (Station No. 7)	
Device	Buffer memory address		Device	Buffer memory address
RX	EC_H to ED_H	←	RY	$16C_H$ to $16D_H$
RY	$16C_H$ to $16D_H$	→	RX	EC_H to ED_H
RWw	$1F8_H$ to $1FB_H$	←	RWr	$2F8_H$ to $2FB_H$
RWr	$2F8_H$ to $2FB_H$	→	RWw	$1F8_H$ to $1FB_H$

(2) Setting checklist

(a) Station information setting checklist

Station No.	Station type	Number of occupied stations	Reserved station/invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic update
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

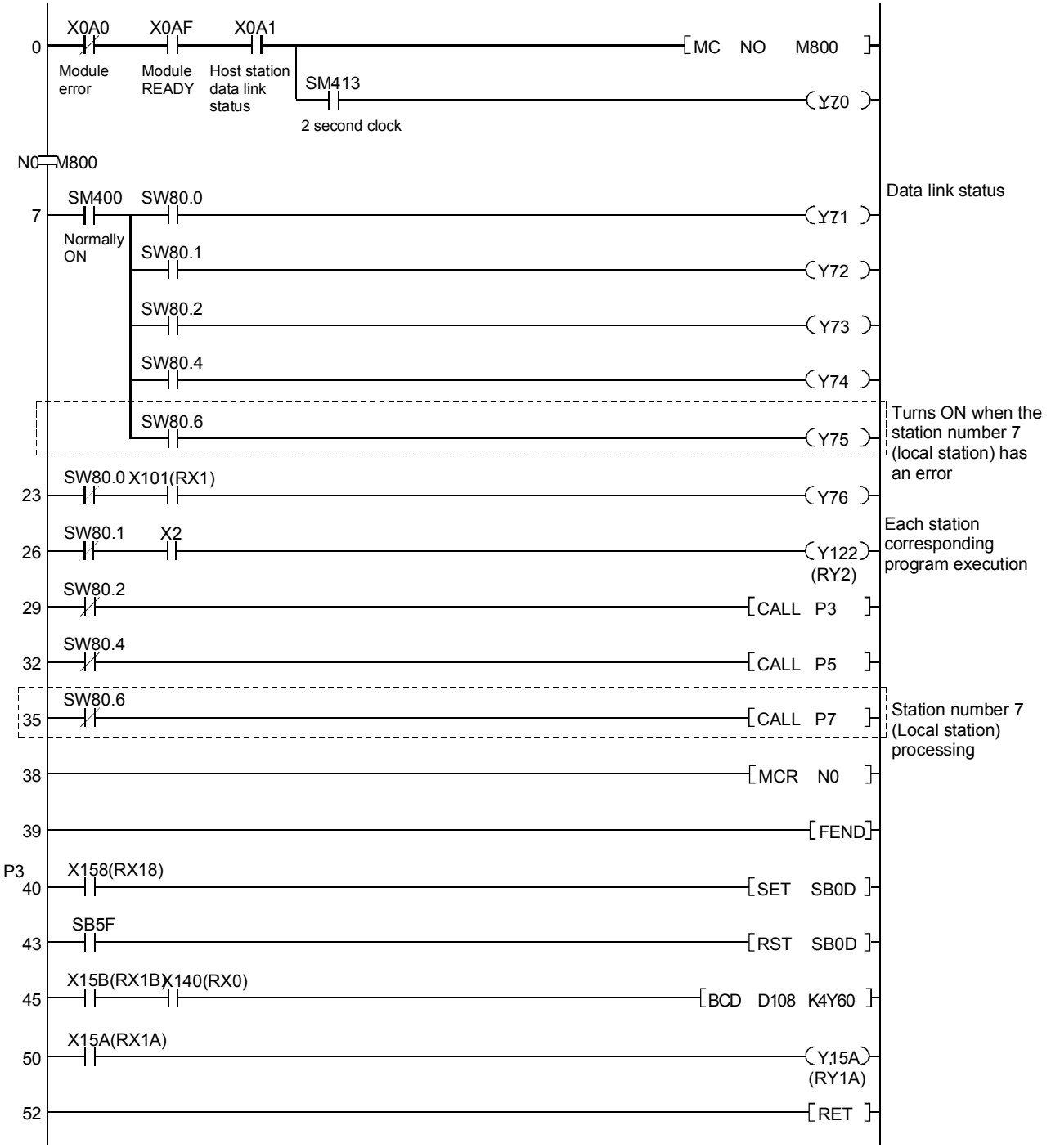
(b) Device assignment checklist

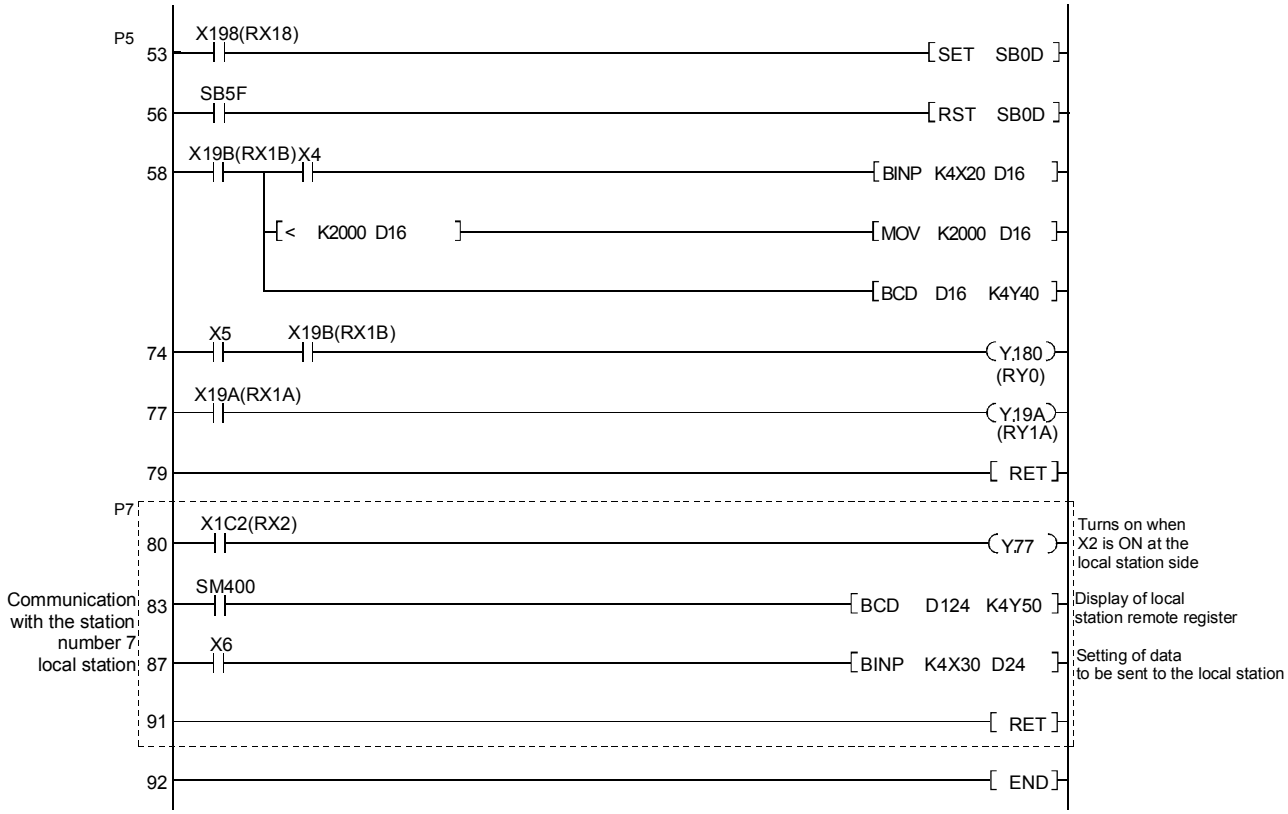
Device / Station No.	RX → ( )		RY ← ( )		RWw → ( )		RWr ← ( )	
	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

5.4.1 Sequence program at the master station side

Create the following sequence program and then write it to the PLC CPU at the master station side.
The broken line (----) part indicates the parts which are added to or changed from the sequence program of Assignment II.

Drive/Path	A:\Q-CC\GXDEV
Project name	EX3-M

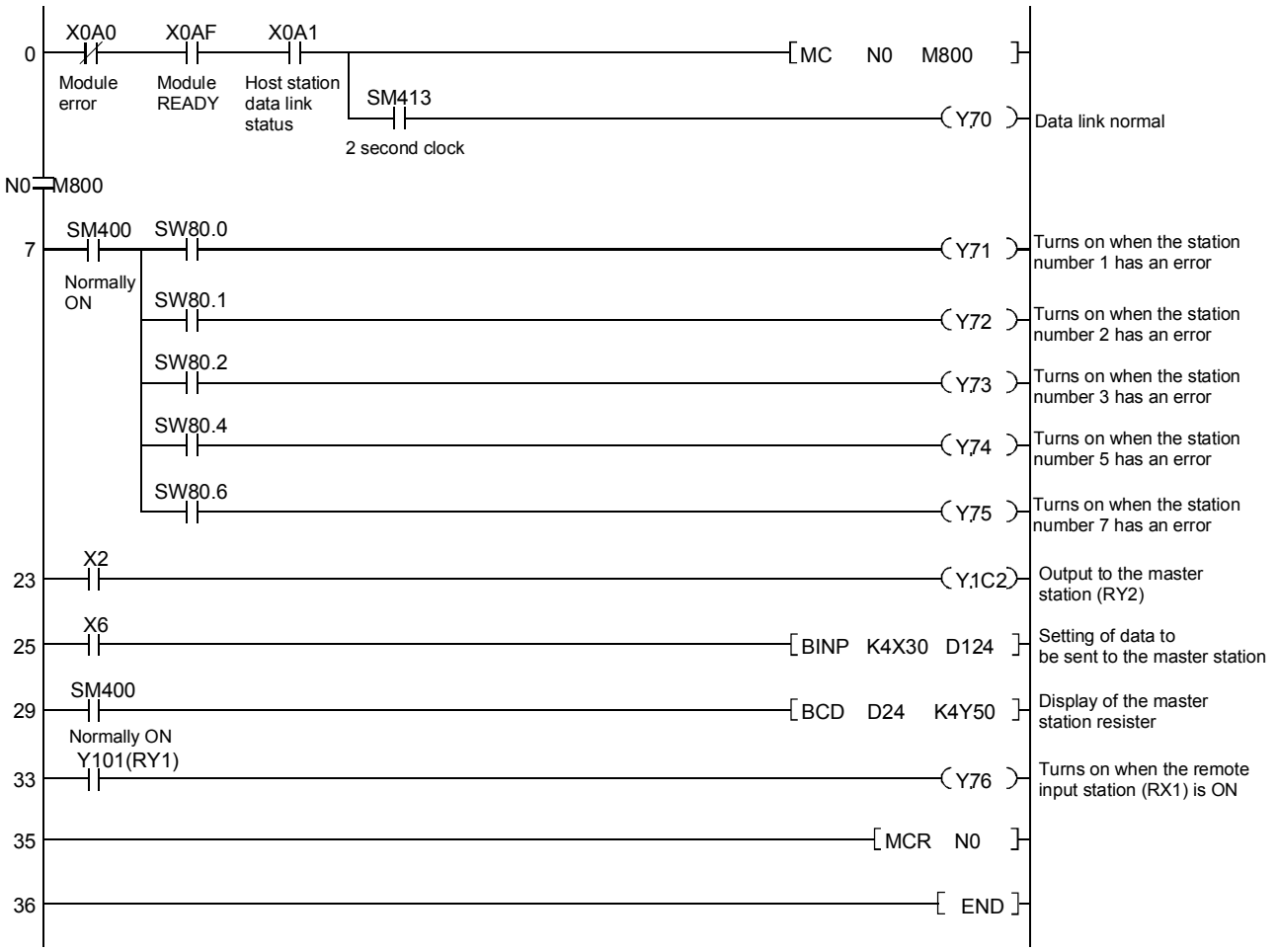



P5
53
X198(RX18)
SET SB0D
56
SB5F
RST SB0D
58
X19B(RX1B)
X4
BINP K4X20 D16
< K2000 D16
MOV K2000 D16
BCD D16 K4Y40
74
X5
X19B(RX1B)
Y180
(RY0)
77
X19A(RX1A)
Y19A
(RY1A)
79
RET
P7
80
X1C2(RX2)
Y77
Turns on when X2 is ON at the local station side
Communication with the station number 7 local station
83
SM400
BCD D124 K4Y50
Display of local station remote register
87
X6
BINP K4X30 D24
Setting of data to be sent to the local station
91
RET
92
END

5.4.2 Sequence program at the local station side

Create the following sequence program and then write it to the PLC CPU at the local station side.

Drive/Path	A:\Q-CC\GXDEV
Project name	EX3-L



Switch operation of demonstration machine

1) Reset with the RESET/L.CLR switch of both PLC CPU of the master station and local station.

2) Set the RUN/STOP switch of the PLC CPUs to the master station and local station sides to RUN.
Y70 .....Flickers according to the host data link status (Data link normal)

3) Turn X2 ON to the local station side.
X2 = ON with the local station program → Y1C2=ON
Y1C2 = ON with the master station program → Y77
• (In effect) At the master station side
Y77 .....ON

4) Confirm that the values set with the digital switch X3F-X30 of the master station and the local station can be sent to each other.
• From the master station to the local station
(1) Set the value to the X3F-X30 digital switch to the master station side.
(Example 1234)
(2) Turn ON X6 at the master station.
(3) Check the Y5-Y50 digital display at the local station.
• From the local station to the master station
(1) Set the value to the X3F-X30 digital switch to the local station side.
(Example 5678)
(2) Turn ON X6 at the local station.
(3) Check the Y5-Y50 digital display at the master station.

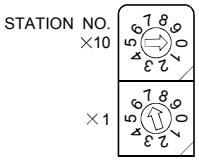
5) Turn ON the terminal block switch of the remote I/O station (AJ65BTB2-16D).
Y76 turns ON when Y101(RY1) turns ON with the local station program.
* X101 (RX1) at the master station corresponds to Y101 (RY1) at the local station.

5.6 Setting of Standby Master Station

The standby master station function is used to operate a station as a local station when the master station is normally operating and controls the data link by switching to a standby master station if a malfunction occurs in the master station.
This section describes the settings for using the standby master station function.

(1) Module Settings

Set the module to be set as a standby master station as follows.

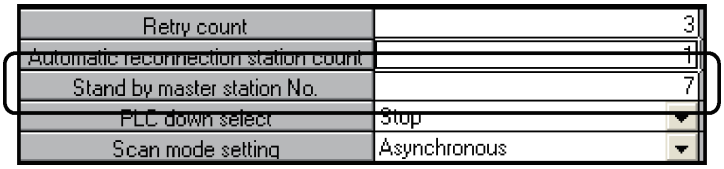
Setting Location	Setting details
Station number setting switches 	Set between 1 and 64.

(2) Network parameter settings

The settings are required for the modules to be a master station and a standby station.

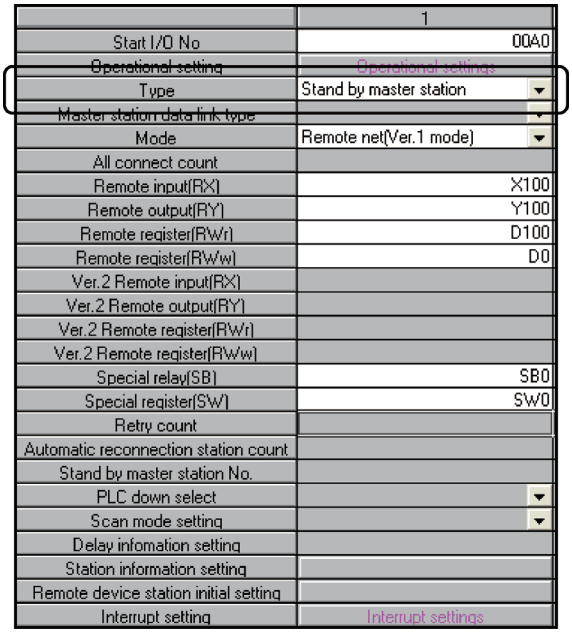
(a) Network parameter of the master station

Set the station number (1 to 64) of the module which is specified as a standby master station to the "Standby master station No." using the network parameters of the master station.



(b) Network parameters of the standby master station

For the network parameters of the standby master station, set "Standby master station" for "Type".



For details of the standby master station function, refer to the User's Manuals of master and local modules.

MEMO

CHAPTER 6 ASSIGNMENT IV (REMOTE I/O NET MODE)

6.1 Features of Remote I/O Net Mode

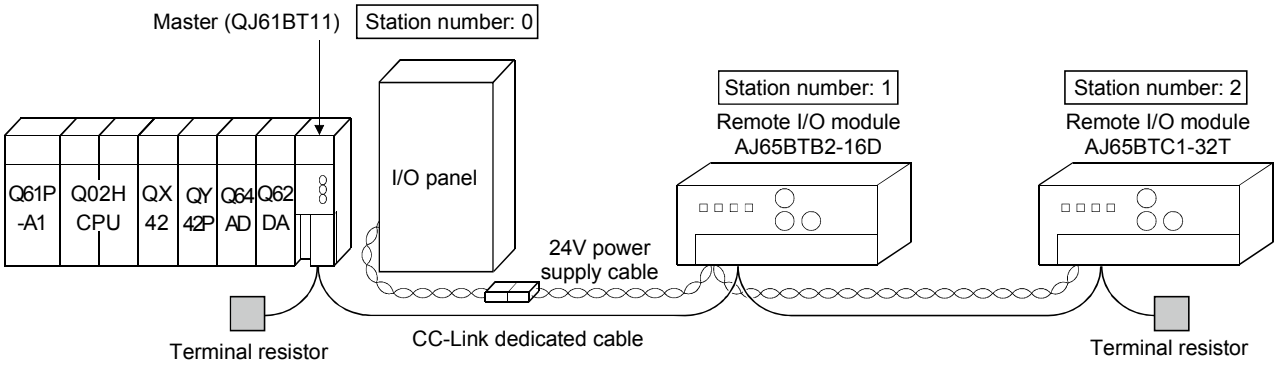
The remote I/O net mode can be used for a system consisting of only the master station and remote I/O stations.
The remote I/O net mode allows a cyclic transmission at high speed so that the link scan time can be shortened.
The table below lists the link scan times for both the remote I/O net mode and the remote net mode.

Number of stations	Remote I/O net mode	Remote net mode
8	0.65ms	1.2ms
16	1.0ms	1.6ms
32	1.8ms	2.3ms
64	3.3ms	3.8ms

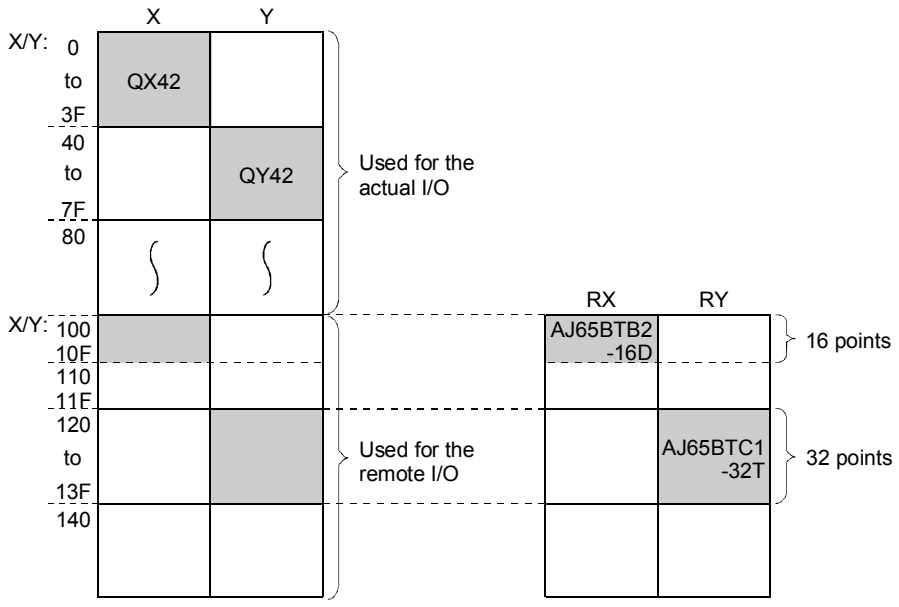
(Transmission rate: at 10Mbps)

6.2 System Configuration of Exercise

The following shows the system configuration of the exercise in Assignment IV.



* The module settings of the master station and remote I/O stations, and the connection of CC-Link dedicated cable 24V power supply cables are the same as those of the exercise system in Assignment I (Section 3.2 and 3.4).



6.3 Settings of Network Parameters and Automatic Refresh Parameters

Set the following network parameters and automatic refresh parameters, then write them to the PLC CPU.
For the settings and write operation, refer to Section 3.5.2 to 3.5.4.
[Number of module "1"]

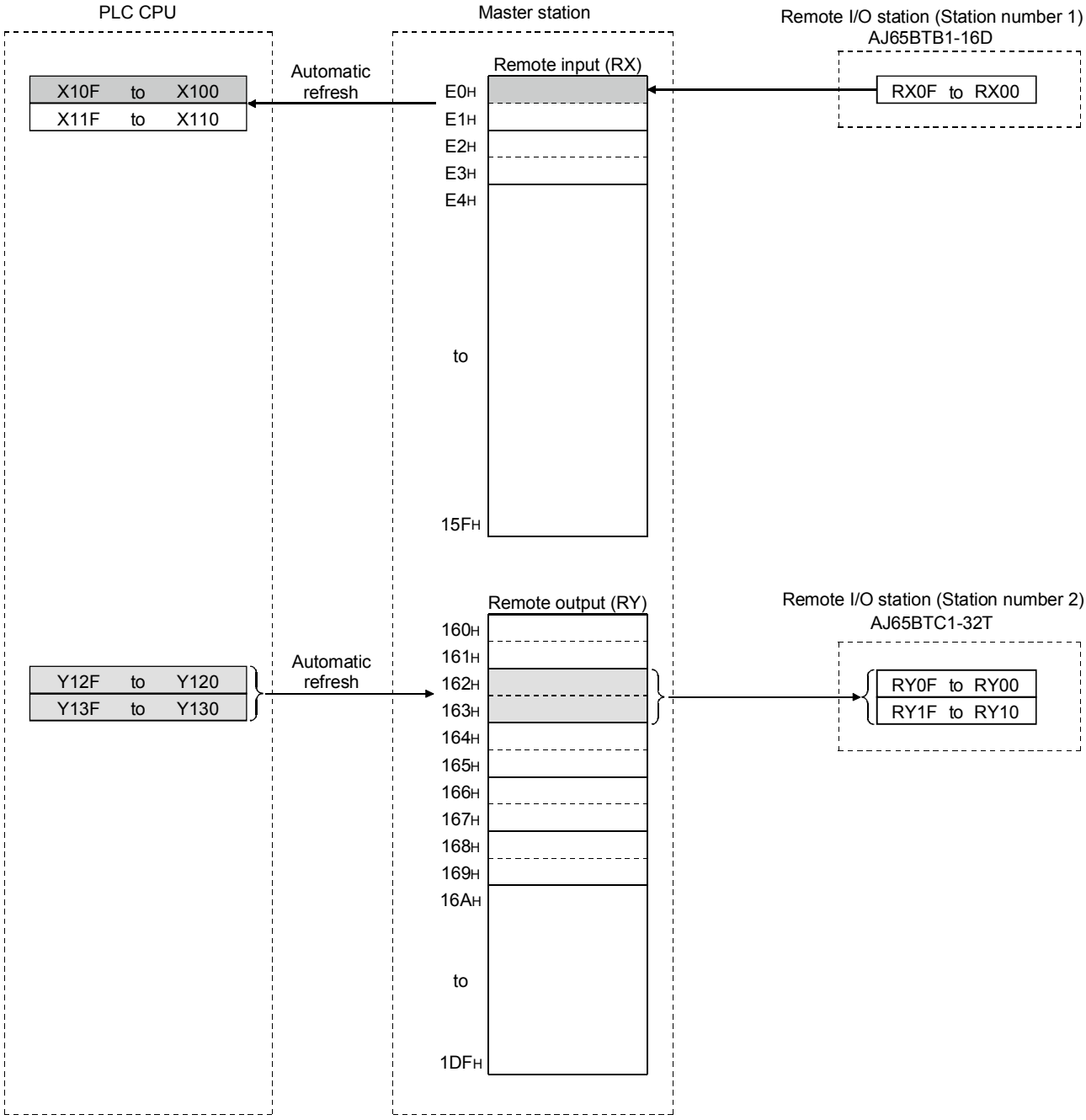
	1
Start I/O No	00A0
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote I/O net mode
All connect count	2
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	
Automatic reconnection station count	
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	
Station information setting	
Remote device station initial setting	
Interrupt setting	Interrupt settings

• Station information is not required in the remote I/O net mode.

6.4 Sequence Program

(1) Refresh support

The following shows the refresh relationship between the PLC CPU, the master station buffer memory and the remote I/O stations.



(2) Setting checklist

(a) Station information setting checklist

Station No.	Station type	Number of occupied stations	Reserved station/invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic update
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

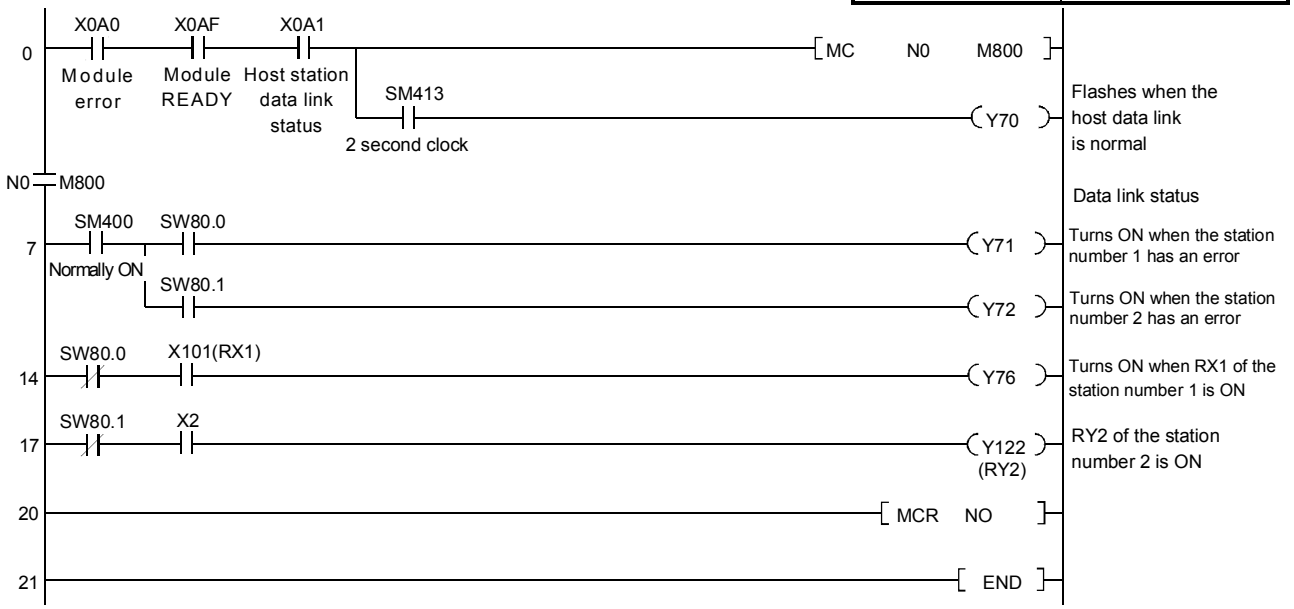
(b) Device assignment checklist

Device / Station No.	RX → ( )		RY ← ( )		RWw → ( )		RWr ← ( )	
	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program

The following sequence program is the same as that of Assignment I.
Write it to the PLC CPU.

Drive/Path	A:\Q-CC\GXDEV
Project name	EX4



6.5 Communication in Remote I/O Net Mode

Switch operation of demonstration machine

1) Reset with the RESET/L.CLR switch on the PLC CPU.

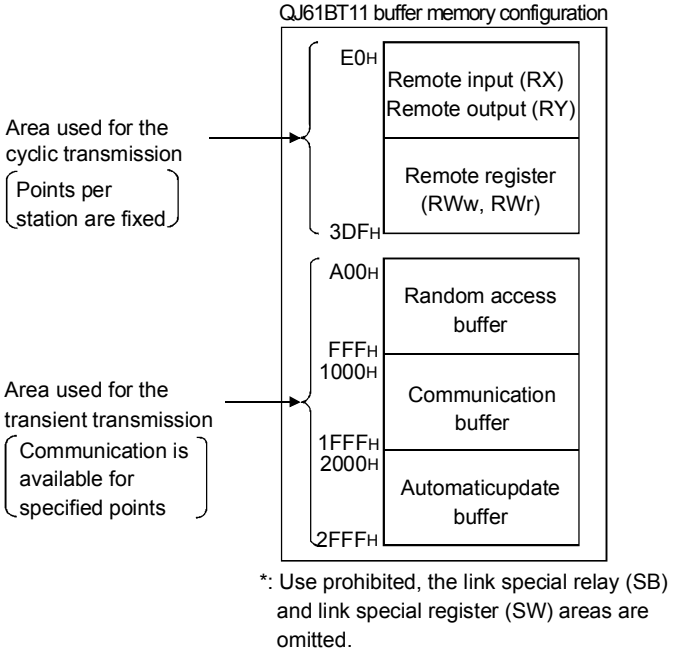
2) Set the RUN/STOP switch on the PLC CPU to RUN.
   Y70 .....Flashes according to the host data link status (Data link normal)

3) Turn ON the terminal block switch of the remote I/O station (AJ65BTB2-16D).
   Y76 .....Turns ON by RX1=ON

4) Turn X2 ON.
   LED (A 2) of the remote I/O station (AJ65BTC1-32T)..... ON

CHAPTER 7 ASSIGNMENT V (TRANSIENT TRANSMISSION: COMMUNICATION WITH RS-232 INTERFACE MODULE)

In this assignment, the exercise for communicating with the intelligent device station by a transient transmission is performed.
The intelligent device station is a station where can make a 1 to 1 data communication (a transient transmission) with a specified station apart from the cyclic transmission using the devices (RX, RY, RWr, RWw) of the remote station where are assigned to the master station. (The transient transmission is also available for the local station.)
For the AJ65BT-R2 type RS-232C interface module, the communication is performed using the communication buffer of the master module or the automatic update buffer.



*: Use prohibited, the link special relay (SB) and link special register (SW) areas are omitted.

In Assignment V, the reading and writing of the data communicating between the AJ65BT-R2 and the automatic update buffer of the master module are performed using the RIFR and RITO dedicated instructions.

- RIFR: Reads data from the automatic update buffer or the random access buffer for the specified station in the host master module.
- RITO: Writes data into the automatic update buffer or the random access buffer for the specified station in the host master module.

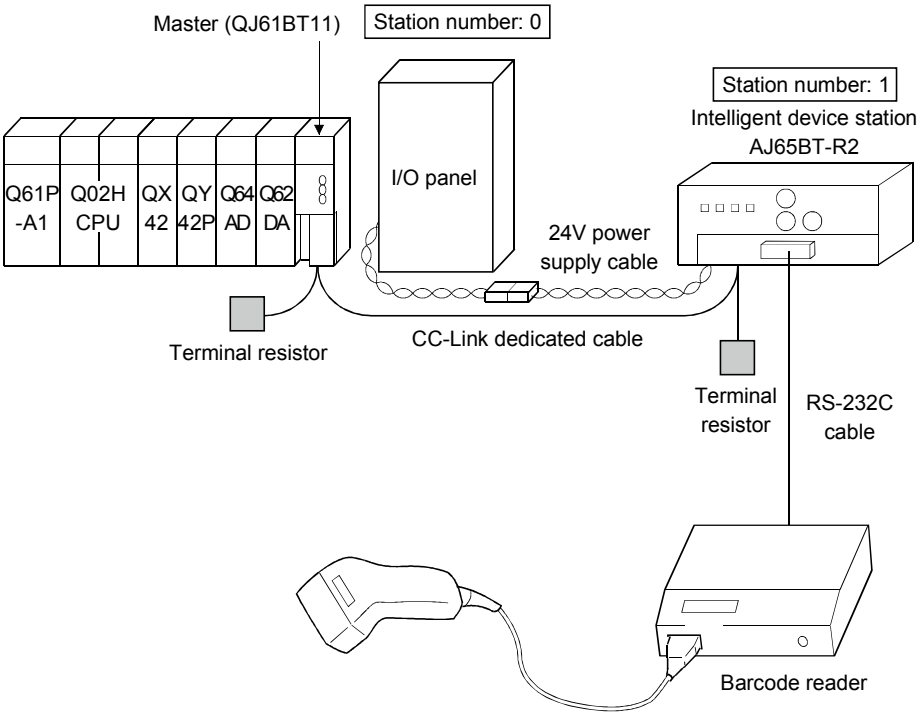
The direct transient transmission with the specified station via the communication buffers of the master module is also available.
The following shows the dedicated instructions to be used.

Target station	Instruction	Description
Master station Local station	RIRD	Reads data from the buffer memory or PLC CPU device of the specified station.
	RIWT	Writes data to the buffer memory or PLC CPU device of the specified station.
Intelligent device station	RIRD	Reads data from the buffer memory of the specified station.
	RIWT	Writes data to the buffer memory of the specified station.
	RIRCV	Automatically performs handshaking with the specified station and reads data from the buffer memory of that station.
	RISEND	Automatically performs handshaking with the specified station and writes data to the buffer memory of that station.

For CC-Link dedicated instructions, refer to Appendix 4.

7.1 System Configuration of Exercise

The following shows the system configuration of the exercise in Assignment V.
The master module setting is the same as that of Assignment I.

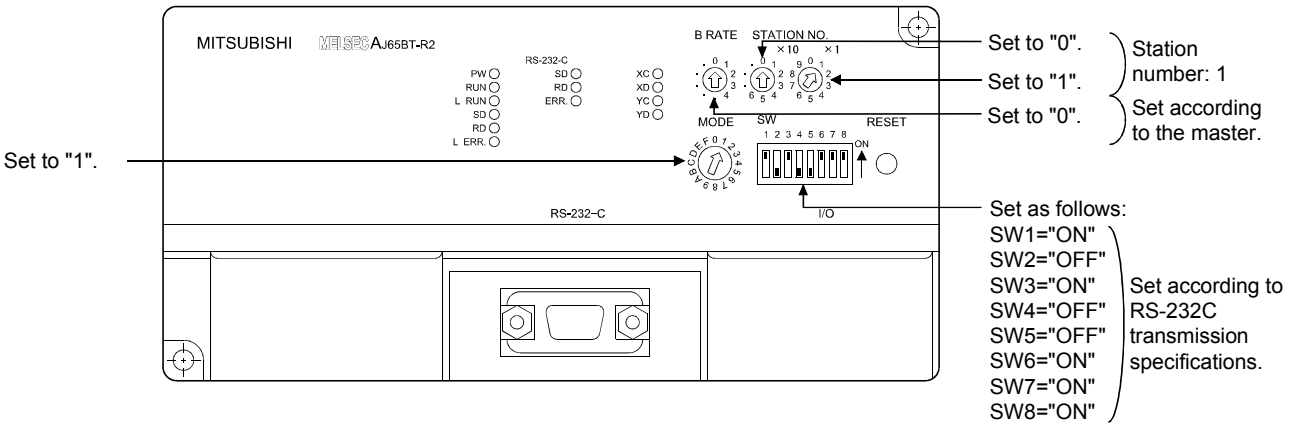


7.2 Settings and Connection of Intelligent Device Station and External Device

This section explains the settings and connection of the intelligent device station (AJ65BT-R2) and the settings of the external device (the barcode reader).

7.2.1 Module settings

The following describes the setting of AJ65BT-R2.
For details on the functions and specifications of the module, refer to the User's Manual of AJ65BT-R2.

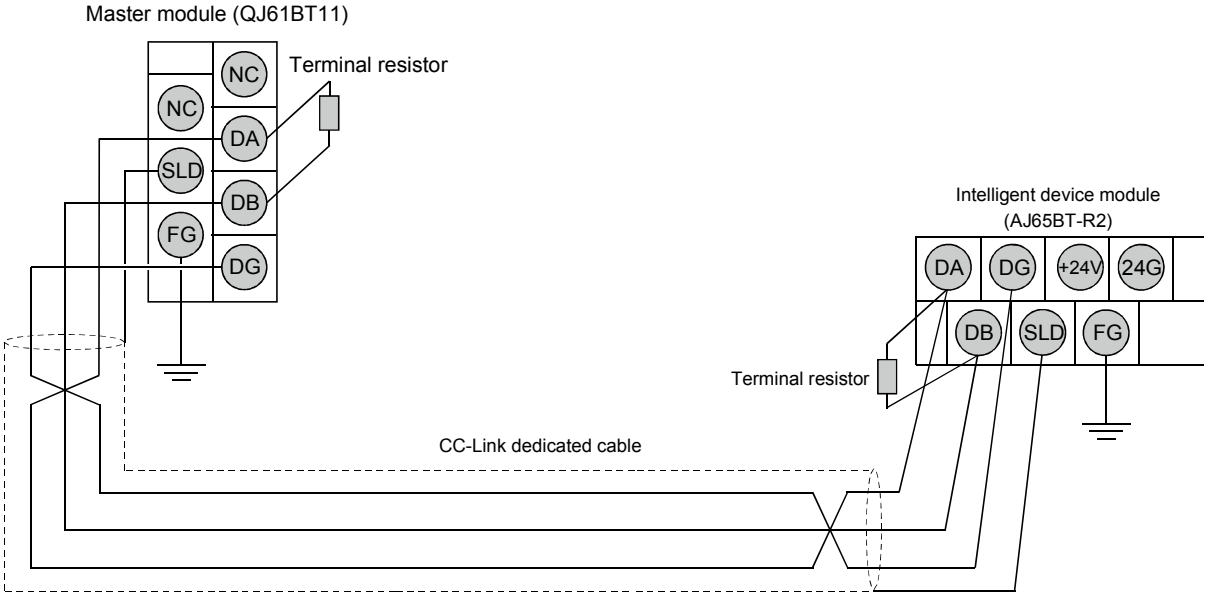


RS-232C transmission specifications with the setting above

- Transmission speed 9600bps
- Data bit length ..... 7 bits
- Parity bit..... Yes (Even)
- Stop bit length ..... 2 bits

7.2.2 Module connection

The following shows the connection of CC-Link dedicated cables and terminal resistors in Assignment V.
Perform the same wiring for 24V power supply cable as that of the remote I/O station. (Refer to 3.4.2)
When wiring a cable such as a CC-Link dedicated cable or 24V power supply cable, make sure to turn the power off before wiring.

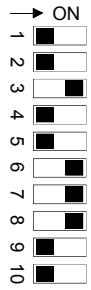


7.2.3 Barcode reader settings

This section describes the settings and specifications of the barcode reader.

(1) Barcode reader settings

(Tohken Co., Ltd. TCD-4000/TBR-4000)

Setting switch		Setting switch status			
	1	OFF	Baud rate 9600bps		
	2	OFF			
	3	ON			
	4	OFF	Parity (Even)		
	5	OFF	Terminator STX/ETX		
	6	ON	Barcode type JAN	ON	USS-39 (code 39)
	7	ON		OFF	
	8	ON		OFF	
	9	OFF		OFF	
	10	OFF		OFF	

Transmission specifications

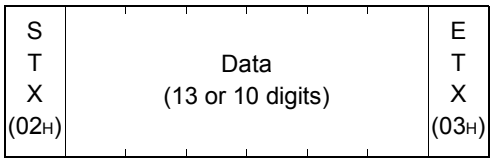
(a) RS-232C interface Asynchronous

(b) 7-bit ASCII code

(c) Data specifications
- Start bit .....1 bit
- Data .....7 bits
- Parity (Even) .....1 bit
- Stop bit .....2 bits

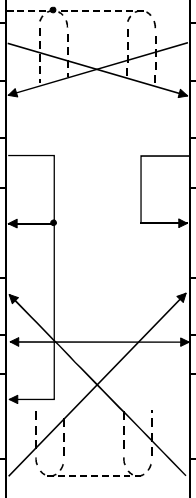
(d) Baud rate Selectable from 300 to 19200 (bps)

Data format transmitted from the barcode reader



Note) In the case of 10 digits, the first and the last digits are shown as "*".

(2) Wiring

AJ65BT-R2 side		Connection and signal direction	Barcode reader side		Name	Description (based on the barcode reader side)
Signal name	Pin No.		Pin No.	Signal name		
FG	1		1	FG	Frame ground	Cable shield terminal
SD	2		2	SD	Send data	Signal terminal which sends the actual send data
RD	3		3	RD	Receive data	Signal terminal which receives the actual receive data
RS	4		4	RS	Request to send	Turns ON when the host station is ready for sending and sends a signal to the host CS (simplified). At the same time, sends a signal which informs the existence of send data to the target side.
CS	5		5	CS	Clear to send	
DR	6		6	DR	Data set ready	Terminal which receives an operation ready signal of the target side.
SG	7		7	SG	Send ground	Signal ground terminal
CD	8		8	CD	Data channel receive carrier detection	Terminal which receives the ON signal when there is send data from the target side
ER	20		20	ER	Data terminal ready	Terminal which informs that the host station is ready for the operation

[Barcode example]

JAN

USS-39 (Code 39)

Set the following network parameters and automatic refresh parameters, then write them to the PLC CPU.
For the settings and write operation, refer to Section 3.5.2 to 3.5.4.

• Network parameters/automatic refresh parameters
[Number of module "1"]

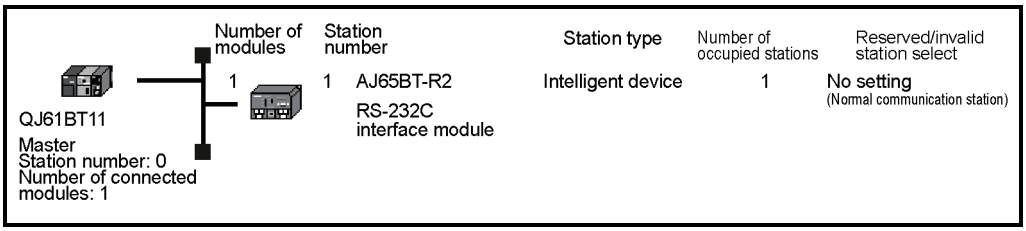
	1
Start I/O No	00A0
Operational setting	Operational settings
Type	Master station
Master station data link type	PLC parameter auto start
Mode	Remote net(Ver.1 mode)
All connect count	1
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	
Remote register(RWw)	
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

• Station information

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	Intelligent device station	single	Exclusive station 1	32 points	No setting	0	0	1536

Specify the points used for the transient transmission and also 1536 (600H) words to the automatic update buffer in the "Intelligent buffer select".

<Reference> The station information of Assignment V is shown in the figure below.



REMARK

The total size of each area in the master station automatic update buffer of the AJ65BT-R2 is 600H by default. (→Refer to the next page)
As the size of the automatic update area possessed by the master station is 1000H, up to two AJ65BT-R2s can be connected in the default condition.
For this reason, it is necessary to make the automatic update size per station smaller for the adjustment to use 3 stations or more.

<Reference>

1. The data transmission between each area for the automatic update function assigned by the buffer memories of AJ65BT-R2 and the automatic update buffers of the corresponding master module is automatically performed when the update condition set for each area is satisfied.
   Also, the data transmission direction is predetermined for each area.
   In this assignment, the data transmission by the automatic update function is performed using the assignment for the initial settings of AJ65BT-R2.
   The following table shows the automatic update function area and the data transmission direction by the automatic update for the initial settings.
   For details, refer to Appendix 8.

Assignment of automatic update area at initial settings (AJ65BT-R2)			Data direction
Address	Name		
0_H to $19F_H$ (0_H to FF_H) (100_H to$19F_H$)	Initial setting area (Various assignment designation area) (Parameter area)		Master station ↔ AJ65BT-R2
118_H to $19F_H$		Transmission area 1)	Master station → AJ65BT-R2
		Monitor transmission area 1)	
$1A0_H$ to $1BF_H$ ($1A0_H$ to $1A7_H$) ($1A8_H$ to $1BF_H$)	Status storage area (Setting status storage area) (Communication status storage area)		AJ65BT-R2 → Master station
1C0H to $1EF_H$	E²PROM area		Master station → AJ65BT-R2
$1C7_H$ to $1EF_H$		User registration frame area	
1F0 to 1FF	Area not used		–
200_H to $3FF_H$	User free area	Transmission area 2)	Master station → AJ65BT-R2
		Monitor transmission area 2)	
400_H to $5FF_H$		Reception area	AJ65BT-R2 → Master station
600 to 7FF		Area not used	–

2. For the example using three AJ65BT-R2 modules, refer to Appendix 1.
   For the case of more modules and the details, refer to the AJ65BT-R2 type RS-232C Interface Module User's Manual.

7.4 AJ65BT-R2 Initial Settings

AJ65BT-R2 must make the initial settings required for the data communication with the master station or external devices.
In this assignment, only the items required for the exercise are shown. (For the details of initial settings, refer to the User's Manual of AJ65BT-R2.)

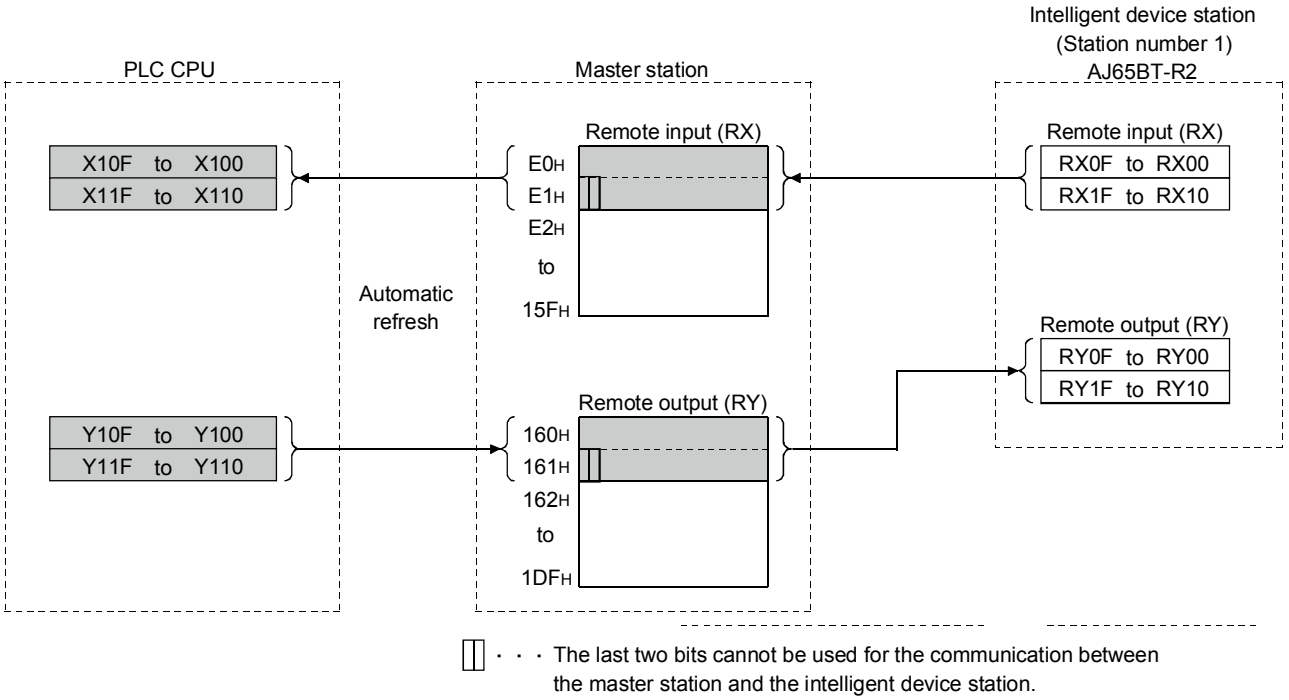
Setting item (Parameter)	Set value (Decimal)	Setting details	AJ65BT-R2 buffer memory address (Hexadecimal)
Word/byte unit designation	1	Byte	102_H
Reception head frame No. designation	2	STX	108_H
Reception end frame No. designation	3	ETX	$10C_H$
Reception timeout designation	20	2s	112_H

7.5 Sequence Program

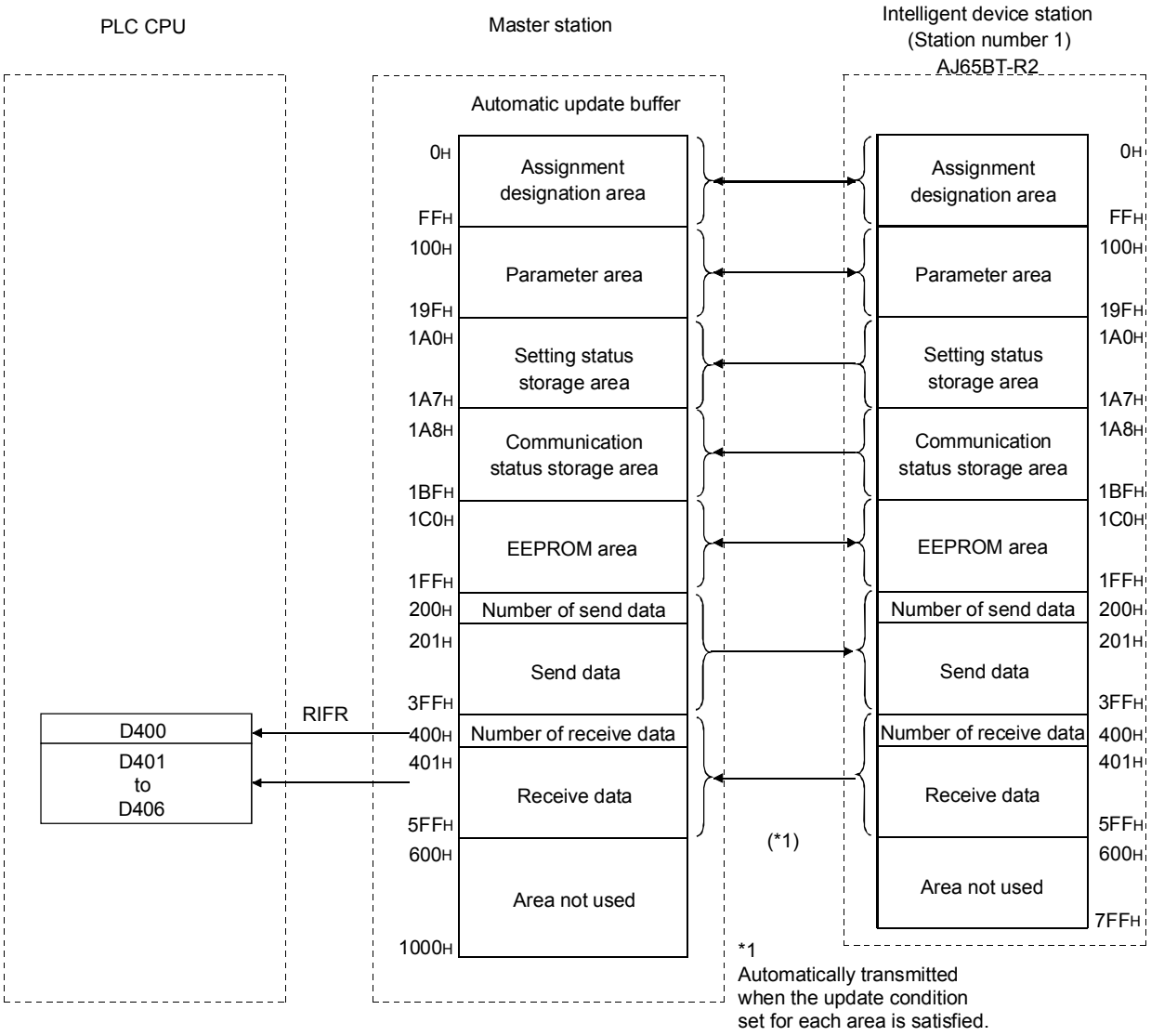
(1) Refresh support

The following shows the refresh relationship between the PLC CPU, the master station buffer memory and the intelligent device station.

[Remote input (RX), Remote output (RY)]



[Automatic update buffer].... (When the assignment of the automatic update buffer is the default value)



Note 1: In this assignment, the remote registers (RWw, RWr) are not used.

(2) Setting checklist

(a) Station information setting checklist

Station No.	Station type	Number of occupied stations	Reserved station/invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic update
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

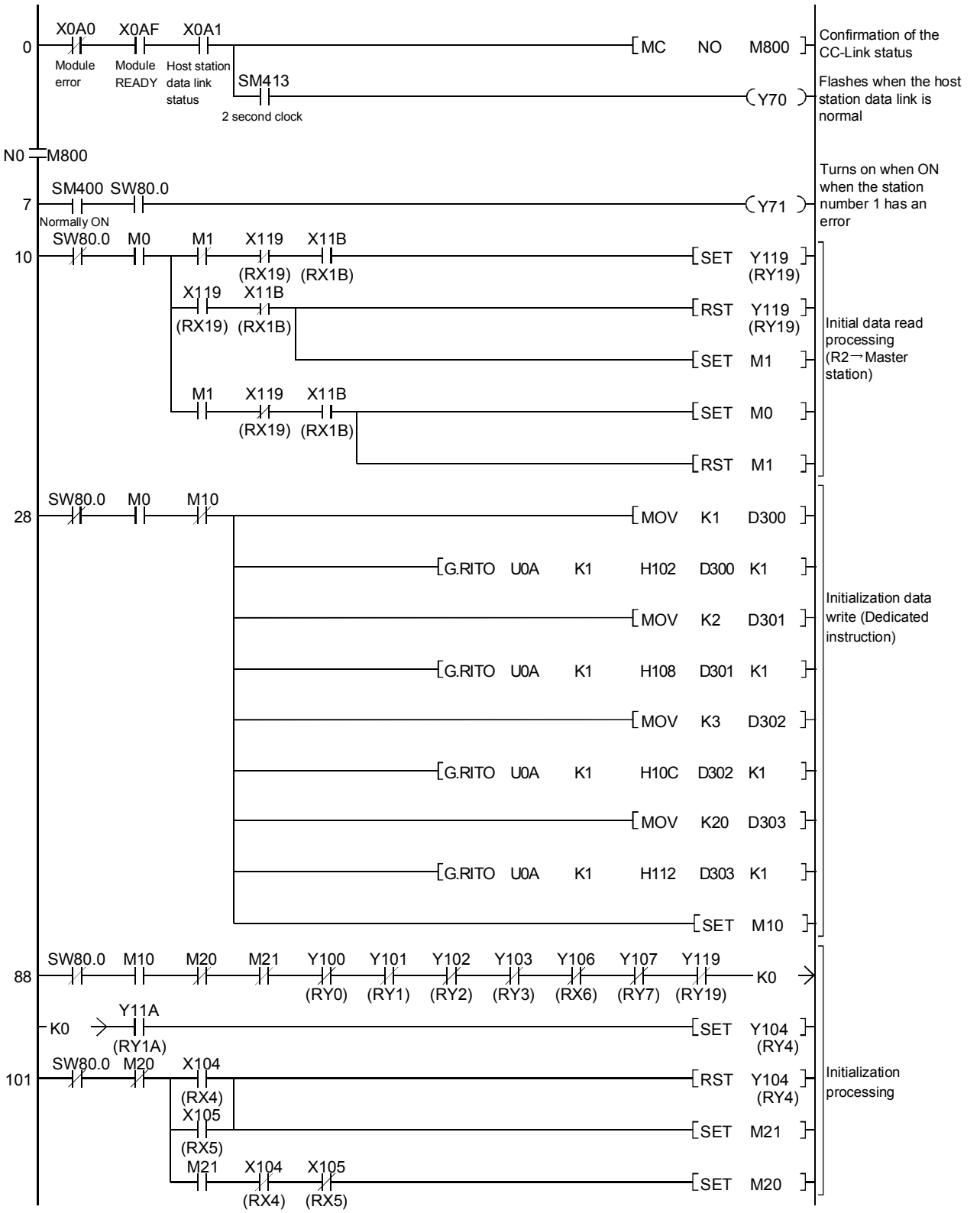
(b) Device assignment checklist

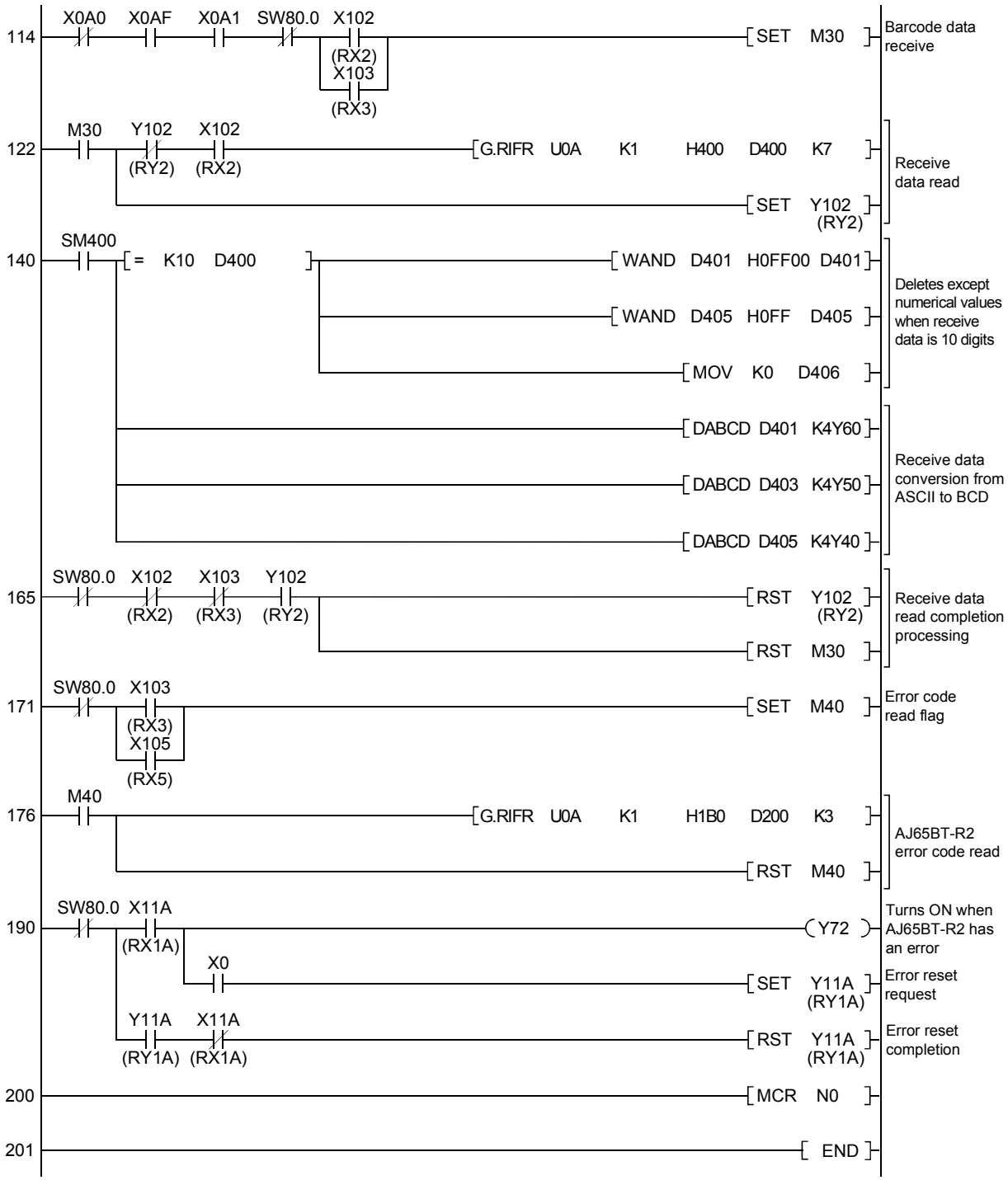
Device / Station No.	RX → ( )		RY ← ( )		RWw → ( )		RWr ← ( )	
	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program

Create the following sequence program and then write it to the PLC CPU.

Drive/Path	A:\Q-CC\GXDEV
Project name	EX5




114
X0A0
X0AF
X0A1
SW80.0
X102
(RX2)
X103
(RX3)
SET M30
Barcode data receive
122
M30
Y102
(RY2)
X102
(RX2)
G.RIFR U0A K1 H400 D400 K7
SET Y102 (RY2)
Receive data read
140
SM400
= K10 D400
WAND D401 H0FF00 D401
WAND D405 H0FF D405
MOV K0 D406
Deletes except numerical values when receive data is 10 digits
DABCD D401 K4Y60
DABCD D403 K4Y50
DABCD D405 K4Y40
Receive data conversion from ASCII to BCD
165
SW80.0
X102
(RX2)
X103
(RX3)
Y102
(RY2)
RST Y102 (RY2)
RST M30
Receive data read completion processing
171
SW80.0
X103
(RX3)
X105
(RX5)
SET M40
Error code read flag
176
M40
G.RIFR U0A K1 H1B0 D200 K3
RST M40
AJ65BT-R2 error code read
190
SW80.0
X11A
(RX1A)
Y72
Turns ON when AJ65BT-R2 has an error
X0
SET Y11A (RY1A)
Error reset request
Y11A
(RY1A)
X11A
(RX1A)
RST Y11A (RY1A)
Error reset completion
200
MCR N0
201
END

The data read by the barcode reader are stored in the automatic update buffer memory via AJ65BT-R2.
The PLC CPU writes and reads the data using the dedicated instructions for writing/reading the automatic update buffer.

Switch operation of demonstration machine

1) Reset with the RESET/L.CLR switch on the PLC CPU.

2) Set the RUN/STOP switch on the PLC CPU to RUN.
   Y70 ..... Flashes according to the host data link status (X0A1) (Data link normal)
3) Read a barcode using the barcode reader.
   The barcode is displayed in the digital display of Y40 to Y6F.
   When the read barcode has 10 digits, the first digit (Y6F to Y6C) and the 10th to 12th digits (Y4B to Y40) are displayed as "0".
   When the read barcode has 13 digits, the 13th digit is not displayed.

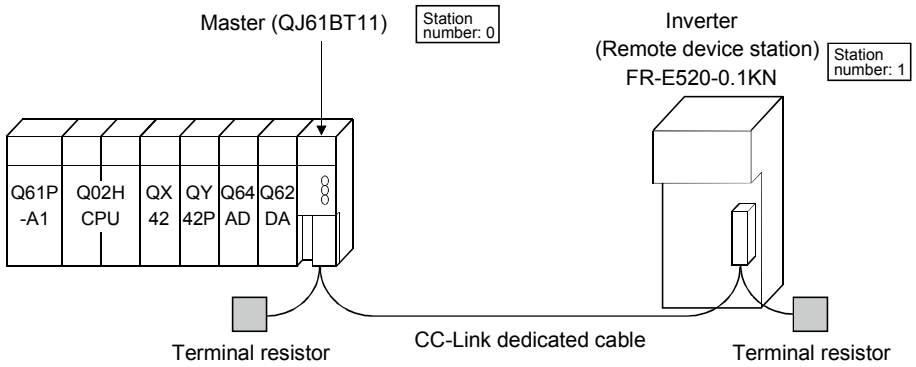
MEMO

CHAPTER 8 ASSIGNMENT VI (CONNECTION WITH INVERTER)

In this assignment, the parameter settings for the CC-Link type inverter via CC-Link and the operation exercise are performed.

8.1 System Configuration of Exercise

The following shows the system configuration of the exercise in Assignment VI. The master module setting is the same as that of Assignment I.



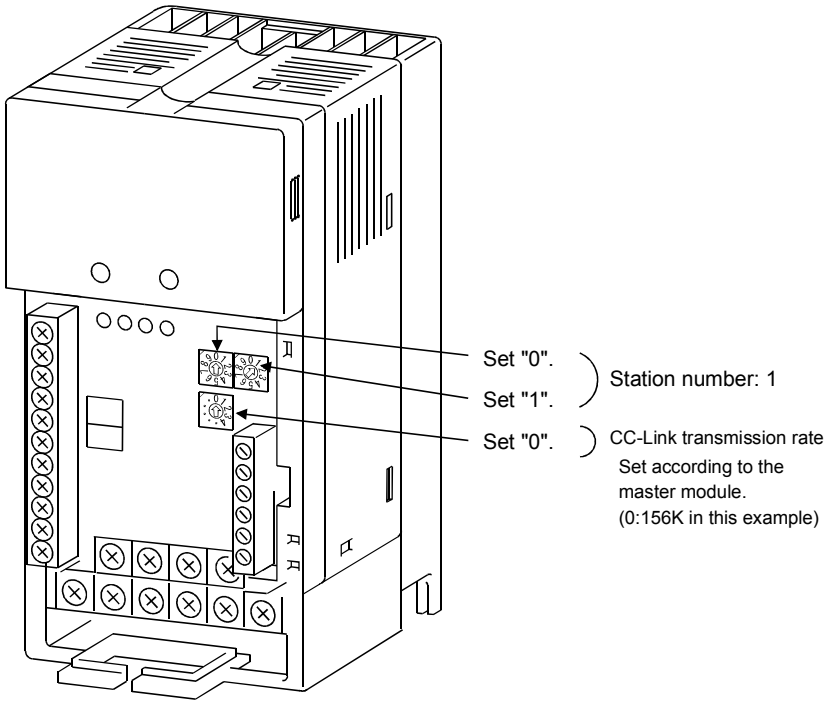
The CC-Link type inverter is handled as a remote device station.

8.2 Settings and Connection of Inverter

This section explains the settings and connection of the general purpose inverter (FR-E520-0.1KN) for the CC-Link connection.

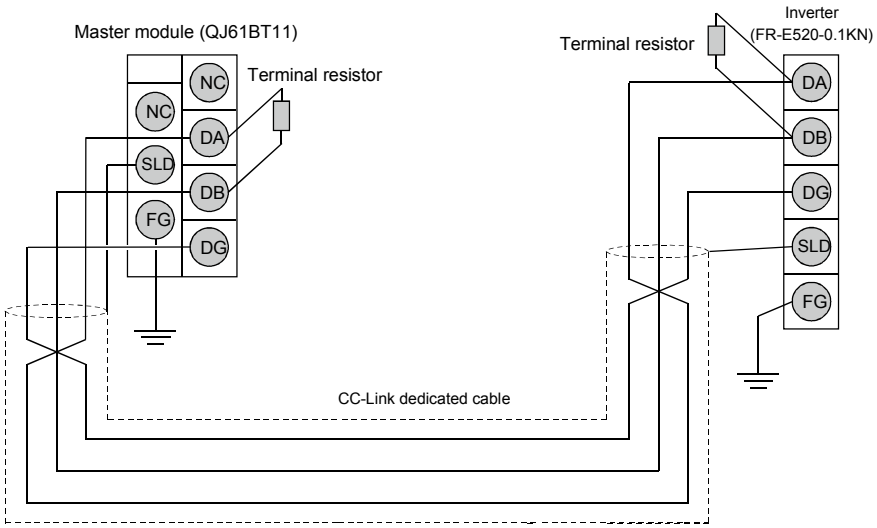
8.2.1 Module settings

This section describes the settings of FR-E520-0.1KN.
For details on the functions and specifications, refer to the instruction manual.



8.2.2 Module connection

The following shows the connection of CC-Link dedicated cables and terminal resistors.
For the wiring of 3-phase 200V power input, use the wiring that has already connected.
When wiring a cable such as a CC-Link dedicated cable or power supply cable, make sure to turn the power off before wiring.



Set the following network parameters and automatic refresh parameters, then write them to the PLC CPU.
For the settings and write operation, refer to Section 3.5.2 to 3.5.4.

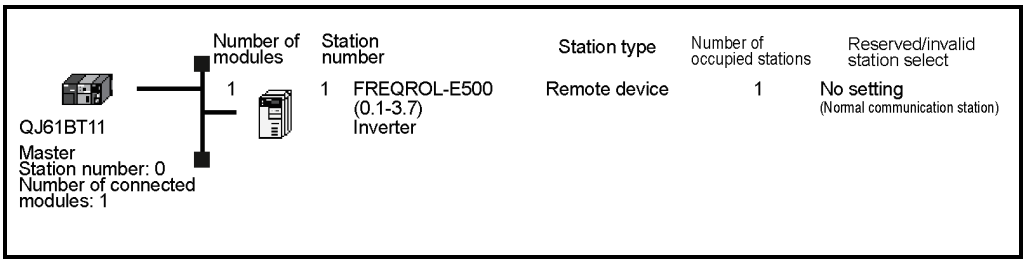
- Network parameters/automatic refresh parameters
  [Number of module "1"]

	1
Start I/O No	00A0
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	1
Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	D100
Remote register(RWw)	D0
Ver.2 Remote input(RX)	
Ver.2 Remote output(RY)	
Ver.2 Remote register(RWr)	
Ver.2 Remote register(RWw)	
Special relay(SB)	SB0
Special register(SW)	SW0
Retry count	3
Automatic reconnection station count	1
Stand by master station No.	
PLC down select	Stop
Scan mode setting	Asynchronous
Delay infomation setting	0
Station information setting	Station information
Remote device station initial setting	Initial settings
Interrupt setting	Interrupt settings

- Station information

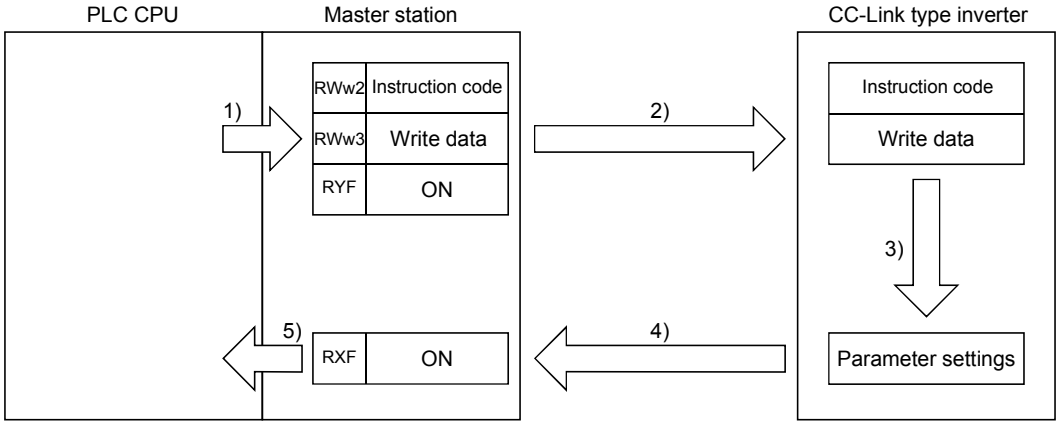
Station No.	Station type	Expanded cyclic setting	Exclusive station count	Remote station points	Reserve/invalid station select	Intelligent buffer select(word)		
						Send	Receive	Automatic
1/ 1	Remote device station	single	Exclusive station 1	32 points	No setting			

<Reference> The station information of Assignment V is shown in the figure below.



8.4 Parameter Settings of Inverter

The inverter needs to set many parameters before the operation.
For the CC-Link type inverter, parameters can be set using the remote output (RY) and remote register (RWw).
The following shows the outline of parameter settings via CC-Link.
For the I/O signals and remote registers of the inverter FR-E500-0.1KN, refer to Appendix 9.
For the setting method by a parameter module and the details of each parameter, refer to the inverter instruction manual.



1) Set the instruction codes and write data in the remote register using the sequence program and turn ON the instruction code execution request signal (RYF).
2) Send to the inverter using the data link.
3) Change the corresponding parameter value according to the instruction code.
4) When the write is completed, the instruction code execution completion signal (RXF) turns ON.
5) The write completion is confirmed by the instruction code execution completion signal.

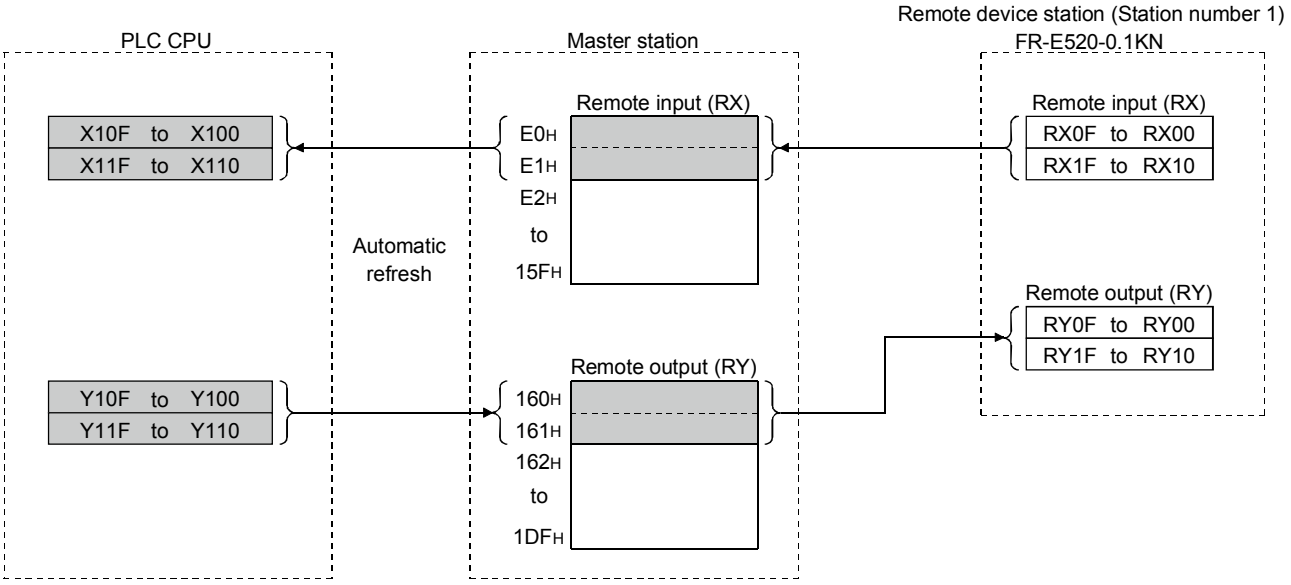
*: The instruction code is specified by what is to be executed by the inverter.
<Example> Operation mode write .....FB_H
Pr.4 Multi-speed setting (high speed) write .....84_H

8.5 Sequence Program

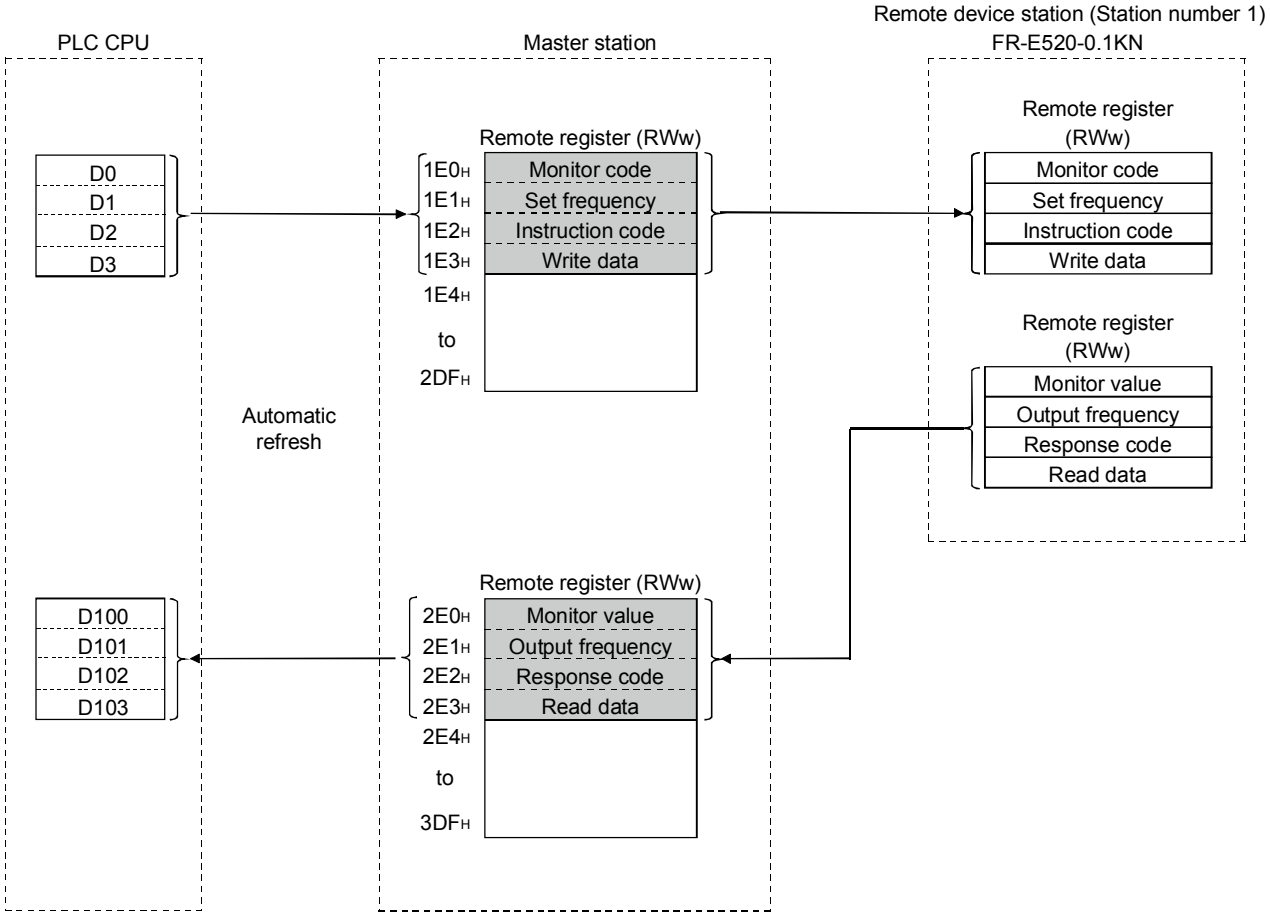
(1) Refresh support

The following shows the refresh relationship between the PLC CPU, the master station buffer memory and the remote device station.

[Remote input (RX), Remote output (RY)]



[Remote register (RWw, RWr)]



(2) Setting checklist

(a) Station information setting checklist

Station No.	Station type	Number of occupied stations	Reserved station/invalid station select	Intelligent buffer select (Word)		
				Send	Receive	Automatic update
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

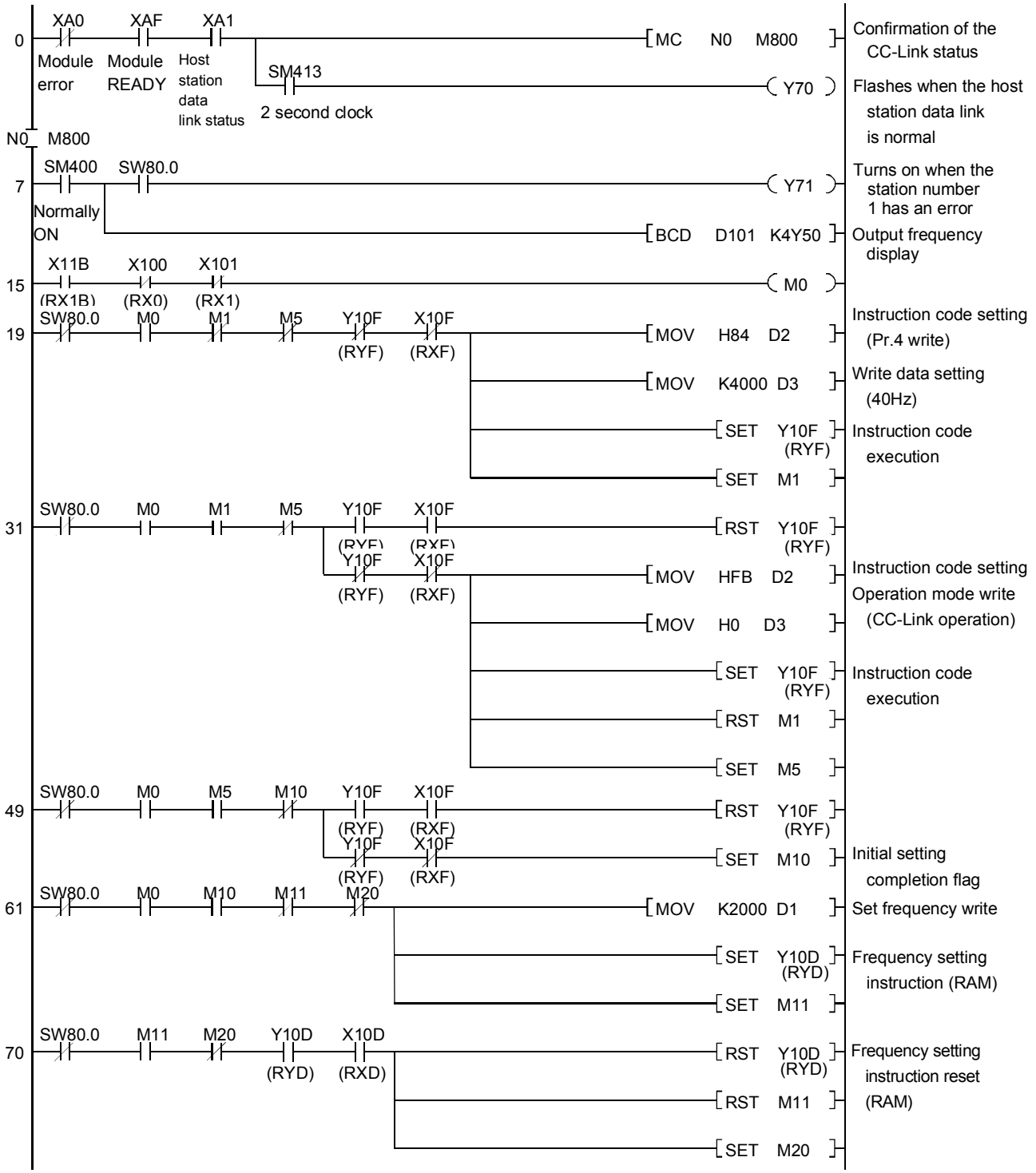
(b) Device assignment checklist

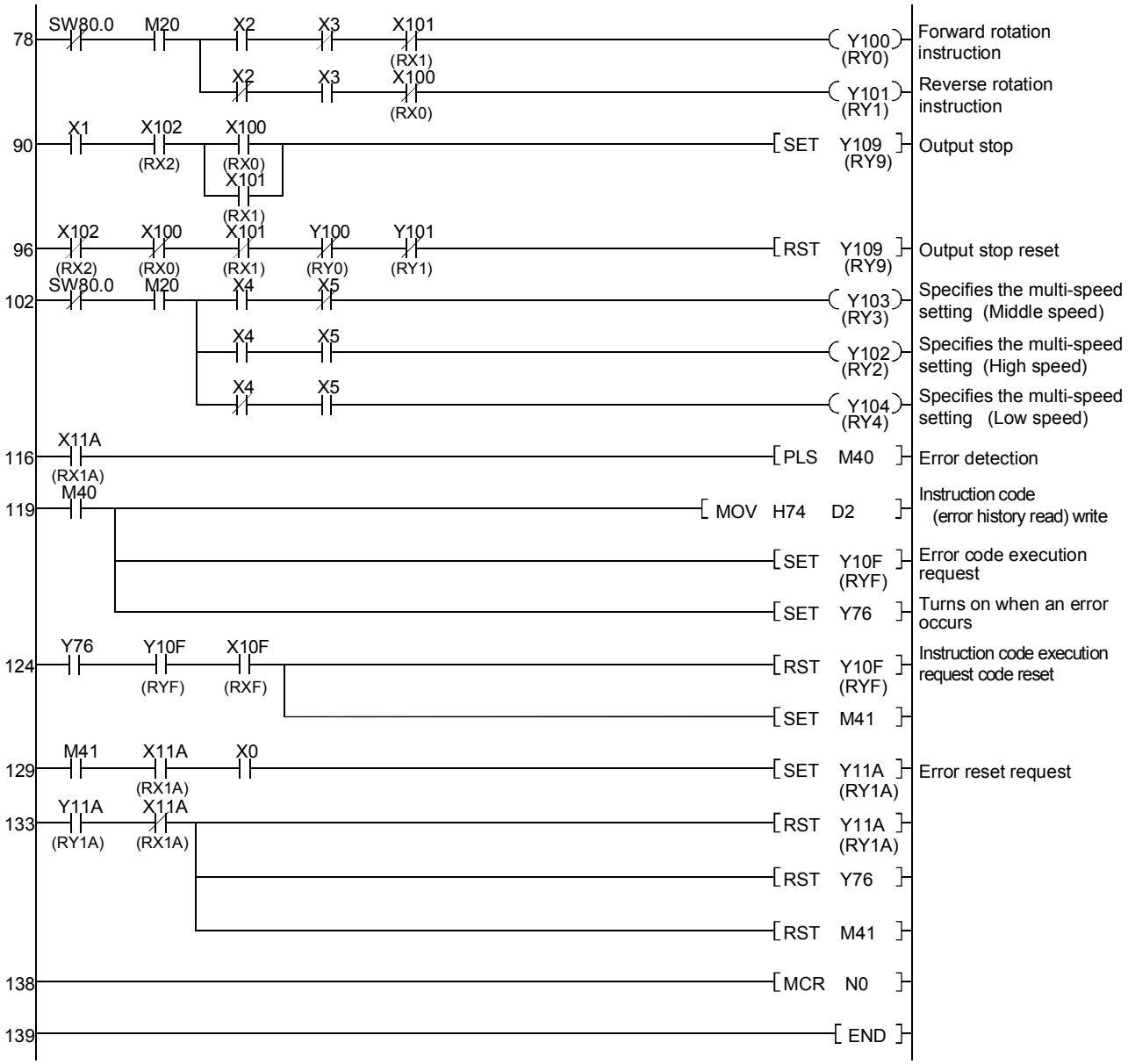
Device / Station No.	RX → ( )		RY ← ( )		RWw → ( )		RWr ← ( )	
	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side	Device on the remote side	Device on the CPU side
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

(3) Sequence program

Create the following sequence program and then write it to the PLC CPU.

Drive/Path	A:\Q-CC\GXDEV
Project name	EX6




78
SW80.0
M20
X2
X3
X101
(RX1)
Y100
(RY0)
Forward rotation instruction
X2
X3
X100
(RX0)
Y101
(RY1)
Reverse rotation instruction
90
X1
X102
(RX2)
X100
(RX0)
X101
(RX1)
SET Y109
(RY9)
Output stop
96
X102
(RX2)
X100
(RX0)
X101
(RX1)
Y100
(RY0)
Y101
(RY1)
RST Y109
(RY9)
Output stop reset
102
SW80.0
M20
X4
X5
Y103
(RY3)
Specifies the multi-speed setting (Middle speed)
X4
X5
Y102
(RY2)
Specifies the multi-speed setting (High speed)
X4
X5
Y104
(RY4)
Specifies the multi-speed setting (Low speed)
116
X11A
(RX1A)
PLS M40
Error detection
119
M40
MOV H74 D2
Instruction code (error history read) write
SET Y10F
(RYF)
Error code execution request
SET Y76
Turns on when an error occurs
124
Y76
Y10F
(RYF)
X10F
(RXF)
RST Y10F
(RYF)
Instruction code execution request code reset
SET M41
129
M41
X11A
(RX1A)
X0
SET Y11A
(RY1A)
Error reset request
133
Y11A
(RY1A)
X11A
(RX1A)
RST Y11A
(RY1A)
RST Y76
RST M41
138
MCR N0
139
END

Switch operation of demonstration machine

1) Reset with the RESET/L.CLR switch of the PLC CPU.

2) Set the RUN/STOP switch of the PLC CPU to RUN.
   Y70 ..... Flickers according to the host data link status (X0A1) (when the data link is normal)
   Y71 ..... Flickers according to other stations data link status (when the station number 1 has an error)
   (Inverter error occurred by the PLC CPU rest.)

3) Turn ON X0. (Inverter error reset request)
   Y76 ..... OFF (Station number 1 normal)

4) Turn ON X2.
   Starts the forward rotation at the set frequency (20.00Hz) of E^2PROM
   Y5F-Y50 digital display ..... Displays "2000" (Output frequency)

5) Turn ON X4. (X2=ON,X3=OFF,X4=ON,X5=OFF)
   Forward rotation at the frequency (30.00Hz) of the parameter (Multi-speed (Middle speed)) initial value.
   Y5F-Y50 digital display ..... Displays "3000" (Output frequency)

6) Turn ON X5. (X2=ON,X3=OFF,X4=ON,X5=ON)
   Forward rotation at the frequency (40.00Hz) written in the parameter (Multi-speed (High speed)).
   Y5F-Y50 digital display ..... Displays "4000" (Output frequency)

7) Turn OFF X4. (X2=ON,X3=OFF,X4=OFF,X5=ON)
   Forward rotation at the frequency (10.00Hz) of the parameter (Multi-speed (Low speed)) initial value.

8) Turn ON X1.
   Stops the inverter frequency output.
   (The motor coasts to a stop.)
   * For deceleration to a stop, turn OFF X2 (Forward rotation instruction) or X3 (Reverse rotation instruction).

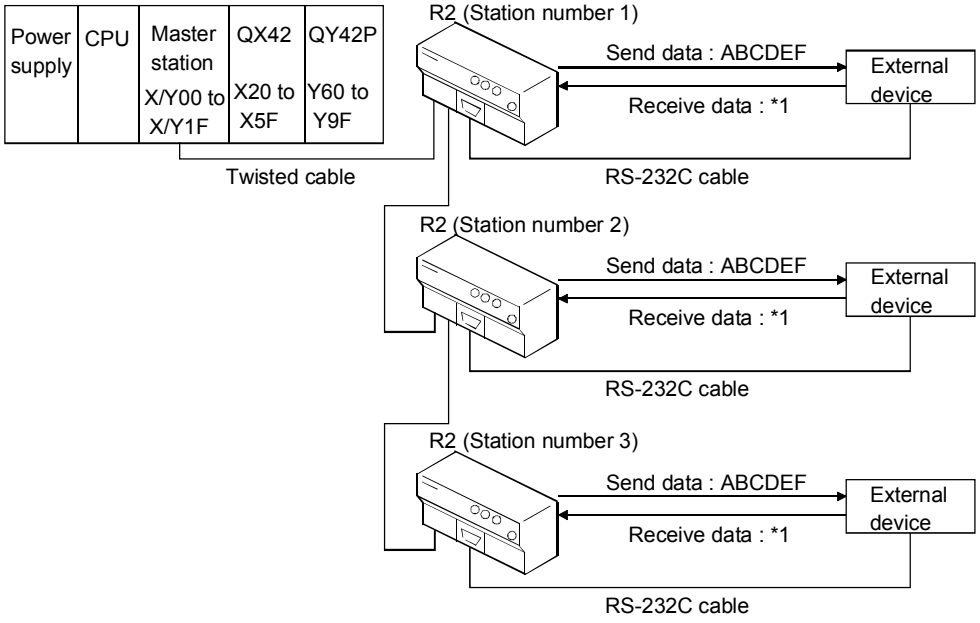
MEMO

APPENDIX

Appendix 1 System Configuration Example for Use of Multiple AJ65BT-R2 Modules

The following shows the system configuration when the connection is made using three AJ65BT-R2 modules.

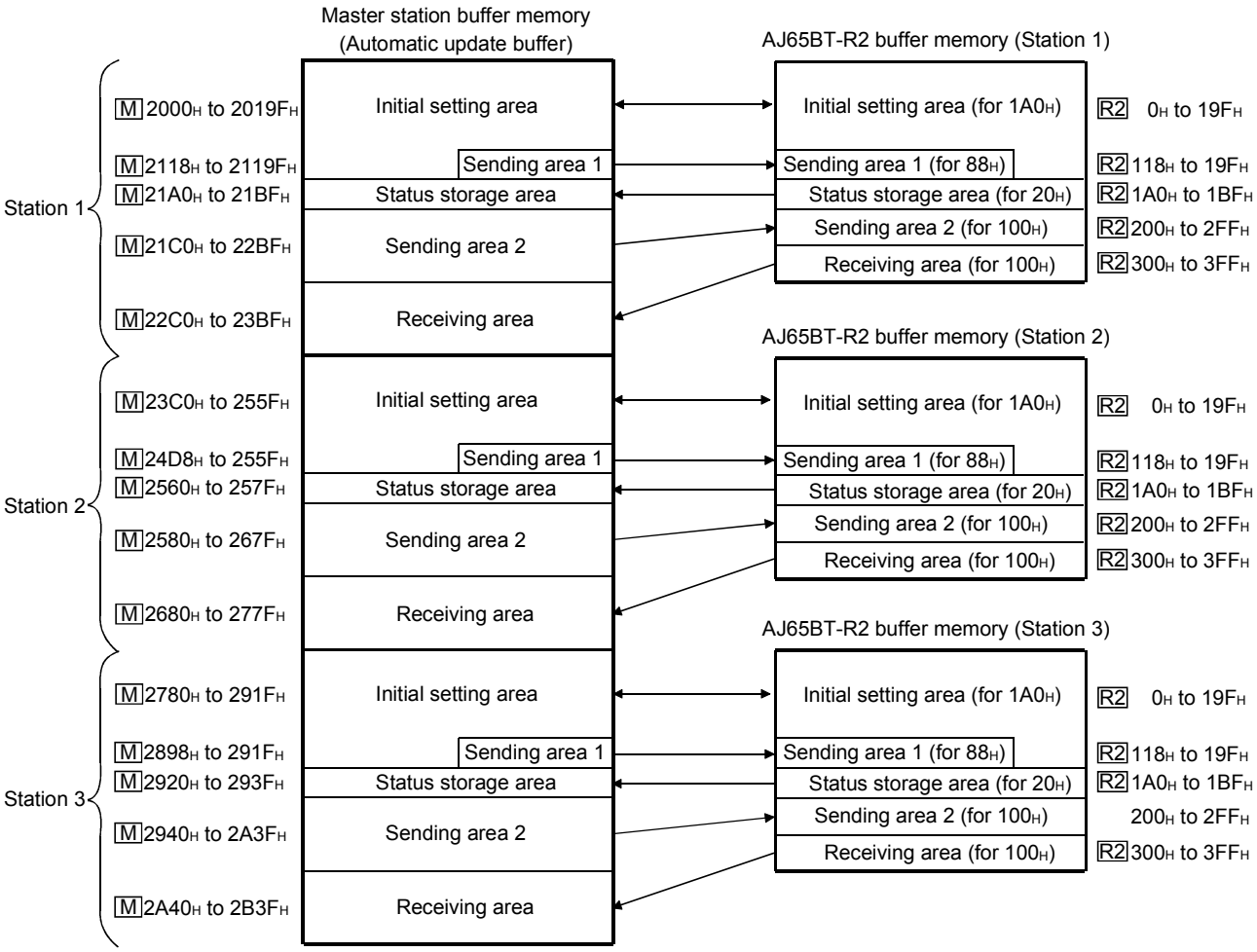
(1) System configuration example



*1: "Random data + CR ($0D_H$)" or "Random data + LF ($0A_H$)"

(2) Buffer memory configuration

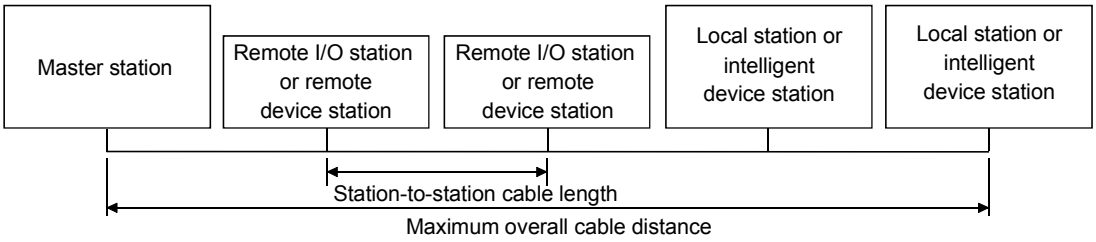
As shown in the system configuration example, the buffer memory assignment example when three AJ65BT-R2 modules are connected to CC-Link is shown below.



APPENDIX 2 Specifications of CC-Link Cable

(1) Maximum overall cable distance (for Ver.1.10)

The relationship 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	Transmission speed	Station to station cable length	Maximum overall cable distance
156kbps	20cm (7.87in.) or longer	1200m (3937.0ft.)	2.5Mbps	20cm (7.87in.) or longer	400m (1312.3ft.)
625kbps		900m (2952.8ft.)	5Mbps		160m (524.9ft.)
–		–	10Mbps		100m (328.1ft.)

POINT

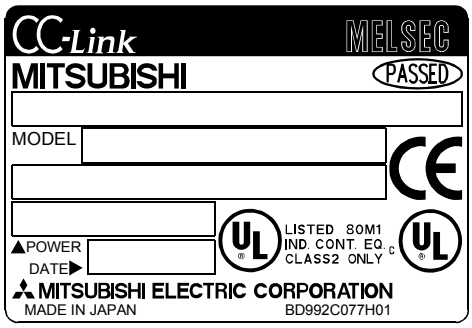
(1) Version 1.10 modules have a uniform station-to-station cable length of 20 cm or more by improving the restrictions on the conventional station-to-station cable length.
In contrast, the conventional modules are defined as Version 1.00.

(2) In order to make the station-to-station cable length uniformly 20 cm or more, the following conditions are required:
1) All the modules that make up the CC-Link system must be of Version 1.10.
2) All the data link cables must be CC-Link dedicated cables conforming to Version 1.10.

(3) The specifications for Version 1.00 should be used for the maximum cable overall distance and station-to-station cable length if a system contains the modules and cables of both Version 1.00 and Version 1.10.

REMARK

How to check if the module is of Version 1.10
1) The modules of Version 1.10 have the logo "CC-Link" on the "rating plate."
2) The modules of Version 1.10 have the logo "CC-Link" on the "package label."



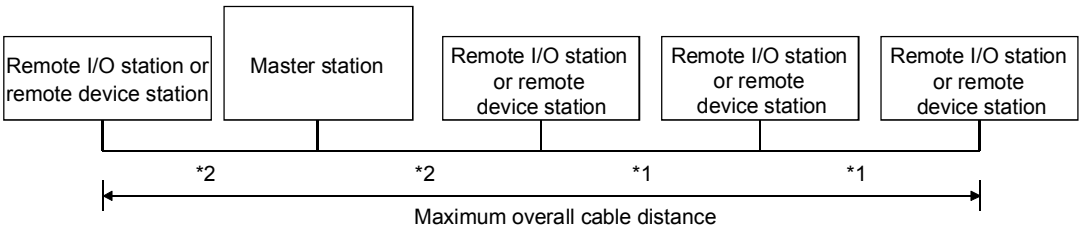
Sample of rating plate

Sample of package label

(2) Maximum overall cable distance (for Ver.1.00)

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

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



*1 The cable length between remote I/O stations or remote device stations

*2 The cable length between the master station and the adjacent stations

CC-Link dedicated cable (Terminal resistor of 110Ω used)

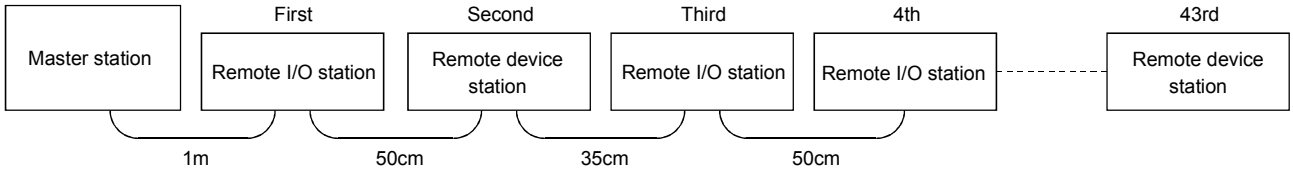
Transmission rate	Station to station cable length		Maximum overall cable distance
	*1	*2	
156kbps	30cm (11.81in.) or more	1m (3.28ft.) or more	1200m (3937ft.)
625kbps			600m (1968.6ft.)
2.5Mbps			200m (656.2ft.)
5Mbps	30cm (11.81in.) to 59cm (23.23in.)*		110m (360.9ft.)
	60cm (23.62in.) or more		150m (492.15ft.)
10Mbps	30cm (11.81in.) to 59cm (23.23in.)*		50m (164.1ft.)
	60cm (23.62in.) to 99cm (38.98in.)*		80m (262.5ft.)
	1m (3.28ft.) or more		100m (328.1ft.)

CC-Link dedicated high performance cable (Terminal resistor of 130Ω used)

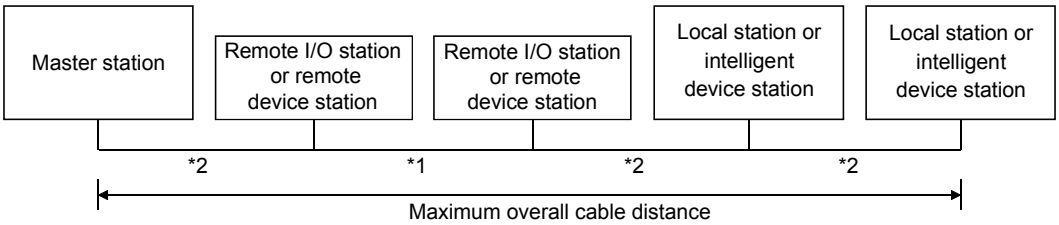
Transmission rate		Station to station cable length		Maximum overall cable distance
		*1	*2	
156kbps		30cm (11.81in.) or more	1m or more	1200m (3937.2ft.)
625kbps				900m (2952.9ft.)
2.5Mbps				400m (1312.4ft.)
5Mbps				160m (524.96ft.)
10Mbps	Number of connected stations: 1 to 32			100m (328.1ft.)
	Number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

* If even one location is wired with the length indicated with * for the cable connection between stations, the cable distance must be within the maximum overall cable distance shown at the corresponding column in the tables above. (Refer to the example at the next page.)

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



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



*1 The cable length between remote I/O stations or remote device stations.
*2 The cable length between the master station or local station or intelligent device station and the adjacent stations.

CC-Link dedicated cable (Terminal resistor of 110Ω used)

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

CC-Link dedicated high performance cable (Terminal resistor of 130Ω used)

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

* If even one location is wired with the length indicated with * for the cable connection between stations, the cable distance must be within the maximum overall cable distance shown at the corresponding column in the tables above.

Appendix 3 Link Special Relays, Registers (SB/SW) and Error Codes

The data link status can be checked with the 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 the automatic refresh parameter.

- Link special relays (SB) Buffer memory addresses $5E0_H$ to $5FF_H$
- Link special registers (SW) Buffer memory addresses 600_H to $7FF_H$

(1) Link special relays (SB)

The link special relays SB0000 to SB003F are turned ON/OFF by the sequence program, and SB0040 to SB01FF are automatically turned ON/OFF.
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 the local station.
For the correspondence with the buffer memory, refer to Section 2.1.4.
The values in parentheses in the number column of the table indicate the buffer memory address and the bit position.

Link special relay list (1/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB0000 ($5E0_H$,b0)	Data link restart	Restarts the data link that has been stopped by SB0002. OFF : Restart not instructed ON : Restart instructed	○	○	×
SB0001 ($5E0_H$,b1)	Refresh instruction at the standby master switching	Instructs to refresh a cyclic data after the data link control is transferred to the standby master station. OFF : Not instructed ON : Instructed	○	×	×
SB0002 ($5E0_H$,b2)	Data link stop	Stops the host data link. However, when the master station executes this, the entire system will stop. OFF : Stop not instructed ON : Stop instructed	○	○	×
SB0003 ($5E0_H$,b3)	Refresh instruction when changing parameters by the dedicated instruction	Instructs to refresh a cyclic data after changing parameters by the RLPASET instruction. OFF : Not instructed (stop refreshing) ON : Instructed (start/continue refreshing)	○	○	×
SB0004 ($5E0_H$,b4)	Temporary error invalid request	Establishes the stations specified by SW0003 to SW0007 as temporary error invalid stations. OFF : Not requested ON : Requested	○	×	×
SB0005 ($5E0_H$,b5)	Temporary error invalid canceling request	Cancels the temporary error invalid status of stations specified by SW0003 to SW0007. OFF : Not requested ON : Requested	○	×	×
SB0008 ($5E0_H$,b8)	Line test request	Executes line tests for the stations specified by SW0008. OFF : Not requested ON : Requested	○	×	×
SB0009 ($5E0_H$,b9)	Parameter information read request	Reads the parameter setting information for the actual system configuration. OFF : Normal ON : Abnormal	○	×	×

Link special relay list (2/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
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	○*2	×	×
SB000D ($5E0_H$,b13)	Remote device station initialization procedure registration instruction	Starts the initial processing using the information registered during the initialization procedure registration. OFF : Not instructed ON : Instructed	○*1	×	×
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 acknowledgment status. OFF : Not acknowledged ON : Startup instruction acknowledged	○	○	×
SB0041 ($5E4_H$,b1)	Data link restart complete	Indicates the data link restart instruction acknowledgment completion status. OFF : Not completed ON : Startup complete	○	○	×
SB0042 ($5E4_H$,b2)	Refresh instruction acknowledgment status at the standby master switching	Indicates whether or not the refresh instruction at the standby master switching have been acknowledged. OFF : Not executed ON : Instruction acknowledged	○	×	×
SB0043 ($5E4_H$,b3)	Refresh instruction complete status at the standby master switching	Indicates whether or not the refresh instruction at the 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 acknowledgment status. OFF : Not acknowledged ON : Stop instruction acknowledged	○	○	×
SB0045 ($5E4_H$,b5)	Data link stop complete	Indicates the data link stop instruction acknowledgment completion status. OFF : Not completed ON : Stop completed	○	○	×
SB0046*3 ($5E4_H$,b5)	Forced master switching executable status	Indicates whether the forced master switching (SB000C) signal can be executed or not. OFF : Not executable. ON : Executable.	○*2	×	×
SB0048 ($5E4_H$,b8)	Temporary error invalid acceptance status	Indicates the acknowledgment 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 acknowledgment 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 acknowledgment status	Indicates the acknowledgment status of remote station temporary error invalid cancel instruction. OFF : Not executed ON : Instruction acknowledged	○	×	×

*1: Can be used for the master station only.

*2: Can be used for the standby master station only.

*3: The link special relay added to the module having the serial No. whose first five digits are 03082 or later.

Link special relay list (3/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SB004B ($5E4_H$,b11)	Temporary error invalid canceling complete status	Indicates the acknowledgment 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 acknowledgment status. OFF : Not executed ON : Instruction acknowledged	○	×	×
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 acknowledgment status	Indicates the parameter information read request acknowledgment 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 completed	○	×	×
SB0050 ($5E5_H$,b0)	Offline test status	Indicates the offline test execution status. OFF : Not executed ON : In progress	×	×	○
SB005A ($5E5_H$,b10)	Master switching request acknowledgment	Indicates the acknowledgment 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 completed ON : Completed	○	×	×
SB005C ($5E5_H$,b12)	Forced master switching request acknowledgment	Indicates whether or not a forced master switching request has been acknowledged. OFF : Not acknowledged ON : Instruction acknowledged	○*2	×	×
SB005D ($5E5_H$,b13)	Forced master switching request complete	Indicates whether or not a forced master switching request is complete. OFF : Not completed ON : Completed	○*2	×	×
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	○*1	×	×
SB005F ($5E5_H$,b15)	Completion status of remote device station initialization procedure execution	Indicates the completion status of the initialization procedure execution. OFF : Not completed ON : Completed	○*1	×	×
SB0060 ($5E6_H$,b0)	Host mode	Indicates the mode setting status of the transmission rate/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	○	○	○

*1: Can be used for the master station only.

*2: Can be used for the standby master station only.

Link special relay list (4/5)

<table>
<tr><th rowspan="2">Number</th><th rowspan="2">Name</th><th rowspan="2">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SB0065
($5E6_H$,b5)</td><td>Input data status of the host data link faulty station</td><td>Indicates the input status setting from a data link faulty station of the host.
OFF : Clear
ON : Retain</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0066
($5E6_H$,b6)

SB0067 *4
($5E6_H$,b7)</td><td>Number of host occupied stations</td><td>Indicates the setting status of host occupied stations.
<table><tr><th>Number of occupied stations</th><th>SB0066</th><th>SB0067</th></tr><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></table></td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SB006A
($5E6_H$,b10)</td><td>Switch setting status</td><td>Indicates the switch setting status.
OFF : Normal
ON : Setting error exists (The error code is stored in SW006A)</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SB006D
($5E6_H$,b13)</td><td>Parameter setting status</td><td>Indicates the parameter setting status.
OFF : Normal
ON : Setting error exists (The error code is stored in SW0068)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB006E
($5E6_H$,b14)</td><td>Host station operation status</td><td>Indicates the host data link operation status.
OFF : Being executed
ON : Not executed</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0070
($5E7_H$,b0)</td><td>Master station information</td><td>Indicates the data link status.
OFF : Data link control by the master station
ON : Data link control by the standby master station</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0071
($5E7_H$,b1)</td><td>Standby master station information</td><td>Indicates whether or not a standby master station is present.
OFF : Not present
ON : Present</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0072
($5E7_H$,b2)</td><td>Scan mode setting information</td><td>Indicates the scan mode setting information.
OFF : Asynchronous mode
ON : Synchronous mode</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB0073
($5E7_H$,b3)</td><td>Operation specification status at the CPU down</td><td>Indicates the operation specification status using a parameter when the CPU is down.
OFF : Stop
ON : Continue</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SB0074
($5E7_H$,b4)</td><td>Reserved station specified status</td><td>Indicates the reserved station specification status using a parameter.
OFF : No specification
ON : Specification exists (The information is stored in SW0074 to SW0077)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0075
($5E7_H$,b5)</td><td>Error invalid station specified status</td><td>Indicates the error invalid station specification status using a parameter.
OFF : No specification
ON : Specification exists (The information is stored in SW0078 to SW007B)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0076
($5E7_H$,b6)</td><td>Temporary error invalid station setting information</td><td>Indicates whether there is a temporary error invalid station setting.
OFF : No setting
ON : Setting exists (The information is stored in SW0007C to SW007F)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SB0077
($5E7_H$,b7)</td><td>Parameter receive status</td><td>Indicates the parameter receive status from the master station.
OFF : Reception completed
ON : Reception not completed</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SB0078
($5E7_H$,b8)</td><td>Host station switch change detection</td><td>Detects changes to the host setting switch during the data link.
OFF : No changes detected
ON : Changes detected</td><td>○</td><td>○</td><td>×</td></tr>
</table>

*4: For the QJ61BT11 of the function version A, it is always OFF.

Link special relay list (5/5)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
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)	○	×	×
SB007B ($5E7_H$,b11)	Host master/standby master operation status	Indicates whether the host operates as a master or standby master station. OFF : Operates as a master station (controlling the data link) ON : Operates as a standby master station (standby)	○	○	×
SB0080 ($5E8_H$,b0)	Other station data link status	Indicates the communication status between the remote/local/intelligent device/standby master stations. OFF : All stations normal ON : Faulty station exists (The 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	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 the data link. 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)	Transient transmission status	Indicates whether there is a transient transmission error. OFF : No error ON : Error occurrence	○	○	×
SB0095 ($5E9_H$,b5)	Master station transient transmission status	Indicates the transient transmission status of the master station. OFF : Normal ON : Abnormal	×	○	×

(2) Link special registers (SW)

The data is stored in the link special registers SW000 to SW003F by the sequence program, and it is automatically stored in SW0040 to SW01FF.

When the standby master station is controlling the data link, the availability of the link's special registers 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 registers is identical to that of a local station.

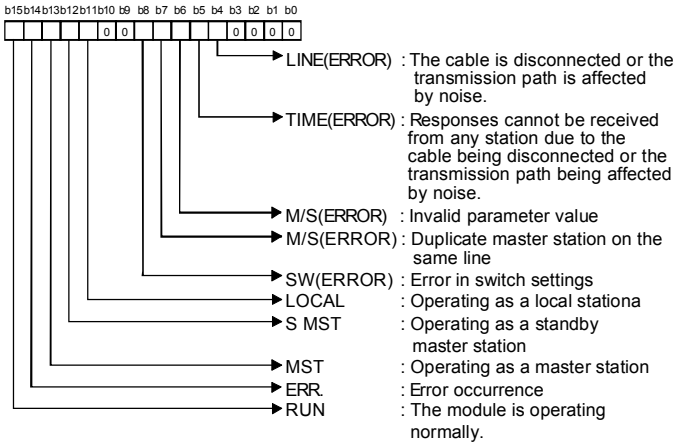
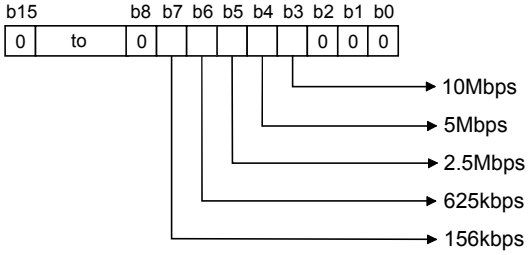
The values in parentheses in the number column of the table indicate the buffer memory address.

Link special register list (1/7)

Number	Name	Description	Availability (○: Available, ×]: Not available)		
			Online		Offline
			Master station	Local station	
SW0003 (603_H)	Multiple temporary error invalid station specification	Selects 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 *3	Specifies a temporary error invalid station. 0: Not specified as a temporary error invalid station 1: Specified as a temporary error invalid station 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.	○	×	×
SW0008 (608_H)	Line test station specification	Sets the station for which line tests are executed. 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.	○	○	×
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.	○	○	×
SW0020 (620_H)	Module status	Indicates the module status. 0 : Normal Other than 0 : Stores the error code.	○	○	○
SW0041 (641_H)	Data link restart result	Stores the execution result of the data link restart instruction with SB0000. 0 : Normal Other than 1 : Stores the error code.	○	○	×
SW0043 (643_H)	Refresh instruction at the standby master switching result	Indicates the execution result of the refresh instruction at the standby master switching. 0 : Normal Other than 0 : Stores the error code.	○	×	×

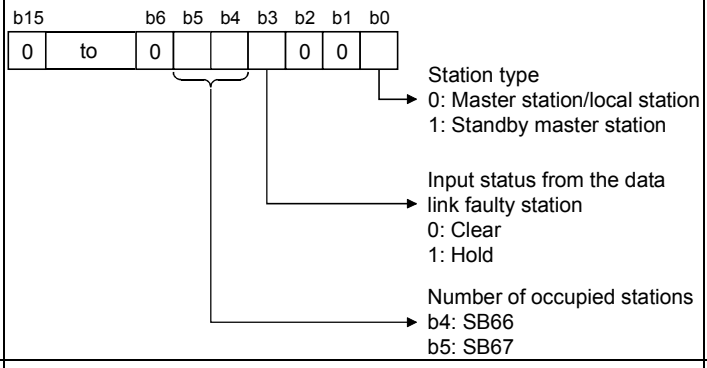
*3: Only the bit for the first station number is turned on.

Link special register list (2/7)

Number	Name	Description	Availability (○: available, ×: Not available)		
			Online		Offline
			Master station	Local station	
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 the error code.	○	○	×
SW0049 (649_H)	Temporary error invalid station specification result	Indicates the execution result of the temporary error invalid station specification. 0 : Normal Other than 0 : Stores the error code.	○	×	×
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 the error code.	○	×	×
SW004D ($64D_H$)	Line test result	Indicates the execution result of the line test. 0 : Normal Other than 0 : Stores the error code.	○	×	×
SW004F ($64F_H$)	Parameter setting test result	Indicates the execution result of the parameter setting test. 0 : Normal Other than 0 Stores the error code.	○	×	×
SW0052 *4 (652_H)	Automatic CC-Link startup execution result	Stores the system configuration check result when a new station is added to the system using the automatic CC-Link startup. 0 : Normal Other than 0 : Stores the error code.	○	×	×
SW0058 (658_H)	Detailed LED display status	Stores the details of the LED display status. 0: OFF 1: ON 	○	○	○
SW0059 (659_H)	Transmission rate settings	Stores the contents of the transmission rate settings. 0: Cancel 1: Set 	○	○	○

*4: The link special register added in the QJ61BT11 of the function version B.

Link special register list (3/7)

Number	Name	Description	Availability (○: Available, ×: Not available)		
			Online		Offline
			Master station	Local station	
SW005D ($65D_H$)	Forced master switching instruction result	Stores the execution result of the forced master switching instruction with SB000C. 0 : Normal Other than 1 : Stores the error code.	○*2	×	×
SW005F ($65F_H$)	Remote device station initialization procedure registration instruction result	Stores the execution result of the initialization procedure registration instruction with SB000B. 0 : Normal Other than 1 : Stores the error code.	○*1	×	×
SW0060 (660_H)	Mode setting status	Stores the mode setting status. 0: Online (with automatic return) 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	○	○	○
SW0062 (662_H)	Module operating status	Stores the operation setting status of the module. 	○	○	○
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 setting information for the scan interval delay time. 0 to 100 (50μs)	○	×	×
SW0067 (667_H)	Parameter information	Stores the parameter information area to be used. 0H: CPU built-in parameters 3H: Dedicated instruction (The parameter setting with the RLPASET instruction and the data link startup.) DH: 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.	○	○	×
SW0069 (669_H)	Loading status *4	Stores the duplicate station number status and parameter matching of each station. 0 : Normal Other than 0 : Stores the error code. Details are stored in SW0098 to 9B and SW009C to 9F.	○	×	×

*1: Can be used for the master station only.

*2: Can be used for the standby master station only.

*4: This register checks and stores the status only at the link startup.

Link special register list (4/7)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW006A
(66A_H)</td><td>Switch setting status</td><td>Stores the switch setting status.
0 : Normal
Other than 0 : Stores the error code.</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>SW006D
(66D_H)</td><td>Max. link scan time</td><td>Stores the maximum value of the link scan time.
(in 1 ms units)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006E
(66E_H)</td><td>Current link scan time</td><td>Stores the current value of the link scan time.
(in 1 ms units)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW006F
(66F_H)</td><td>Min. link scan time</td><td>Stores the minimum value of the link scan time.
(in 1 ms units)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0070
(670_H)</td><td>Total number of stations</td><td>Stores the final station number set in the parameter.
1 to 64 (stations)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0071
(671_H)</td><td>Max. communication station number</td><td>Stores the maximum station number (setting of the station number setting switch) that is performing the data link.
1 to 64 (stations)</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0072
(672_H)</td><td>Number of connected modules</td><td>Stores the number of modules that are performing the data link.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW0073
(673_H)</td><td>Standby master station number</td><td>Stores the station number of the standby master station.
1 to 64 (stations)</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0074
(674_H)
SW0075
(675_H)
SW0076
(676_H)
SW0077
(677_H)</td><td>Reserved station specified status *3</td><td>Stores the reserved station setting status.
0: Not reserved station
1: Reserved station
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0074</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0075</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0076</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0077</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0078
(678_H)
SW0079
(679_H)
SW007A
(67A_H)
SW007B
(67B_H)</td><td>Error invalid station specified status *1</td><td>Stores the error invalid station setting status.
0: Other than error invalid station
1: Error invalid station
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0078</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0079</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

*3: Only the bit for the first station number is turned on.

Table 8.4 Link special register list (5/7)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW007C
($67C_H$)
SW007D
($67D_H$)
SW007E
($67E_H$)
SW007F
($67F_H$)</td><td>Temporary error invalid status *3</td><td>Indicates the temporary error invalid status.
0: Normal status
1: Temporary error invalid status
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW007C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW007D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW007E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW007F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0080
(680_H)
SW0081
(681_H)
SW0082
(682_H)
SW0083
(683_H)</td><td>Other station data link status *6</td><td>Stores the data link status of each station.
0: Normal
1: Data link error occurrence
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0080</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0081</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0082</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0083</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0084
(684_H)
SW0085
(685_H)
SW0086
(686_H)
SW0087
(687_H)</td><td>Other station watchdog timer error occurrence status *3</td><td>Indicates the watchdog timer error occurrence status.
0: No watchdog timer error
1: Watchdog timer error occurrence
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0084</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0085</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0086</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0087</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

*3: Only the bit for the first station number is turned on.

*6: Bits for the number of occupied stations are turned on.

Link special register list (6/7)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0088
(688_H)
SW0089
(689_H)
SW008A
($68A_H$)
SW008B
($68B_H$)</td><td>Other station fuse blown status *6</td><td>Stores the fuse blown occurrence status of each station.
0: Normal
1: Abnormal
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0088</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0089</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW008C
($68C_H$)
SW008D
($68D_H$)
SW008E
($68E_H$)
SW008F
($68F_H$)</td><td>Other station switch change status *3</td><td>Indicates the switch change status of other stations performing the data link.
0: No change
1: Change occurred
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW008C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW008D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW008E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW008F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
<tr><td>SW0090
(690_H)</td><td>Line status</td><td>Stores the line status.
0: Normal
1: The data link cannot be performed (disconnected)</td><td>×</td><td>○</td><td>×</td></tr>
<tr><td>SW0094
(694_H)
SW0095
(695_H)
SW0096
(696_H)
SW0097
(697_H)</td><td>Transient transmission status *1</td><td>Indicates the occurrence status of a transient transmission error.
0: No transient transmission error
1: Transient transmission error occurrence
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0094</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0095</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW0096</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW0097</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>○</td><td>×</td></tr>
</table>

*3: Only the bit for the first station number is turned on.

*6: Bits for the number of occupied stations are turned on.

Link special register list (7/7)

<table>
<tr><th rowspan="3">Number</th><th rowspan="3">Name</th><th rowspan="3">Description</th><th colspan="3">Availability
(○: Available, ×: Not available)</th></tr>
<tr><th colspan="2">Online</th><th rowspan="2">Offline</th></tr>
<tr><th>Master station</th><th>Local station</th></tr>
<tr><td>SW0098
(698_H)
SW0099
(699_H)
SW009A
($69A_H$)
SW009B
($69B_H$)</td><td>Station number overlap status *7</td><td>Stores the overlap status when the first station number of each module is not overlapped.
0: Normal
1: Overlap station number (The first station number only)
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW0098</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW0099</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009A</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009B</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW009C
($69C_H$)
SW009D
($69D_H$)
SW009E
($69E_H$)
SW009F
($69F_H$)</td><td>Loading/parameter consistency status *7</td><td>Stores the consistency status between the loaded station and the parameter settings.
0: Normal
1: Matching error
<table><tr><th>Installation</th><th>Parameter</th></tr><tr><td>Remote device station</td><td>Remote I/O station</td></tr><tr><td rowspan="2">Intelligent device station</td><td>Remote I/O station</td></tr><tr><td>Remote device station</td></tr></table><table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW009C</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW009D</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW009E</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW009F</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>SW00B4
($6B4_H$)
SW00B5
($6B5_H$)
SW00B6
($6B6_H$)
SW00B7
($6B7_H$)</td><td>Line test 1 result *6</td><td>Stores the line test 1 result.
0: Normal
1: Abnormal
<table><tr><th></th><th>b15</th><th>b14</th><th>b13</th><th>b12</th><th>to</th><th>b3</th><th>b2</th><th>b1</th><th>b0</th></tr><tr><td>SW00B4</td><td>16</td><td>15</td><td>14</td><td>13</td><td>to</td><td>4</td><td>3</td><td>2</td><td>1</td></tr><tr><td>SW00B5</td><td>32</td><td>31</td><td>30</td><td>29</td><td>to</td><td>20</td><td>19</td><td>18</td><td>17</td></tr><tr><td>SW00B6</td><td>48</td><td>47</td><td>46</td><td>45</td><td>to</td><td>36</td><td>35</td><td>34</td><td>33</td></tr><tr><td>SW00B7</td><td>64</td><td>63</td><td>62</td><td>61</td><td>to</td><td>52</td><td>51</td><td>50</td><td>49</td></tr></table>Numbers 1 to 64 in the above table indicate the station numbers.</td><td>○</td><td>×</td><td>○</td></tr>
<tr><td>SW00B8
($6B8_H$)</td><td>Line test 2 result</td><td>Stores the line test 2 result.
0 : Normal
Other than 0 : Stores the error code.</td><td>×</td><td>×</td><td>○</td></tr>
</table>

*6: Bits for the number of occupied stations are turned on.

*7: Only the bit for the first station number is turned on. In addition, these registers check and store the status at the link startup.

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

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 (Update after each station is stabilized.)
SW0045		SW0072	
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		SW00B9	
SW0070		—	—

(3) Error codes

The following lists the error codes that are stored in the link special registers (SW). When the standby master station is operating as a 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.

Error code list (1/4)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
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.	Check the line.	○	○
B114	Link error	A line error has occurred.	Check the line.	○	○
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 initialization procedure registration function	In the remote device station initialization procedure registration function, the specification of the remote device station initialization procedure registration was turned off before all procedures were completed.	Do not turn the specification of the remote device station initialization 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 initialization procedure registration function was turned on at a station other than the master station.	Turn on the specification of the remote device station initialization procedure registration at the master station.	×	○
B125	Parameter not set error of the remote device station initialization procedure registration function	The specification of the remote device station initialization procedure registration function was turned on without setting the remote device station initialization procedure registration.	Turn on the specification of the remote device station initialization procedure registration function after setting the remote device station initialization procedure registration.	○	×
B201	Corresponding station error during the sending	A data link error occurred at the corresponding station during the 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.	○	○
B301	Processing request error during the link stop	A 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 a temporary error invalid request/temporary error invalid cancel request.	Specify a station number that is no greater than the highest communication station number.	○	×
B303	Specified station number not set error	The station number was not specified during a 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 the 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 a temporary error invalid request/temporary error invalid cancel request.	Specify a head station when a temporary error invalid request/temporary error invalid cancel request is requested.	○	○
B307	All stations data link error	All stations were in the 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".	○	×

Error code list (2/4)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
B309	Station number overlap error	The station number of the connected module was duplicated (including occupied stations). However, this excludes the duplicate head station number.	Check the module station number.	○	×
B30A	Loading/parameter compatibility error	The station types of the module are different from parameter settings. Example) Connected module: Remote device — Parameter setting: Remote I/O; Connected module: Intelligent device — Parameter setting: Remote I/O or Remote device	Set the correct parameters.	○	×
B30B	Loading/parameter compatibility 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	The 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 and line test requests were issued before starting the link.	Issue the requests after the data link is started.	○	×
B30F	Temporary error invalid station specification error	A temporary error invalid station was specified while the data link is being performed upon the 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.	○	×
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 PLC system off and back on, or resetting the PLC 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 PLC system off and back on, or reset the PLC CPU.	○	×
B381	Station number switch setting error	The station number switch was outside of the setting range.	Set the station number switch within the setting range.	○	○
B383	Baud rate setting error	The baud rate setting was outside of the setting range.	Set the baud rate setting within the setting range.	○	○
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 1H to 40H."	Set within the range of "1H to 40H".	○	×
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	Use prohibited area write error	A write operation was performed to the use prohibited area (not used) in the buffer memory.	Do not write to any of the use prohibited areas (not used) in the buffer memory.	○	○
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".	○	×
B389	Use prohibited area write error	A write operation was performed to the use prohibited area (not used) in the buffer memory.	Do not write to any of the use prohibited areas (not used) in the buffer memory.	○	○

Error code list (3/4)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
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.	○	×
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 occupying 4 stations (station numbers 5 to 8).	Set "Head station number of the module". Do not set "Station number not specified in the parameter".	○	×
B38E	Communication buffer assignment error	The total size of the communication buffers in the station information parameter exceeded 4k words.	Set the total size of the communication buffers to 4k words or less.	○	○
B38F	Automatic update buffer assignment error	The total size of the automatic update buffer in the station information parameter exceeded 4k words.	Set the total size of the automatic update buffer to 4k 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: (16x4)+(54xB)+(88xC)≦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 the 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)	"Station type" is set to "Standby master station" with a station other than the station specified by "Standby master station" of the master station parameter.	Check the parameters.	×	○
B39B	Reserved station setting error	All stations were set as reserved stations.	Check the reserved station settings.	○	×
B39C	Standby master station setting error	The station number designated for the standby master station is specified to a station other than an intelligent device station.	Specify the standby master station as an intelligent device station.	○	×
B401	Parameter change error	Parameter change was executed during a 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.	○	○
B415	Execution station type error	The RLPASET instruction was executed on a station other than the master station.	Check that the self-station type has been set to the master station.	×	○

Error code list (4/4)

Error code (hexadecimal)	Error details	Cause of error occurrence (details)	Corrective action	Detectability	
				Master station	Local station
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	A 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 station's 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 designation 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 the host connection.	○	○
B783	Transient storage buffer error	An error occurred in the transient storage buffer when a transient transmission of greater than 1k was being performed.	Wait a while and then retransmit.	○	○
B801	Instruction type setting error	An instruction type that does not exist was set.	Set the correct instruction type.	○	○
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 was 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, a transient transmission was performed even though the target station does not support the 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	Address definition error	The address was not a multiple of 16 when the bit device was accessed.	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.	○	○
B815	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.	○	○
B823	Remote control mode error	The mode specification of the remote control was incorrect.	Check the mode specification.	○	○
B903	Transient request error	A transient request was issued to the 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.	○	○
BA19	Corresponding station error	The corresponding station that is being tested stopped communication during the line test 1.	Check the cable and the corresponding station.	○	×
BA1B	All stations error	All stations stopped communications during the line test 1.	Check the cables.	○	×
BD85	Hardware error detection	A hardware error was detected.	There is most likely a hardware error in either the QJ61BT11, the CPU module, the base unit or other modules. Contact your nearest Mitsubishi representative.	○	○
BFFB	Transient request overload error	There are too many transient requests to the corresponding station.	Check that the self-station type has been set to the master station.	○	○
BFFE	CPU monitoring timer time out	The CPU monitoring timer timed out.	Check the operation of the target station.	○	○

Appendix 4 CC-Link Dedicated Instruction

The transient transmission can be performed for the local stations and intelligent device stations using dedicated instructions.
The following table lists the dedicated instructions that can be used for each of these stations:

Executable station column M : Master station L: Local station
Access target column M : Master station L: Local station
Rd : Remote device station
Id : Intelligent device station
Rio: Remote I/O station

Instruction	Description	Instruction executable station		Accessible station (Access target)					Reference section
		M	L	M	L	Id	Rd	Rio	
RIRD	Reads data from the buffer memory or PLC CPU device of the specified station.	○		×	○	○	×	×	Appendix 4.1
			○	○	○	×	×	×	
RIWT	Writes data into the buffer memory or PLC CPU device of the specified station.	○		×	○	○	×	×	Appendix 4.2
			○	○	○	×	×	×	
RIRCV	Automatically performs a handshaking with the specified station and reads data from the buffer memory of that station.	○	×	×	×	○	×	×	Appendix 4.3
RISEND	Automatically performs a handshaking with the specified station and writes data into the buffer memory of that station.	○	×	×	×	○	×	×	Appendix 4.4
RIFR	Reads data from the automatic update buffer or random access buffer for the specified station.	○	×	Accessible for the host master module from the master station					Appendix 4.5
RITO	Writes data into the automatic update buffer or random access buffer for the specified station.	○	×						Appendix 4.6
RLPASET	Sets the network parameters for the master module and starts up the data link.	○	×						Appendix 4.7

Executable station column ○: Executable ×: Not executable

Access target column ○: Accessible ×: Not accessible

POINT

(1) 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.

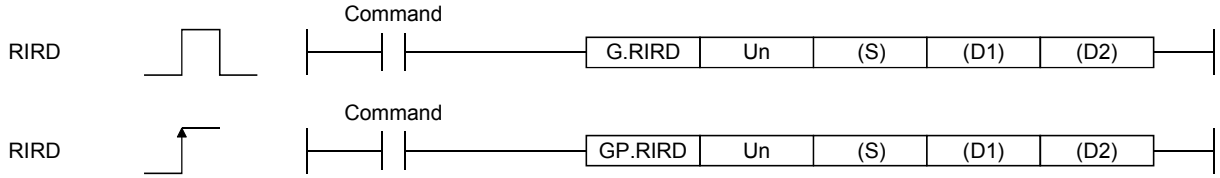
(2) For the communication between the following stations, the final two bits of the remote input (RX) and remote output (RY) of the corresponding target station cannot be used in the sequence program since they are used in the system.
• Between the master and local stations
• Between the master and intelligent device stations

Appendix 4.1 RIRD instruction

The RIRD instruction reads the data for the specified points from the buffer memory or PLC CPU device of the specified station.

Setting data	Usable devices								
	Internal device (System, user)		File register	MELSECNET/H Direct J□\□		Special module U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K,H	S	
(S)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(D2)	○			—				—	—	—

[Instruction symbol] [Execution condition]

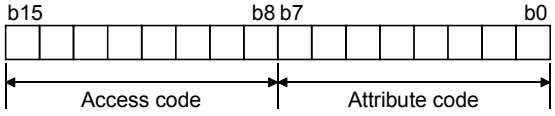


Setting data

Device	Setting details	Setting range	Data type
Un	Start I/O number of the module	0 to FE_H	Binary 16 bits
(S)	Start number of the device in which control data is stored.	Within the range of the specified devices	Device name
(D1)	Start number of the device to which read data is to be stored.	Within the range of the specified devices	
(D2)	Device that is turned ON during a 1 scan in the case of a reading completion. (D2) + 1 also turns ON in the case of an abnormal completion.	Within the range of the specified devices	Bit

* 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	Setting data	Setting range	Set by
(S) + 0	Complete status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0: Error code	—	System
(S) + 1	Station No.	Specify the station numbers of the local station and intelligent device station.	0 to 64	User
(S) + 2	Access code Attribute code		Refer to (1) and (2)	User
(S) + 3	Buffer memory address or device number	Specify the buffer memory start address or device start number.	*1	User
(S) + 4	Number of points to read	Specify the number of read data (in word units).	1 to 480*2 1 to 32*3	User

*1: Refer to the manual for the local station or intelligent device station from which data will be read.
When the random access buffer is specified, specify the address by setting the start address of the random access buffer memory as 0.

*2: Indicates the maximum number of data items that can be read.
Specify the buffer memory size of the local station or intelligent device station. Also, specify the receive buffer area setting range to be set with a parameter.

*3: When the counterpart PLC CPU is other than the following models and reads the PLC CPU device, the setting range will be 1 to 32 words.
QCPU (Q mode), QCPU (A mode), QnACPU, AnUCPU

(1) Buffer memory in the CC-Link

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

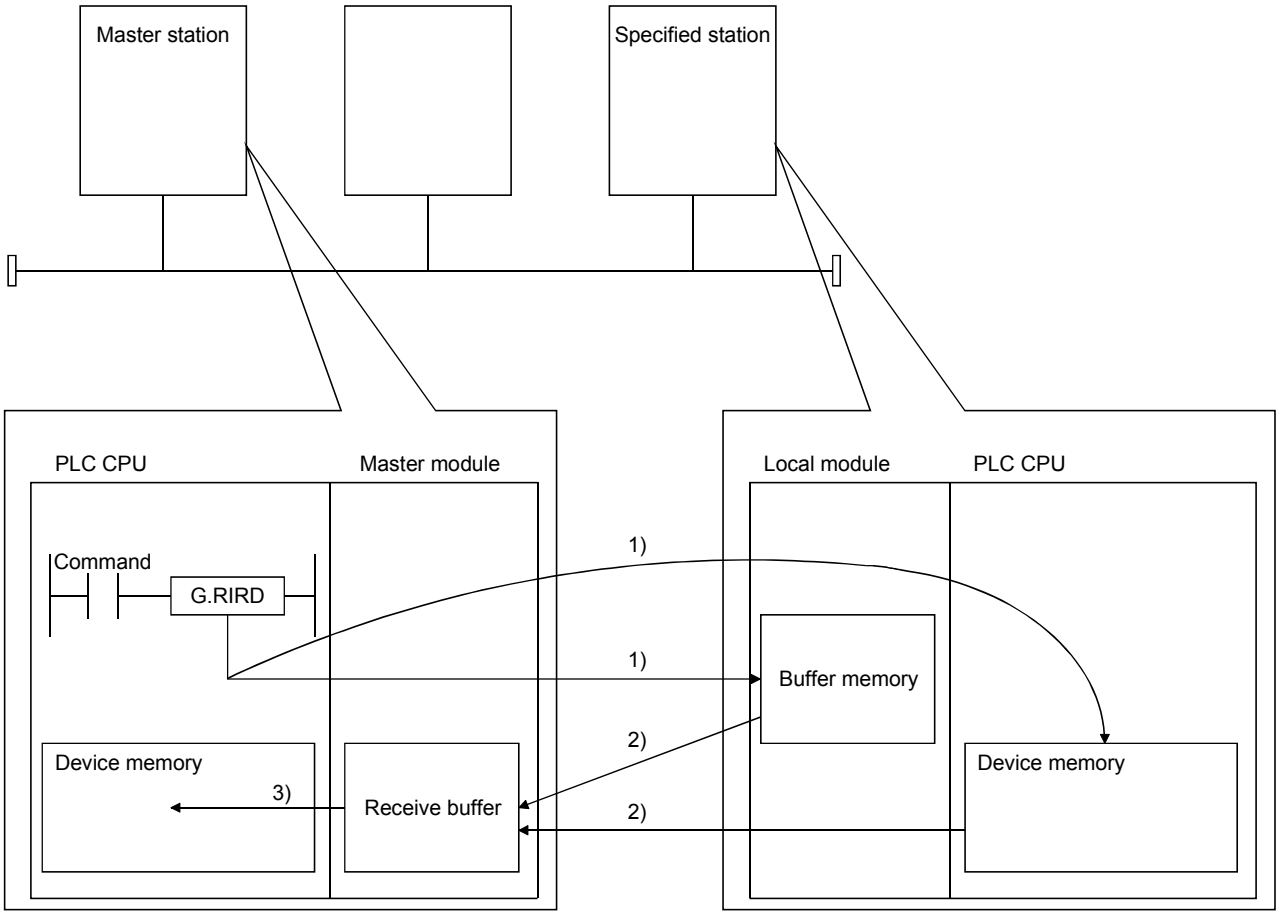
(2) Device memory in the PLC CPU

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	
Special link relay	SB	○		Hexadecimal	63H	
Special link 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 the bit position with 0 or a multiple of 16.

(3) Functions

(a) Operation chart for the RIRD instruction



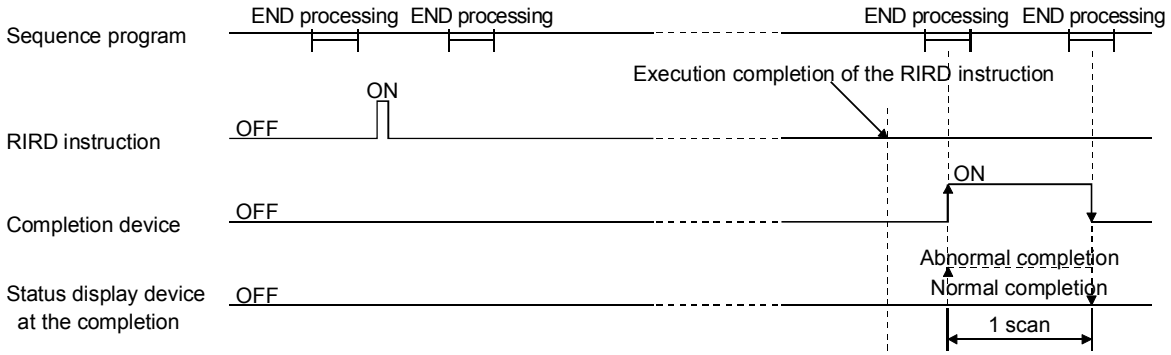
1) Reads the data from the buffer memory specified by (S)+2 and (S)+3 of the station specified by (S)+1, or the PLC CPU device.
2) Stores the data that has been read in the receive buffer of the master module.
3) Stores the data that has been read after the device specified in (D1), and the device specified by (D2) turns on.

(b) The RIRD instruction can be executed to multiple local stations or intelligent device stations simultaneously.
However, for the same local station or intelligent device station, this instruction cannot be executed simultaneously at more than one location.

(c) There are two types of interlock signals for the RIRD instruction: the completion device (D2) and the status display device at completion (D2) + 1.

1) Completion device (D2)
Turns ON in the END processing of the scan where the RIRD instruction is completed, and turns OFF in the next END processing.

2) Status display device at the completion (D2)+1
Turns ON and OFF depending on the completion status of the RIRD instruction.
Normal completion : Stays OFF and does not change.
Abnormal completion : Turns ON in the END processing of the scan where the RIRD instruction is completed, and turns OFF in the next END processing.



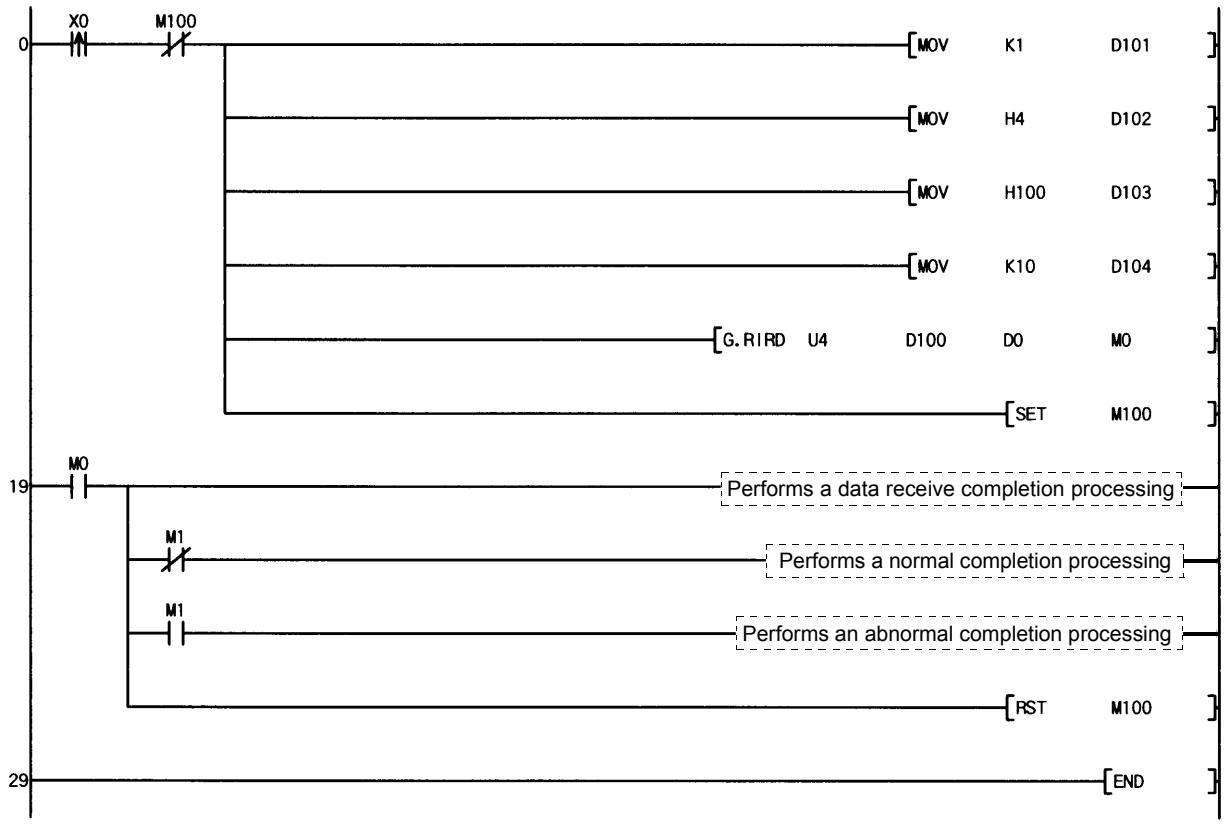
(d) The basic number of steps of the RIRD instruction is 8 steps.

(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 the 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

When X0 is turned ON, this program stores 10-word data to D0 and succeeding addresses from the buffer memory address 100H of the station (station number 1), which is connected to the master module installed at the I/O numbers from X/Y40 to X/Y5F.

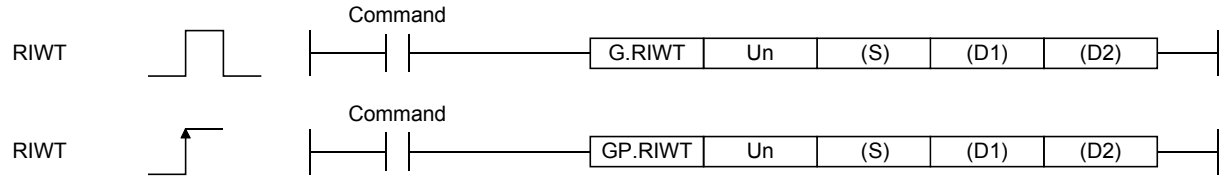


Appendix 4.2 RIWT instruction

The RIWT instruction writes the data for the specified points, to the buffer memory or the PLC CPU device of the specified station.

Setting data	Usable devices									
	Internal device (System, user)		File register	MELSECNET/H Direct J□\□		Special module U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K,H	S	
(S)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(D2)	○			—				—	—	—

[Instruction symbol] [Execution condition]

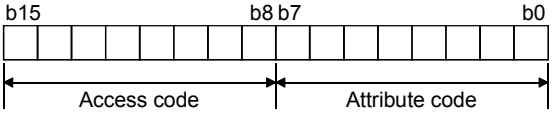


Setting data

Device	Setting details	Setting range	Data type
Un	Start I/O number of the module	0 to FE$_H$	Binary 16 bits
(S)	Start number of the device in which control data is stored.	Within the range of the specified devices	Device name
(D1)	Start number of the device to which write data is stored.	Within the range of the specified devices	
(D2)	Device that is turned ON during a 1 scan in the case of a writing completion. (D) + 1 also turns ON in the case of an abnormal completion.	Within the range of the specified devices	Bit

* 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	Setting data	Setting range	Set by
(S) + 0	Complete status	Stores the status when the instruction is complete. 0 : No error (normal completion) Other than 0: Error code	—	System
(S) + 1	Station No.	Specify the station numbers of the local station and intelligent device station.	0 to 64	User
(S) + 2	Access code Attribute code		Refer to (1) and (2)	User
(S) + 3	Buffer memory address or device number	Specify the buffer memory start address or device start number.	*1	User
(S) + 4	Number of points to write	Specify the number of write data (in word units).	1 to 480*2 1 to 10*3	User

*1: See the manual for the local station or intelligent device station to which data will be written.
When the random access buffer is specified, specify the address by setting the start address of the random access buffer memory as 0.

*2: Indicates the maximum number of data items that can be written.
Specify the buffer memory capacity of the local station or intelligent device station. Also, specify the send buffer area setting range to be set with a parameter.

*3: When the counterpart PLC CPU is other than the following models and writes the PLC CPU device, the setting range will be 1 to 10 words.
CPU (Q mode), QCPU (A mode), QnACPU, AnUCPU

(1) Buffer memory in the CC-Link

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

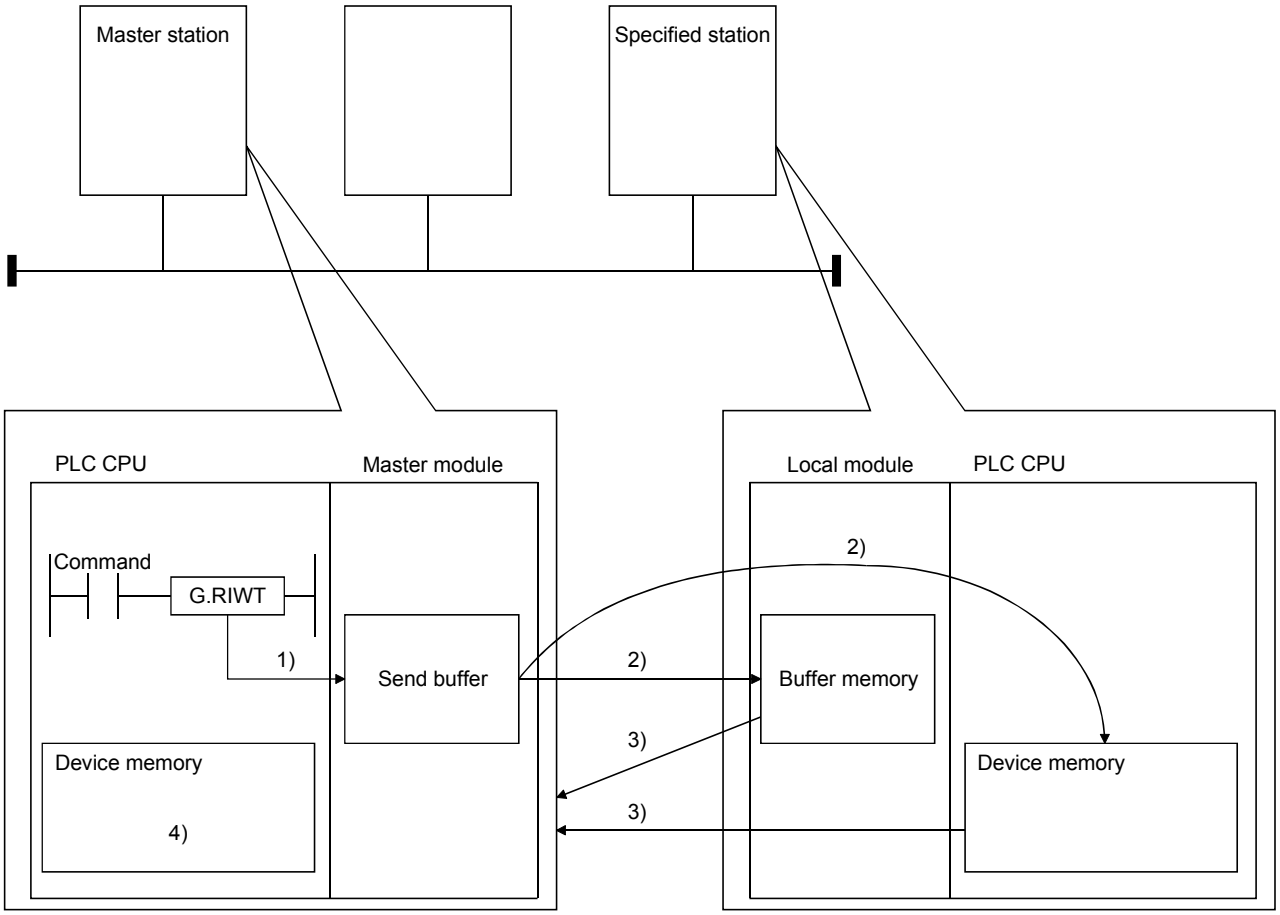
(2) Device memory in the PLC CPU

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	
Special link relay	SB	○		Hexadecimal	63H	
Special link 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 the bit position with 0 or a multiple of 16.

(3) Functions

(a) Operation chart for the RIWT instruction



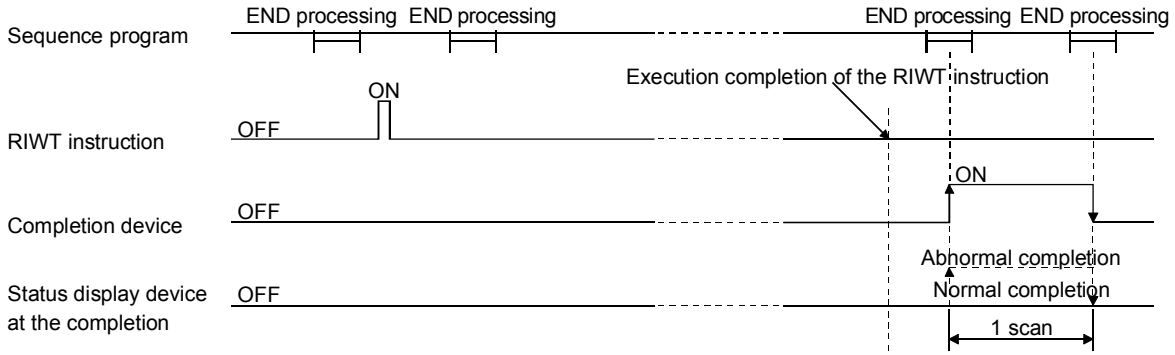
1) Stores the data to be written to the specified station in the send buffer of the master module.
2) Writes the data specified by (D1) to the buffer memory specified by (S)+2 and (S)+3 of the station specified by (S)+1 or to the PLC CPU device.
3) The specified station returns the write complete response to the master station.
4) The device specified by (D) turns ON.

(b) The RIWT instruction can be executed to multiple local stations or intelligent device stations simultaneously.
However, for the same local station or intelligent device station, this instruction cannot be executed simultaneously at more than one location.

(c) There are two types of interlock signals for the RIWT instruction: the completion device (D) and the status display device at completion (D) + 1.

1) Completion device (D)
Turns ON in the END processing of the scan where the RIWT instruction is completed, and turns OFF in the next END processing.

2) Status display device at the completion (D)+1
Turns ON and OFF depending on the completion status of the RIWT instruction.
Normal completion: Stays OFF and does not change.
Abnormal completion: Turns ON in the END processing of the scan where the RIWT instruction is completed, and turns OFF in the next END processing.



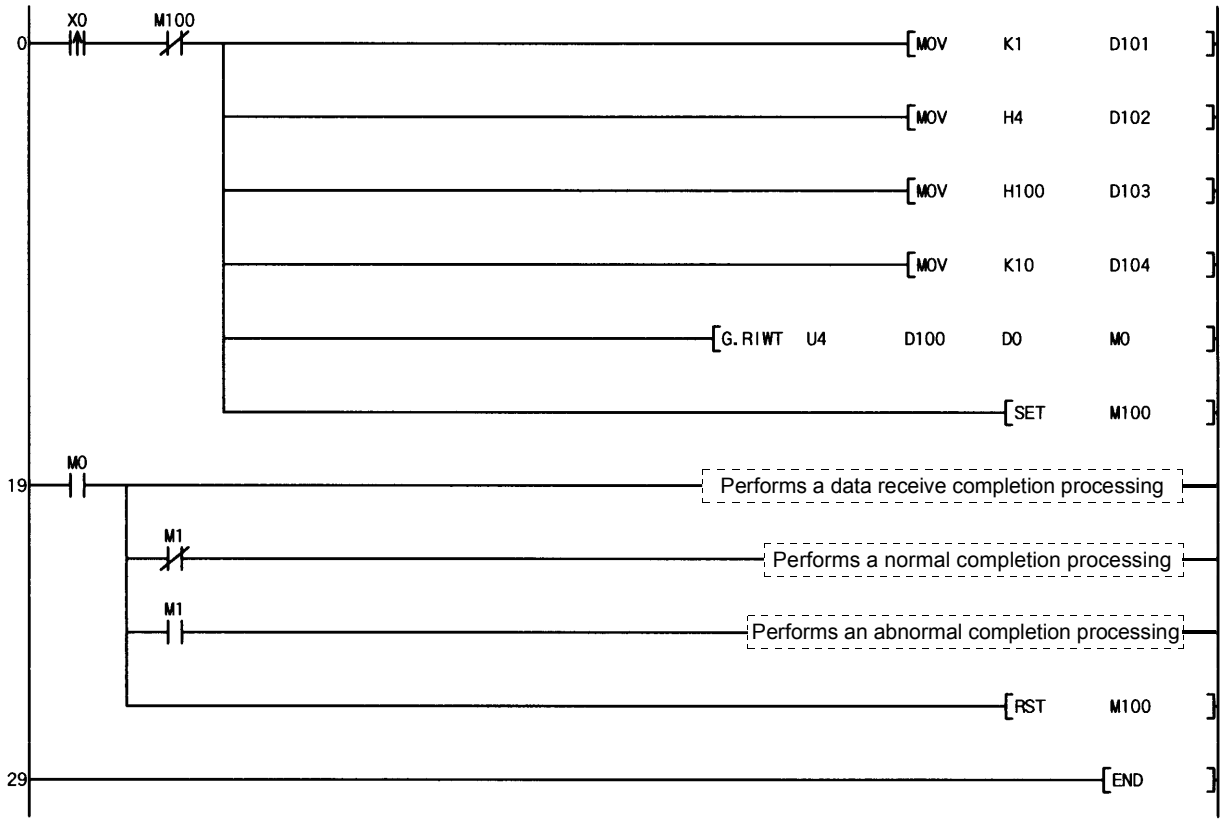
(d) The basic number of steps of the RIWT instruction is 8 steps.

(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 the 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

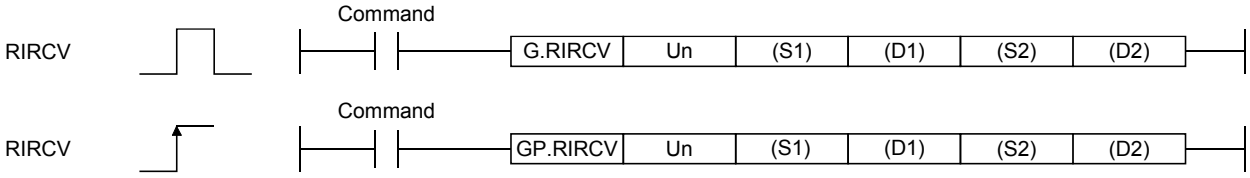
When X0 is turned ON, this program writes 10-word data from D0 to succeeding addresses from the buffer memory address 100H of the station (station number 1), which is connected to the master module installed at the I/O numbers from X/Y40 to X/Y5F.



When the remote input (RX) to be used as a handshake signal of the specified intelligent device station turns on, the data is read from the buffer memory.
Then, when the data reading is finished, the remote output (RY) to be used as a handshake signal turns on.
Reading data reading and turning ON/OFF the remote output are automatically performed.

Setting data	Usable devices									
	Internal device (System, user)		File register	MELSECNET/H Direct J□\□		Special function module U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K,H	S	
(S1)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(D2)	○			—				—	—	—

[Instruction symbol] [Execution condition]



Setting data

Device	Setting details	Setting range	Data type
Un	Start I/O number of the module	0 to FE$_H$	Binary 16 bits
(S1)	Start number of the device in which control data is stored.	Within the range of the specified devices	Device name
(D1)	Start number of the device to which read data is to be stored.	Within the range of the specified devices	
(S2)	Start number of the device where the handshake signal is stored. (Device specifying the numbers of remote input and remote output to be used as a handshake signal)	Within the range of the specified devices	Bit
(D2)	Device that is turned ON during a 1 scan in the case of a reading completion. (D2) + 1 also turns ON in the case of an abnormal completion.	Within the range of the specified devices	

* 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	Setting data	Setting range	Set by
(S1) + 0	Complete 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".	0004$_H$	User
(S1) + 3	Buffer memory address	Specify the buffer memory start address.	*1	User
(S1) + 4	Number of points to read	Specify the number of read data (in word units).	1 to 480*2	User

*1: Refer to 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.

Handshake signal storage devices

Device	Item	Setting data	Setting range	Set by
(S2) + 0	b15 to b8 b7 to b0 0 | RY	RY: Request device (*2)	0 to 127	User
		Set the upper 8 bits to 0.	0	User
(S2) + 1	b15 to b8 b7 to b0 RWr | RX	RX : Completion device (*3)	0 to 127	User
		RWr : Error code storage device (*1) If none, set to FF_H.	0 to 15 FF_H	User
(S2) + 2	b15 to b0 Completion mode	0: Complete with switching from ON to OFF of the 1 device (RXn specified with (S2)+1) 1: Complete with switching from ON to OFF of the 2 device (RXn, RXn+1 specified with (S2)+1) (RXn+1 turns ON at an abnormal completion.)	0/1	User

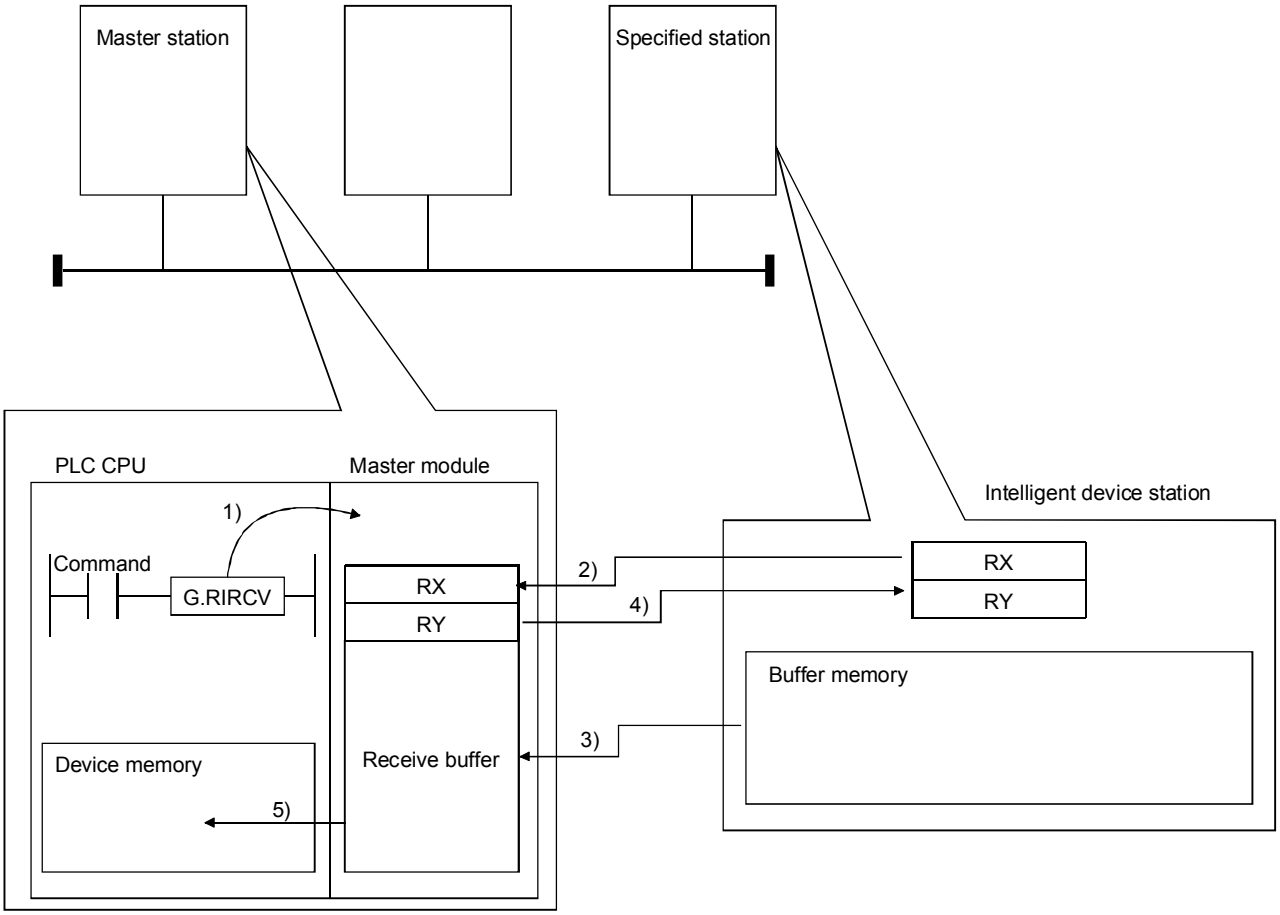
*1: For the error code storage device, set the start of remote register for the target intelligent device station as "RWr0" and then specify the remote register number in which the error code at receiving is stored.
When a receiving error occurred, the contents of error code storage device are also stored in the complete status of control data.

*2: For the request device, set the start of remote output for the target intelligent device station as "RY0" and then specify the remote output (RY) number which turns ON when the data read completion is notified to the intelligent device station.
(Specification of the handshake signal for output)

*3: For the completion device, set the start of remote input for the target intelligent device station as "RX0 and then specify the remote input (RX) number to be used for the data read timing.
(Specification of the handshake signal for input)

(1) Functions

(a) Operation chart for the RIRCV instruction



1) Instructs the data reading from the buffer memory specified by (S1)+2 and (S1) +3 of the station specified by (S1) +1.
2) The master module monitors the remote input (RX) specified by (S2) +1. (Monitoring of the handshake signal for input)
3) The master module reads data from the buffer memory of specified station by switching the remote input specified by (S2) + 1 from OFF to ON. The read data is stored in the received buffer of the master module.
4) The master module turns ON the remote output (RY) specified by (S2) + 0. (Output of the handshake signal for output) The remote output turns OFF by switching the above remote input from ON to OFF.
5) Stores the data that has been read from the specified station after the device specified by (D1), and then the device specified by (D2) turns ON.

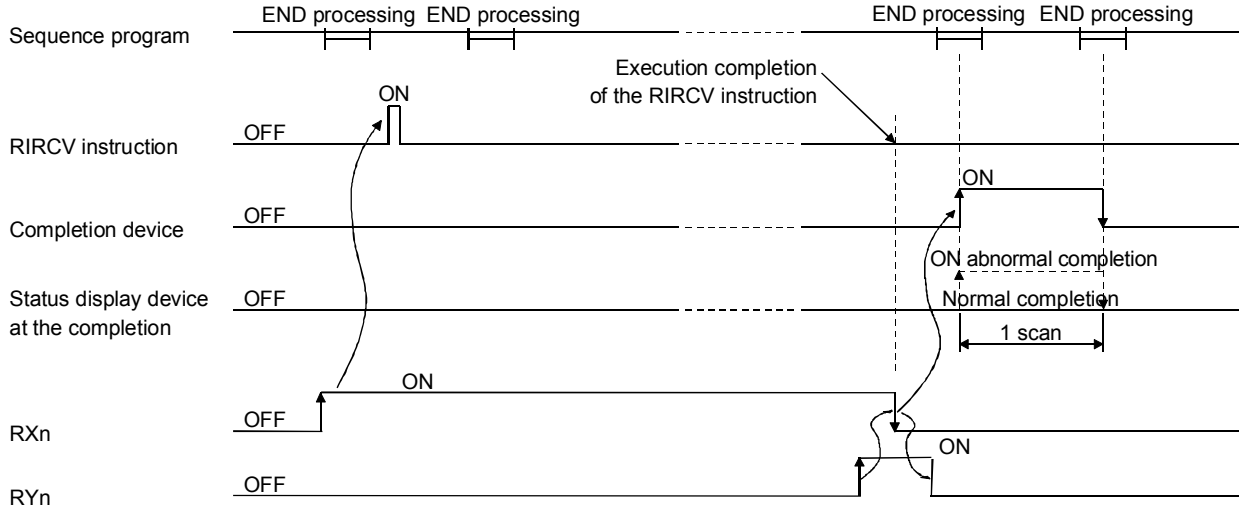
(b) The RIRCV instruction can be executed to multiple intelligent device stations simultaneously.
However, this instruction cannot be executed simultaneously at more than one location for the same intelligent device station.

(c) There are two types of interlock signals for the RIRCV instruction: the completion device (D2) and the status display device at the completion (D2) + 1.

1) Completion device (D2)
Turns ON in the END processing of the scan where the RIRCV instruction is completed, and turns OFF in the next END processing.

2) Status display device at the completion (D2) +1
Turns ON and OFF depending on the completion status of the RIRCV instruction.

Normal completion : Stays OFF and does not change.
Abnormal completion : Turns ON in the END processing of the scan where the RIRCV instruction is completed, and turns OFF in the next END processing.



(d) The basic number of steps of the RIRCV instruction is 10 steps.

(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.

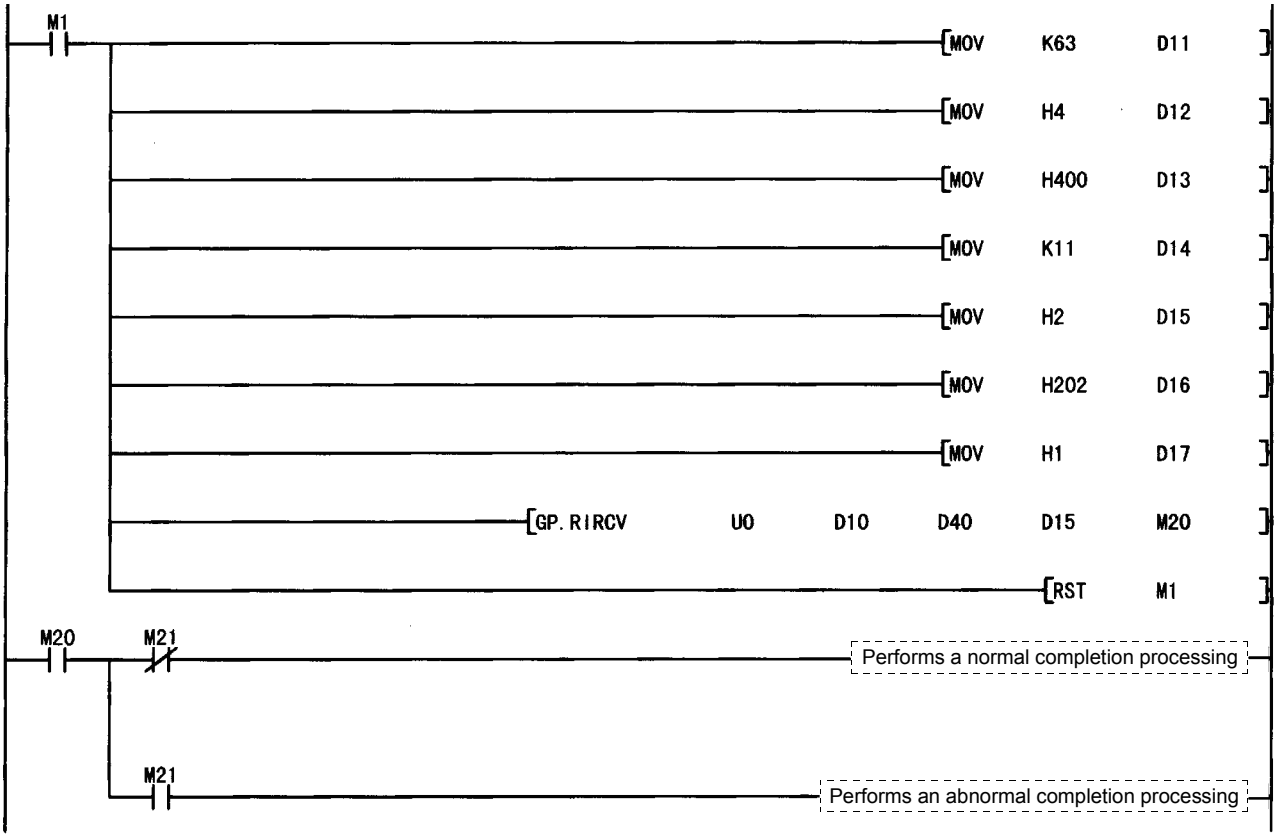
Error Code	Description of operation error
2112	When the module specified by Un is not an intelligent function module
	When the module specified by Un is not a special function module
4002	When an attempt was made to execute the unsupported instruction
4003	When the number of devices in the instruction 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 is turned ON, this program reads 11-word data from the buffer memory address 400H of the station (station number 63) connected to the master module installed at the I/O numbers from X/Y00 to X/Y1F and stores it into D40 and succeeding addresses.

The settings of the handshake signal storage device (S2) are as follows:

Request device: RY2, Completion device: RX2, Error code storage device: RWr2, Completion mode: 1.

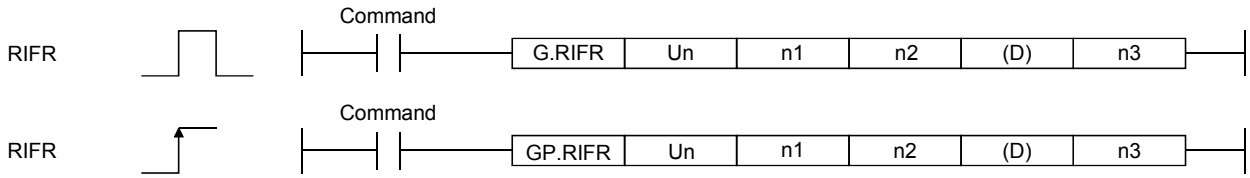


Appendix 4.4 RISEND instruction

The RISEND instruction writes data to the buffer memory of the specified intelligent device station and turns ON the remote output (RY) to be used as a handshake signal. Also, the instruction turns OFF the remote output by turning ON the remote input (RX) to be used as a handshake signal.
Writing data and turning ON/OFF the remote output are automatically performed.

Setting data	Usable devices									
	Internal device (System, user)		File register	MELSECNET/H Direct J□\□		Special function module U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K,H	S	
(S1)	—	○		—				—	—	—
(D1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(D2)	○			—				—	—	—

[Instruction symbol] [Execution condition]



Setting data

Device	Setting details	Setting range	Data type
Un	Start I/O number of the module	0 to FE$_H$	Binary 16 bits
(S1)	Start number of the device in which control data is stored.	Within the range of the specified devices	Device name
(D1)	Start number of the device to which write data is stored.	Within the range of the specified devices	
(S2)	Start number of the device where the handshake signal is stored. (Device specifying the numbers of remote input and remote output to be used as a handshake signal)	Within the range of the specified devices	
(D2)	Device that is turned ON during a 1 scan in the case of a writing completion. (D) + 1 also turns ON in the case of an abnormal completion.	Within the range of the specified devices	Bit

* 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	Setting data	Setting range	Set by
(S1) + 0	Complete 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".	0004$_H$	User
(S1) + 3	Buffer memory address	Specify the buffer memory start address.	*1	User
(S1) + 4	Number of points to write	Specify the number of write data (in word units).	1 to 480*2	User

*1: Refer to the manual for the intelligent device station from 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 send buffer area setting range to be set with a parameter.

Handshake signal storage devices

Device	Item	Setting data	Setting range	Set by
(S2) + 0	b15 to b8 b7 to b0 0 | RY	RY : Request device (*2)	0 to 127	User
		Set the upper 8 bits to 0.	0	User
(S2) + 1	b15 to b8 b7 to b0 RWr | RX	RX : Completion device (*3)	0 to 127	User
		RWr : Error code storage device (*1) If none, set to FFH.	0 to 15 FFH	User
(S2) + 2	b15 to b0 Completion mode	0 : Complete with switching from ON to OFF of the 1 device (RXn specified with (S2)+1) 1 : Complete with switching from ON to OFF of the 2 device (RXn, RXn+1 specified with (S2)+1) (RXn+1 turns ON at an abnormal completion.)	0/1	User

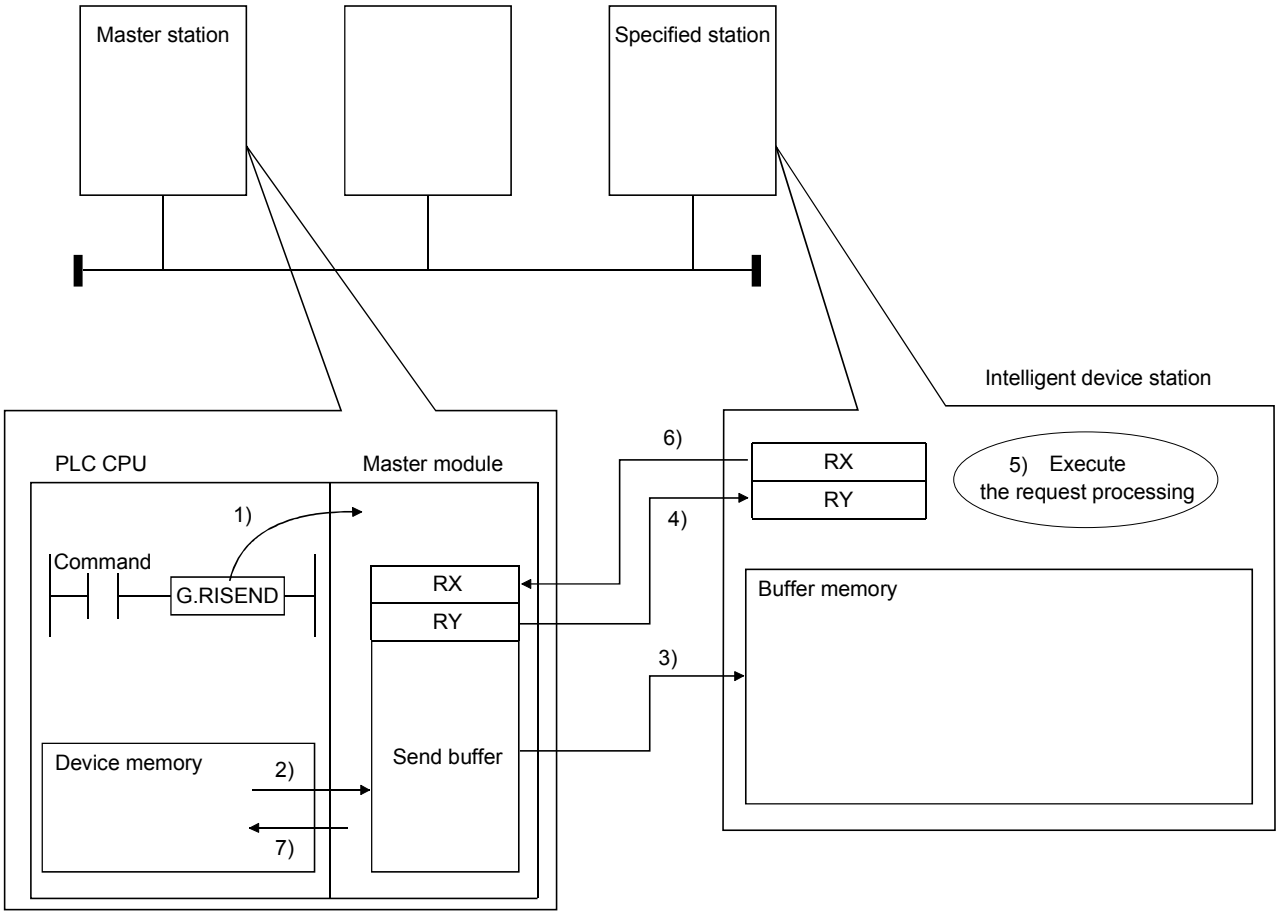
*1: For the error code storage device, set the start of remote register for the target intelligent device station as "RWr0" and then specify the remote register number in which the error code at sending is stored.
When a sending error occurred, the contents of the error code storage device are also stored in the complete status of control data.

*2: For the remote device, set the start of remote output for the target intelligent device station as "RY0" and then specify the remote output (RY) number which turns ON when the processing request is notified after writing data to the intelligent device station.
(Specification of the handshake signal for output)

*3: For the completion device, set the start of remote input for the target intelligent device station as "RX0" and the specify the remote input (RX) number to be referred as the processing complete timing (switching from OFF to ON)for the processing request after writing data to the intelligent device station.
(Specification of the handshake signal for input)

(1) Functions

(a) Operation chart for the RISEND instruction



1) Instructs the data writing to the buffer memory specified by (S1) + 2 and (S1) +3 of the station specified by (S1) + 1 and processing by the specified handshake signal.
2) Stores the data to be written to the specified station in the send buffer of the master module.
3) Writes the data to the buffer memory specified by (S1) + 2 and (S1) +3 of the station specified by (S1) +1.
4) The master module turns the handshake signal RYn specified by (S2) + 0 ON.
5) The station specified by (S1) + 1 executes the processing for the handshake signal RYn.
6) The station specified by (S1) + 1 turns the handshake signal RXn specified by (S2) + 1 ON with the processing completion for the handshake signal RYn.
   Also, the write complete response is returned to the master station.
7) The device specified by (D2) turns ON.

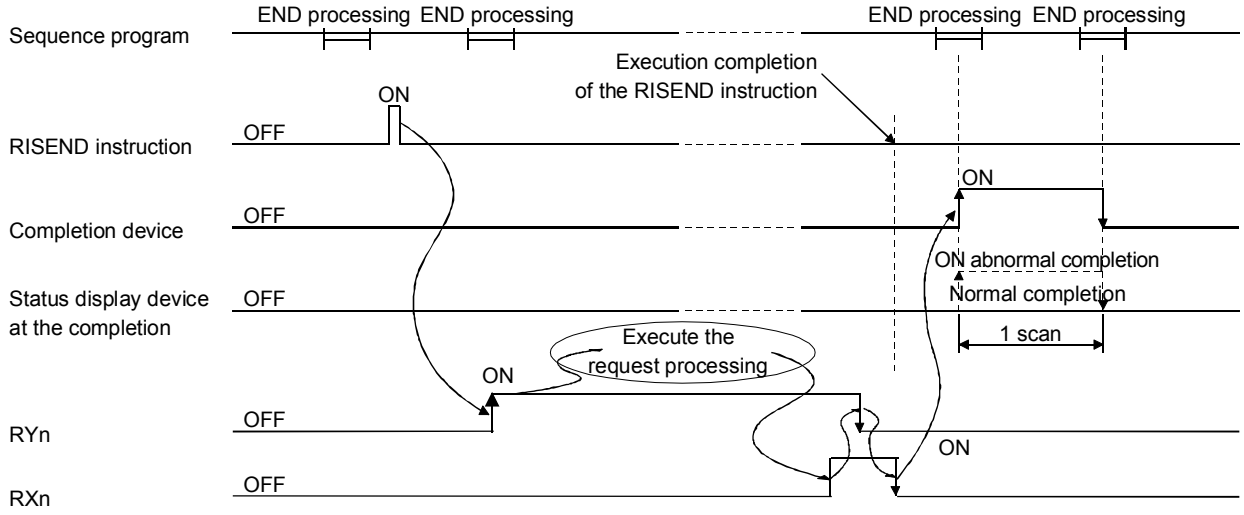
(b) The RISEND instruction can be executed to multiple intelligent device stations simultaneously.
However, this instruction cannot be executed simultaneously at more than one location for the same intelligent device station.

(c) There are two types of interlock signals for the RISEND instruction: the completion device (D2) and the status display device at the completion (D2) + 1.

1) Completion device (D2)
Turns ON in the END processing of the scan where the RISEND instruction is completed, and turns OFF in the next END processing.

2) Status display device at the completion (D2) +1
Turns ON and OFF depending on the completion status of the RISEND instruction.

Normal completion : Stays OFF and does not change.
Abnormal completion : Turns ON in the END processing of the scan where the RISEND instruction is completed, and turns OFF in the next END processing.



(d) The basic number of steps of the RISEND instruction is 10 steps.

(2) Operation error

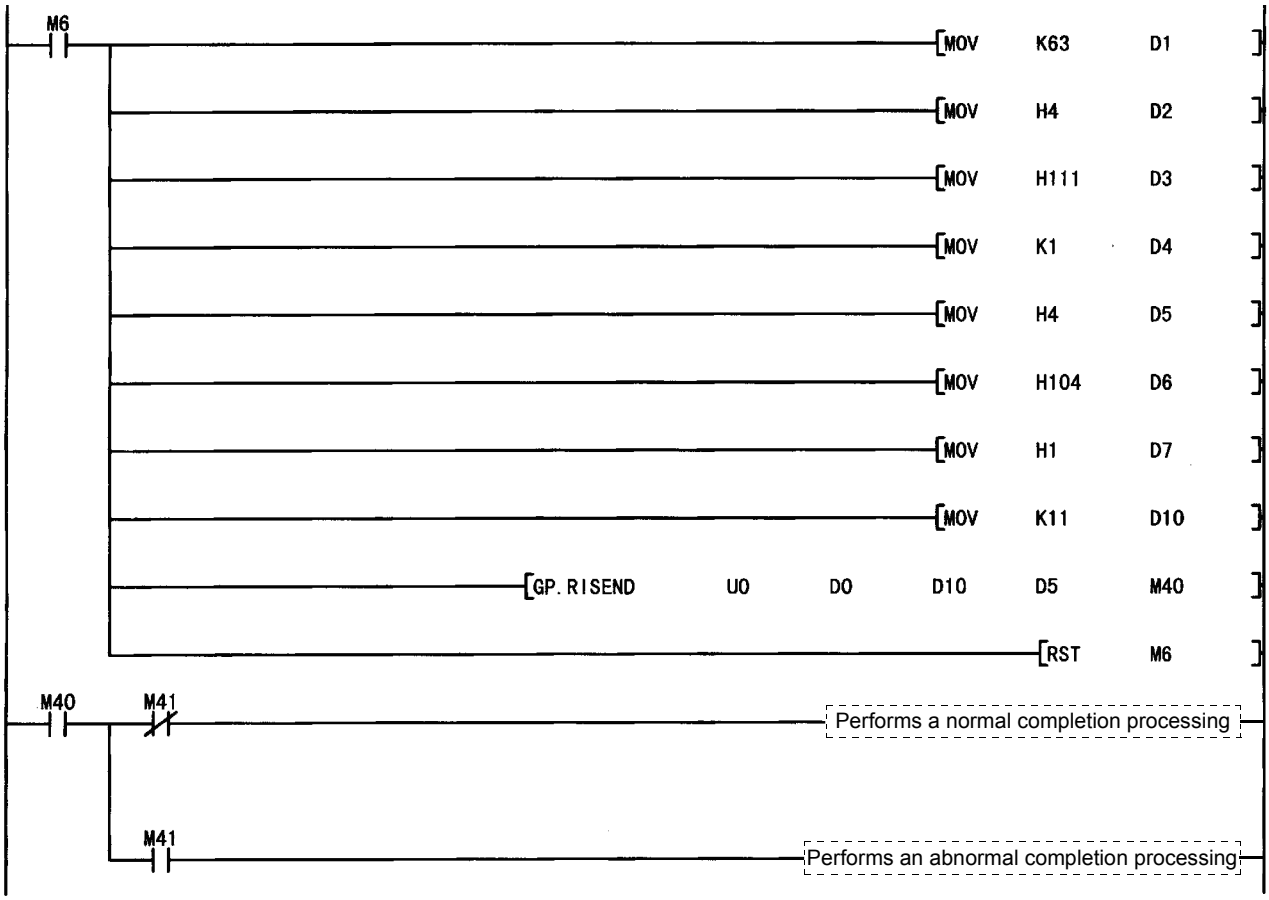
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

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 the 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 is turned ON, this program writes the one-word data of D10 to the buffer memory address 111H of the station (station number 63), which is connected to the master module installed at the I/O numbers from X/Y00 to X/Y1F.

The settings of the handshake signal storage device (S2) are as follows: Request device: RY4, Completion device: RX4, Error code storage device: RWr1, Completion mode 1.

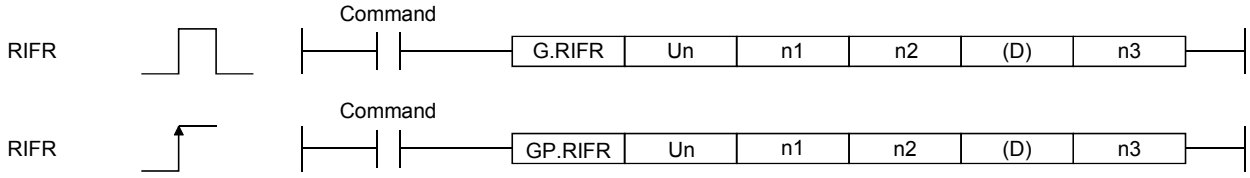


Appendix 4.5 RIFR instruction

The RIFR instruction reads the data from the automatic update buffer or random access buffer for the specified station addressing to the buffer memory of the host station master module.
It can be executed only with the master station.

Setting data	Usable devices									
	Internal device (System, user)		File register	MELSECNET/H Direct J□\□		Special function module U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K,H	S	
n1	○	○		—				○	—	—
n2	○	○		—				○	—	—
(D)	—	○		—				—	—	—
n3	○	○		—				○	—	—

[Instruction symbol] [Execution condition]



Setting data

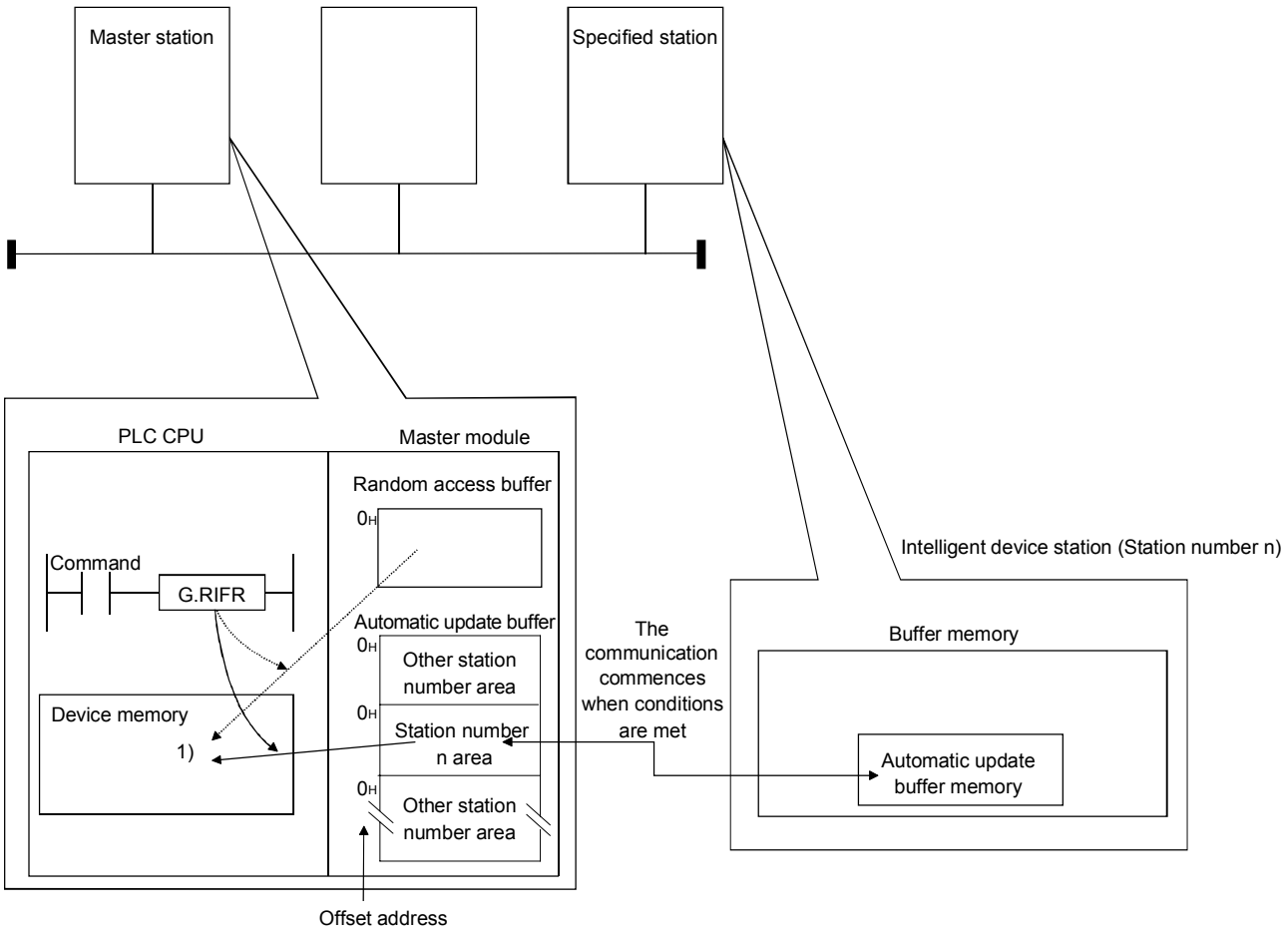
Device	Setting details	Setting range	Data type
Un	Start I/O number of the module	0 to FE_H	Binary 16 bits
n1	Intelligent device station number	1 to 64	
	Random access buffer specification	FF_H	
n2	Any of the following offset addresses in the master module • Automatic update buffer for the specified intelligent device station • Random access buffer	Between 0 and parameter setting value *1	
(D)	Start number of the device to which the 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 GX Developer
- Specify the start area of the automatic update buffer for the specified station by the offset address that sets the address to 0 when reading data from the automatic update buffer for the intelligent device station.
- Specify the start area of the random access buffer by the offset address that sets the address to 0 when reading data from the random access buffer.

*2: No processing will be performed when set to "0".

(1) Functions

(a) Operation chart for the RIFR instruction



1) Reads data from any of the following buffer memories specified by n1 and n2 in the master module specified by Un.
   • Automatic update buffer for the intelligent device station specified by n1 and n2.
   • Random access buffer specified by n1 and n2.
   The data that has been read is stored after the device specified by (D).

(b) The 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 RIFR instruction are 4096.

(d) The basic number of steps of the RIFR instruction is 9 steps.

(e) The automatic update buffer assignment is performed using the "Station information settings" of the network parameters of GX Developer.

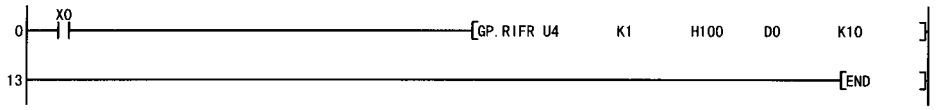
(2) Operation error

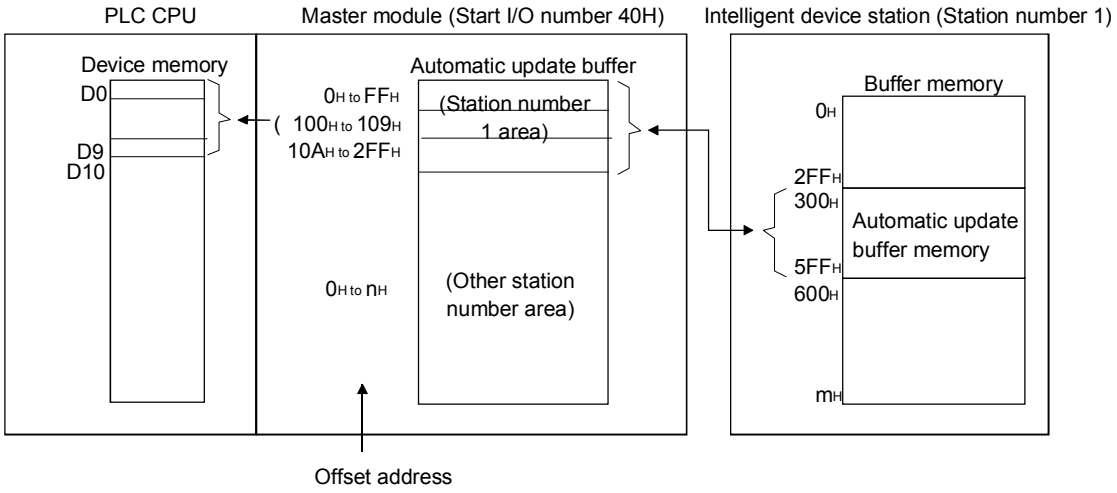
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

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 the 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 number of points to read (n3) is out of the setting range
	When the station number specified by n1 does not exist.

(3) Program example

When X0 is turned ON, the following example program reads the 10-word data from the automatic update buffer offset address 100H for the station number 1 (corresponding to 400H of the intelligent device station) in the master module and stores it into D0 or succeeding addresses.



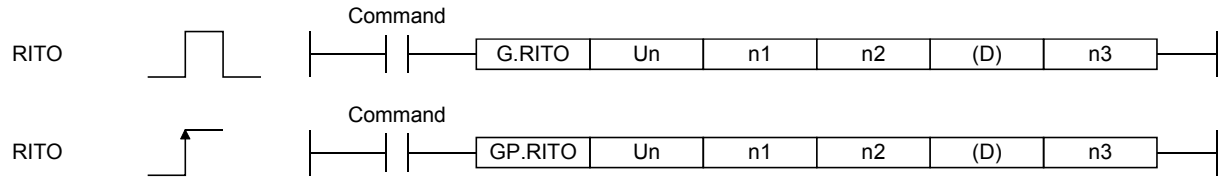


Appendix 4.6 RITO instruction

The RITO instruction writes data to the automatic update buffer or random access buffer for the specified station addressing to the buffer memory of the host station master module.
It can be executed only with the master station.

Setting data	Usable devices									
	Internal device (System, user)		File register	MELSECNET/H Direct J□\□		Special function module U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K,H	S	
n1	○	○		—				○	—	—
n2	○	○		—				○	—	—
(D)	—	○		—				—	—	—
n3	○	○		—				○	—	—

[Instruction symbol] [Execution condition]



Setting data

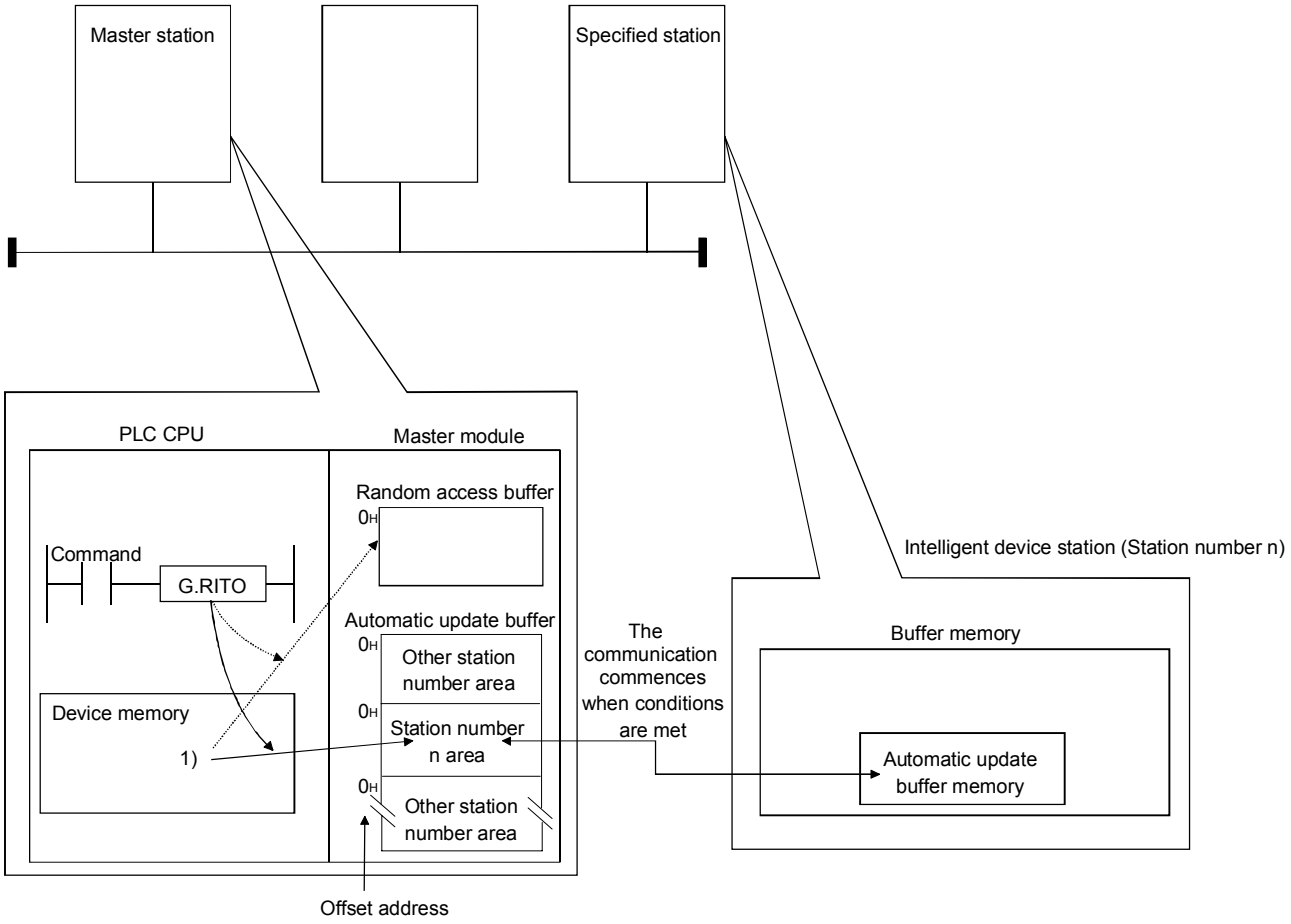
Device	Setting details	Setting range	Data type
Un	Start I/O number of the module	0 to FE_H	Binary 16 bits
n1	Intelligent device station number	1 to 64	
	Random access buffer specification	FF_H	
n2	Any of the following offset addresses in the master module • Automatic update buffer for the specified intelligent device station • Random access buffer	Between 0 and parameter setting value *1	
(D)	Start number of the device to which the data to write is 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 GX Developer
- Specify the start area of the automatic update buffer for the specified station by the offset address that sets the address to 0 when writing data to the automatic update buffer for the intelligent device station.
- Specify the start area of the random access buffer by the offset address that sets the address to 0 when writing data to the random access buffer.

*2: No processing will be performed when set to "0".

(1) Functions

(a) Operation chart for the RITO instruction



1) Writes the data to any buffer memory specified by n1 and n2 of the master module specified by Un from the following:
   • Automatic update buffer for the intelligent device station specified by n1 and n2.
   • Random access buffer specified by n1 and n2.

(b) The 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 written by the RITO instruction are 4096.

(d) The basic number of steps of the RITO instruction is 9 steps.

(e) The automatic update buffer assignment is performed using the "Station information settings" of the network parameters of GX Developer.

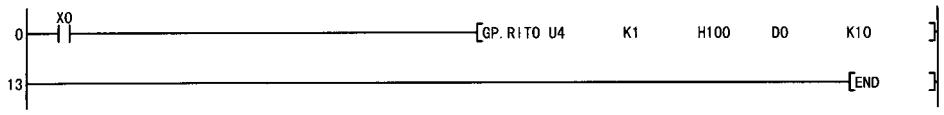
(2) Operation error

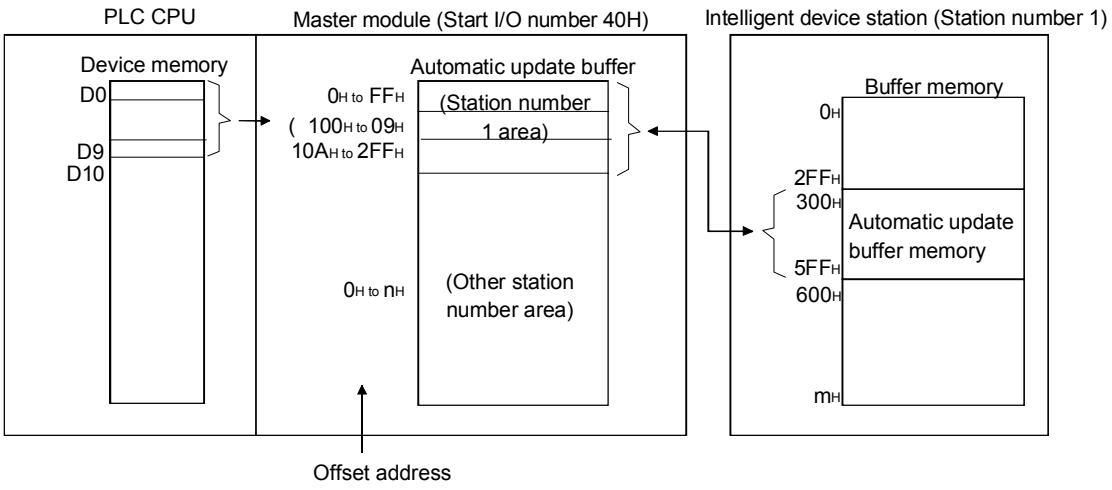
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

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 the 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 number of points to write (n3) is out of the setting range
	When the station number specified by n1 does not exist

(3) Program example

When X0 is turned ON, the following example program writes the 10-word data from D0 to 100H (corresponding to 400H of the intelligent device station) and succeeding addresses of the automatic update buffer offset value for the station number 1 in the module.



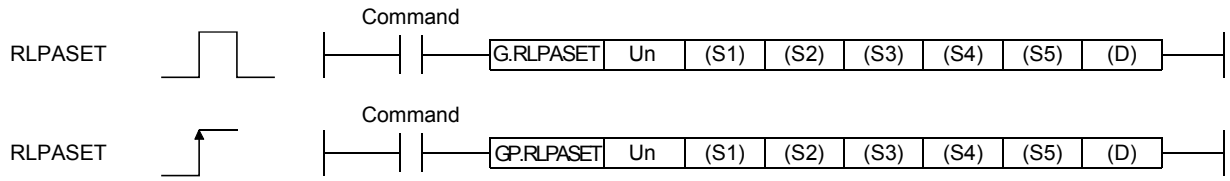


Appendix 4.7 RLPASET instruction

The RLPASET instruction sets the network parameters for the master module and starts up the data link.

Setting data	Usable devices									
	Internal device (System, user)		File register	MELSECNET/H Direct J□\□		Special function module U□\G□	Index register Z□	Constant		Other
	Bit	Word		Bit	Word			K,H	S	
(S1)	—	○		—				—	—	—
(S2)	—	○		—				—	—	—
(S3)	—	○		—				—	—	—
(S4)	—	○		—				—	—	—
(S5)	—	○		—				—	—	—
(D)	○			—				—	—	—

[Instruction symbol] [Execution condition]



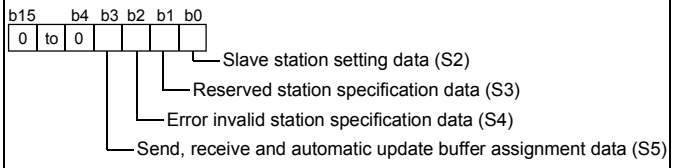
Setting data

Device	Setting details	Setting range	Data type
Un	Start I/O number of the module	0 to FE$_H$	Binary 16 bits
(S1)*	Start number of the device in which control data is stored.	Within the range of the specified devices	Device name
(S2)*	Start number of the device in which slave station setting data is stored.	Within the range of the specified devices	
(S3)*	Start number of the device in which reserved station specification data is stored.	Within the range of the specified devices	
(S4)*	Start number of the device in which error invalid station specification data is stored.	Within the range of the specified devices	
(S5)*	Start number of the device in which send/receive buffer and automatic update buffer assignment data are stored.	Within the range of the specified devices	
(D)	Device that is turned ON during a 1 scan in the case of a setting completion. (D) + 1 also turns ON in the case of an abnormal completion.	Within the range of the specified devices	Bit

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

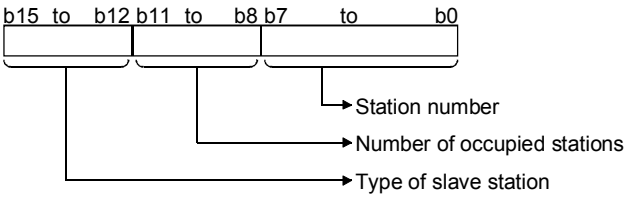
* When the setting data for (S2) to (S5) are not to be set, specify a dummy device.

Control data

Device	Item	Setting data	Setting range	Set by
(S1) + 0	Complete 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: Valid 	—	User
(S1) + 2	Number of connected modules involved in communication	Sets the total number of connected modules on the CC-Link system.	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 1 link scan.	1 to 10	
(S1) + 5	Operation specification when the CPU is down	Specifies the data link status when a master station PLC CPU error occurs. 0: Stop 1: Continue	0, 1	
(S1) + 6	Scan mode specification	Specifies either the synchronous or asynchronous mode of link scan for the sequence scan. 0: Asynchronous 1: Synchronous	0, 1	
(S1) + 7	Delay time setting	Sets the link scan interval. (Unit: 50μs)	0 to 100	

*1: For the setting data specified invalid, the default parameter will be applied.

Slave station setting data

Device	Item	Setting data	Setting range	Set by
(S2) + 0 to (S2) + 63	Settings for 1 to 64 modules *2	The type of slave station, number of occupied stations and station number are set as follows.  The default parameter settings are "0101H to 0140H" (Station number: 1 to 64, number of occupied stations: 1, type of slave station: remote I/O station).	—	User
		Setting of the station number: 1 to 64 (BIN setting)	1 to 40H	
		Setting of the number of occupied stations Number of occupied stations / Setting / Number of occupied stations / Setting 1 station / 1H / 3 stations / 3H 2 stations / 2H / 4 stations / 4H	1 to 4H	
		Setting of the type of slave station Type of slave station / Setting / Type of slave station / Setting Remote I/O station / 0H / Local station / 2H Remote device station / 1H / Intelligent device station / 2H	0 to 2H	

*2: Perform the settings for as many connected modules involved in the communication as has been specified by the control data.

Reserved station specification data

Device	Item	Setting data	Setting range	Set by
(S3) + 0 to (S3) + 3	Settings for 1 to 64 modules *3	Specify the reserved stations. *4 0: Not specified 1: Specified (S3)+0: 16 15 14 13 to 4 3 2 1 (S3)+1: 32 31 30 29 to 20 19 18 17 (S3)+2: 48 47 46 45 to 36 35 34 33 (S3)+3: 64 63 62 61 to 52 51 50 49 1 to 64 in the above table indicate the station numbers. The default parameter is "No reserved station specification for all stations."	—	User

*3: Perform the settings for station numbers up to the largest station number set by the slave station setting data.

*4: Perform the settings only for the bit(s) of 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.

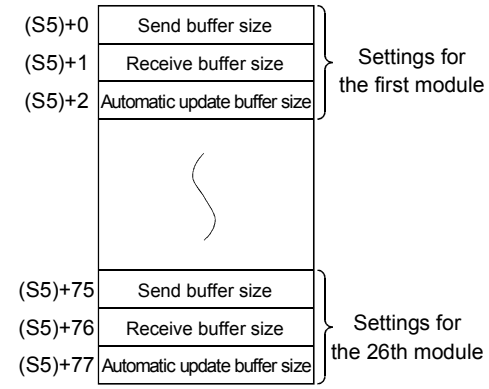
Error invalid station specification data

Device	Item	Setting data	Setting range	Set by
(S4) + 0 to (S4) + 3	Settings for 1 to 64 modules *5	Specify the error invalid station. *6 0: Not specified 1: Specified (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 above table indicate the station numbers. The default parameter is "No error invalid station specification for all stations".	—	User

*5: Perform the settings for station numbers up to the largest station number set by the slave station setting data.

*6: Perform the setting only for the bit(s) of 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 update buffer assignment data

Device	Item	Setting data	Setting range	Set by
(S5) + 0 to (S5) + 77	Settings for 1 to 26 modules *7	Specify assignments of the buffer memory size at a transient transmission to local stations and intelligent device stations.  The default parameter settings are "Send buffer size: 40H, receive buffer size: 40H, automatic update buffer size: 80H."	Send/receive buffer *8 : 0H (No setting), 40 H to 1000H word (64 to 4096 words) Automatic update buffer *9 : 0H (No setting), 80 H to 1000H word (128 to 4096 words)	User

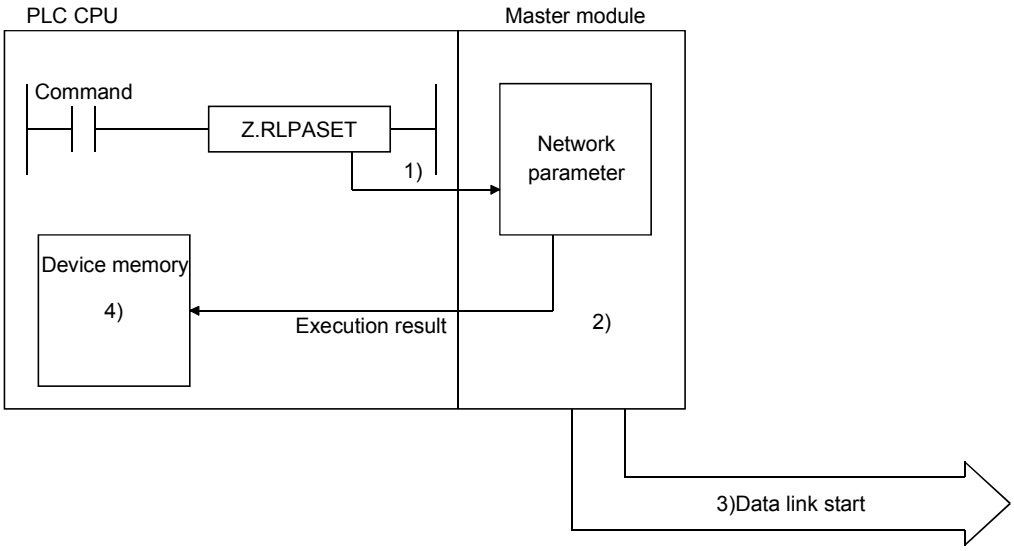
*7: Perform the settings for stations specified as local stations or intelligent device stations in the slave station setting data, starting from the smallest station number.

*8: Keep the total size of the send/receive buffer sizes at 1000H (4096 (words)) or less.
For the send/receive buffer size, specify the size that is calculated by adding 7 words to the data size to be sent or received.

*9: Keep the total size of the automatic update buffer sizes at 1000H (4096 (words)) or less.
Specify the necessary automatic update buffer size for each intelligent device station.

(1) Functions

(a) Operation chart for the RLPASET instruction



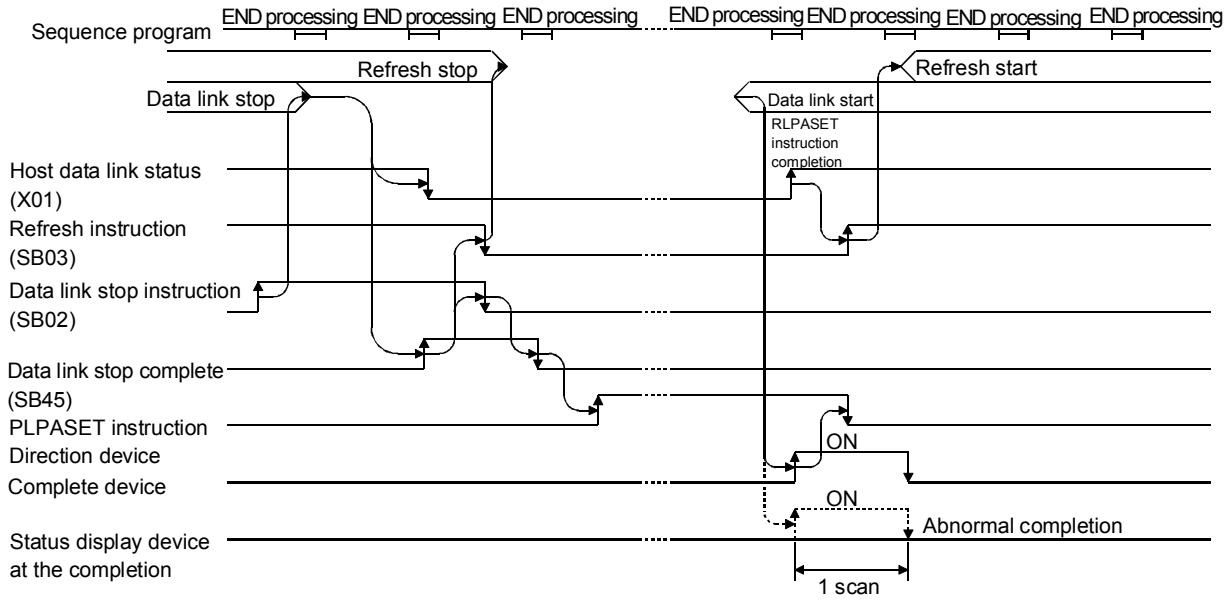
1) Pass the network parameters set in (S1) to (S5) to the master module specified by Un.
2) The master module analyzes the settings of the network parameters.
3) If the network parameter settings are correct, the data link is started.
4) The device specified by (D) turns ON.

(b) It is impossible to execute more than one RLPASET instruction simultaneously.

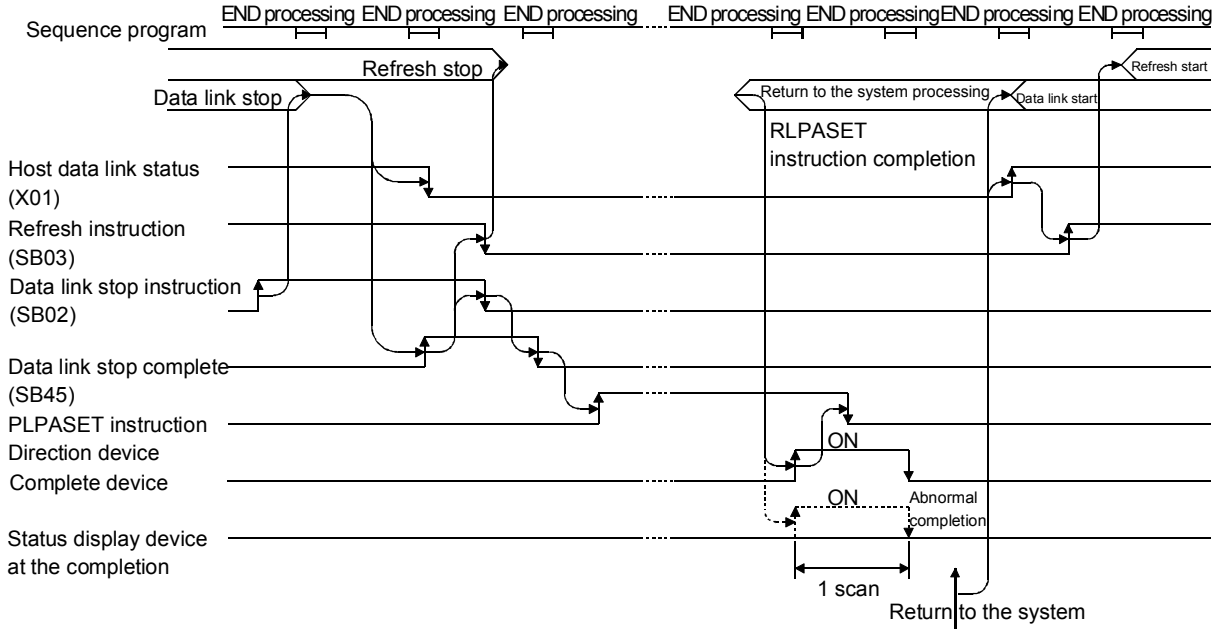
(c) There are two types of interlock signals for the RLPASET instruction: the completion device (D) and the status display device at the completion (D) + 1.

1) Completion device (D)
   Turns ON in the END processing of the scan where the RLPASET instruction is completed, and turns OFF in the next END processing.
2) Status display device at the completion (D)+1
   Turns ON and OFF depending on the completion status of the RLPASET instruction.
   Normal completion: Stays OFF and does not change.
   Abnormal completion: Turns ON in the END processing of the scan where the RLPASET instruction is completed, and turns OFF in the next END processing.

[When all the stations are normal]



[When all the stations are faulty]



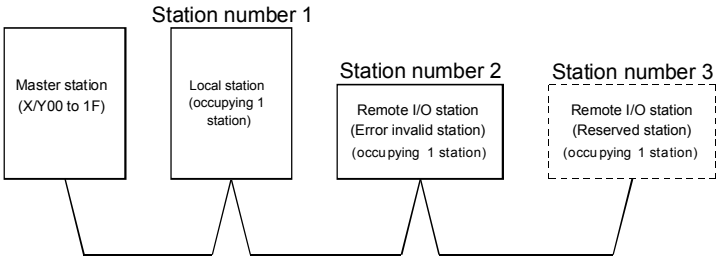
(4) Operation error

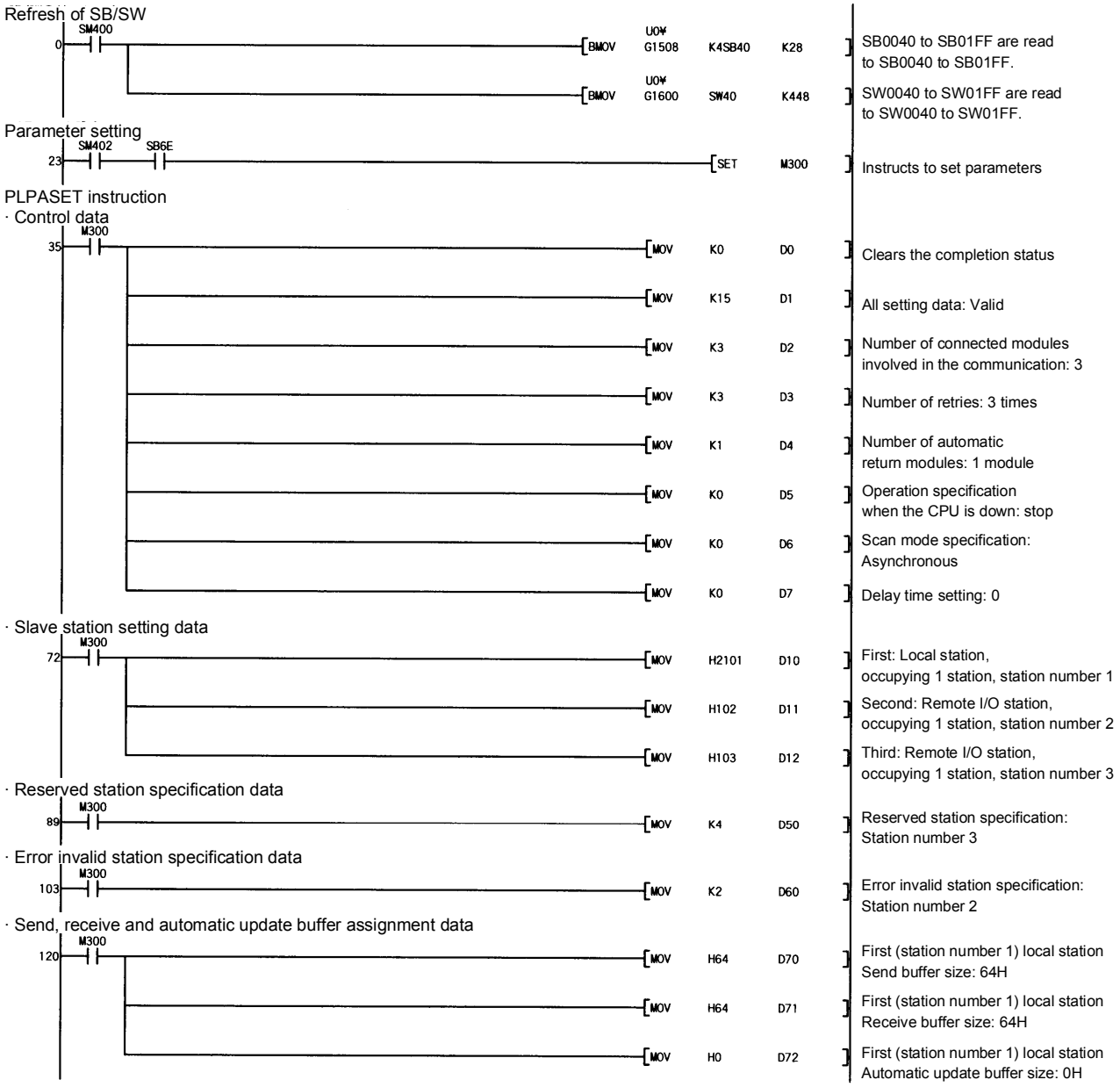
In the following cases, an operation error occurs; the error flag (SM0) turns ON and the error code is stored in SD0.

Error Code	Description of operation error
2112	When the module specified by Un is not an intelligent function module
4002	When an attempt was made to execute the unsupported instruction
4003	When the number of devices in the instruction is incorrect
4004	When the instruction specifies the device that cannot be used
4100	When the instruction contains the data that cannot be used
4101	1) 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 (including dummy devices) 2) The required size 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 update buffer assignment data: 78 points Example: Assume that data link registers D0 to D12287 are available for the Q02CPU. If the device start number of the slave station setting data is set to D12284 because there are only 4 slave stations, the PLC CPU checks the range from D12284 to D122347 (for 64 stations) and an error indicating that the available range is exceeded occurs.

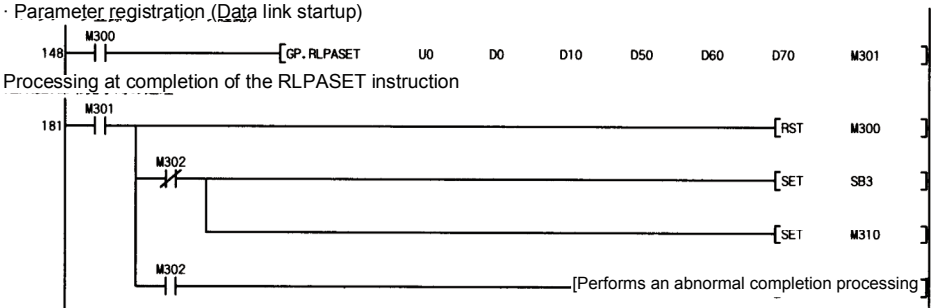
(5) Program example

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.





· Parameter registration (Data link startup)



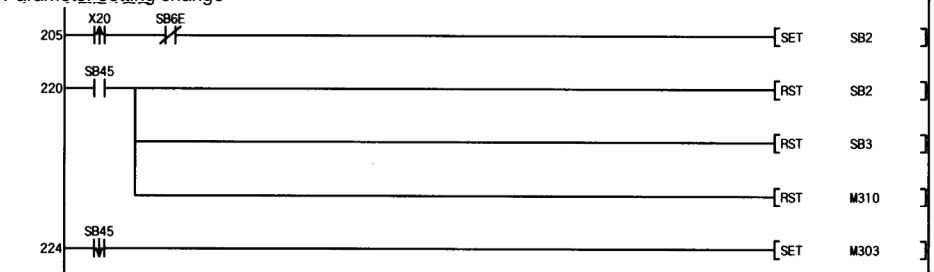
Processing at completion of the RLPASET instruction

Turns the parameter setting instruction OFF

Instructs to refresh at the normal completion of the RLPASET instruction

Instructs to start the control program at the normal completion of the RLPASET instruction

Parameter setting change



Instructs to stop the data link

Turns the data link stop instruction OFF

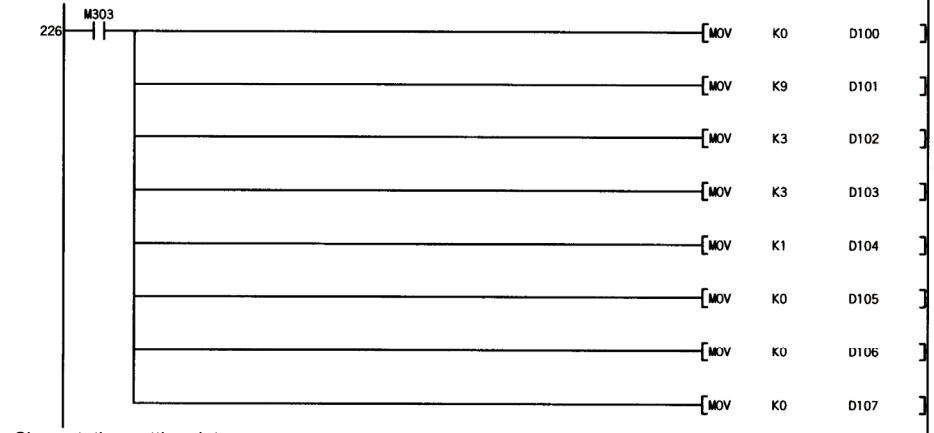
Instructs to stop refreshing

Instructs to stop the control program

Instructs to change parameters

RLPASET instruction

· Control data



Clears the completion status

Slave station setting data/ send, receive and automatic update buffer assignment data: Valid

Number of connected modules involved in communication: 3 modules

Number of retries: 3 times

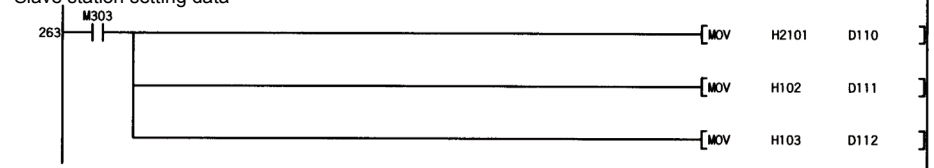
Number of automatic return modules: 1 module

Operation specification when the CPU is down: Stop

Scan mode specification: Asynchronous

Delay time setting: 0

· Slave station setting data

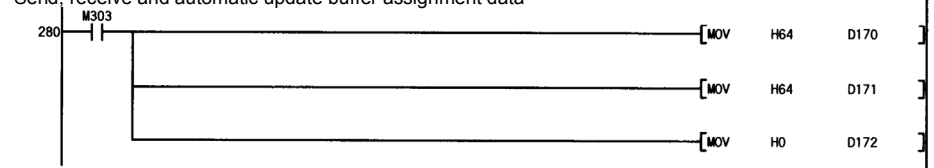


First: Local station, occupying 1 station, station number 1

Second: Remote I/O station, occupying 1 station, station number 2

Third: Remote I/O station, occupying 1 station, station number 3

· Send, receive and automatic update buffer assignment data



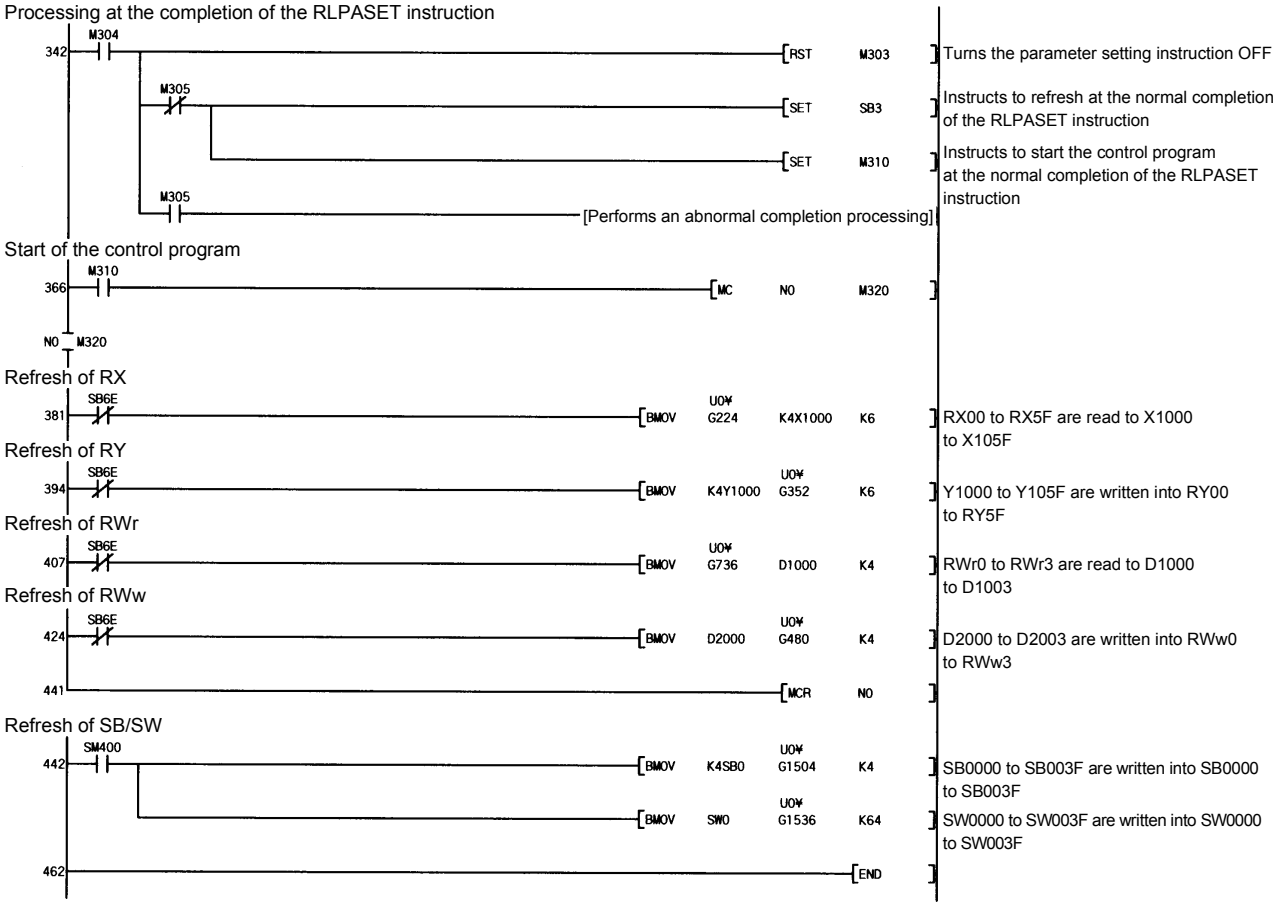
First (station number 1) local station Send buffer size: 64H

First (station number 1) local station Receive buffer size: 64H

First (station number 1) local station Automatic update buffer size: 0H

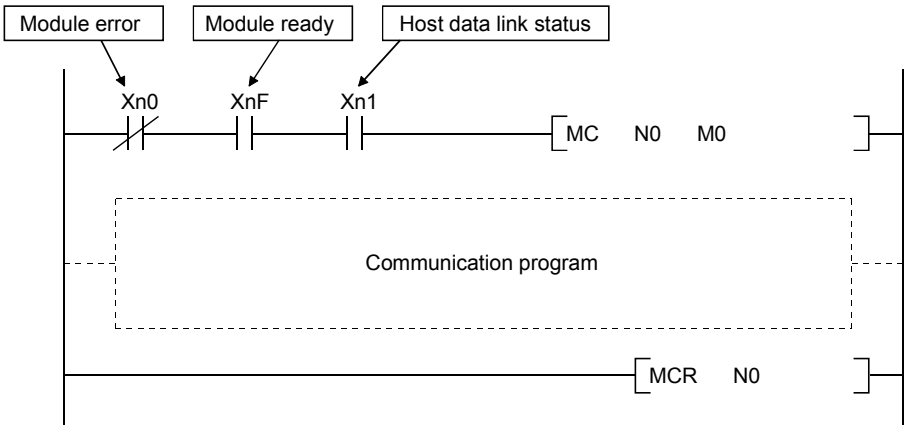
· Parameter registration (Data link startup)

Dedicated instruction (RLPASET)

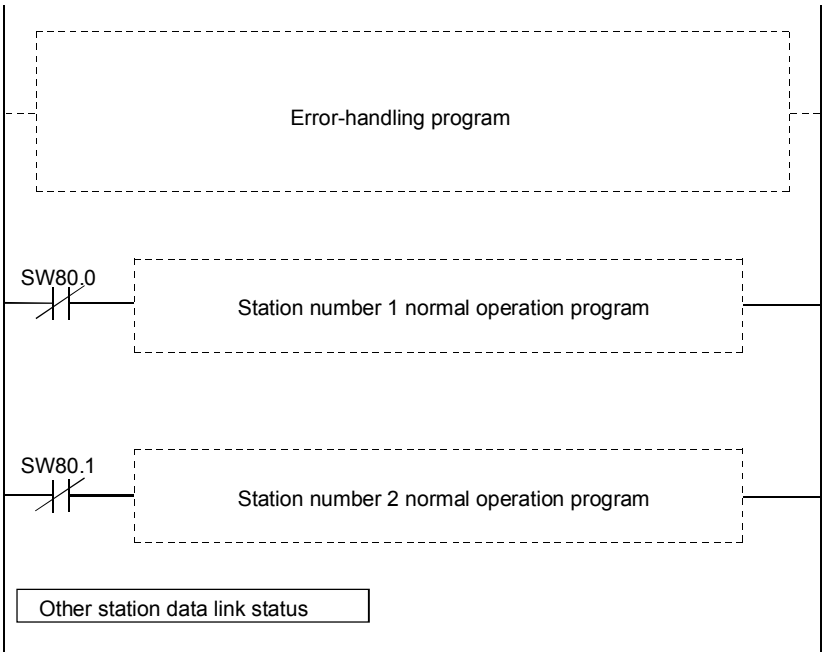

Processing at the completion of the RLPASET instruction
342 M304 RST M303 Turns the parameter setting instruction OFF
M305 SET SB3 Instructs to refresh at the normal completion of the RLPASET instruction
SET M310 Instructs to start the control program at the normal completion of the RLPASET instruction
M305 [Performs an abnormal completion processing]
Start of the control program
366 M310 MC N0 M320
N0 M320
Refresh of RX
381 SB6E BMOV U0¥G224 K4X1000 K6 RX00 to RX5F are read to X1000 to X105F
Refresh of RY
394 SB6E BMOV K4Y1000 U0¥G352 K6 Y1000 to Y105F are written into RY00 to RY5F
Refresh of RWr
407 SB6E BMOV U0¥G736 D1000 K4 RWr0 to RWr3 are read to D1000 to D1003
Refresh of RWw
424 SB6E BMOV D2000 U0¥G480 K4 D2000 to D2003 are written into RWw0 to RWw3
441 MCR N0
Refresh of SB/SW
442 SM400 BMOV K4SB0 U0¥G1504 K4 SB0000 to SB003F are written into SB0000 to SB003F
BMOV SW0 U0¥G1536 K64 SW0000 to SW003F are written into SW0000 to SW003F
462 END

MEMO

(1) Make a program that reads the receive data and writes the send data after the host has been set to the data link status (Xn1 is ON).



(2) Create a program that detects the data-link status and interlocks with the remote I/O stations, remote device stations and local stations.
In addition, create an error-handling program.



Appendix 6 List of AJ65BT-64AD I/O Signal and Remote Register Assignment

(1) List of I/O signals

The AJ65BT-64AD uses 32 points for input and 32 points for output in the data communication with the master module.

Signal direction: AJ65BT-64AD → Master module		Signal direction: Master module → AJ65BT-64AD	
Device No.	Signal name	Device No.	Signal name
RXn0	CH.1 A/D conversion completion flag	RYn0	Selection of offset/gain values
RXn1	CH.2 A/D conversion completion flag	RYn1	Voltage/current selection
RXn2	CH.3 A/D conversion completion flag	RYn2 to RY(n + 1)7	Use prohibited
RXn3	CH.4 A/D conversion completion flag		
RXn4 to RX(n + 1)7	Use prohibited		
RX(n + 1)8	Initial data processing request flag	RY(n + 1)8	Initial data processing completion flag
RX(n + 1)9	Initial data setting completion flag	RY(n + 1)9	Initial data setting request flag
RX(n + 1)A	Error status flag	RY(n + 1)A	Error reset request flag
RX(n + 1)B	Remote READY	RY(n + 1)B to RY(n + 1)F	Use prohibited
RX(n + 1)C to RX(n + 1)F	Use prohibited		

n : The address allocated from the master module by the station number setting

POINT
The functions as the AJ65BT-64AD cannot be guaranteed if the unusable device is turned on/off from the sequence program.

(2) Remote register assignment

Signal direction	Address	Description	Default values
Master → Remote	RWwm	Average processing setting	0
	RWwm + 1	CH1 average time, number of times	0
	RWwm + 2	CH2 average time, number of times	
	RWwm + 3	CH3 average time, number of times	
	RWwm + 4	CH4 average time, number of times	
	RWwm + 5	Data format	0
	RWwm + 6	A-D conversion enable/disable setting	0
	RWwm + 7	Use prohibited	—
Remote → Master	RWrn	CH1 digital output value	0
	RWrn + 1	CH2 digital output value	
	RWrn + 2	CH3 digital output value	
	RWrn + 3	CH4 digital output value	
	RWrn + 4	Error code	0
	RWrn + 5	Use prohibited	—
	RWrn + 6		
	RWrn + 7		

m, n: The address allocated from the master module by the station number setting

POINT
Do not read and write from/to the unusable remote register. The function as the AJ65BT-64AD cannot be guaranteed if the reading/writing is performed.

Appendix 7 List of AJ65BT-64DAV I/O Signal and Remote Register Assignment

(1) List of I/O signals

The AJ65BT-64DAV uses 32 points for input and 32 points for output on exchanging signals with the master station.

Signal direction: AJ65BT-64DAV → Master		Signal direction: Master → AJ65BT-64DAV	
Device No.	Signal name	Device No.	Signal name
RXn0 to RXnF	Use prohibited	RYn0	CH.1 analog output permission signal
		RYn1	CH.2 analog output permission signal
		RYn2	CH.3 analog output permission signal
		RYn3	CH.4 analog output permission signal
		RYn4	Selection of offset/gain values
		RYn5 to RYnF	Use prohibited
RX(n + 1)0 to RX(n + 1)7	Use prohibited	RY(n + 1)0 to RY(n + 1)7	Use prohibited
RX(n + 1)8	Initial data processing request flag	RY(n + 1)8	Initial data processing completion flag
RX(n + 1)9	Initial data setting completion flag	RY(n + 1)9	Initial data setting request flag
RX(n + 1)A	Error status flag	RY(n + 1)A	Error reset request flag
RX(n + 1)B	Remote READY	RY(n + 1)B	Use prohibited
RX(n + 1)C	Use prohibited	RY(n + 1)C	
RX(n + 1)D		RY(n + 1)D	
RX(n + 1)E	(Use prohibited: QnA)	RY(n + 1)E	(Use prohibited: QnA)
RX(n + 1)F		RY(n + 1)F	

n: The address allocated from the master station by the station number setting

POINT
The functions as the AJ65BT-64DAV cannot be guaranteed if the unusable device is turned on/off from the sequence program.

(2) Remote register assignment

Signal direction	Address	Description	Default values
Master → Remote	RWwm	CH.1 digital value setting area	0
	RWwm + 1	CH.2 digital value setting area	0
	RWwm + 2	CH.3 digital value setting area	0
	RWwm + 3	CH.4 digital value setting area	0
	RWwm + 4	Analog output enable/disable area	0
	RWwm + 5	Use prohibited	
	RWwm + 6		
	RWwm + 7		
Remote → Master	RWrn	CH.1 set value check code	0
	RWrn + 1	CH.2 set value check code	0
	RWrn + 2	CH.3 set value check code	0
	RWrn + 3	CH.4 set value check code	0
	RWrn + 4	Error Code	0
	RWrn + 5	Use prohibited	
	RWrn + 6		
	RWrn + 7		

m, n: The address allocated from the master station by the station number setting

POINT

Do not read and write from/to the unusable remote register. The function as the AJ65BT-64DAV cannot be guaranteed if the reading/writing is performed.

Appendix 8 I/O Signals and Buffer Memory for AJ65BT-R2

(1) List of I/O signals

Signal direction: Master module ← R2			Signal direction: Master module → R2		
Device No. (Input)	Signal name		Device No. (Output)	Signal name	
RXn0	Transmission normal complete		RYn0	Transmission request	
RXn1	Transmission error complete		RYn1	Transmission cancel request	
RXn2	Reception normal read request		RYn2	Reception read complete	
RXn3	Reception error read request		RYn3	Forced reception complete request	
RXn4	Initialization normal complete		RYn4	Initialization request	
RXn5	Initialization error complete		RYn5	Use prohibited	
RXn6	OS reception area clear complete		RYn6	OS reception area clear request	
RXn7	E2PROM function normal complete		RYn7	E2PROM function request	
RXn8	E2PROM function error complete		RYn8	Use prohibited	
RXn9	Signal status	CS(CTS) signal	RYn9	Signal setting	RS(RTS) signal *1
RXnA		DR(DSR) signal	RYnA		ER(DTR) signal *2
RXnB		CD signal	RYnB	Use prohibited	
RXnC to RXnD	General-purpose external input signal		RYnC to RYnD	General-purpose external output signal	
RXnE to RX(n+1)8	Use prohibited		RYnE to RY(n+1)8	Use prohibited	
RX(n+1)9	Initial data read complete		RY(n+1)9	Initial data read request	
RX(n+1)A	Error status		RY(n+1)A	Error reset request	
RX(n+1)B	Remote station ready		RY(n+1)B to RY(n+1)D	Use prohibited	
RX(n+1)C to RX(n+1)D	Use prohibited				
RX(n+1)E	Intelligent device station access complete		RY(n+1)E	Intelligent device station access request	
RX(n+1)F	Use prohibited		RY(n+1)F	Use prohibited	

n: The address allocated from the master module by the station number setting

*1: The RS signal setting is valid only when the "RS signal status designation (R2 101H)" is set to "Follow RYn9 ON/OFF (0)".

*2: The ER signal setting is invalid when the "Flow control designation (R2 100H)" is set to "Carry out the flow control. (DTR/DSR (ER/DR) control) (1)".

IMPORTANT

(1) Do not designate the RXn0 to RXn8, RXnE to RX(n+1)F, RYn0 to RYn8, RYnB or RYnE to RY(n+1)F signals with the following functions.
- Monitor target RX/RY for the monitor transmission function
- Reference RX/RY for the registration frame RX/RY/RW reference special character

(2) Do not output (turn ON) the usage prohibited RY signals.
If an output is carried out to the usage prohibited signal, the PLC system may malfunction.

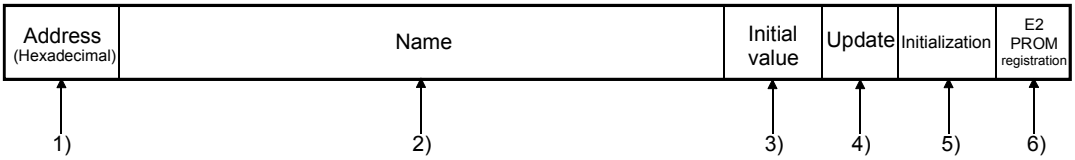
(2) Buffer memory list

The entire configuration of the AJ65BT-R2 (hereafter referred to as R2) is explained in this section.

The contents of the R2 buffer memory are reset to the default values when the power is turned OFF.

However, if the user has registered the default values in the R2 E2PROM, the E2PROM default values will be written in when the power is turned ON.

Refer to the buffer memory list in the following manner.



No.	Name	Details
1)	Address	Indicates R2 buffer memory address as a hexadecimal notation.
2)	Name	Indicates the name of the R2 buffer memory.
3)	Initial value	Indicates the default value at the R2 shipment.
4)	Update	Indicates whether the R2 buffer memory value is updated by the master station or R2. • M station : Updated by the master station • R2 : Updated by R2 • Both : Updated by both master station and R2.
5)	Initialization	Indicates whether an initialization is required when the R2 buffer memory values have been changed. Refer to the User's Manual of R2 for details on the initialization. • Required : An initialization is required. • Not required : An initialization is not required.
6)	E2PROM registration	Indicates whether the contents of the R2 buffer memory can be registered in the R2 E2PROM. Refer to the User's Manual of R2 for details on registering to the E2PROM. • Possible : The registration to the E2PROM is possible. • Not possible : The registration to the E2PROM is not possible.

(a) Area for designating various assignments

Address (hexadecimal)	Name			Initial value	Update	Initialization	E2PROM registration
R2 0H	Head address designation area		Transmission area head address designation	200H	Both	Required	Possible
R2 1H			Transmission area size designation	200H			
R2 2H			Reception area head address designation	400H			
R2 3H			Reception area size designation	200H			
R2 4H to FH	System area (Use prohibited)			—	—	—	—
R2 10H	Automatic update area designation (*1)	Status storage area	Transmission size	20H	Both	Required	Possible
R2 11H			R2 side head address	1A0H			
R2 12H			(Fixed value: 4004_H)	4004H			
R2 13H			Master station side offset address	1A0H			
R2 14H		Transmission area 1)	Transmission size	88H			
R2 15H			R2 side head address	118H			
R2 16H			(Fixed value: 4004_H)	4004H			
R2 17H			Master station side offset address	118H			
R2 18H		Transmission area 2)	Transmission size	200H			
R2 19H			R2 side head address	200H			
R2 1AH			(Fixed value: 4004_H)	4004H			
R2 1BH			Master station side offset address	200H			
R2 1CH		Reception area	Transmission size	200H			
R2 1DH			R2 side head address	400H			
R2 1EH			(Fixed value: 4004_H)	4004H			
R2 1FH			Master station side offset address	400H			
R2 20H		Initial setting area	Transmission size	1A0H			
R2 21H			R2 side head address	0H			
R2 22H			(Fixed value: 4004_H)	4004H			
R2 23H			Master station side offset address	0H			
R2 24H		E2PROM function area	Transmission size	30H			
R2 25H			R2 side head address	1C0H			
R2 26H			(Fixed value: 4004_H)	4004H			
R2 27H			Master station side offset address	1C0H			

Address (hexadecimal)	Name			Initial value	Update	Initialization	E2PROM registration
R2 28H	Automatic update area designation (*1)	User registration frame area	Transmission size	29H	Both	Required	Possible
R2 29H			R2 side head address	1C7H			
R2 2AH			(Fixed value: 4004_H)	4004H			
R2 2BH			Master station side offset address	1C7H			
R2 2CH		Monitor transmission area 1)	Transmission size	88H			
R2 2DH			R2 side head address	118H			
R2 2EH			(Fixed value: 4004_H)	4004H			
R2 2FH			Master station side offset address	118H			
R2 30H		Monitor transmission area 2)	Transmission size	200H			
R2 31H			R2 side head address	200H			
R2 32H			(Fixed value: 4004_H)	4004H			
R2 33H			Master station side offset address	200H			
R2 34H to 3FH	System area (Use prohibited)			—	—	—	—
R2 40H	RW update interval time designation			1	Both	Required	Possible
R2 41H	RWw update validity designation			0			
R2 42H	RWr update validity designation			1			
R2 43H	RW refresh destination address designation		Master station → R2 (RWw0)	118H			
R2 44H			R2 → Master station (RWr0)	1B0H			
R2 45H			Master station → R2 (RWw1)	119H			
R2 46H			R2 → Master station (RWr1)	1B1H			
R2 47H			Master station → R2 (RWw2)	120H			
R2 48H			R2 → Master station (RWr2)	1B2H			
R2 49H			Master station → R2 (RWw3)	121H			
R2 4AH			R2 → Master station (RWr3)	1B6H			
R2 4BH to 6FH	System area (Use prohibited)			—	—	—	—
R2 70H	Monitor interval time designation			0	Both	Required	Possible
R2 71H	No. of monitor designation			0			
R2 72H to 77H	System area (Use prohibited)			—	—	—	—
R2 78H	Monitor designation-1		Monitor target designation	0	Both	Required	Possible
R2 79H			Transmission data designation	0			

Address (hexadecimal)	Name		Initial value	Update	Initialization	E2PROM registration
R2 7AH	Monitor designation-2	Monitor target designation	0	Both	Required	Possible
R2 7BH		Transmission data designation	0			
R2 7CH to F5H	•		0			
R2 F6H	Monitor designation-64	Monitor target designation	0			
R2 F7H		Transmission data designation	0			
R2 F8H to FFH	System area (Use prohibited)		—	—	—	—

(b) Parameter area

Address (hexadecimal)	Name		Initial value	Update	Initialization	E2PROM registration
R2 100H	Flow control designation		1	Both	Required	Possible
R2 101H	RS (RTS) signal status designation		0			
R2 102H	Word/byte unit designation		0			
R2 103H	ASCII-BIN conversion designation		0			
R2 104H	Chinese character shift JIS/JIS conversion designation		0			
R2 105H	Transient timeout time designation		0			
R2 106H to 107H	System area (Use prohibited)		—	—	—	—
R2 108H	Reception head frame No.		0	Both	Required	Possible
R2 109H			0			
R2 10AH			0			
R2 10BH			0			
R2 10CH	Reception end frame No.		AH	Both	Required	Possible
R2 10DH			DH			
R2 10EH			0			
R2 10FH			0			
R2 110H	Reception head frame/reception end frame abort designation		1			
R2 111H	Reception end data size designation		0			
R2 112H	Reception timeout time designation		0			
R2 113H to 117H	System area (Use prohibited)		—	—	—	—
R2 118H	Transmission frame -1 area	Transmission head frame number	0	Both	Not required	Possible
R2 119H		Transmission end frame number	0			

Address (hexadecimal)	Name			Initial value	Update	Initialization	E2PROM registration
R2 11AH	Transmission timeout time designation			0	Both	Not required	Possible
R2 11BH to 11FH	System area (Use prohibited)			—	—	—	—
R2 120H	Transmission frame -2 area	Transmission table head number designation		0	Both	Not required	Possible
R2 121H		Number of transmission tables		0			
R2 122H		Transmission table designation	No. 1	0			
R2 123H to 184H			to				
R2 185H			No. 100				
R2 186H to 18FH	System area (Use prohibited)			—	—	—	—
R2 190H	Chinese character shift in/out change presence designation			0	Both	Not required	Possible
R2 191H	Chinese character shift in character count designation			3			
R2 192H	Chinese character shift out character count designation			3			
R2 193H	Chinese character shift in character designation			241BH			
R2 194H				40H			
R2 195H				0			
R2 196H				0			
R2 197H				0			
R2 198H	Chinese character shift out character designation			281BH			
R2 199H				48H			
R2 19AH				0			
R2 19BH				0			
R2 19CH				0			
R2 19DH to 19FH	System area (Use prohibited)			—	—	—	—

(c) Setting status storage area

Address (hexadecimal)	Name	Initial value	Update	Initialization	E2PROM registration
R2 1A0H	Station number setting switches	Depends on switch settings	R2	Not required	Not possible
R2 1A1H	Data link transmission speed setting switch				
R2 1A2H	Mode setting switch				
R2 1A3H	RS-232C transmission speed				
R2 1A4H	RS-232C data bit length				
R2 1A5H	RS-232C parity bit presence				
R2 1A6H	RS-232C stop bit length				
R2 1A7H	Buffer memory default value setting status storage	0			

(d) Communication status storage area

Address (hexadecimal)	Name		Initial value	Update	Initialization	E2PROM registration
R2 1A8H to 1AFH	Error code storage area	Error code history	0	R2	Not required	Not possible
R2 1B0H		General error code	0			
R2 1B1H		Error code at the transmission	0			
R2 1B2H		Error code at the reception	0			
R2 1B3H	System area (Use prohibited)		—	—	—	—
R2 1B4H	Actual transmission data size storage		0	R2	Not required	Not possible
R2 1B5H	Reception frame index number storage		0			
R2 1B6H	Data size storage in OS reception area		0			
R2 1B7H to 1BEH	System area (Use prohibited)		—	—	—	—
R2 1BFH	Software version storage		Depends on version	R2	Not required	Not possible

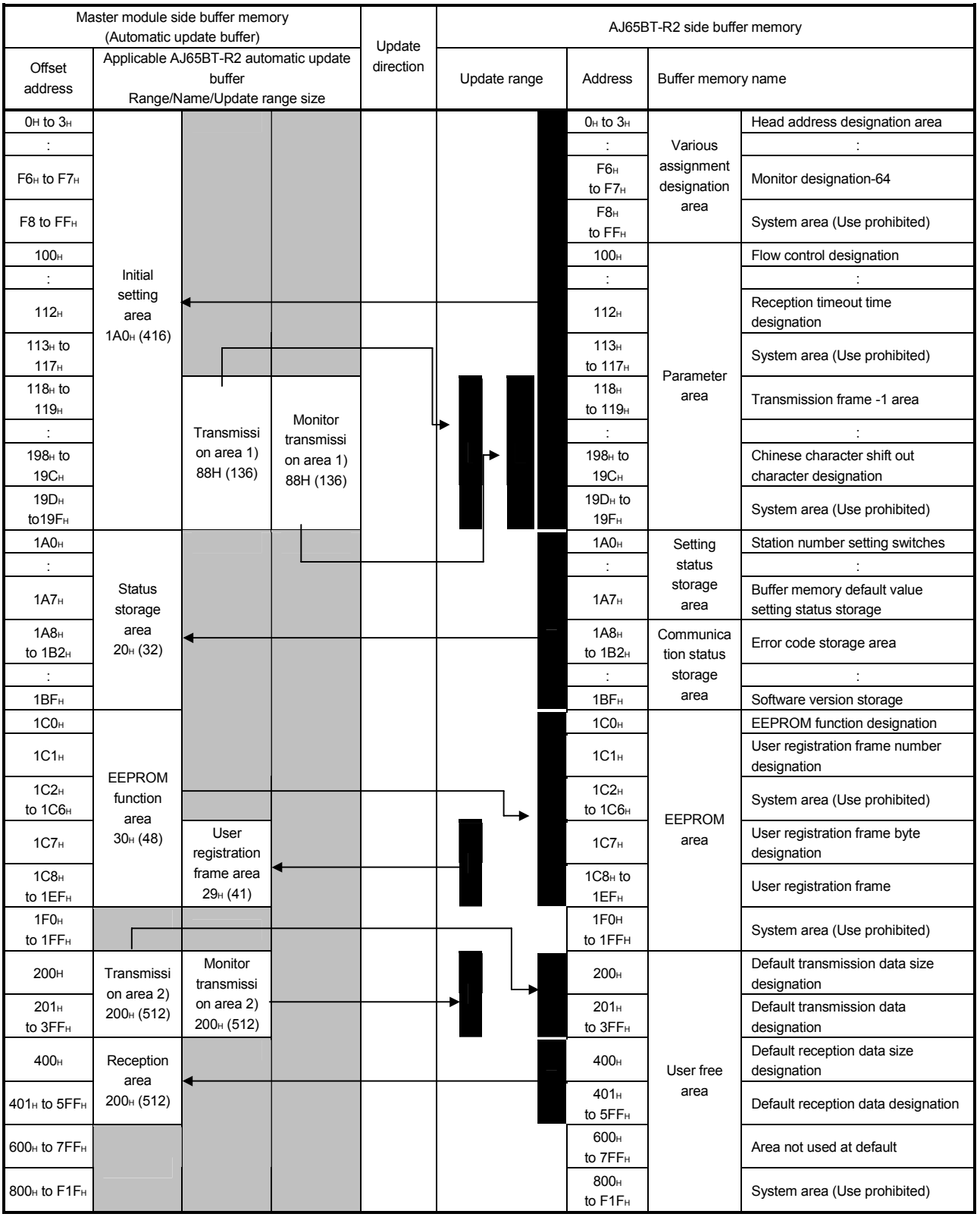
(e) E2PROM area

Address (hexadecimal)	Name	Initial value	Update	Initialization	E2PROM registration
R2 1C0H	E2PROM function designation	0	M station	Not required	Not possible
R2 1C1H	User-registered frame number designation	0			
R2 1C2H to 1C6H	System area (Use prohibited)	—	—	—	—
R2 1C7H	User-registered frame byte designation	0	Both	Not required	Not possible
R2 1C8H to 1EFH	User-registered frame	0			
R2 1F0H to 1FFH	System area (Use prohibited)	—	—	—	—

(f) User free area

Address (hexadecimal)	Name	Initial value	Update	Initialization	E2PROM registration
R2 200H	Default transmission data size designation area	0	M station	Not required	Not possible
R2 201H to 3FFH	Default transmission data designation area	0			
R2 400H	Default reception data size designation area	0	R2	Not required	Not possible
R2 401H to 5FFH	Default reception data designation area	0			
R2 600H to 7FFH	Area not used at default	0	Depends on the setting of communi-cation area	Not required	Not possible
R2 800H to F1FH	System area (Use prohibited)	—	—	—	—

*1: The data update between the automatic update buffer of master module and the buffer memory of AJ65BT-R2 is automatically performed when the update condition set for the update area is satisfied.
In addition, the data update direction with the automatic update is predetermined and the data within the applicable range of master module or AJ65BT-R2 is automatically updated.
The following list shows the assignment range with the default value of automatic update buffer memory which is set to AJ65BT-R2 and the data update direction.



(Automatic update timing) M: Master module R2: AJ65BT-R2)

The following outlines the update condition set to each update area.

1) Initial setting area (update direction: R2→M)
   When AJ65BT-R2 received the initial data read request (RY19: OFF→ON) from the PLC CPU

2) Initial setting area (update direction : M→R2)
   When AJ65BT-R2 received the initialization request (RY4: OFF→ON) from the PLC CPU

3) Transmission area 1), Transmission area 2) (update direction: M→R2)
   When AJ65BT-R2 received the transmission request (RY0: OFF→ON) from the PLC CPU

4) Monitor transmission area 1), Monitor transmission area 2) (update direction: M→R2)
   When AJ65BT-R2 detects that the monitor transmission condition set to AJ65BT-R2 is satisfied with using the monitor transmission function of AJ65BT-R2.

5) Status storage area (update direction: R2→M)
   - When AJ65BT-R2 notifies the transmission result (normal or abnormal) (RXn0/RXn1: OFF→ON) to the PLC CPU.
   - When AJ65BT-R2 notifies the receive data reading request (RXn2/RXn3: OFF→ON) to the PLC CPU.
   - When AJ65BT-R2 notifies the processing result of initialization (normal or abnormal) (RXn4/RXn5: OFF→ON) to PLC CPU.
   - When AJ65BT-R2 notifies the processing result of initialization (normal or abnormal) (RXn7/RXn8: OFF→ON) to the PLC CPU with using the EEPROM function of AJ65BT-R2.
   - When AJ65BT-R2 was received the error reset request (RY1A: OFF→ON) from the PLC CPU.
   - When AJ65BT-R2 detects an error while sending data to external devices using the monitor transmission function of AJ65BT-R2.
   - When AJ65BT-R2 notifies the initial data read complete (RX19: OFF→ON) to the PLC CPU.

6) EEPROM function area (update direction: M→R2)
   When AJ65BT-R2 receives the request for using AJ65BT-R2 EEPROM function (RYn7: OFF→ON) from the PLC CPU.

7) User registration frame area (update direction: R2→M)
   When AJ65BT-R2 notifies the requested processing result (normal/abnormal) (RXn7/RXn8: OFF→ON) to the PLC CPU while using the AJ65BT-R2 EEPROM function.

8) Reception area (update direction: R2→M)
   When AJ65BT-R2 notifies the receive data read request (RXn2/RXn3: OFF→ON) to the PLC CPU .

Appendix 9 List of FR-E520-0.1KN I/O Signals and Remote Register Assignment

(1) List of I/O signals

Signal direction: FR-E520-0.1KN → Master		Signal direction: Master → FR-E520-0.1KN	
Device No.	Signal name	Device No.	Signal name
RXn0	Forward running	RYn0	Forward rotation command (STF)
RXn1	Reverse running	RYn1	Reserve rotation command (STR)
RXn2	Running (RUN) *2	RYn2	RH terminal function *1
RXn3	Up to frequency (SU)	RYn3	RM terminal function *1
RXn4	Overload (OL)	RYn4	RL terminal function *1
RXn5	Unused (reserved for the system)	RYn5	Unused (reserved for the system) *3
RXn6	Frequency detection (FU) *2	RYn6	
RXn7	Abnormal (ABC) *2	RYn7	
RXn8	Unused (reserved for the system)	RYn8	
RXn9		RYn9	Output halt *1
RXnA		RYnA	Unused (reserved for the system) *3
RXnB		RYnB	
RXnC	Monitoring	RYnC	Monitor command
RXnD	Frequency setting completion (RAM)	RYnD	Frequency setting command (RAM)
RXnE	Frequency setting completion (E2PROM)	RYnE	Frequency setting command (E2PROM)
RXnF	Instruction code execution completion	RYnF	Instruction code execution request
RX(n + 1)0	Unused (reserved for the system)	RY(n + 1)0	Unused (reserved for the system) *3
RX(n + 1)1		RY(n + 1)1	
RX(n + 1)2		RY(n + 1)2	
RX(n + 1)3		RY(n + 1)3	
RX(n + 1)4		RY(n + 1)4	
RX(n + 1)5		RY(n + 1)5	
RX(n + 1)6		RY(n + 1)6	
RX(n + 1)7		RY(n + 1)7	
RX(n + 1)8		RY(n + 1)8	
RX(n + 1)9		RY(n + 1)9	
RX(n + 1)A	Error status flag	RY(n + 1)A	Error reset request flag
RX(n + 1)B	Remote READY	RY(n + 1)B	Unused (reserved for the system) *3
RX(n + 1)C	Unused (reserved for the system)	RY(n + 1)C	
RX(n + 1)D		RY(n + 1)D	
RX(n + 1)E		RY(n + 1)E	
RX(n +1)F		RY(n + 1)F	

n: The address allocated from the master station by the station number setting

*1: Using Pr. 180 to Pr. 183 (the input terminal (remote output) signal function selection), you can change the signal function. (However, any functions cannot turn ON or OFF the instruction with CC-Link.)

*2: Using Pr. 190 to Pr. 192 (the output terminal (remote output) function selection), you can change the output contents.

*3: The unused output signal should be OFF. (Enter 0)

POINT
The functions as the FR-E520-0.1KN cannot be guaranteed if the unused device is turned on/off from the sequence program.

(2) Remote register assignment

Signal direction	Address	Signal name	Description
Master → Remote	RWwm	Monitor code	Set the monitor code to be referenced. By switching ON the RYC signal after setting, the specified monitor data is set to RWr0.
	RWwm + 1	Set frequency	Specify the set frequency. At this time, whether it is written to RAM or E2PROM is distinguished by the RYD and RYE signals. After setting the frequency to this register, switch ON the above RYD or RYE to write the frequency. On the completion of frequency write, RXD or RXE switches ON in response to the input command.
	RWwm + 2	Instruction code	Set the instruction code for execution of operation mode rewrite, Pr. read/write, error reference, error clear, etc. The corresponding instruction is executed by switching ON RYF after the completion of register setting. RXF switches ON after completion of instruction execution.
	RWwm + 3	Write data	Set the data specified by the above instruction code. (As required) Switch RYF ON after setting the above instruction code and this register. Set zero when the write code is not required.
Remote → Master	RWrn	Monitored value	The monitored value specified by RWwm is set.
	RWrn + 1	Output frequency	The present output frequency is always set.
	RWrn + 2	Replay code	The replay code corresponding to the RWm +2 instruction code is set. 0 is set for a normal replay, and a value other than 0 is set for a data error.
	RWrn + 3	Read data	For a normal replay, the replay data to the instruction specified by the instruction code is set.

m, n: The address allocated from the master module by the station number setting

Appendix 10 RX, RY, RWr and RWw Buffer Memory Assignment

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

(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.

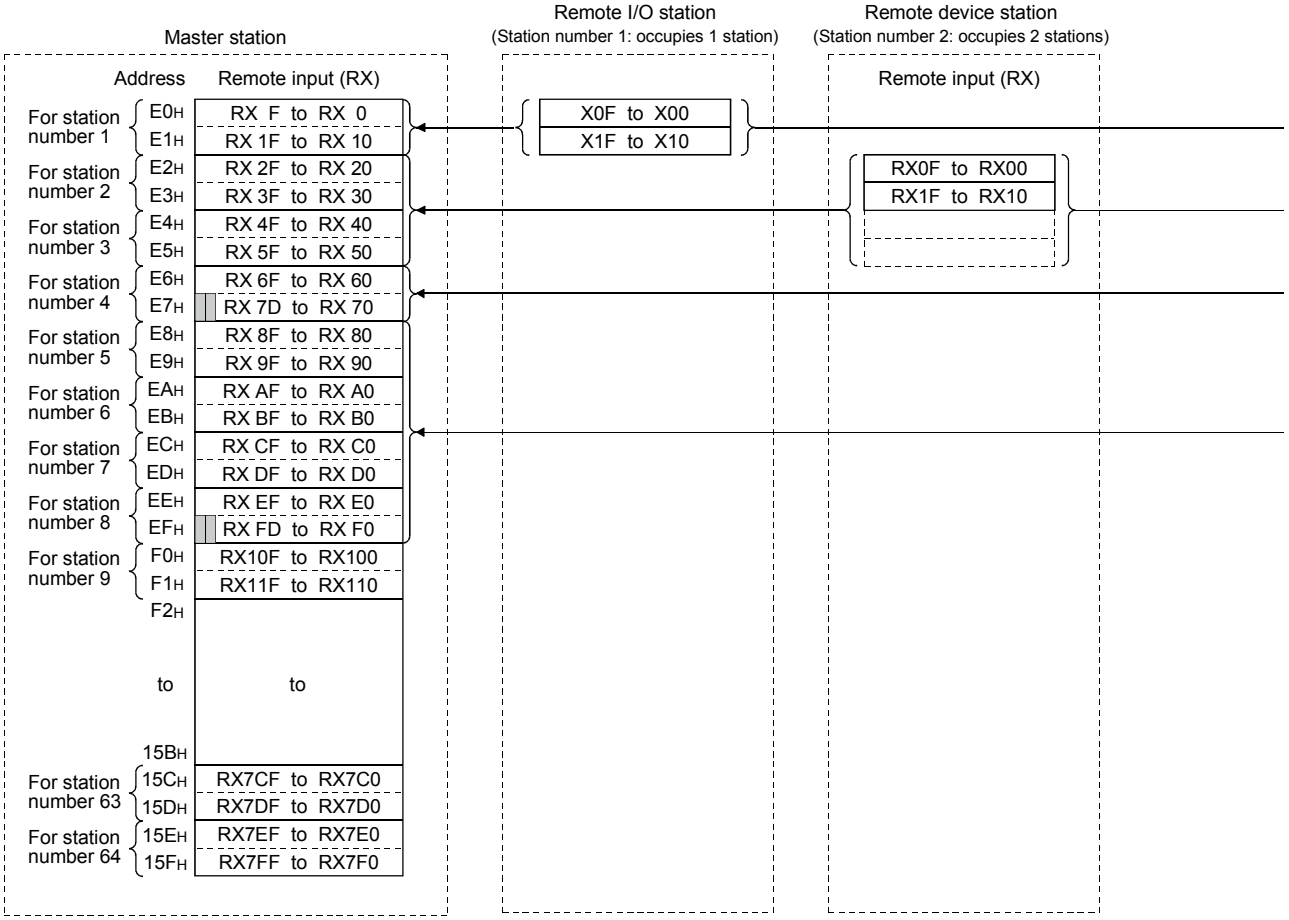


Table of buffer memories and corresponding station numbers of the master station

Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address
1	$E0_H$ 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	-	-

2) Local station

- The 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.

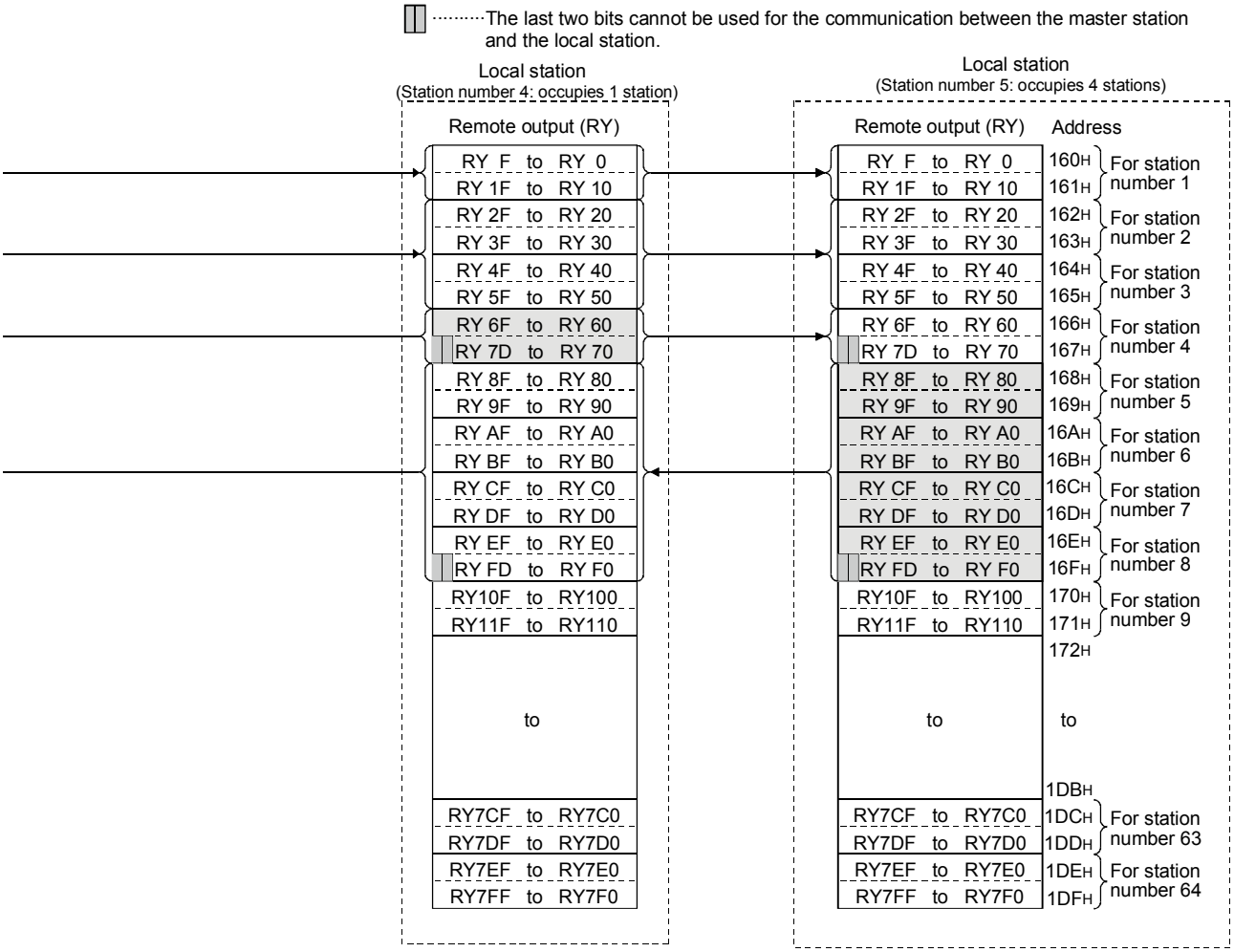


Table of buffer memory addresses and corresponding station numbers of local station

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

(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.

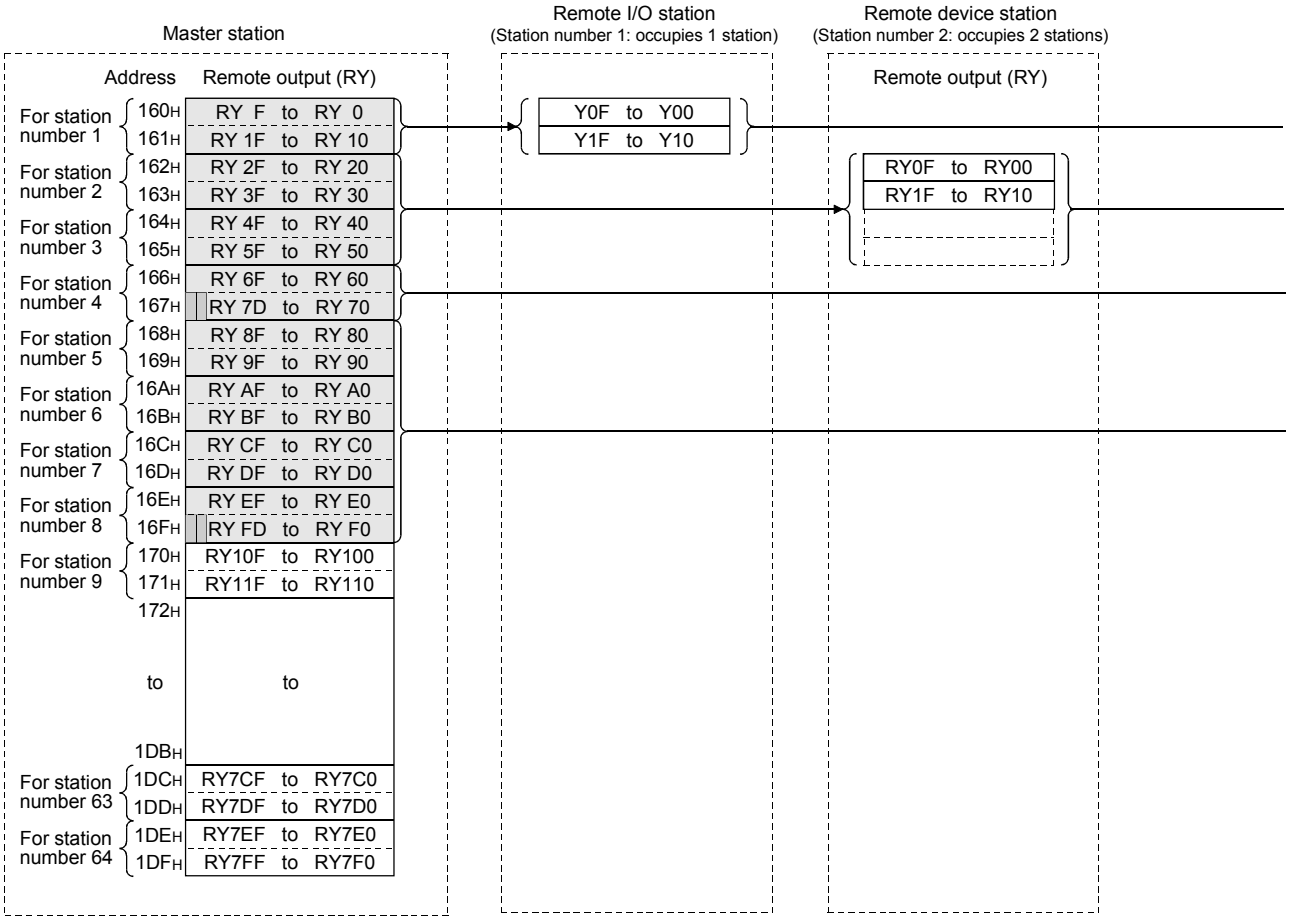


Table of buffer memory addresses and corresponding station numbers of master station

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

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.

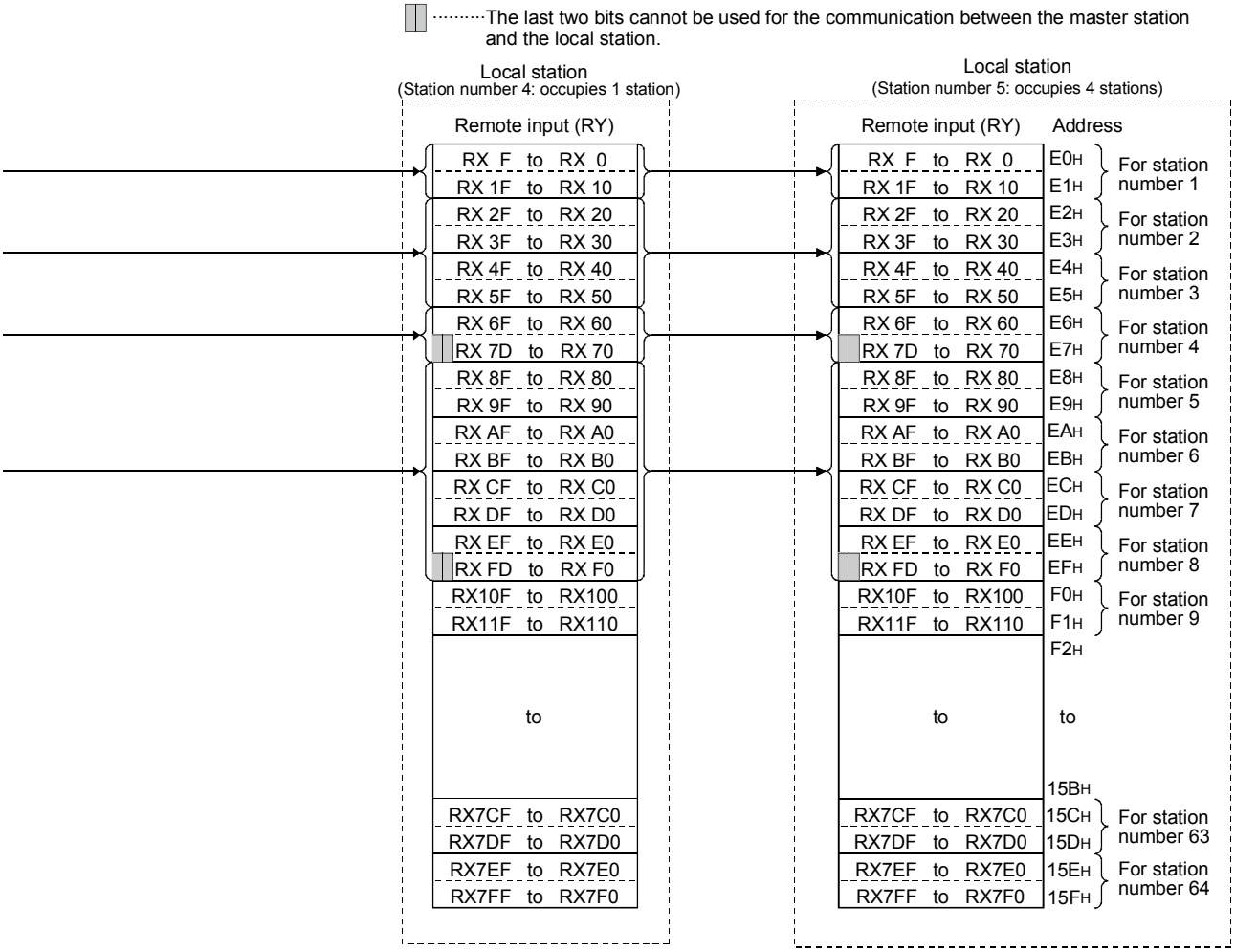


Table of buffer memories and corresponding station numbers of local station

Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address	Station No.	Buffer memory address
1	$E0_H$ 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	-	-

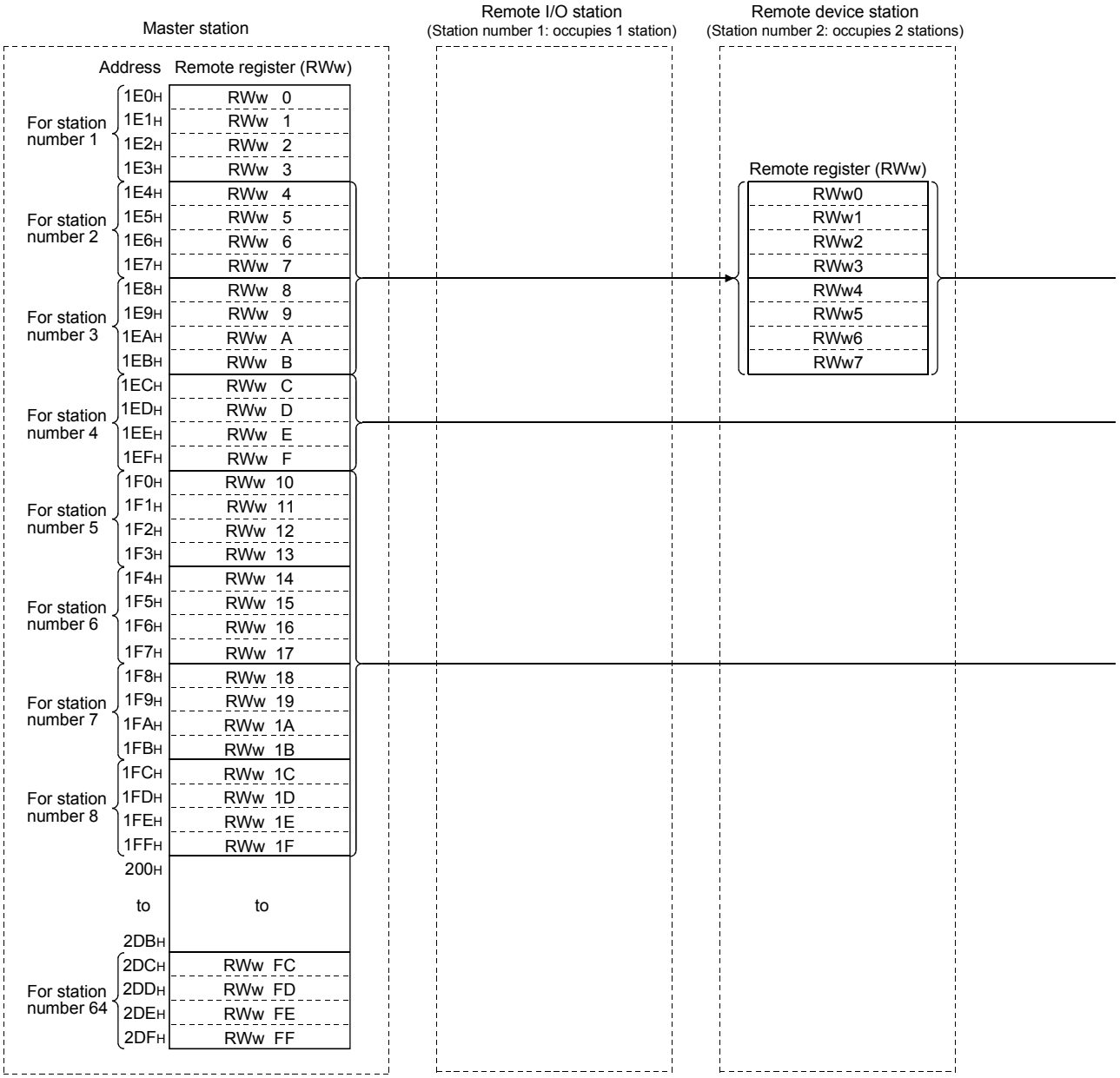
(3) Remote registers (RWw) and (RWr)

(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 remote device station and the remote registers (RWr) of all local stations are stored.

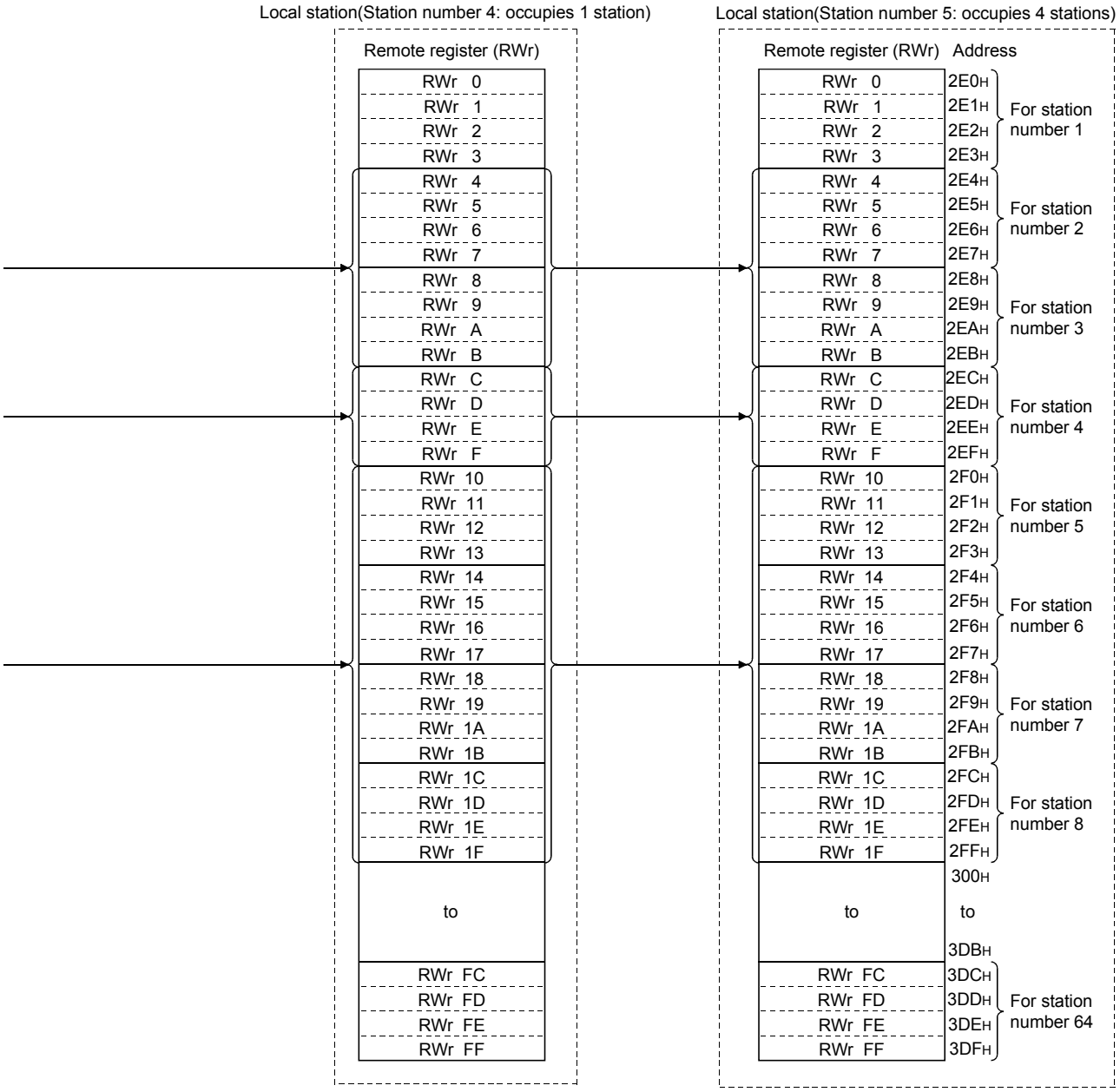
• Four words are used per station.



2) Local station

• The data sent to the remote register (RWw) of remote device station can also be received.

• Four words are used per station.



The following tables show the relationship between station numbers and buffer memory addresses to be used.

[Master station]

Table of station numbers and corresponding buffer memory addresses

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

[Local station]

Table of station numbers and corresponding buffer memory addresses

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

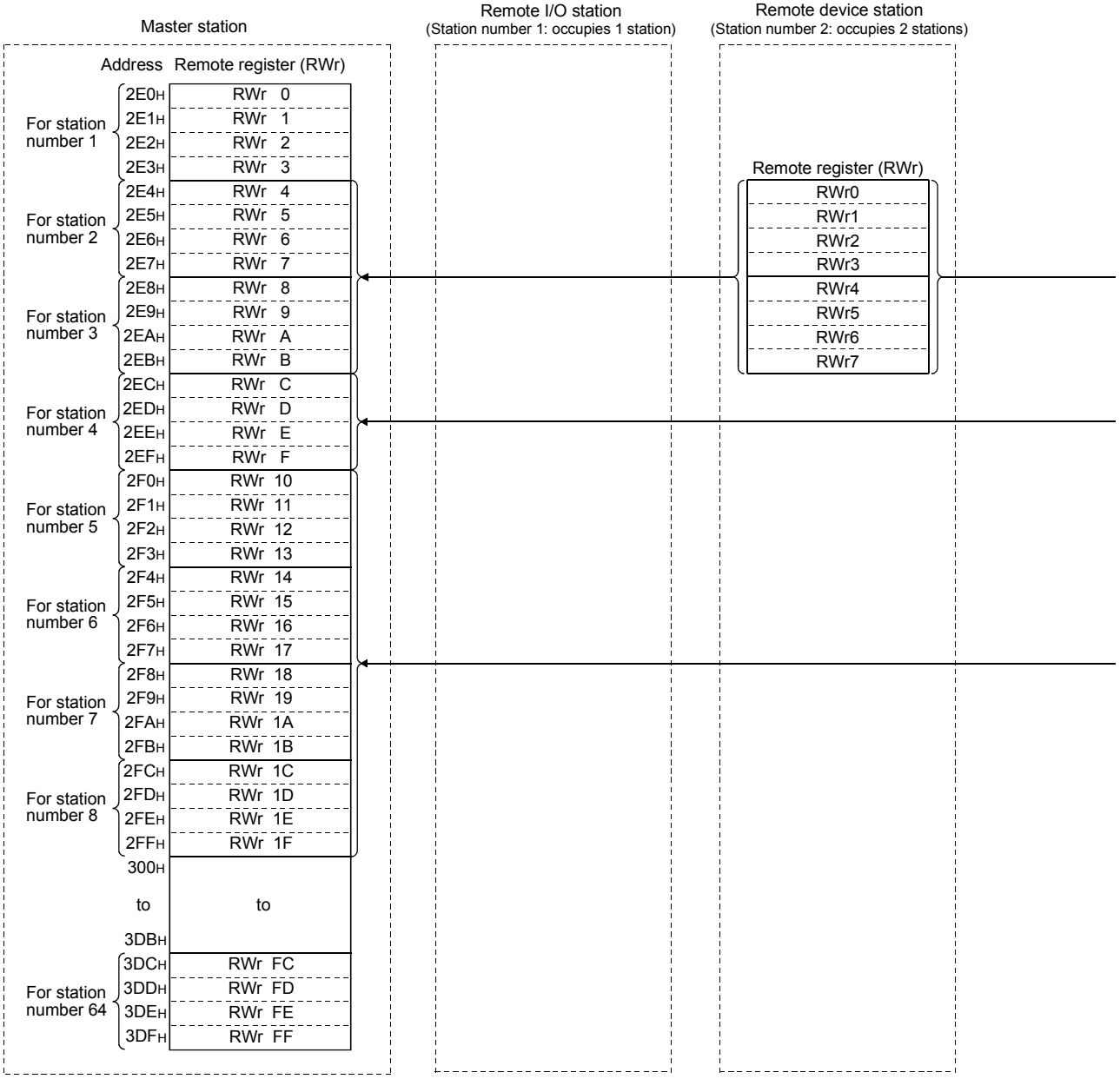
MEMO

(b) Master station (RWr)←Remote device station (RWr)/Local station (RWw)

1) Master station

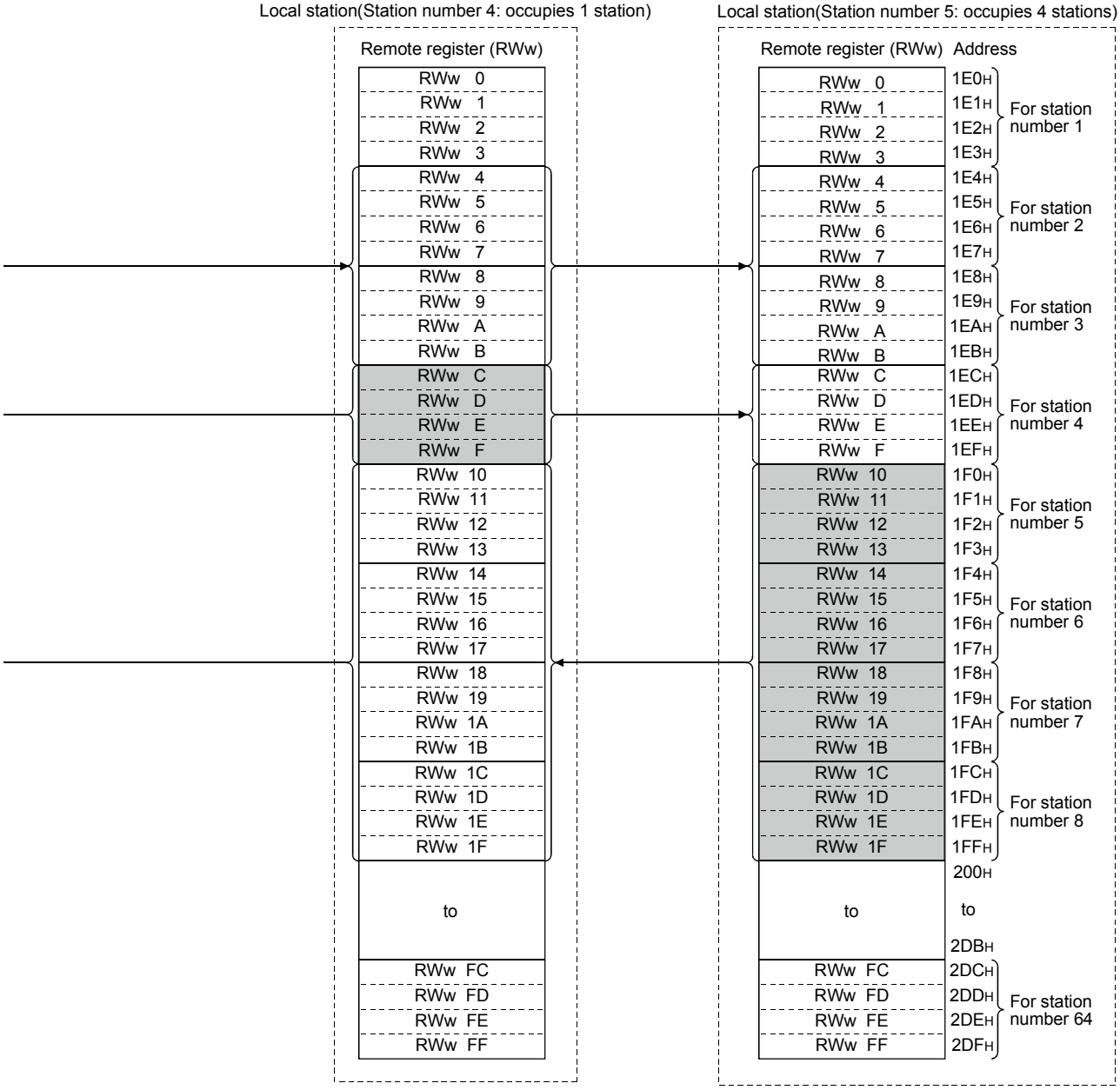
• The send data from the remote register (RWr) of remote device station and the remote register (RWw) of local station is stored.

• Four words are used per station.



2) Local station

- The data is sent to the master station and other local stations by storing it in the address corresponding to the host station number.
- The data in the remote register (RWr) of remote device station can also be received.



The following tables show the relationship between station numbers and buffer memory addresses to be used.

[Master station]

Table of station numbers and corresponding buffer memory addresses

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

[Local station]

Table of station numbers and corresponding buffer memory addresses

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

(4) Link special relay (SB)

The link special relays store the data link status using the bit ON/OFF data.

The buffer memory addresses 5E0H to 5FFH correspond to the link special relays SB0000 to SB01FF.

For details on the link special relays (SB0000 to SB01FF), refer to Appendix 3.

The following table shows the relationship between the buffer memory addresses 5E0H to 5FFH and the link special relays SB0000 to SB01FF.

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

(5) Link special registers (SW)

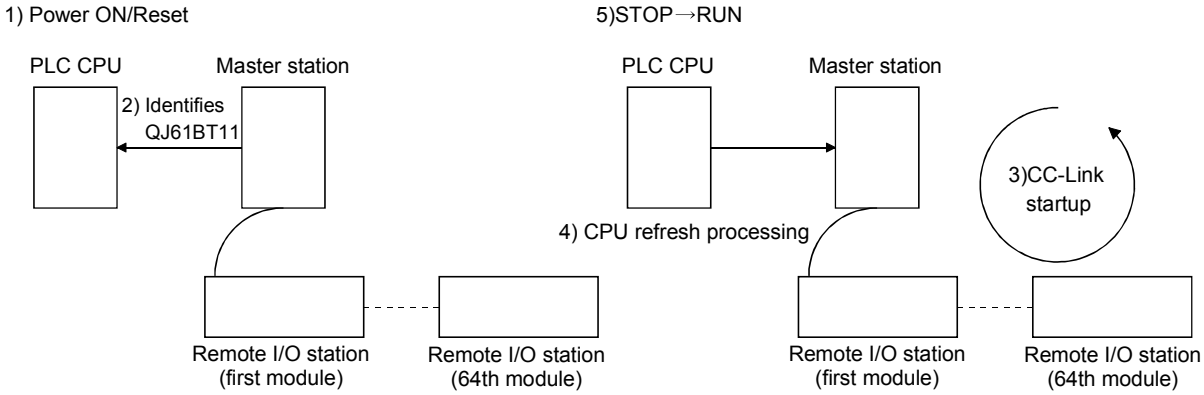
The link special registers store the data link status using word data. The buffer memory addresses 600H to 7FFH correspond to the link special registers SW0000 to SW01FF. For more details on the link special registers (SW0000 to SW01FF), refer to Appendix 3.

Appendix 11 Method for Enabling the Data Link Simply by Powering On (Automatic CC-Link Startup)

When the system is configured by connecting the remote I/O station, remote device station and intelligent device station to the QJ61BT11 of the master station, this data link allows the CC-Link startup and the complete data refresh to be automatically performed by just turning on the power.

By using this function, a sequence program, which performs the CC-link startup and the complete data refresh, is no longer required.

However, when the total number of connected stations is less than 64, it is necessary to set the network parameters in order to optimize the link scan time.



REMARK

For the QJ61BT11 of the function version A, the automatic CC-Link startup can be performed with a system configuration only of the master station and remote I/O stations.

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

The following lists the contents of the default automatic refresh parameter settings, network parameter settings, and buffer memory size specifications for the intelligent device station when the automatic CC-Link starts up.

Content of default automatic refresh parameter settings

Q02/Q02H/Q06H/ Q12H/Q25HCPU side	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 W6FF	←	RWr00 to RWrFF
W1F00 to W1FFF	→	RWw00 to RWwFF	W700 to W7FF	→	RWw00 to RWwFF
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	Online (Remote net mode)	Standby master station number	No standby master station is specified.
Total number of connected stations	64 stations	CPU down specification	Data link stop when a master station CPU error occurs
Number of retries	3 times	Scan mode setting	Asynchronous
Number of automatic return modules	1 module	Delay time setting	No delay time is specified.

Content of buffer memory size specifications for the intelligent device station

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

POINT

(1) If the automatic CC-Link startup is performed on a system that includes a local station, the local station will occupy one station during the operation.

(2) Make sure to perform line tests for all stations if the automatic CC-Link startup is performed and changes for the replacement of a module, etc. are made to the system during the 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.

(3) If the automatic CC-Link startup was performed, a temporary error invalid station cannot be used.

(4) In case of a multiple PLC system where each CPU controls several QJ61BT11 modules, the automatic CC-Link startup is performed on the QJ61BT11 that has the smallest head I/O number.

(2) Execution conditions

(a) When the parameters are not set, the automatic CC-Link startup function is applicable only to one "QJ61BT11".
Even when more than one QJ61BT11 are mounted on the base unit, the automatic CC-Link startup function is applicable only to the first one.
It is applied to the QJ61BT11 that has the smallest start I/O number, as seen from the PLC CPU side.

(b) When performing the automatic CC-Link startup without setting the parameters, up to three MELSECNET/10H modules can be used on the master station CPU.

MEMO

Mitsubishi Programmable Logic Controller Training Manual
CC-Link course(Q-series)

MODEL	SCHOOL-Q-CCLINK-E
MODEL CODE	13JW53
SH(NA)-080620ENG-A(0601)MEE	

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN